DISTORTIONS TO AGRICULTURAL INCENTIVES IN EUROPE'S TRANSITION ECONOMIES

Editors
Kym Anderson • Johan Swinnen

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DEDICATION

To the authors of the country case studies and their assistants, especially for generating the time series of distortion estimates that underpin the chapters; and to our long-suffering wives, Bron and Martine, for putting up with our long working hours and frequent absences from home while completing this book.

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ACKNOWLEDGMENTS

This book provides an overview of the evolution of distortions to agricultural incentives caused by price and trade policies in the World Bank–defined region of Europe and Central Asia (in which Europe refers to Central and Eastern Europe). It includes commissioned country and subregional studies of the 10 transition economies of Central and Eastern Europe that joined the European Union in 2004 or 2007, of seven other large member countries of the Commonwealth of Independent States, and of Turkey. Together these 18 countries account for 89 percent of the region's agricultural value added, 91 percent of the population, and 95 percent of total gross domestic product. The country studies are preceded by an introduction and overview chapter and are followed by an appendix that provides information on the methodology used to measure the nominal and relative rates of assistance to farmers and of taxes and subsidies related to food consumption.

To the authors of the country case studies, who are listed on the following pages, we are extremely grateful for the dedicated way in which they have delivered far more than we could have reasonably expected. Benoit Blarel and Holger Kray of the World Bank's Europe and Central Asia Region provided much appreciated guidance and administrative support throughout the drafting of the report and the related work. Karen Brooks, Maurizio Guadagni, and John Nash reviewed the study proposal and the final report to the region and provided generous and insightful advice and assistance throughout the project. Participants in the draft review meeting also supplied helpful suggestions, as did some of the World Bank's country directors in the countries studied. Marianne Kurzweil, Damiano Sandri, and Ernesto Valenzuela generously assisted in compiling material for the opening overview chapter, and Marianne Kurzweil also assisted, together with Marie Damania, in copyediting the country chapters. Our thanks go to the Europe and

Central Asia Region of the World Bank and to the trust funds for financial assistance from the governments of the Netherlands and the United Kingdom. This support has made it possible for the particular set of countries to be included as part of a wider study that also encompasses around 40 developing countries and 20 high-income countries. Three companion volumes to this one examine our case studies of developing countries in a similar way, but for a much longer time period (back to the mid-1950s or early 1960s). Also published in 2008, these volumes cover Africa (coedited by Kym Anderson and Will Masters), Asia (coedited by Kym Anderson and Will Martin), and Latin America (coedited by Kym Anderson and Alberto Valdés). A global overview volume edited by Kym Anderson will also be published. For all of this work, but especially for the work on this European volume, we are extremely grateful to the OECD for providing access to their data, and to Olga Melyukhina for her many useful comments on our work in progress.

Last but certainly not least, we thank our wives and children for tolerating the long hours we have needed at our desks to complete this project.

Kym Anderson and Johan Swinnen
May 2008

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ABBREVIATIONS AND ACRONYMS

ARIP	Agricultural Reform Implementation Project
ASCU	agricultural sales cooperative union
CAP	common agricultural policy (EU)
CEFTA	Central European Free Trade Agreement
CIS	Commonwealth of Independent States: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, the Kyrgyz Republic, Moldova, the Russian Federation, Tajikistan, Turkmenistan (associate member), Ukraine, and Uzbekistan
CIS-7	Kazakhstan, the Kyrgyz Republic, the Russian Federation, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan
CSE	consumer support estimate
CTE	consumer tax equivalent
DIS	direct income support
EU	European Union
EU-8	new EU members as of May 2004, excluding Cyprus and Malta: the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Slovak Republic, and Slovenia
EU-10	EU-8, plus Bulgaria and Romania
EU-15	EU members prior to 2004: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom
GDP	gross domestic product
MFN	most favored nation

MPS	market price support
NRA	nominal rate of assistance
OECD	Organisation for Economic Co-operation and Development
PSE	producer support estimate
RRA	relative rate of assistance
SEE	state economic enterprise (Turkey)
TBI	trade bias index
WTO	World Trade Organization

Note: All dollar amounts are U.S. dollars (US$) unless otherwise indicated.


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PART I

INTRODUCTION

1

INTRODUCTION AND SUMMARY

Kym Anderson and Johan Swinnen

In a recent World Bank report on trade patterns, performance, and policies in Eastern Europe and the former Soviet Union (Broadman 2006), the priority trade policy reforms recommended would be aimed at reducing the mean and the variance in tariffs and the tariff equivalents of nontariff barriers. In particular, they would aim at reducing unilaterally the anti-export bias in the policy regime, especially in countries exporting primary products. To achieve progress in reform in these areas efficiently and effectively and to see how recent policies line up with those of the European Union (EU), we require better information on the extent of progress during the past decade or so and on the current policy influences on incentives within and among sectors. Policies in the countries of Eastern Europe and the former Soviet Union (hereafter, referred to as the region) at the start of their transition to market economies greatly distorted producer and consumer incentives, especially for agricultural products. These distortions have since been reduced substantially in several countries. There are, however, large variations across the region, and distortions appear to be growing again in some of the countries. There is thus a need now to examine how policies affecting agriculture are evolving in these countries, including in 10 of the economies as part of their adjustment to EU accession (the EU-10: Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, the Slovak Republic, and Slovenia).

For this reason, the main purpose of this study is to assess the changing landscape of agricultural protection and taxation patterns in the region. The study is based on the EU-10 sample, plus Turkey, as well as seven countries in the Commonwealth of Independent States (CIS): Kazakhstan, the Kyrgyz Republic, the

Russian Federation, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan (the CIS-7). In 2000–04, these countries accounted for 89 percent of the region's agricultural value added, 91 percent of the population, and 95 percent of total gross domestic product (GDP). Some key characteristics of these economies are shown in table 1.1.

In agricultural subsidy and trade policy, analyses of politically feasible reforms or policy options for coping with structural changes (such as the current boom in energy raw material prices that has intersectoral Dutch disease effects) need to be based on a clear understanding of the recent and current extent of policy interventions and the political and economic forces behind the evolution of these interventions. The second purpose of this study is thus to improve our understanding of the political economy of distortions in agricultural incentives in countries in the region. Based on this better understanding, the study's third purpose is to explore the prospects for additional reductions in the distortions in agricultural incentives and their implications for the agricultural competitiveness and trade of countries in the region.

Now is an especially timely moment for such a study because eight countries in the region joined the EU in May 2004 (the EU-8: the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Slovak Republic, and Slovenia); two others joined on January 1, 2007 (Bulgaria and Romania), ten are in the process of joining the World Trade Organization (WTO), and all are currently assessing their policies unilaterally and as part of regional and multilateral trade negotiations.

The great diversity within the group of countries in the region—in terms of relative resource endowments and comparative advantages, stages of development and transition, agricultural and trade policy regimes, and membership in the EU, the WTO, the Organisation for Economic Co-operation and Development (OECD), and regional trading agreements (table 1.2)—means that the countries selected represent a rich sample for comparative study. The Central and Eastern European subsample differs substantially from the countries of the former Soviet Union that are now members of the CIS because the former have a higher per capita income (three-quarters of the global average compared with one-third for the CIS) and a higher population density (50 percent of the global average amount of land per worker and 70 percent of the global average amount of agricultural land per capita compared with 340 and 250 percent, respectively, for the CIS).

Growth and Structural Changes during Transition

Before our examination of policy changes, it is helpful to review the economic growth and intersectoral changes that have taken place in Europe's various transition economies over the past 15 years. The initial years of transition in the

Table 1.1. Key Economic and Trade Indicators in the Region, 2000–04

Country or region	Share of world (%)			National relative to world (= 100)			Primary agricultural trade specialization, 2000–02 $(X - M)/(X + M)$ (world average = 0)
	Population	Total GDP	Agricultural GDP	GDP per capita	Agricultural land per capita	Revealed agricultural and food comparative advantage	
Slovenia	0.03	0.07	0.04	216	32	52	−0.68
Czech Republic	0.16	0.22	0.19	135	52	61	−0.44
Hungary	0.16	0.20	0.14	122	72	90	0.40
Estonia	0.02	0.02	0.03	102	78	199	−0.38
Poland	0.62	0.57	0.47	93	57	105	−0.39
Slovak Republic	0.09	0.07	0.09	92	57	57	−0.50
Lithuania	0.06	0.04	0.08	80	125	176	−0.21
Latvia	0.04	0.03	0.03	76	132	364	−0.51
Turkey	1.12	0.62	1.97	55	70	131	0.09
Romania	0.35	0.15	0.49	41	84	74	−0.06
Bulgaria	0.13	0.05	0.15	39	86	143	0.37
EU-10, plus Turkey	2.75	2.05	3.67	74	70	98	−0.09
Russian Federation	2.34	1.10	1.58	47	186	53	−0.46
Kazakhstan	0.24	0.08	0.18	33	1,737	76	—
Ukraine	0.78	0.13	0.46	17	107	112	—
Turkmenistan	0.07	0.01	0.06	18	881	92	—
Uzbekistan	0.41	0.03	0.27	8	134	—	—
Kyrgyz Republic	0.08	0.00	0.05	6	268	390	—
Tajikistan	0.10	0.00	0.03	4	85	192	—
CIS-7	4.02	1.37	2.62	34	270	—	0.02
Other countries in the region	0.64	0.19	0.61	29	82	166	0.41
The region	7.43	3.60	6.90	48	179	—	−0.06

Sources: Sandri, Valenzuela, and Anderson 2007; World Development Indicators Database 2007.

Note: — = no data are available.

Table 1.2. Membership in International Organizations, 1993–2004

Country	EU	WTO	Eurasian Economic Community
Czech Republic	since 2004	since 1995	not a member
Estonia	since 2004	since 1999	not a member
Hungary	since 2004	since 1995	not a member
Latvia	since 2004	since 1999	not a member
Lithuania	since 2004	since 2001	not a member
Poland	since 2004	since 1995	not a member
Slovak Republic	since 2004	since 1995	not a member
Slovenia	since 2004	since 1995	not a member
Bulgaria	since 2007	since 1996	not a member
Romania	since 2007	since 1995	not a member
Turkey	not a member	since 1995	not a member
Kazakhstan	not a member	observer 1996	since 2000
Kyrgyz Republic	not a member	since 1998	since 2000
Russian Federation	not a member	observer 1993	since 2000
Tajikistan	not a member	observer 2001	since 2000
Turkmenistan	not a member	not a member	not a member
Ukraine	not a member	since 2008	observer 2000
Uzbekistan	not a member	observer 1994	observer 2000

Sources: EU: http://europa.eu/abc/european_countries/index_en.htm; WTO: http://www.wto.org/english/theWTO_e/whatis_e/tif_e/org6_e.htm; Eurasian Economic Community: http://www.photius.com/eaec/.

region from central planning to a more market-based economy saw production fall in the majority of sectors before it recovered at varying rates from the mid-1990s. Table 1.3 summarizes macroeconomic performance during the first half of the 1990s compared with the subsequent decade for our two samples of countries and for the rest of the region. Real GDP in the region fell by almost 6 percent per year during 1990–94. The decline in the Central and Eastern European sample was only 0.6 percent, while, in the CIS sample, it was 11 percent, and, in the residual countries not under study, it was 12 percent. By contrast, annual GDP growth in 1995–2004 averaged 2.7 percent; the CIS sample was the slowest in growth (2.2 percent), while the countries in Central and Eastern Europe were somewhat higher at 3.2 percent, and the residual countries enjoyed 5.1 percent growth.

Within these economies, agricultural value added measured at constant prices appears to have declined less rapidly than nonagricultural GDP in the early years

Table 1.3. Growth of Real GDP in the Region, 1990–2004
(at constant 2000 prices, percent per year, trend based)

	Agriculture		Industry		Services		Total GDP	
Sample	1990–94	1995–2004	1990–94	1995–2004	1990–94	1995–2004	1990–94	1995–2004
EU-8	n.a.	1.7	n.a.	3.4	n.a.	3.9	−2.0	3.7
Bulgaria	−11.6	3.4	−6.6	1.8	−1.3	2.7	−4.0	2.5
Romania	−2.3	0.1	−4.6	1.3	−4.5	1.9	−4.2	1.5
Turkey	0.7	0.8	4.3	1.9	3.4	3.4	3.2	2.7
EU-10, plus Turkey	n.a.	1.0	n.a.	2.8	n.a.	3.6	−0.6	3.2
CIS-7	−6.4	1.7	−16.8	3.0	−6.9	1.9	−10.8	2.2
Other	−10.2	1.7	−12.3	6.9	−4.9	5.0	−12.4	5.1
All region	−3.9	1.3	−9.5	2.9	−2.3	2.9	−5.9	2.7

Sources: Sandri, Valenzuela, and Anderson 2007; World Development Indicators Database 2007.

Note: n.a. = not applicable.

of transition, but also to have grown less rapidly in the subsequent decade. The domestic terms of trade (the prices of domestic producer outputs compared with the prices of inputs purchased by domestic producers) apparently fell even more among farmers than among nonfarmers because agriculture's share of GDP measured in current prices declined during the early transition period as well. Unlike during the central planning period, this did not allow more rapid industrialization, but rather an expansion in the services sector, which increased from less than half the economy prior to 1993 to two-thirds by 2004 (table 1.4).

The halving of agriculture's share of GDP in the region between 1992 and 2004 was accompanied by a decline of only one-quarter in agriculture's share in employment, according to statistics in the FAOSTAT Database of the Food and Agriculture Organization of the United Nations (which, because of definitional differences, is not always consistent with databases within countries). In all three subgroups of countries (the EU-8; the EU-10, plus Turkey; and the CIS-7), the share of agriculture in employment now averages three times the share of agriculture in GDP, or five times in the case of the EU-8 (compare tables 1.4 and 1.5). This suggests that there was much lower labor productivity on farms than in other areas of employment.

The share of farm and food products in total merchandise exports has also fallen, and this by as much as half in some countries (table 1.6). Expressing the share of agriculture and processed food in national exports compared with the share of such products in worldwide exports (known as the revealed comparative advantage index), table 1.7 indicates that most countries in the region have lost comparative advantage in farm products over the past decade. However, the index varies greatly across the region, from a low of less than 0.5 for mineral-rich Russia and densely populated Slovenia to a high of more than 3 for Latvia and the Kyrgyz Republic.

The region as a whole has become more open as a consequence of the shift from the planned economy to the market economy, notwithstanding the maintenance of numerous trade barriers. A common indicator is the value of goods and services exports, expressed as a percentage of GDP. For most countries of the region, this indicator is now above the average for Western Europe (37 percent in 2004), and the indicator for several countries in the region is approaching 60 percent (table 1.8).

With this as background, we now review briefly the evolution of policy under communism, and then we examine how sectoral and trade policies have changed in the region in response to or as contributors to macroeconomic and structural changes. We make extensive use of estimates of nominal and relative rates of assistance to agriculture; so, it is first necessary to summarize the methodology underlying these measures.

Table 1.4. Sectoral Shares of GDP in the Region, 1992–2004
(percent)

	Agriculture				Industry				Services			
Sample	1992	1996	2000	2004	1992	1996	2000	2004	1992	1996	2000	2004
EU-8	7	5	3	3	39	32	30	29	55	63	66	68
Bulgaria	12	14	12	9	39	29	27	26	49	57	61	65
Romania	19	19	11	13	43	40	32	33	38	41	57	54
Turkey	14	16	13	11	27	25	22	19	59	59	65	71
EU-10, plus Turkey	11	10	8	6	34	30	27	26	55	60	65	68
CIS-7	11	8	8	6	43	35	33	31	46	57	59	63
Other	25	16	13	11	37	29	28	29	39	55	59	60
All region	11	9	8	6	39	32	29	28	49	59	63	66

Sources: Sandri, Valenzuela, and Anderson 2007; World Development Indicators Database 2007.

Table 1.5. Agriculture's Share of Employment in the Region, 1992–2003

(percent)

Sample	1992	1996	2000	2003
EU-8	20	18	16	15
Bulgaria	12	9	7	6
Romania	22	18	15	13
Turkey	49	47	44	41
EU-10, plus Turkey	30	28	26	24
CIS-7	18	16	15	14
Other	25	22	20	18
All region	23	21	19	18

Sources: Sandri, Valenzuela, and Anderson 2007; FAOSTAT Database 2007.

Table 1.6. Agricultural Shares in Merchandise Exports in the Region, 1995 and 2004

(percent)

	Agriculture and processed food		Other primary products		Other goods	
Sample	1995	2004	1995	2004	1995	2004
EU-8	14	8	10	7	76	85
Bulgaria	21[a]	13	16[a]	20	63[a]	67
Romania	10	6	11	11	79	83
Turkey	21	10	5	5	74	85
Russian Federation	5[a]	4	53[a]	58	26[a]	21
Kazakhstan	13	5	49	79	38	16
Ukraine	20[a]	13[b]	11[a]	17[b]	69[a]	70[b]
Kyrgyz Republic	35	31	24	26	41	43

Sources: Sandri, Valenzuela, and Anderson 2007; World Development Indicators Database 2007.

a. 1996.
b. 2000–02.

Methodology for Measuring Nominal and Relative Rates of Assistance

The nominal rate of assistance (NRA) is defined as the percentage share by which government policies have raised (or lowered) gross returns to producers above what these returns would have been without the government's intervention. There

Table 1.7. Revealed Comparative Advantage Index in Agriculture and Processed Food, 1995 and 2004
(world = 1.0)

Sample	1995	2004
EU-8	1.2	0.9
Bulgaria	1.9[a]	1.4
Romania	0.8	0.7
Turkey	1.8	1.2
Russian Federation	0.4[a]	0.5
Kazakhstan	1.1	1.6
Ukraine	1.8[a]	1.6[b]
Kyrgyz Republic	3.0	3.6

Sources: Sandri, Valenzuela, and Anderson 2007; World Development Indicators Database 2007.

Note: The table shows the share of agriculture and processed food in national exports compared with the sector's share in global exports.

a. 1996.
b. 2000–02.

Table 1.8. Exports of Goods and Services as a Percentage of GDP, 1995 and 2004
(percent)

Sample	1995	2004
EU-8	36	59
Bulgaria	54	58
Romania	24	37
Turkey	22	29
Russian Federation	19	35
Kazakhstan	28	54
Ukraine	25	60
Kyrgyz Republic	22	42

Sources: Sandri, Valenzuela, and Anderson 2007; World Development Indicators Database 2007.

are several purposes for which NRAs may be used, and this affects the choice of methodology. Our project seeks to achieve three purposes. One is to generate a comparable set of numbers across a wide range of countries and over an extended period; the methodology thus needs to be simple and somewhat flexible. Another purpose is to provide a single indicator of the net transfers to (or from) farmers

arising from agricultural policies, as well as an indicator of the net transfers to (or from) consumers. This is what the OECD producer support estimate and consumer support estimate accomplish, and they may be negative if the transfers from the relevant group exceed the transfers to the same group. Our project's NRA and consumer tax equivalent (CTE) are similar to the OECD measures, but also involve some important differences (outlined below). The third purpose is to enable modelers to use the NRAs for individual primary and lightly processed agricultural products as producer price wedges in single-sector, multisector, and economy-wide policy simulation models, while using the CTEs as consumer price wedges; the modelers would allocate these wedges to particular policy instruments such as trade taxes or domestic subsidies.

The NRAs are based on estimates of assistance to individual industries. Great care has been taken to generate an NRA for each industry covered, especially in countries in which trade costs are high, pass-throughs along the value chain are affected by imperfect competition, and markets for foreign currencies have been highly distorted at various times and to varying degrees. Space limitations prevent us from providing all methodological details, but key points are mentioned below, and additional details may be found in the appendix.

Most distortions in industries producing tradables arise from trade measures. Examples of trade measures include a tariff imposed on the cost, insurance, and freight component of the import price or an export subsidy or tax imposed on the free on board component of the price at the country's border. Since an ad valorem tariff or export subsidy is the equivalent of a production subsidy and a consumption tax expressed as a percentage of the border price, this is the element captured in the NRA and CTE at the point in the value chain at which the product is traded. To obtain the NRA for farmers, the authors of the country studies have estimated the extent of pass-throughs back to the farmgate and, likewise, going forward to the consumer at the retail level. These aspects, among others, differentiate the World Bank measures from the OECD measures because the OECD producer support estimate is expressed as a percentage of the distorted price (and, hence, will be lower than the NRA, which is expressed as a percentage of the undistorted price), and both the producer support estimate and the consumer support estimate are measured at the farmgate level, whereas the World Bank NRAs are provided at both the farmer and processor levels. To simplify the presentation, we focus in what follows on the NRA at the primary producer (farmer) level.

It was decided in the World Bank project not to seek estimates of the more complex effective rate of assistance even though this is, in principle, better than the nominal rate as a partial equilibrium single measure of distortions in producer incentives (Balassa 1971; Corden 1971). The effective rate of assistance shows how value added is affected rather than the gross value of production,

thereby taking into account differences across industries in the value added share of output, as well as distortions in intermediate input prices. The advantage of the NRA over the effective rate of assistance measure, however, is that the coverage may be wider given the budget limitation and the lack of input data and input-output tables in many developing and transition economies for our time series. Moreover, unlike a generation ago, there are now many national and even global economy-wide computable general equilibrium models that, in principle, may estimate the impact of a complex set of input and output price distortions on value added in an industry and that, in any case, require as parameters the separate nominal rates affecting both outputs and intermediate inputs. In practice, farm input subsidies and taxes have, on average, a small overall impact on value added compared with output price distortions. Hence, for this project, the country study authors have ignored trivial input distortions, but they have captured any significant product-specific input price distortions by estimating the equivalence in terms of a higher output price and including this in the NRA for individual agricultural industries wherever the data allow. They have also been asked to add non-product-specific distortions into the estimate for the sectoral NRA for agriculture as a whole.

The targeted degree of coverage of products for which NRA estimates have been generated is 70 percent (the same share as in the coverage of the OECD producer support estimate); this is based on the gross value of production at undistorted prices. Unlike the OECD, this project has not assumed that the nominal assistance for products not covered is the same as the average for the products covered. This is because, in developing countries at least, policies affecting products that are not covered are often very different from policies for products that are covered. The relevant nontradables, for example, are often low-quality food staples that are subject to no direct distortionary policies. The World Bank project therefore asked the authors of the country case studies to provide three sets of guesstimates of NRAs for the products not covered: one each for the import-competing, exportable, and nontradable subsectors. A weighted average for all agricultural products was then generated using the values of production at unassisted prices as weights. For countries that also provide non-product-specific subsidies or taxes (assumed to be shared on a pro rata basis between tradables and nontradables), these are then added to obtain an NRA for total agriculture and for tradable agriculture (for use in generating the relative rate of assistance [RRA], which is defined below).

The best way to present regional aggregate NRA and RRA estimates depends on the purpose for which the averages are required. The present study is interested in determining the extent to which overall agriculture in each country and in the region is distorted with respect to other countries and regions. For this purpose,

we generate weighted averages across commodities within each country and across countries within each sample group of countries. The weights used are the undistorted value of agricultural production at the farmgate for each primary product and each country.[1]

Farmers are affected not only by the prices of their own outputs, but also, albeit indirectly (via factor market prices), by the incentives nonagricultural producers face, that is, *relative* prices and, hence, *relative* rates of government assistance affect producer incentives. More than 70 years ago, Lerner (1936) provided his symmetry theorem proving that, in a two-sector economy, an import tax has the same effect on the export sector as an export tax. This carries over to a model that also includes a third sector producing only nontradables and to a model with imperfect competition, regardless of the economy's size (Vousden 1990). Thus, if one may assume that there are no distortions in the markets for nontradables, the overall distortion in agricultural incentives may be captured through the extent to which the tradable parts of agricultural production are assisted or taxed compared with the producers of other tradables. Through the generation of estimates of the average NRA for nonagricultural tradables, it is then possible to calculate an RRA, defined in percentage terms, as follows:

$$\text{RRA} = 100[(1 + NRAag^t/100)/(1 + NRAnonag^t/100) - 1] \qquad (1.1)$$

where $NRAag^t$ and $NRAnonag^t$ are the weighted average percentage NRAs for the tradable parts of the agricultural and nonagricultural sectors, respectively. Since the NRA cannot be less than −100 percent if producers are to earn anything, then neither can the RRA. This measure is useful in that, if it is below zero, it provides an internationally comparable indication of the extent to which a country's policy regime has an antiagricultural bias, or, if the RRA is positive, the extent of a bias in the other direction.

The greater the degree of substitution in production, the greater the cost of government policy distortions in incentives in terms of resource misallocation (Lloyd 1974). In the case of agriculture that involves the use of farmland that is sector specific, but transferable among farm activities, the greater the variation in NRAs across industries within the sector, then the higher the welfare cost of the market interventions. A simple indicator of this cost is provided by the standard deviation of industry NRAs within agriculture. We therefore report not only the weighted mean NRA for the industries covered within the farm sector (using the values of production at unassisted farmgate prices as weights), but also the standard deviation around that mean each year.

Each industry is classified as import-competing, as a producer of exportables, or as a producer of nontradables (with its status sometimes changing over the years); it is therefore possible to generate the weighted average NRAs for the two

different groups of tradables for each year. These NRAs are used to generate a trade bias index (TBI), which is defined in percentage terms as follows:

$$\text{TBI} = 100[(1 + NRAag_x/100)/(1 + NRAag_m/100) - 1] \quad (1.2)$$

where $NRAag_m$ and $NRAag_x$ are the average percentage NRAs for the import-competing and exportables parts of the agricultural sector. The TBI indicates in a single number the extent to which the antitrade bias (negative TBI) typical in agricultural policies changes over time.

Distortions in Incentives under the Communist Regime

Incentives for agricultural producers and food consumers were massively distorted under Communist central planning, which was imposed in the former Soviet Union in the 1920s and in Central and Eastern Europe beginning in the 1950s. The distortions resulted from a combination of property rights among collective farms and the centrally controlled organization of production allocation, processing, input provision, and marketing, as well as the setting of prices unrelated to demand-supply conditions (leading to rationing) and state-controlled trading and exchange rate systems.

Land and farms were put under central planning, and, in most countries (the exceptions were Poland and the former Yugoslavia), farming was forcefully organized in collective and state farms.[2] This collectivization process and the associated forced migration (and worse) of many landowners and farmers contributed to massive hunger and death in the Soviet Union before World War II. From Lenin to Stalin and through most of Khrushchev's regime, agriculture was heavily taxed. Capital was drained from an impoverished countryside to finance urban industrial growth (Ellman 1988). The dramatic implications, including the deaths by starvation of millions of peasants, are documented in sobering detail by Conquest (1986).

This all changed at the end of the Khrushchev regime and especially under Brezhnev. The leadership of the Soviet Union decided to increase agricultural production, with a strong emphasis on livestock, and this policy was also followed by many of the Eastern European countries in the Soviet Bloc (Liefert and Swinnen 2002). From the mid-1950s onward and especially in the 1970s and 1980s, large amounts of support and investment were directed toward agriculture. By 1980, almost 30 percent of total Soviet investment was going into agriculture (Gray 1990). At the same time, consumer prices were set low and producer prices high, and the gap was covered by direct subsidies to processing and trading companies or by soft budget constraints.

Consequently, from 1970 to 1990, livestock herds and output in these countries grew by between 40 and 60 percent. The rise in feed requirements for the growing herds stimulated the crop sector. In the late 1980s, the average annual output of feed grain in Hungary and Poland was up by one-quarter and one-half, respectively, compared with output in the late 1960s. In the Soviet Union, the feed requirements were so great that the country also became a substantial importer of feed commodities.

By 1990, the per capita consumption of livestock products and foodstuffs in general compared favorably with that in many OECD countries even though per capita incomes in Central and Eastern Europe were much lower than the OECD average. This achievement came at a cost: large state subsidies for both producers and consumers were necessary to maintain the high levels of production and consumption. For example, by the end of the 1980s, direct budgetary subsidies to the agriculture and food economy represented about 10 percent of GDP in the Soviet Union and between 5 and 10 percent of GDP in most Central and Eastern European countries. The bulk of these subsidies went to the livestock sector.

Calculating the net transfers to farmers and to consumers under the Communist regime is difficult because of the large number of distortions caused by the state regulation of prices, production and consumption, exchange rates, and marketing organizations, as well as the indirect nature of some of the subsidies, and so on. Several policies need to be taken into special account.

First, standard estimates of NRAs undervalue the transfers to agriculture because they do not fully take into account input price effects, that is, they do not sufficiently capture the indirect price regulations because central planners were setting many input prices considerably below market prices, which resulted in significant transfers to farmers.

Second, while it is generally true that producers of farm products were strongly subsidized by price setting toward the end of the Communist regime (in sharp contrast to the 1930s, when farmers were subject to significant discrimination), the complexity of the distortions led sometimes to offsetting effects. For example, while agricultural producers in the later 1980s were supported through high output prices and low input prices, overvalued exchange rates—not taken into account in the preliminary NRA estimates by the OECD (various years)—effectively taxed agricultural (and other) exporters. Correcting for this overvaluation would lead to significantly lower protection indicators (see below).

Third, and perhaps almost as importantly, agriculture was not alone in receiving subsidies; most (heavy) industry was also subsidized or at least protected from import competition.

In short, the available fragments of empirical evidence indicate that, on aggregate and in real terms, there was a substantial net subsidization of agriculture

compared with all other sectors as a group, although there was much more subsidization among livestock producers than among grain and oilseed farmers.

The distortions affected not only farming, but also consumption. The CTE has been estimated, using the methodology outlined in the appendix, at around 40 percent for the EU-8 and is even larger for the Soviet Union during the same period (see chapters 2 and 4). This implies that consumers were taxed substantially. However, this runs counter to the conventional wisdom that consumers were subsidized and importantly so under the Communist regime.

There are several reasons why these CTEs may not be an accurate measure of actual consumer distortions under the Communist regime. First, CTEs do not really measure consumer prices at the retail level, but rather at the farmgate level. However, under the central planning system, subsidies to consumers occurred at the wholesale level because wholesalers were told to sell their food to retailers at below production cost, and, for this, they received state subsidies. The use of retail data would give much lower CTEs. For example, Cook, Liefert, and Koopman (1991) have computed consumer subsidization and taxation using both farm-level and retail-level prices for the Soviet Union, and they have concluded that, while CTEs, as measured, suggested that there was significant taxation of consumers, the retail prices indicated that there was subsidization of consumers.

Second, as with producer assistance, exchange rate distortions also have an impact on CTEs. Because overvalued exchange rates effectively tax exports and subsidize imports, they benefit domestic consumers of tradable products, but to an extent we are unable to measure.

Third, there is another important factor influencing consumer taxation that is not captured by standard indicators. By restricting foreign imports and regulating trade, the Communist regime prevented consumers from accessing higher-quality food products. Huffman and Johnson (2004) estimate that these welfare losses were equivalent to 50 to 75 percent of the direct subsidy benefits to consumers under the Communist regime and the equivalent welfare gains from the subsidy cuts and liberalization after 1990.

Fourth, consumers unable to buy all they wanted at low prices had to incur high search and queuing costs.

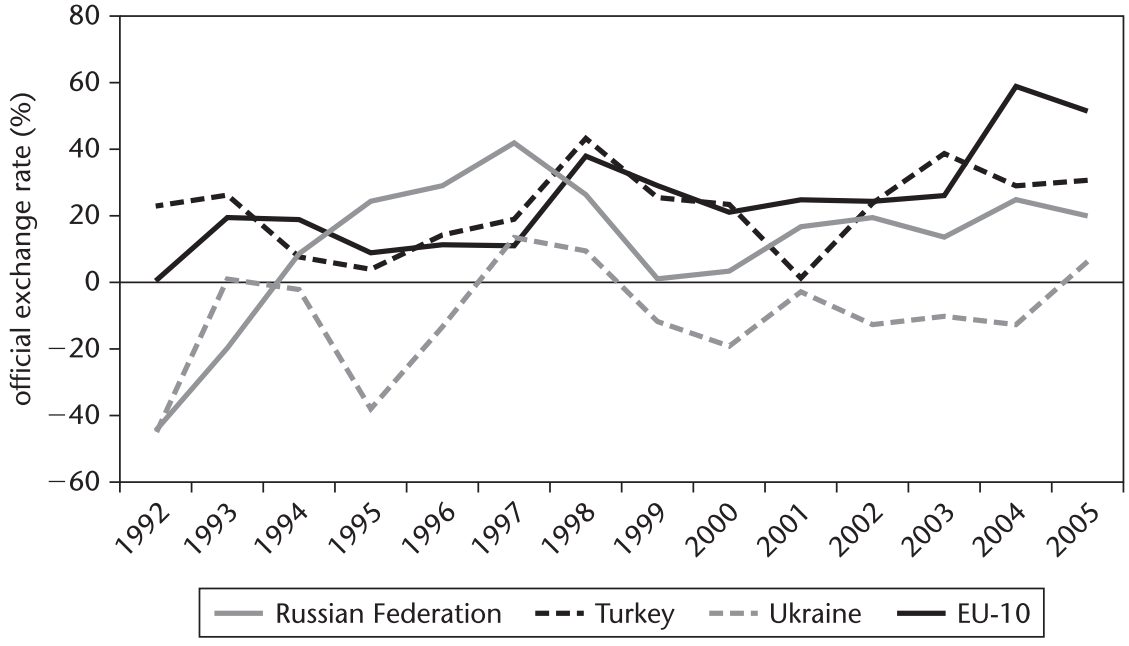
Changes in Distortions in Incentives during Transition

There have been dramatic changes in agriculture and food policies and in the distortions in agricultural incentives in the region since the fall of the Berlin Wall in 1989 and the disintegration of the Soviet Union in 1991. Earlier in the 1980s, because of Communist era subsidies, the agricultural sector had represented a

sizable share of the economy, although there was considerable variation across the region: the agricultural share in employment at the end of the 1980s varied from around 15–20 percent in Central Europe and in the Baltic states to around 40 percent in parts of Central Asia and the Balkans. The distortions favored farming, and a relatively large share of productive resources were accounted for by agriculture, though they might have been used more efficiently in other sectors of the economy, particularly the underdeveloped service sector. As a consequence, when domestic markets, trade, and currency exchange regimes were liberalized, farm output declined dramatically because nominal input prices rose more quickly than output prices. Industrial output also declined by a similar order of magnitude, while the service sector—which had been severely constrained under the Communist system (as stand-alone activities distinct from state-owned industrial enterprises)—grew rapidly after the transition began (see table 1.4).

Beginning in the early 1990s, many trade and price distortions were removed throughout the region. Prices, exchange rates, and trade policies were all liberalized; subsidies were cut; hard budget constraints were introduced; property rights were privatized; and production decisions were shifted to companies and households. One consequence was that, on average, support for agriculture fell to low levels in the early 1990s (as it did also for industrial production); see figure 1.1 and

Figure 1.1. NRAs to Agriculture in the Region, 1992 to 2005



Source: Author calculations based on estimates reported in chapters 2–5 of this volume.

Table 1.9. NRAs to Agriculture in the Region, 1992 to 2005
(official exchange rate, percent)

Country or group	1992–95	1996–99	2000–03	2004–05
Bulgaria	−19	−10	0	13
Czech Republic	20	19	27	—
Estonia	−14	20	20	—
Hungary	19	18	34	—
Latvia	−15	30	36	—
Lithuania	−19	29	32	—
Poland	10	24	7	—
Romania	24	30	55	67
Slovak Republic	28	26	30	—
Slovenia	64	79	80	—
EU-10	12	22	24	—
Turkey	16	25	21	30
Russian Federation	−8	25	13	22
Ukraine	−21	−1	−11	−3
Total, countries under study	3	22	17	—

Source: Author calculations based on estimates reported in chapters 2–5 of this volume.

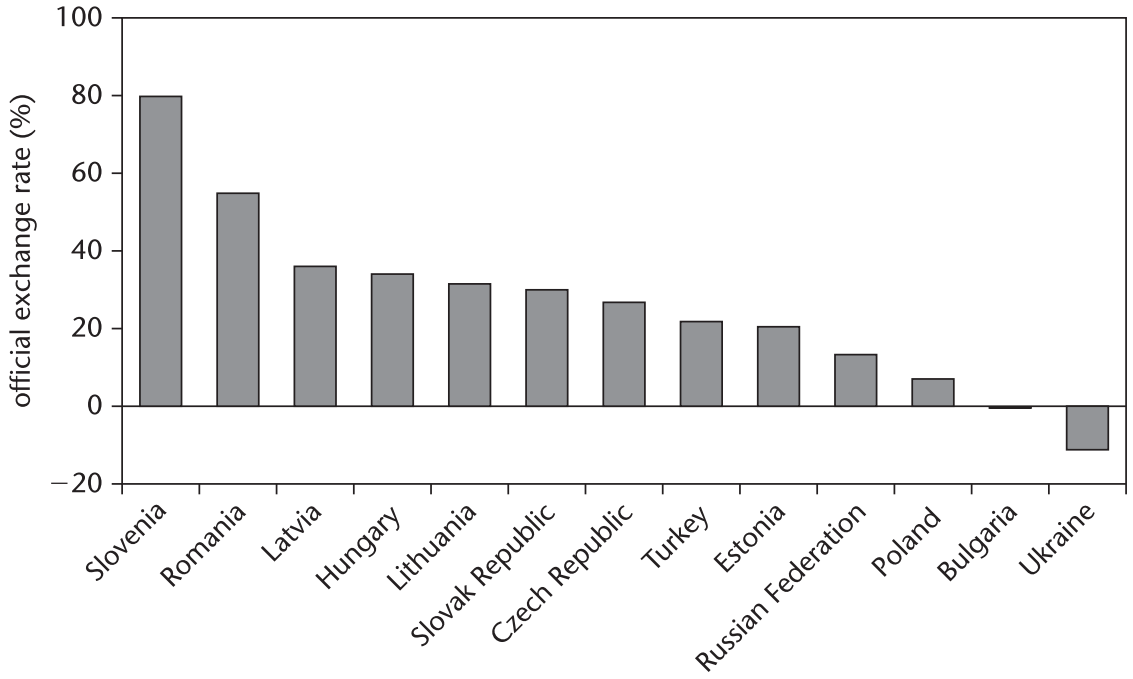
Note: The table shows weighted averages. The weights are based on the gross value of agricultural production at undistorted prices. — = no data are available.

table 1.9. Between 1992 and 1995, nominal assistance to agriculture averaged only 12 percent in the EU-10 and was below zero in Bulgaria and the three Baltic nations, as it was also in Russia and Ukraine. By contrast, in Turkey, where nominal assistance averaged only 5 percent during 1986–89, the NRA rose to an average of 16 percent during 1992–95 and 25 percent in 1996–99.

The changes in policies and, hence, in rates of agricultural assistance have not been smooth; they have been characterized rather by stop-go phases and even reversals of reforms (figure 1.1). The country studies in parts II and III of this book provide detailed information and evidence on these multiple policy changes. Yet, despite this heterogeneity in experience, one may identify a couple of general phases in the changes in policy.

Following the initial collapse, support to agriculture increased in some countries in the region during the mid-1990s. In Central and Eastern Europe, the increase was driven by the explicit introduction of new support policies, while, in Russia, it primarily reflected developments in exchange rates that, in the presence of institutional constraints on the pass-through of border prices to farmgate prices, pushed assistance rates to high levels.

Figure 1.2. NRAs to Agriculture, by Country, 2000–03



Source: Author calculations based on estimates reported in chapters 2–5 of this volume.

The increase in support started in Central Europe where, after the radical liberalization in the early 1990s, political pressures induced governments to introduce a relevant series of measures. NRAs rose from close to zero in 1992 to around 20 to 30 percent in the second half of the 1990s, but then stabilized in the leadup to EU accession in 2004. Between 2000 and 2003, the average rate of assistance to agriculture in the EU-8 was just under 25 percent (figure 1.2), which was slightly less than half the rate of the assistance (including the assistance supplied through programs somewhat decoupled from production) provided to farmers in the EU-15—the EU members prior to 2004: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom—at that time (see Josling 2007).

Further east, two economic changes in the late 1990s had major impacts on agricultural incentives. First, the Russian crisis and the associated devaluation of the ruble (and other currencies in the region) in the presence of imperfect pass-throughs caused a strong decline in the estimated rates of assistance to agriculture. This macroeconomic correction brought estimated assistance rates down to much lower levels, which probably reflected more accurately the actual support to agriculture even in the preceding years (as our country authors might have found if they had been able to capture the effect on the NRAs of the overvalued exchange rates at that time).

Second, the jump in world energy and mineral prices and the general economic growth in the 2000s improved the budgetary situations of many CIS governments. This induced an increase in the budgetary support to agriculture. For example, in Russia, the government announced that agriculture would be one of the priority areas for more funding in 2005. Not all the additional funding in the region was to go to subsidies because some governments have plans to spend considerably on infrastructure and quality upgrading in agriculture. Also, rural incomes have improved because of more timely payments of farm wages and farm and rural pensions and because of improved rural services.

The combination of all these developments led to a somewhat lower estimated NRA for agriculture in the region for the four-year period beginning in 2000: 17 percent during 2000–03 compared with 22 percent in 1996–99 (table 1.9). In Russia, the average support level fell even more (from 25 to 13 percent). However, during 2004 and 2005, the supports rose again, including in those countries that have since joined the EU (though formal estimates of the relevant support levels are no longer published separately from the rest of the EU). Meanwhile, the NRA became less negative in Ukraine, appears to be close to zero also in Kazakhstan, but is probably much more negative in the rest of Central Asia (see chapters 5–8).

Trade Liberalization

International trade was strongly regulated under the centrally planned system. The Communist countries were integrated within the system of the Council for Mutual Economic Assistance, a planned intercountry trading regime that involved trade mainly with other Communist countries. (One might think of the council as the international version of the domestic central planner.) The countries of Central and Eastern Europe were less well integrated than the countries of the former Soviet Union, but, still, a large part of the trade volume went through the system. Important changes in trade and financial flows resulted from the collapse of the system during macroeconomic and trade policy liberalization in the early 1990s.

Trade liberalization reinforced the reallocation in production activities generated by the abolishment of central planning. Traditional international production allocations were no longer possible because trade had to be financed using hard currencies and because inputs were valued according to real costs. Trade liberalization also permitted the importation of high-quality Western produce that had previously been restricted. At the same time, the liberalization in exchange rates removed the discrimination against sectors producing tradables.

The result was a major international reorganization in production activities. Initially, this had a negative impact on producers in the region because traditional

export markets dwindled in the face of shortages in hard currency and because the Western countries remained closed to agricultural exports from the region. Meanwhile, the reduction in the constraints on imports opened the regional market to Western imports. In combination, this caused a worsening of the agricultural trade balance in the region in the first half of the 1990s. Later on, however, agrifood trade intensified, and growth in exports (also to Western markets) contributed to the recovery in the region.

An important development was the shift from extreme specialization that was centrally imposed (for example, dairy production in the Baltic states and cotton production in Central Asia) to more highly diversified production systems and less dependence on single commodities.

Trade effects were only part of the international effects in agrifood systems. Possibly even more important was the massive inflow of foreign direct investment into the food industry in the region, which contributed to significant restructuring, improvements in food quality, productivity enhancements, and investment in agriculture (Dries and Swinnen 2004). The wave of foreign investment in the retail sector led more recently to additional restructuring in the agrifood system, and this had important implications for producers and consumers (Dries, Reardon, and Swinnen 2004).

Variations in Distortion Levels among Countries and across Commodities

After 1989, the EU-8 moved first and most rapidly toward market-based systems. The reforms in the Balkan countries, such as Bulgaria and Romania, were initially half-hearted and involved many inconsistencies during most of the 1990s; government interventions continued to distort incentives substantially. In the large CIS countries (Kazakhstan, Russia, and Ukraine), governments exercised important controls over the agricultural economy through a variety of means, including regional trade controls, input supply controls, and soft budget constraints. While the Kyrgyz Republic liberalized relatively quickly, the other Central Asian countries restricted reforms and liberalization. In particular, major controls are still in place in Turkmenistan and Uzbekistan.

These differences are illustrated by the World Bank price and market reform metric, which is summarized in table 1.10. By 1997, Belarus, Tajikistan, Turkmenistan, and Uzbekistan were lagging far behind the other countries in the region in price and market reforms. However, there were substantial differences also within subregions; Bulgaria, for example, lagged substantially behind the other countries of Central and Eastern Europe until more recently.

Table 1.10. Status of Agricultural Price and Market Reforms in the Region, 1997 to 2002

Country or group	1997	1998	1999	2000	2001	2002
Czech Republic	9	9	9	8	9	9
Slovenia	8	9	9	9	9	9
Estonia	10	9	9	9	9	9
Hungary	9	9	8	8	9	9
Latvia	7	8	9	9	9	9
Slovak Republic	7	7	7	8	8	9
Poland	9	8	7	8	8	8
Lithuania	7	8	8	8	7	7
Bulgaria	6	8	9	9	9	8
Albania	8	8	8	8	8	8
Romania	7	6	7	7	7	8
Croatia	6	6	6	7	7	7
Armenia	7	7	7	8	8	8
Macedonia, FYR	7	8	8	8	8	8
Azerbaijan	6	7	7	8	8	8
Kyrgyz Republic	6	7	7	7	7	7
Serbia and Montenegro	—	—	—	3	6	7
Moldova	7	8	7	7	7	7
Bosnia and Herzegovina	—	6	6	6	7	7
Georgia	7	7	8	8	9	9
Ukraine	7	6	6	6	7	6
Kazakhstan	7	5	6	6	6	6
Russian Federation	7	6	6	6	6	6
Tajikistan	4	5	5	6	6	6
Uzbekistan	4	3	3	3	4	5
Turkmenistan	2	2	2	2	2	2
Belarus	3	2	2	2	2	2
Regional average	6.4	6.7	6.8	7.1	7.4	7.5

Source: World Bank estimates.

Notes: 1 = centrally planned economy; 10 = completed market reforms. — = no data are available.

The progress in market reform is not always correlated with the extent of the distortions. For example, Slovenia was a front runner in liberalization and the development of a market economy, but showed a high level of farm producer support; its average NRA was 80 percent in 2000–03, which is well above the EU-15 rate of only slightly over 50 percent during the period. Meanwhile, much slower reformers such as Bulgaria, Kazakhstan, and Ukraine showed much lower—even negative—NRAs.

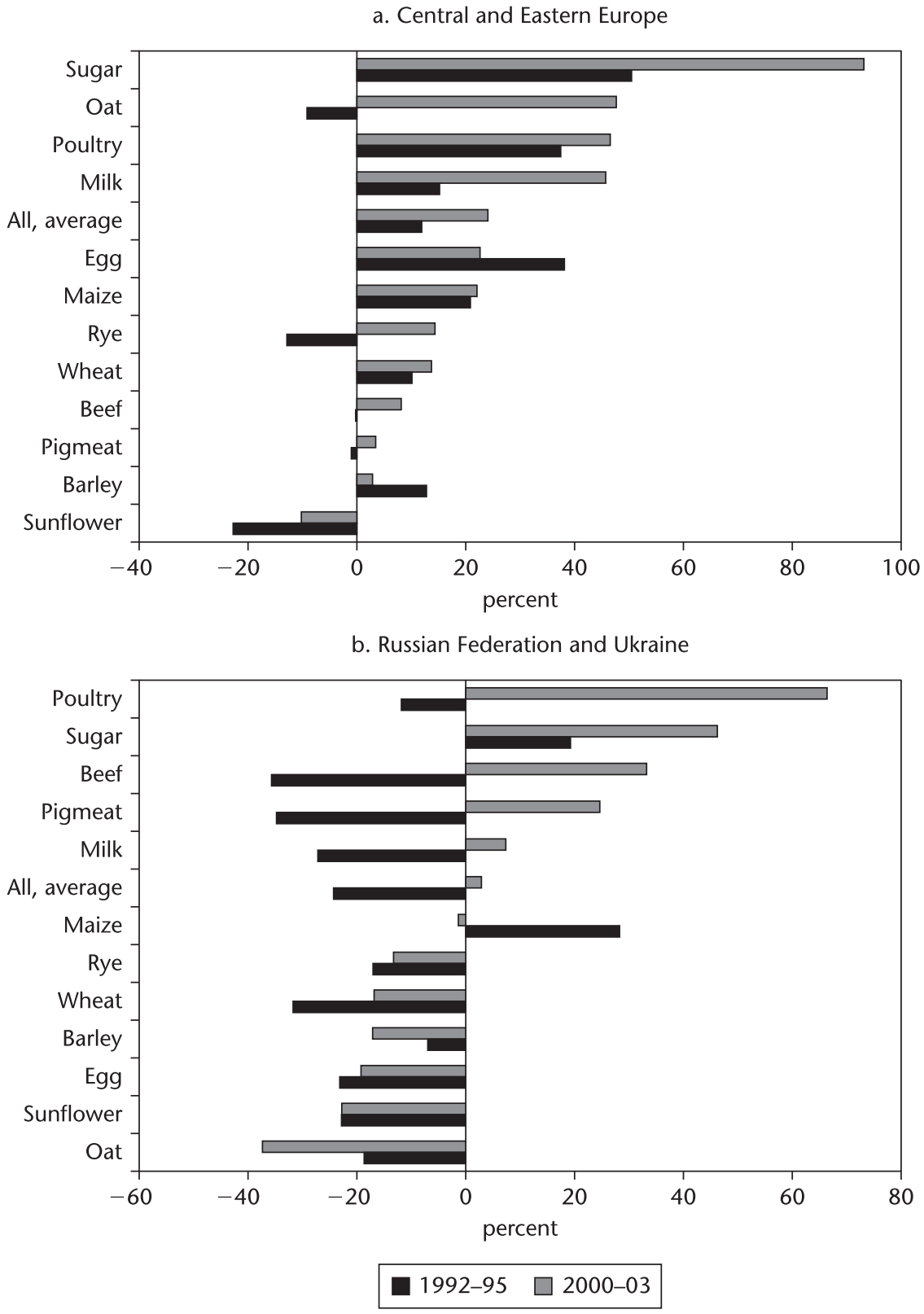
Turkey, which was not under Communist rule, but, nonetheless, had a food system that was highly controlled by the state (including price regulations and state processing companies) especially prior to the 1990s, showed a high level of support in 2004–05 (an NRA of 30 percent, twice the NRA of 1992–95) although there had been a major policy reform after 2000, including a shift in assistance from market price support toward direct payments. As measured by the NRA, Turkey has had little success in reducing the distortions in the agricultural sector.

There are also major differences in distortions across commodities. In the 1980s, virtually all commodities were supported, albeit some more than others. With transition, the variation has remained, but, in the CIS, some commodities are now taxed. For example, by 2000–03, sugar, poultry, and milk had become the most highly protected commodities in the EU-10, and grains, beef, and pork were the least assisted. Meanwhile, in Russia and Ukraine, the range was even more extreme, from high positive assistance for livestock and sugar, but high negative assistance for the production of the key feed inputs into livestock (coarse grains and oilseeds; see figure 1.3). Russia dominates in the production and trade in oilseed made from sunflower seeds, which are the only commodity consistently exported by Russia through the transition period. The case of Kazakhstan is even starker; there, import-competing producers have been highly assisted, while exporting industries have had to endure negative assistance so that, while the average NRA was close to zero in 2000–03, a strong antiagricultural trade bias persists.

Government intervention and controls are especially important for a few key commodities within each country, often because of (real or imagined) food security concerns or the need to raise government revenue to meet other priorities. In Bulgaria, Russia, and Ukraine, for example, this is the case for grains and oilseeds both for human consumption and to support (via low prices for feed inputs) livestock products. It has been true also for cotton in Tajikistan, Turkmenistan, and Uzbekistan, where heavy taxation is distorting incentives for producers, although porous borders make the taxing of cotton exports difficult; meanwhile, tax rates vary across countries in that subregion.

The TBI shown in equation (1.2) above represents one way of capturing the diversity of assistance rates across farm commodities. The more negative the index, the greater the gap between assistance to import-competing farm industries and assistance to export industries (or, in some cases, the effective taxation of export industries). Table 1.11 suggests that the antitrade bias has been a persistent feature of agricultural policies in the region throughout the transition; indeed, it has been worse in recent years than it was a decade ago.

Figure 1.3. NRAs in the Region, by Product, 1992–95 and 2000–03



Source: Author calculations based on estimates reported in chapters 2–5 of this volume.

Note: The charts show weighted averages. The weights are based on the gross value of agricultural production at undistorted prices.

Table 1.11. TBIs in the Region, 1992 to 2005
(percent)

Country or group	1992–95	1996–99	2000–03	2004–05
Bulgaria	−2	−17	−18	−39
Czech Republic	5	−10	−23	—
Estonia	−21	−16	−1	—
Hungary	−14	12	−11	—
Latvia	−35	−18	15	—
Lithuania	−50	−32	−19	—
Poland	−19	−19	−24	—
Romania	−21	−29	−39	−18
Slovak Republic	3	−9	−5	—
Slovenia	26	40	38	—
EU-10	−15	−16	−22	—
Turkey	−34	−46	−31	−31
Russian Federation	−11	−31	−34	−24
Ukraine	−12	−25	−21	−45
Total, countries under study	−18	−30	−28	—

Source: Author calculations based on estimates reported in chapters 2–5 of this volume.

Note: See at equation (1.2), elsewhere above, for an explanation of the TBI. — = no data are available.

An even more comprehensive way to measure the extent of variance of rates across time is to calculate the standard deviation among NRAs for the products covered. These have remained persistently high, too, and have been higher on average in recent years than in the early stages of transition (table 1.12).

Changes in Agricultural Policy Instruments

The total amount of support is an imperfect indicator of the distortions in incentives because different trade, price, and subsidy instruments have different distortion effects. For example, relying on OECD data, Dewbre, Antón, and Thompson (2001) estimate the relative distortions of a series of policy instruments. Setting market price support as a benchmark at 100 percent, they conclude that variable input subsidies are the most distortive (around 130 percent), followed by output subsidies (around 100 percent), and market price support (100 percent). Less distortive are area payments that require the planting of crops (around 35 percent), and area payments that do not require the planting of crops are much less distortive (around 10 percent).

Table 1.12. Standard Deviation in NRAs to Agriculture in the Region, 1992 to 2005

(percent)

Country or group	1992	1996	2000	2005[a]
Bulgaria	13	15	12	43
Czech Republic	31	26	22	31
Estonia	34	23	18	27
Hungary	38	26	39	89
Latvia	44	28	43	44
Lithuania	64	36	59	60
Poland	39	27	35	27
Romania	42	43	47	89
Slovak Republic	29	21	22	29
Slovenia	55	40	27	46
EU-10	33	23	23	35
Turkey	22	21	20	20
Russian Federation	30	35	25	43
Ukraine	26	67	34	42

Source: Author calculations based on estimates reported in chapters 2–5 of this volume.

a. In the case of the EU-8, the year is 2003.

In the region, most support to agriculture was and, despite the reforms, still is provided via policy instruments that are highly distortive and, hence, inefficient. Under the Communist regime, output price distortions were complemented by heavy distortions in input prices, in particular low fertilizer and energy prices and subsidized irrigation. Later, in the 1990s, the majority of farm support in Central and Eastern Europe was provided by keeping output prices above border prices. However, the share of support represented by these measures has declined over the past decade, which is consistent with developments within the EU-15.

These policy changes are reflected in the composition of the assistance that farms receive. Under the Communist system, price support and output subsidies were the main component in Central and Eastern Europe, accounting for more than 80 percent of the NRAs there. After the reforms in the early 1990s, the share of market support and output subsidies declined substantially, falling below half. Since then, it has grown again to around half the NRAs. The other important components of the NRAs of Central and Eastern Europe were input subsidies (as much as one-quarter of the assistance), direct payments, and non-product-specific subsidies. Input subsidies include interest rate subsidies, credit guarantee schemes, fuel subsidies, and support for the purchase of breeding materials.[3]

Water price regulations and subsidies are important policy instruments in the irrigated areas of Central Asia, but it has not been possible to estimate their impact on NRAs for the study represented in this volume. Energy policies are still being used to assist various sectors, for example, in Russia, but because they do not favor agriculture in particular and are becoming less important, they, too, have been omitted from our NRA estimates.

In the CIS countries, soft loans and debt forgiveness continue to play an important role, although fiscal constraints for most of the 1990s limited the ability of governments to support farms through this means. The budgetary situation is changing in the 2000s though, as earnings from mineral and energy exports grow. Hence, this may well become an even more important source of government assistance to farmers in the near future.

Overall, though, the differences between domestic and international prices are the main contributor to agricultural assistance rates. However, not all the differences are caused by price and trade policies. Also important are the costs of trading, to which we now turn.

Trade Costs

The importance of trade costs is mentioned in all of the CIS country case studies in part III of this report. Trade costs are highlighted because they provide high rates of natural protection to import-competing industries and natural taxation on export-oriented industries, especially those involving bulky commodities. For example, the Kazakhstan study reports that trade costs provide the equivalent of an export tax on wheat amounting to 10 to 25 percent. In the Kyrgyz Republic, the country that arguably has been the most reformist of all in Central Asia, policy-induced distortions are minimal; yet, there are large gaps between domestic and international prices.

These price gaps may occur internationally (the difference between prices free on board and prices at cost, insurance, and freight at the country's border, including transit costs in the case of landlocked countries), but they may also occur domestically. The authors of the Russian study, for example, argue that the two main causes of incomplete price transmission between international and local (farmgate) markets are interventions by officials in the regions of Russia and weak domestic infrastructure, including both physical and institutional infrastructure (and encompassing legal issues that may favor poorly defined property rights and widespread corruption).

In the more advanced countries, many of these constraints have been reduced in the course of transition. However, several of the country studies in part II of this volume indicate that these pass-through problems and constraints on supply responses remain important. The combination of physical and institutional trade

constraints may lead to large differences in commodity prices across regions within countries.

Regional Policy

An important policy issue in some of the large CIS countries is the practice among authorities in regions within the countries to impose trade controls periodically if there are perceived (potential) shortages of grain or rising grain prices. These interventions add to price and quantity instability in other regions in the countries and dampen the incentives for farmers to increase their production whenever shortages appear imminent.

The importance of these interventions in regions seems to differ according to the national political structure. For example, in Kazakhstan, the centralized political structure does not allow for much policy autonomy in regions. In contrast, interventions by the regions in grain markets, including setting margins and restrictions on product outflows, are a regular phenomenon in Russia. Moreover, when Russia's federal budget subsidies fell during the early years of transition, governments in the regions became the main source of budget subsidies for farms and were active in setting agricultural policy within their areas. The situation in Ukraine is mixed. As reported in the country chapter, some authorities in the country's regions declared bans on grain and oilseed exports in the late 1990s. While authorities in the regions had no legal right to impose the bans, the response of the central government was ambiguous, and the regional interventions persisted.

Infrastructure

Infrastructural constraints prevent the export of local surpluses to other regions within a country or to other countries, thereby depressing prices in times of good harvests. Conversely, they prevent changes in international prices from being reflected in local markets. The Russia study argues that major changes in the price gap between local Russian regions and international markets are caused mostly by limitations on arbitrage and trade.

Corruption

In several countries, including the Kyrgyz Republic, informal checks by local police are common, and trade costs are higher because of the payment of bribes or because the means of avoiding bribes involve more-costly trading routes. In Ukraine, the removal of export quotas and licenses in 1996—in compliance with World Bank and International Monetary Fund conditionality—induced those who had benefited from these regulations to search for alternatives. As a result, so-called recommended prices were implemented for many products. Although not officially binding, customs officials might insist on their application. To avoid

costly delays, traders had to resolve their disputes locally with the officials or cultivate high-level contacts in Kyiv to guarantee immunity.[4]

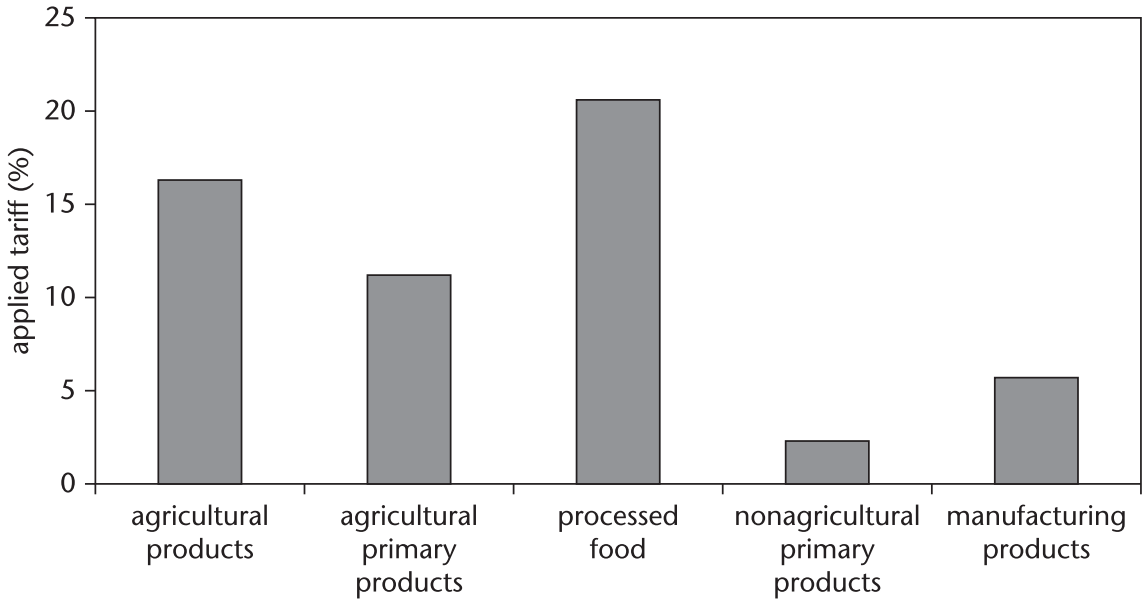
These costs are even higher in landlocked countries such as the Kyrgyz Republic. For most Kyrgyz exporters, the costs of traversing Kazakhstan (and Uzbekistan) are more important than getting goods to the Kyrgyz border because the exporters must pay bribes at each police stop in Kazakhstan. Stryker and Livinets (2002) report that, of the US$4,500 it costs to send a 20-ton truckload of apples from inside the Kyrgyz Republic to Russia, between US$1,500 and US$2,000 (that is, 33–44 percent) goes to bribes and unnecessary transaction costs.

Human capital also continues to be a constraint. The initial opening of international markets to agricultural exports did not necessarily lead to increased exports because neither the infrastructure nor the people involved in processing and trading managed to capture any potential gains. This situation has improved during the transition as entrepreneurs have invested in trading enterprises to benefit from arbitrage both in domestic trade and international trade, although not always legally.

Assistance to Agriculture Relative to Other Tradable Sectors

Average import tariffs on primary agricultural commodities in the region are twice as high as average tariffs in industry, but only half as high as tariffs on

Figure 1.4. Applied Weighted Average Tariffs, Central and Eastern Europe, 2001–03



Source: UNCTAD Trains Database 2007.

Note: The tariffs have been calculated as the simple average of each country's weighted average tariff for each sector based on unbalanced panel data.

processed food. This is true both for Central and Eastern Europe (figure 1.4) and for the CIS. It suggests that, while the region's farmers receive more tariff protection from competition abroad than do nonagricultural producers, food processors are far more tariff-protected.

The import-competing producers are only part of each sector, however. If account also is taken of the support for producers of exports in each sector, an overall NRA for all nonagricultural tradable industries may be used, together with the average NRA for agricultural tradable industries, to calculate the RRA according to equation (1.1) elsewhere above. The resulting estimates are summarized in table 1.13 and figure 1.5. In agriculture, the RRA is lower than the NRA in so far as the NRAs for nonfarm industries are positive. But, in most cases, the nonagricultural NRA is low. Thus, the overall NRA for primary agriculture during 2000–03 is estimated at more than three times the NRA for nonagricultural producers in the region, on average. Only in two countries—Bulgaria and Ukraine—was agricultural production assisted less than nonagricultural tradables (RRA < 0). And, in virtually all countries for which there is a time series, the RRA has been rising over time. The average estimated RRA was 11 percent for the region in 2000–03 and looks to have risen considerably since then, implying that farm prices in the region are more than one-eighth higher than they would be if there were free trade in all goods.

Changes in Exchange Rates

Changes in exchange rates (induced by both policy manipulations and structural changes or changes in terms of trade) have had major impacts on agricultural incentives in the region, as elsewhere. National currencies were heavily overvalued under the Communist regime, implicitly lowering the domestic price of exportable products, including agricultural raw materials and food. Whether this overvaluation of the currency provided protection to import-competing producers or taxed them depends on the way the scarce foreign exchange was allocated to various groups of importers (see the appendix).

Exchange rate liberalizations in the early 1990s strongly affected relative prices for all producers, including farmers. The massive devaluations on their own would have represented a large incentive for the most competitive producers to expand their production and their exports. However, the devaluations were accompanied by reductions in food consumer subsidies and large rises in the prices of previously subsidized farm inputs that largely offset the beneficial effects on farmers of the devaluations.

The subsequent gradual, but steady revaluations of currencies in Central and Eastern Europe from the mid-1990s then reduced the incentives for farmers in

Table 1.13. RRAs to Agriculture in the Region, 1992 to 2005
(percent)

a. EU-10					
Country	NRA, RRA	1992–95	1996–99	2000–03	2004–05
Bulgaria	NRA agricultural	−19	−10	0	13
	NRA nonagricultural	—	—	7	9
	RRA	—	—	−8	4
Czech Republic	NRA agricultural	22	21	29	—
	NRA nonagricultural	—	5	4	—
	RRA	—	15	25	—
Estonia	NRA agricultural	−14	20	20	—
	NRA nonagricultural	—	0	1	—
	RRA	—	19	19	—
Hungary	NRA agricultural	19	18	34	—
	NRA nonagricultural	9	5	6	—
	RRA	9	12	26	—
Latvia	NRA agricultural	−15	30	36	—
	NRA nonagricultural	—	3	3	—
	RRA	—	27	33	—
Lithuania	NRA agricultural	−19	29	32	—
	NRA nonagricultural	—	2	1	—
	RRA	—	26	30	—
Poland	NRA agricultural	10	24	7	—
	NRA nonagricultural	9	6	3	—
	RRA	1	17	4	—
Romania	NRA agricultural	24	30	55	65
	NRA nonagricultural	11	10	8	3
	RRA	12	18	44	61
Slovak Republic	NRA agricultural	28	26	30	—
	NRA nonagricultural	—	—	21	—
	RRA	—	—	9	—
Slovenia	NRA agricultural	64	79	80	—
	NRA nonagricultural	—	—	6	—
	RRA	—	—	70	—
EU-10	NRA agricultural	12	22	24	—
	NRA nonagricultural	—	—	5	—
	RRA	—	—	19	—

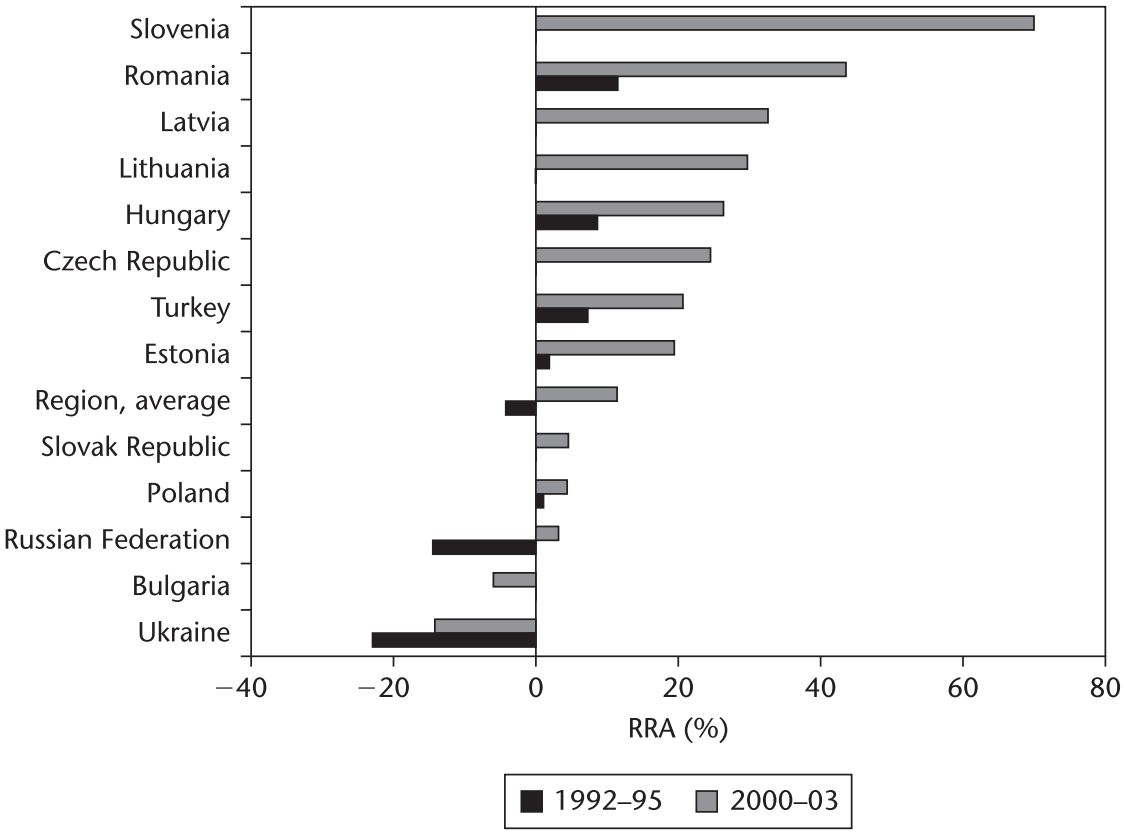
Table 1.13. (continued)

b. Others					
Country	NRA, RRA	1992–95	1996–99	2000–03	2004–05
Turkey	NRA agricultural	16	25	21	30
	NRA nonagricultural	7	2	1	1
	RRA	8	23	20	29
Russian Federation	NRA agricultural	−8	25	13	22
	NRA nonagricultural	7	11	10	9
	RRA	−14	12	3	12
Ukraine	NRA agricultural	−21	0	−11	−3
	NRA nonagricultural	2	3	3	3
	RRA	−23	−3	−14	−6
All countries under study	NRA agricultural	3	22	17	—
	NRA nonagricultural	—	—	5	—
	RRA	—	—	11	—

Source: Author calculations based on estimates reported in chapters 2–5 of this volume.

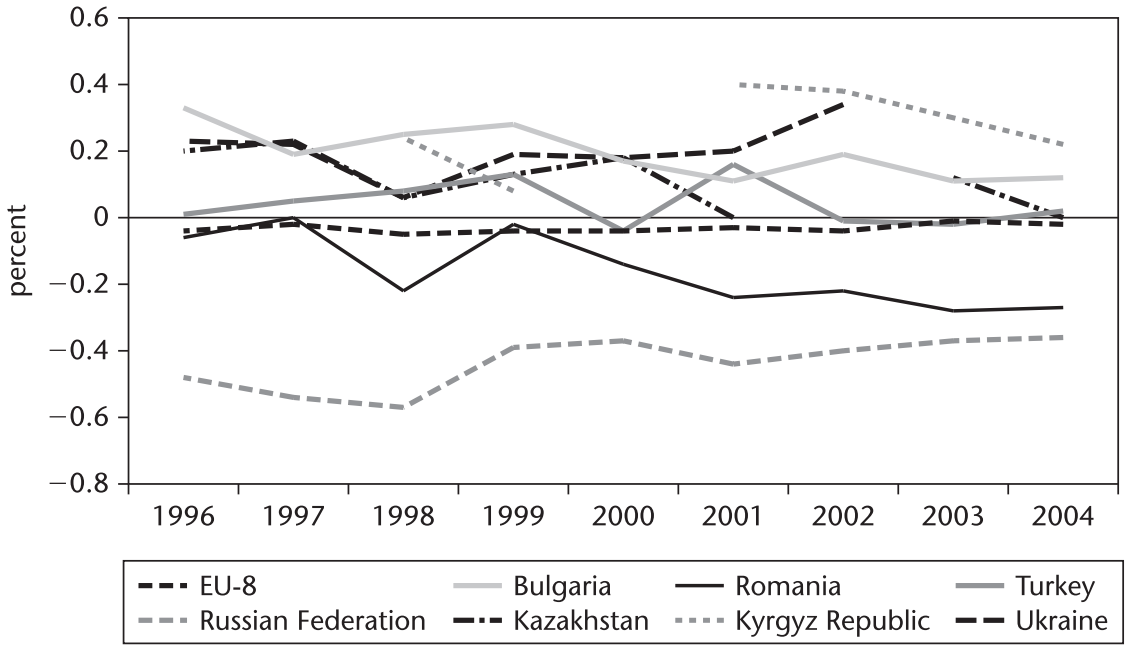
Note: See at equation (1.1), elsewhere above, for an explanation of the RRA. — = no data are available.

Figure 1.5. RRAs to Agriculture in the Region, 1992–95 and 2000–03



Source: Author calculations based on estimates reported in chapters 2 and 3 of this volume.

Figure 1.6. Net Agricultural Exports as a Share of Agricultural and Food Exports and Imports in the Region, 1996 to 2004



Sources: Sandri, Valenzuela, and Anderson 2007; World Development Indicators Database 2007.

that subregion to produce tradables, offsetting the effects of the increases in direct agricultural assistance. This helps explain why the net exports of agricultural products from these countries (expressed as a percentage of agricultural exports, plus imports; see figure 1.6) have not grown over the past decade in response to the greater assistance to agriculture.

In contrast, the Russian fiscal crisis of 1998 led to a steep reversal of the five-year appreciation of the country's currency. This second exchange rate devaluation had major implications for several CIS countries, in addition to Russia, improving the agricultural competitiveness of these countries.

The Inefficiency of Transfers

Some policy instruments are more efficient than others in transferring income. The inefficiency of policy instruments is typically correlated with the distortions that the instruments cause. In general, the most efficient instruments (such as lump-sum transfers) cause the least distortions. In contrast, price and trade interventions such as price supports or import tariffs are much less efficient: the OECD estimates that the transfer efficiency of this sort of support is around 25 percent, meaning that, for every dollar in cost imposed on taxpayers or consumers, only 25 cents ends up as income gains among producers.

The policy efficiency in the countries of the region is often low. Budgetary transfers to the food sector under the Communist system not only served to support farmers and consumers, but also (as is still the case in Turkey) to cover for the inefficiencies of agribusiness and food companies. These policies have been eliminated, and the inefficiency associated with this set of transfers via the budget has been greatly reduced since then. However, a different set of inefficiencies has been introduced, such as transfers from consumers to producers by way of import restrictions. Up to the mid-1990s, policies in all countries except Slovenia and Turkey imposed the equivalent of low or negative taxes on food consumers, but CTEs have become positive since then (table 1.14). Turkey's CTE was 27 percent by 2005, for example, compared with only 17 percent in the EU following the EU policy reinstrumentation toward more direct farm income supports this decade. The 2003 CTEs in Romania and Slovenia were well above 17 percent and, presumably, will fall during the transition of these countries to the EU's common agricultural policy.

Many of the direct subsidies to producers do not reach farmers. This is because of a combination of institutional constraints and induced reactions to policy changes. One reason is that some subsidies targeted at farms dissipate to other groups as factor and output prices react to the policies. For example, increased assistance to agriculture in Central and Eastern Europe has induced a substantial increase in factor prices, particularly land prices, as a result of EU accession. As subsidies become capitalized into the value of farmland, this benefits landowners rather than farmers, and many of the landowners are urban households (Ciaian and Swinnen 2006). In cases where the landowners are not the tillers, but rather urban households, income and wealth distribution may be worsening rather than improving as a result of the price-support programs. On average, early empirical evidence on subsidies related to the common agricultural policy in the new EU member states shows that farm incomes have gone up considerably, but that land rents have increased strongly as well.

Part of the transfer leakages may go to food industries or to agribusiness. This was certainly the case under the Communist system, but, even now, with unequal bargaining power in the food chain between processors and farmers, agribusiness companies are also extracting some of the benefits that would otherwise accrue to primary producers.

That the subsidies go to a subset of farms, typically those with the best political connections, is another problem. For example, the Ukraine study points out that there is considerable variation among farms in how they benefit (or not) from agricultural policies. Thus, 75 percent of the production subsidies provided to livestock producers in Ukraine in 2004 were eventually captured by 7 percent of livestock-producing farms (Zorya 2006). It is argued that rent seeking underlies

Table 1.14. CTEs for Food Products in the Region, 1992 to 2005
(percent)

Country	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Bulgaria	−34	−9	−26	−21	−35	−11	7	−2	5	−5	−9	13	12	5
Czech Republic	15	26	17	0	1	1	27	17	7	17	22	22	—	—
Estonia	−37	−22	−8	2	6	4	25	5	5	6	11	13	—	—
Hungary	9	22	18	3	3	2	12	17	15	17	20	19	—	—
Latvia	−41	−16	9	0	3	11	37	38	28	32	32	16	—	—
Lithuania	−39	−16	−16	2	5	13	42	43	24	21	30	24	—	—
Poland	−7	9	13	6	15	12	26	20	6	4	0	−6	—	—
Romania	2	28	16	5	5	2	47	30	26	65	46	62	42	40
Slovak Republic	2	16	14	1	−6	2	21	16	7	4	11	13	—	—
Slovenia	48	50	48	49	37	45	72	75	46	39	43	47	—	—
Russian Federation	−62	−38	−31	−6	5	18	7	−5	−1	8	11	8	13	8
Ukraine	−54	−10	−10	−33	−13	13	7	−7	1	3	−12	−7	−3	8
Turkey	37	29	9	9	12	28	36	28	27	1	21	35	26	27

Source: Author calculations based on estimates reported in chapters 2–5 of this volume.

Note: — = no data are available.

many agricultural policies in Ukraine because a small group of individuals and firms who stand to gain a great deal through export and import regulations have a significant influence on policy. Similarly, in Bulgaria, much of the grain policy rents have gone to large grain traders and wholesalers. In Turkey, too, where the agricultural sector as a whole has been heavily supported, traditionally much of the support has not reached farmers; there are extensive leakages to inefficient organizations that are supposed to transfer the support to farmers.

The pass-through to farmers of changes in international prices or in rates of assistance at the trader or processor level of the value chain is limited in numerous countries in the region. This is due to a combination of poor institutional and physical infrastructure, corruption, inadequate human capital, and policy interventions, all of which reduce the tradability of certain commodities. These constraints are very important in some of the countries.

Within the larger countries of the region, such as Russia and Ukraine, intranational regional authorities also periodically impose trade controls if there are perceived (potential) shortages of grain or rising grain prices. These interventions add to price and quantity instability in other regions within these and neighboring countries and dampen the incentives for farmers to respond by increasing production whenever shortages become imminent.

An additional constraint on pass-throughs is the incompatibility between the large-scale firms that supply inputs and process foods and the growing proportion of small farmers. This constraint was particularly important in the early stages of transition and is still important in some of the less-well-developed parts of the region.

Human capital constraints have influenced business and government. These constraints matter to business because, during the early stages of the transition, entrepreneurs quickly invested in trading enterprises to benefit from opportunities for arbitrage in domestic and international trade (not always through legal means). They matter also to government because of the ongoing weaknesses in expertise in understanding and analyzing policies. The lack of expertise was important even in some of the more affluent countries of Central and Eastern Europe in the early to mid-1990s because it contributed to various ad hoc policy interventions and inconsistencies in policies. It continues to be pervasive and problematic in some of the poorer CIS countries today.

Forces behind Transitional Policy Choices

Several stylized facts of political economy that are widely observed in market economies—for reasons explained in, for example, Anderson (1995), Anderson and Hayami (1986), de Gorter and Swinnen (2002), and Swinnen (1994)—are

Table 1.15. Relative per Capita Income, Agricultural Comparative Advantage, NRAs, and RRAs in the Region, 2000–03

Country	Relative per capita income	Agricultural comparative advantage	NRA	RRA
Slovenia	216	52	80	70
Czech Republic	135	61	29	25
Hungary	122	90	34	26
Estonia	102	199	20	19
Poland	93	105	7	4
Slovak Republic	92	57	30	9
Lithuania	80	176	32	30
Latvia	76	364	36	33
Turkey	55	131	21	20
Russian Federation	47	53	13	3
Romania	41	74	55	44
Bulgaria	39	143	0	−8
Ukraine	17	112	−11	−14

Sources: Columns 1 and 2: Sandri, Valenzuela, and Anderson 2007; columns 3 and 4: chapters 2–5 of this volume.

Note: The table shows income per capita relative to the world average in 2000–04 and the share of agriculture and food in national exports as a percentage of the share of agriculture and food in global exports in 2000–04.

also found in the post-transition countries in the region. The data indicate that, on average, farmer assistance tends to be higher in higher-income countries and in countries with weaker comparative advantage in agriculture. We observe the same correlations in the region (table 1.15); so, it is likely that similar political and economic interactions and mechanisms are at work in this region and in other parts of the world.

Interestingly, though, chapter 2 reports hereafter that these correlations are becoming weaker among the countries of Central and Eastern Europe over time. Why they are becoming less significant in the course of transition is not entirely clear, but some insights emerge in the following discussion of the forces that underlie the political economy of agricultural taxation and assistance in the region.

Causes of Rent Extraction

Heavy negative government intervention in the form of depressed incentives tends to be concentrated on commodities that have the potential to provide export tax revenue for the government. This is especially the case in the cotton

sectors of Tajikistan, Turkmenistan, and Uzbekistan. There, as in a number of African countries, governments control the cotton chain to extract rents, thereby depressing farmer prices and production incentives. There is a clear division in Central Asia between the roughly neutral policy toward cotton in Kazakhstan and the Kyrgyz Republic (where cotton exports once accounted for a relatively modest share of exports) and the extensive taxation and extraction of rents from cotton in Tajikistan, Turkmenistan, and Uzbekistan (countries in which cotton has traditionally been an important export tax resource). In Turkmenistan and Uzbekistan, the governments use state monopoly powers over marketing to transfer substantial resources away from agriculture. Most of the transfers in Uzbekistan appear to go to general government revenue, whereas, in Turkmenistan, much is wasted (for example, in inefficient cotton mills with negative value added) or accrues to secret accounts under the president's personal control. Recently, potentially important reforms have been undertaken in Uzbekistan to reduce some of the distortions in farm incentives, while no reforms have been undertaken in Turkmenistan. In Tajikistan, the rent distribution is more opaque, but equally detrimental to farms; there, a coalition of the government and a monopolistic private trading company has led to depressed prices and fewer incentives for farmers. Not surprisingly, farmers have responded sharply to these various incentive distortions through rapid growth in Kazakhstan and the Kyrgyz Republic and stagnation or declines in the other countries (table 1.16).

The grain and oilseed export sectors of Bulgaria, Ukraine, and the grain-surplus regions of Russia are similarly characterized by heavy government regulation and interventions. In traditional grain-exporting countries such as Bulgaria and Ukraine, the grain sector has disproportionate political significance for historical and psychological reasons. For example, in Bulgaria in the mid-1990s, ministers of agriculture resigned regularly following reports that there had been grain shortfalls or that unregulated exports were threatening local grain supplies. In Ukraine, ad hoc grain market interventions have continued in recent years.

Opportunities for rent seeking that have been created because of distorted policies inhibit policy reform; the few who benefit disproportionately from the distortions lobby strongly for the status quo. This applies to various policies, including cotton regulations in Central Asia, regulations aimed at the grain trade in Bulgaria, Russia, and Ukraine, and water policy in Central Asia. But it also applies to policies in countries in which benefits go to specific groups of farms. For example, the continuation of soft budget constraints in the large CIS countries and the failure of governments to enforce bankruptcy regulations and to protect land rights benefit large farming companies disproportionately, while smaller family farms are often hurt by these policies. In Turkey, parastatal agricultural

Table 1.16. Annual Growth Rates in Cotton Area and Production and Changes in Seed Cotton Prices, Central Asia, 1993–2003

Indicator	Kazakhstan	Kyrgyz Republic	Uzbekistan	Tajikistan
Harvested area (hectares), %				
1993–98	12.3	6.0	−1.7	3.7
1993–2003	5.8	7.6	−1.7	−0.1
Seed cotton production (1,000 metric tons), %				
1993–98	26.7	11	−2.3	8.4
1993–2003	8.9	11.5	−2.8	0.1
Baled cotton production (1,000 metric tons),%				
1993–98	12.6	20.4	−2.7	0.4
1993–2003	5.4	25.9	−2.6	−3.5
Seed cotton price, US$ per metric ton, 2003	550	450	200	165

Sources: Chapter 8 in this volume; Sadler 2006; World Bank 2006.

Note: There are significant differences in seed cotton production and baled cotton production. The most important reason for these differences is probably the smuggling of seed cotton from Tajikistan and Uzbekistan to Kazakhstan and the Kyrgyz Republic, although there are no hard data on the amounts of smuggled seed cotton.

companies and marketing cooperatives benefit from farm support and are major lobbyists in favor of market regulation and support.

Sometimes specific political, regional, or ethnic coalitions play a role. For example, in Kazakhstan before independence, many residents of the rich northern grain regions were German or Russian. After independence, the power shifted to Kazakh nationals, limiting the influence of Germans and Russians in government and causing many of them to emigrate. In Bulgaria, the resistance of the government to the privatization of tobacco processing and the government's decision to allocate a disproportionate level of subsidies to tobacco growers have arisen from the fact that the Turkish minority in Bulgaria is active in the tobacco sector and holds the key positions in the Ministry of Agriculture.

Causes of Increases in Support during Transition

The increases in agricultural support in the region—in Central and Eastern Europe in the second half of the 1990s and in the CIS more recently—have been the result of interactions between domestic political forces and the international

context. The increase in farmer assistance in Central and Eastern Europe was likely caused by the sort of domestic internal pressures that normally come to bear in a contested political environment. Such pressures result in rises in agricultural protectionism as per capita incomes increase and as agricultural comparative advantage declines. During the more recent period, it has been necessary to reverse somewhat the overshooting in reform that occurred during the first few years of transition.

The EU accession process is also playing a role by encouraging governments in Central and Eastern Europe to target the levels of support they expect in the EU by the end of the phase-in period of accession so as to maximize the transfer of benefits from Brussels. However, it appears that, during the years before accession, the accession process had more impact on the introduction of new support instruments than on the overall level of support, probably because the cost of the support must be borne within the national economy before accession (Swinnen 2002).

Another contributing factor has been improvements in the budgetary situation of governments, which has allowed more subsidies to be given to farmers than was possible during the early years of transition. This factor has played a role throughout the region, but particularly in Russia and some of its neighbors, where the recovery from the post-1998 fiscal crisis has been aided by windfall gains from the dramatic rise in the prices of energy raw material exports. This factor was stronger in countries where governments have more access to mineral resources, such as Kazakhstan (oil), Russia (oil and gas), and Turkmenistan (gas).

Crises, Political Change, and Reforms

General political and economic crises have played an important role in inducing changes in agricultural distortions. The most obvious example is the fall of the Communist regime, and the disintegration of the Soviet Union, and the related central directives from Moscow. However, even later, general crises have triggered other changes. Most often, the policy reforms come only after new elections induce a change in government to reflect changed electoral preferences.

For example, in Bulgaria and Romania, important progress in the removal of distortions and market reforms only occurred in the late 1990s after electoral change had brought reform-minded governments to power (in Bulgaria, caused by the financial crisis in 1996). In Ukraine, important reform progress was made in the years after the 1999 election in which the large farm lobby fell out with President Kuchma, who then introduced a series of reforms that the farm lobby had always opposed.

However, democratic political change is not a sufficient precondition for better agricultural policy. For example, in the Kyrgyz Republic and Ukraine, recent political changes (the Tulip Revolution and the Orange Revolution, respectively) have

not contributed to better agricultural policy. Indeed, the government in Ukraine seems to have reversed, while, in the Kyrgyz Republic, change has mostly resulted in more instability, while relatively few distortions remain in agriculture.

The Impact of International Agreements

EU accession, both prospective and actual, has had obvious and profound influences on policy choices. The EU-8, which joined in May 2004, have raised domestic agricultural and food prices toward levels in the EU-15. An important portion of EU farm subsidies take the form of direct payments. Farmers in the EU-8 receive considerably less of these subsidies than farmers in the EU-15. The EU-8 subsidies will gradually increase, reaching EU-15 levels only by 2010. Another important difference is that the subsidies in the EU-15 will be assigned on a per farm basis (single farm payments) before this will be the case in the EU-8.

The EU-8 have also been induced to undertake major regulatory improvements to stimulate their markets, including private investments in the food chain and public rural infrastructure investments. Trade policies among the EU-8 have likewise changed to allow free access for all products from all EU member countries and, in most cases, also freer access for nonagricultural products from non-EU countries because the common external tariff is typically lower than the tariffs that had previously been applied in acceding countries.

The EU accession process has not caused a major increase in food prices in the EU-8. One reason is the increased competition in consumer markets in the EU-8 because of the opening of agrifood markets to imports and the massive inflow of foreign direct investment in the retail sector.

The impact of other international agreements (including WTO accessions) has varied. The Czech Republic, Hungary, Poland, Romania, the Slovak Republic, Slovenia, and Turkey have been members of the WTO since its creation in 1995. Albania, Armenia, Bulgaria, Estonia, Georgia, the Kyrgyz Republic, Latvia, and Lithuania joined the WTO later, while Kazakhstan, Russia, and Ukraine are still at various stages of negotiating WTO accession.

WTO accession has not strongly disciplined the countries in the region that were founding members in 1995.[5] For those countries that had to negotiate their entry in the later 1990s, the constraints on introducing or maintaining distortions were more serious. And, for those large countries still negotiating accession, notably, Kazakhstan, Russia, and Ukraine, WTO membership has been even tougher in the demands that must be met (following the firm stand taken toward China during its accession process). Whether such a stance will help liberalize agricultural trade remains to be seen, but at least it will provide a ceiling on the extent to which agricultural protection and subsidies may be raised in the future.

For the countries of Central and Eastern Europe, the most important impact of the WTO has been indirect: in anticipation of eastward enlargement, the EU was forced to introduce major changes to the common agricultural policy, and this, in turn, has affected agricultural distortions in Central and Eastern Europe since accession.

An additional, somewhat erratic influence has been the regional trading arrangements among countries. These include the Eurasian Economic Community, the Central European Free Trade Area, and the Baltic Free Trade Area. However, the impact of these agreements in reducing agricultural policy distortions has generally been limited because the agreements include many exceptions for agricultural and food products, especially for so-called sensitive products that make up a substantial share of production. Moreover, the Central Asian countries such as Kazakhstan and the Kyrgyz Republic have been reluctant to join the Eurasian Economic Community because it would impose Russia's trade and customs preferences on them.

The Influence of International Institutions

The role of other international institutions was very important at the start of transition because it provided guidance in policy reform in all these countries. However, in more recent years, this guidance has been less effective. For those countries joining the EU, the policy advice from Brussels has been considered more relevant. This is especially, but not only, the case for the EU accession countries. Also, for those countries aspiring to join the EU (such as most of the Balkan countries and even countries farther east, such as Ukraine) or for those seeing the accession countries as models for their own development strategies, the policy advice from Brussels is taken seriously. Another reason is that the improved fiscal and macroeconomic situation has made many of the countries of Southeastern Europe and the CIS less beholden to international financial institutions that require reform as a condition for loans or financial assistance.

Human Capital Constraints

A factor that is mentioned in some cases as a constraint on policy reform is the continued weakness of intellectual capacity in both policy analysis and understanding policy. While this was important in many countries in Central and Eastern Europe in the mid-1990s when it contributed to various ad hoc policy interventions and policy inconsistencies, the emergence of a new generation of agricultural economists, policy advisors, and politicians has largely overcome this constraint. However, in some of the less advanced countries, this constraint seems to be pervasive and problematic. For example, the Ukraine study in this volume emphasizes that the weakness of intellectual capacity is a major direct

and indirect constraint on the development of a better and more consistent policy framework.

Prospects for Reducing Distortions: Implications for Agricultural Competitiveness and Trade

There have been *major reductions in distortions to agricultural incentives in the region* over the past two decades. A great deal has been accomplished in removing the distortions in agricultural incentives in the region; dramatic changes have dismantled the most distortionary policy regimes. In many of the countries in the region, average protection levels are now relatively low.

However, there is still *substantial room for reduction in the distortions* in agricultural incentives. Some of the countries in the region still have a considerable task ahead to remove distortions, and others have introduced new distortions. Improving policies and reducing distortions may be accomplished through various methods: overall reductions in support policies, shifting support to less-distortive policy instruments, focusing budgetary resources on investments in public goods rather than farm subsidies, investing in infrastructure and institutions to reduce trade costs, shifting from a quantity-based to a quality-based policy paradigm, and so on.

In terms of additional reductions in policy distortions, *some of the most distortive cases involve the taxation of agriculture* (for example, controls and rent extraction in the cotton sectors in some Central Asian countries). Removing these distortions would facilitate a substantial improvement in incentives to domestic producers. Some progress has been made in recent years, but much more can be done.

The countries that are unlikely to accede to the EU in the medium run (such as Turkey, Ukraine, and many of the countries in the Balkans) should focus policy attention in the near term *on efficiency improvements in policy and the agricultural economy*. Neither of these is inconsistent with the objective of EU accession. The EU has shifted in recent years to decoupled farm support and is demanding that countries make a similar shift and improve the efficiency of farms and food companies.

From this perspective, *other reforms are also important*, such as macroeconomic and regulatory reforms to stimulate food industry investment, labor market reforms to enhance off-farm employment opportunities, and credit reforms to stimulate access to rural credit.

A crucial component of this should be a *shift in the policy paradigm from policies focused on quantity and minimum standards to policies focused on quality and*

high standards. Safety and quality standards are increasingly crucial components of modern food chains domestically and internationally. Because of emerging technologies and the growing influence of large retail and processing chains, the demand for traceability and high quality standards will increase. These developments will also pose new policy challenges in terms of equity (exclusion and rent extraction) and efficiency (contracting problems, quarantine trade disputes, and so on). Traditional trade and price policies are not suitable for dealing with the challenges posed by these modern chains.

The same policy framework should be promoted in countries to the east, which include those countries that are likely to spend more funds on agriculture in the coming years as their fiscal situation improves. *Increased funding should be focused on upgrading infrastructure, on quality, on the efficiency of the agrifood system, and on the introduction or improvement of a variety of institutions necessary to support rural markets*. In several of the poorer and the larger countries of the region, institutional and infrastructure problems, as well as corruption, remain a major constraint on trade and thereby distort farm incentives. Policies and projects should target such constraints to reduce trade costs. This could have major positive effects on farm incentives and incomes.

Competition and antitrust policy is an important area for policy attention. In supply chains in which farms have to sell their products to trading, processing, and retailing companies, the ability to choose freely among companies is crucial in obtaining better farm conditions. This applies across the region, where monopoly buyers (state-owned or private) push down prices and contract conditions, although the sources of anticompetitive behavior and the policy details are likely to differ across countries in, for example, the increasing dominance of large retail chains in Central Europe or some of the government-controlled cotton chains in Central Asia.

An important policy finding is that *exchange rate developments have had and will continue to have an important impact on farmer incentives*. Some of these exchange rate effects have been caused or influenced by policy (for instance, the government set exchange rates under the Communist regime, and pegged exchange rates still apply in some countries), and some have been a consequence of macroeconomic developments. In either case, over the past two decades, both before and during transition, exchange rate distortions and adjustments have had substantial impacts on incentives. This factor is likely to continue to be important, particularly in countries in which high energy prices may lead to a Dutch disease effect in agriculture.

It is important to realize that the *political economy forces* identified in this study may *constrain the prospects for additionally reducing distortions* in agricultural incentives in the foreseeable future because of changes in the pressure for and the

constraints on policy reform. First, the accession of countries in Central and Eastern Europe to the EU has increased the level of their farm assistance, although they will face more competition within the enlarged EU. Reducing farm assistance in Central and Eastern Europe will not occur without a reduction in EU protection levels. Some reforms are currently under way in the EU (for example, the cut in EU sugar price support and the shift from per hectare payments to single farm payments). However, the suspension of the WTO Doha trade negotiations has reduced the pressure for reform. Second, in the mineral- and energy-rich CIS states, the rise in export earnings is reducing the budgetary constraints on governments inclined to give assistance to farmers as national incomes grow. Third, overall income growth will also lead to political economy pressures to raise the support for agriculture, which is suggested by the positive relationship between agricultural protection and economic development and which this report also finds in the region.

These policy constraints also have *implications for the impact of international institutions and organizations*. The role of other international institutions was important at the start of the transition because they provided policy reform guidance to all these countries. However, in more recent years, this advice has been less effective. For countries in the region wanting to join the EU, EU accession (or wider integration) has taken priority. In the future, other countries in the region will be in a better position to bargain with international institutions such as the International Monetary Fund and the World Bank because their growth and improved fiscal position will make them less obliged to follow the conditions imposed by international institutions.

From this perspective, the *WTO's multilateral trade negotiations represent a unique opportunity to exercise discipline* over agricultural policy distortions. This may be especially relevant for agricultural policy in Kazakhstan, Russia, and Ukraine because larger economies tend to be required by the WTO's current members to reform more than smaller ones. However, the WTO is unlikely to be a panacea. For example, in the case of Russia, the WTO may require some constraints on policies, but it is unlikely to have much impact on current policy because none of the key instruments of assistance currently used would be greatly restricted.

The challenges to reform repesented by policy interventions in local regions also deserve attention. Regional agricultural policies in Russia that affect markets are largely ad hoc and nontransparent and account for important distortions. However, eliminating these policy interventions would require fundamental reforms in Russia's political system, including a transformation of attitudes and behaviors involving governance. Accession to the WTO is unlikely to have much effect on such regional policy interventions in the medium term.

In summary, *there are key policy areas where the World Bank may still play an important role*. In infrastructure and institutional improvement, the World Bank has both the expertise and the instruments to assist countries. Also, in policy analysis, there is much room to contribute both directly and indirectly in preparation for WTO accession and for negotiating or renegotiating regionwide integration agreements.

Notes

1. If one were interested in each polity as a separate observation for the purposes of cross-country political economy analysis, then a simple (unweighted) average across countries would be more appropriate.

2. The focus of this study is primarily on the incentive distortions caused by policies affecting prices, trade, and exchange rates both directly and indirectly. We refer to other studies for analyses of the effects of property rights and the effects of distortions and reforms in farm organization.

3. There has been a significant shift to less-distortionary assistance, that is, direct payments based on the area planted or the number of animals. The share of these payments in total NRA increased during the transition, from less than 5 percent in 1986 to 20 percent in 2000, but this is still far from the share in the EU (35 percent). Decoupled payments (payments based on historical entitlements) were almost zero in both Central and Eastern Europe and the CIS before 2004, but this will change importantly in coming years.

4. One of the reasons why enormous farm conglomerates have reemerged in Russia is their ability to deal with government regulations. Evidence from Kazakhstan, Russia, and Ukraine indicates that an important constraint on enterprise development is rent extraction by local governments, for example, through taxation and ad hoc regulations. A major benefit of the large (often vertically integrated) farming corporations in these countries is their ability to withstand pressures from local authorities. This leads to a paradoxical situation: instead of public policy assisting small farms to grow in a market environment dominated by large companies, farms need to be large to withstand public pressure (Swinnen 2006).

5. For example, the applied tariffs are significantly below bound tariffs in many Central and Eastern European countries. This suggests that these countries have not been constrained by the WTO agreements (Bacchetta and Drabek 2002). For the Central and Eastern European countries that joined early, their commitments were based on the high support levels of the 1980s and therefore caused little constraints on their policies in the 1990s; for the others, the restrictions were more severe.

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PART II

EASTERN EUROPE

2

NEW EU MEMBER COUNTRIES

Pavel Ciaian and Johan Swinnen

The objective of this chapter is to document and explain the extent of policy distortions to agricultural market incentives in Central and Eastern Europe over recent decades.[1] In seeking to meet this objective, we provide an historical review of the policy changes in the subregion and calculate indicators of direct and indirect assistance to agriculture and indicators of taxation on consumers. The country coverage includes the eight Central and Eastern European countries that joined the European Union (EU) in 2004 (the EU-8: the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Slovak Republic, and Slovenia), plus the two countries that joined the EU in 2007 (Bulgaria and Romania, which, together with the EU-8, are referred to as the EU-10). The other big economies in the subregion—Russia, Turkey, and Ukraine—are not discussed here, but are the subject of parallel studies in later chapters of this report.

Agricultural production and food consumption in these countries were heavily subsidized under the Communist system, distorting incentives for both consumers and producers. Consumer retail prices were set low; producer prices were set high; and the gap was covered by direct subsidies to processing and trading companies or by soft budget constraints. However, at the same time, exchange rates were overvalued, and the assistance to nonagricultural industries negatively affected agriculture. The net effect of these distortions is difficult to estimate accurately, but there is general agreement among experts that agriculture was assisted relative to the nonagricultural sector in the later 1980s. There is an indicator of this outcome in that, at the end of the 1980s, direct budgetary subsidies to agriculture and food represented between 5 and 10 percent of gross domestic product (GDP) in most countries in Central and Eastern Europe.

In the late 1980s and early 1990s, subsidies were cut; prices, trade, and exchange rates were liberalized; and many distortions were removed. The net result was a major reduction in direct assistance to farmers. On average, the nominal rate of assistance (NRA) to agriculture was close to zero in the early 1990s. Consumers experienced offsetting effects. While they got access to a much wider set of options in terms of the quantity and quality of food products, retail food prices increased substantially in real terms.

After the initial liberalizations, assistance to agriculture increased again gradually, but substantially; the average NRA went from around 0 percent in 1992 to around 40 percent in 1998, after which it stabilized when the EU-8 began preparing for accession to the EU. In 2004, there was an increase in assistance to farmers when the agricultural policy regimes in the EU-8 became integrated into the common agricultural policy (CAP) of the EU. The groundwork had been laid for this through a gradual change in policy instruments. There was a reduction in the use of market supports and output subsidies in the 1990s, and direct payments and other supports for agriculture had come to account for a substantive share of the total assistance to agriculture by 2000. Not surprisingly, farm incomes increased strongly with accession. This was true even among people who did not own land and whose rent payments were going up.

During the past decade, indirect disincentives to agriculture in the EU-10 have been limited. Exchange rate distortions were largely removed by the second half of the 1990s, and the indirect taxation through tariffs on the rest of the economy was equivalent to less than 10 percent, on average, and decreasing.

In recent years, the agricultural sectors in Latvia and Slovenia have been the most well supported. In those countries, agriculture represents a small share of the economy. Meanwhile, protection has been lowest in Bulgaria, Estonia, and Poland. There has been considerable variation among countries and commodities, however. In our political economy analysis below, we show that structural variations in the economies of Central and Eastern Europe are associated with different support levels, that international agreements have played some (albeit limited) role in influencing policy distortions, and that budgetary and human capital constraints have also played a role. More specifically:

- Agricultural support is higher, ceteris paribus, in richer countries, in import-competing industries that lack a comparative advantage, and in industries that are negatively affected by economic changes such as real exchange rate appreciation.
- Regional trade agreements and EU accession agreements have had a limited effect on policy distortions.
- World Trade Organization (WTO) trade agreements were much more constraining on the countries that joined the WTO in the second half of the 1990s or later than on countries that had joined before then.

- Budgetary constraints limited government expenditures on agricultural support in Central and Eastern Europe especially in the 1990s, while inexperience in policy setting in a market environment had some serious effects on policy design and policy reversals in the 1990s.

Much was accomplished in removing distortions in agricultural incentives in the subregion in the 1990s, but there is much room for more reduction. Improving policies and reducing distortions may be accomplished through overall reductions in support policies, shifts in support to less distortive policy instruments, a focus in budgetary expenditures on investments in public goods rather than farm subsidies, a switch from a quantity-based to a quality-based policy paradigm, and so on. Such reforms would not be inconsistent with EU accession because the EU has tended to use more clearly decoupled farm supports in recent years. Moreover, reforms are under way in the EU that have important implications for distortions in Central and Eastern Europe, such as the reforms in some of the commodity regimes and the shift from per hectare payments to single-farm payments. These reforms will be implemented, too, in the subregion in coming years.

Other reforms have also been important, such as regulatory reforms to stimulate food industry investment and labor market reforms to enhance off-farm employment opportunities. A crucial component of this effort has been a shift in the policy paradigm from policies focused on quantity and low standards to policies focused on quality and high standards. Standards in quality and food safety are increasingly crucial features of modern food chains domestically and internationally. Competition policy and antitrust policy are another important area for policy attention. In supply chains in which farms must sell their products to trading, processing, and retailing companies, the ability to choose freely among companies is crucial to better farm conditions.

From the perspective of additional reforms and the consolidation of reform, the ongoing WTO negotiations may impose greater discipline on agricultural policy distortions. Indirectly, the WTO agreements have already had a major impact on distortions in Central and Eastern Europe because they have imposed constraints on the policies and the distortions that an EU, enlarged to 27 members, may implement. This has contributed to EU policy reforms during this decade, which are lowering the distortions in the subregion below the level they might have reached without the reforms.

The chapter is organized as follows. In the next section, we give an historical overview of the changes in government policies that have affected agriculture and food consumers in recent decades. We then present our estimates of the extent of producer and consumer assistance and the policy distortions. The methodology is detailed in the appendix. We make extensive use of data collected by international organizations, including data from the Food and Agriculture Organization of the

United Nations, the GTAP Database, Eurostat, the World Bank, the United Nations, and, especially, the producer support estimates of the Organisation for Economic Co-operation and Development (OECD). In the penultimate section, we review political economy factors that have affected policy choices to understand how they may help us explain the changes and differences in policy distortions in agriculture in Central and Eastern Europe. The final section identifies some lessons and prospects for reducing distortions in the future.

Historical Perspective on Agriculture and Policy Distortions

Until World War II, agriculture in Central and Eastern Europe was organized much like agriculture in neighboring Western Europe. By the 1940s, agriculture made up a considerable share of total output and a large share of total employment, although there was substantial variation among countries.

The Communist Period

After World War II, the economies of Central and Eastern Europe became subject to Communist rule. Land and farms were put under central planning, and, with the exception of Poland and the former Yugoslavia, agriculture was forcefully organized into collective and state farms.

Central planning in the agricultural economy created distorted allocations among production factors and distorted incentives among consumers and producers. Consumer prices were set low, and producer prices were set high; the gap was covered by direct subsidies to processing and trading companies or by soft budget constraints.

More specifically, in the late 1960s, the leadership of the Soviet Union decided to increase agricultural production, with a strong emphasis on livestock, a policy the Eastern European countries of the Soviet Bloc generally followed (Liefert and Swinnen 2002). As a consequence, livestock herds and output in these countries grew by 40 to 60 percent between 1970 and 1990. The rise in feed requirements caused by the expanding herds stimulated the crop sector. In the late 1980s, the average annual output of feed grain in Hungary and Poland was up by one-quarter and one-half, respectively, compared with output in the late 1960s. In the Soviet Union, the feed requirements were so great that the country also became a substantial importer of feed commodities.

By 1990, per capita consumption of livestock products and foodstuffs in general compared favorably with the consumption in many OECD countries, even though incomes in Central and Eastern Europe were much lower than the OECD average. This achievement came at a cost, however, because large state subsidies for both

producers and consumers were necessary to maintain the high levels of production and consumption. For example, at the end of the 1980s, direct budgetary subsidies in the agriculture and food economy represented between 5 and 10 percent of GDP in most countries in Central and Eastern Europe, and the bulk of these subsidies went to the livestock sector.

Because of these measures, agriculture made up a sizable share of the economies of Central and Eastern Europe in the 1980s, accounting for 15 percent of output and 25 percent of employment, on average. While there was significant variation (for example, the share of agricultural employment in total employment at the end of the 1980s ranged from 27 percent in Poland to 8 percent in Slovenia), the distortions ensured that a relatively large portion of resources remained in agriculture and were therefore not used more efficiently in other sectors of the economy.

However, while consumers and producers were strongly subsidized in nominal terms because output prices were set high and input prices were set low, interventions and regulations in the rest of the economy had counteracting effects on agriculture. Thus, several industrial sectors were also subsidized, and exchange rates that were set administratively discouraged all tradable sectors. The net effect of these various distortions is difficult to measure, but experts generally agree that agriculture was heavily subsidized in the subregion in the 1970s and 1980s (Brooks and Nash 2002; Cook, Liefert, and Koopman 1991; Liefert and Swinnen 2002; OECD 1996a, 1996b, 1996c, 1996d; Valdés 2000).

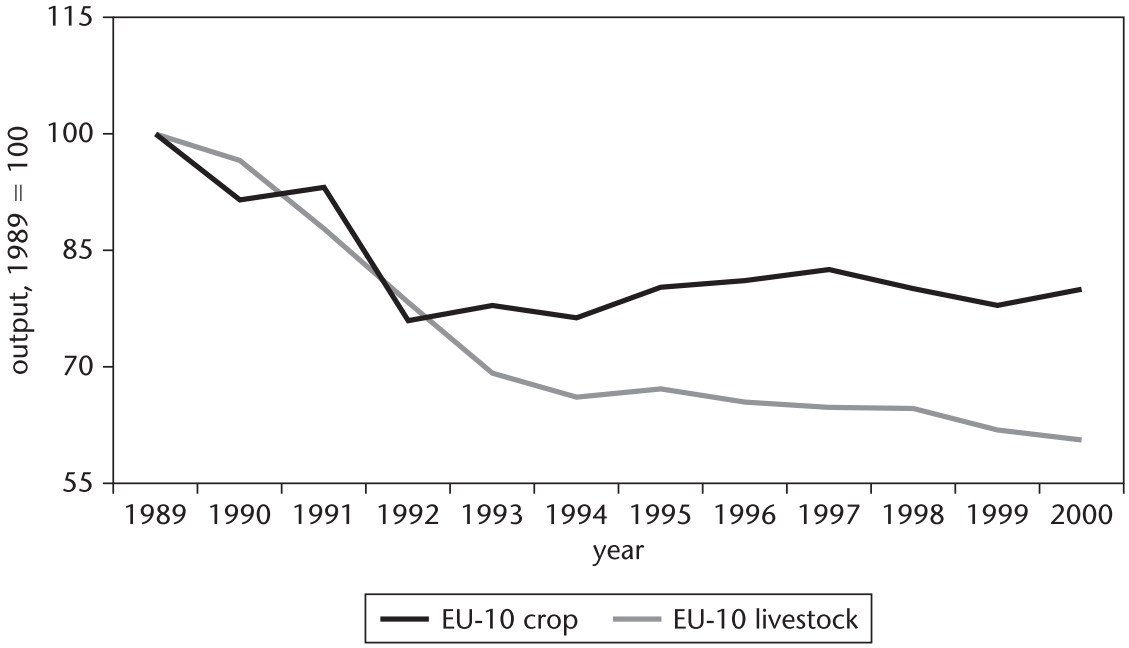
The Transition Period, 1989 to 2000

After the fall of the Berlin Wall in 1989, rapid changes took place in Central and Eastern Europe. We identify the 1990s as the period of transition, and we identify three phases of change in agricultural price and trade policies during that decade. The distinction among these phases is useful in understanding the changes in agricultural policies and distortions during the period between Communism and the EU, even though, in reality, there was not such a clear separation among these phases, and not all countries moved from one phase to the next at the same time.

Phase One: Liberalization

During the first phase (sometime between 1988 and 1992, depending on the country), price and trade regimes were liberalized, and subsidies to producers and consumers were reduced; this was accompanied by macroeconomic reforms. As a result, consumer prices soared, and real incomes often declined; so, domestic demand fell. Reduced domestic demand, together with falling incomes and subsidy cuts, were reinforced by falling foreign demand for local products and increased import competition from Western countries.

Figure 2.1. Changes in Crop and Livestock Output, EU-10, 1989 to 2000



Source: Author calculation based on OECD data.

Note: The figure does not include Hungary.

The impact on consumers was mixed. Real food prices increased, but access to higher-quality food products was also improved directly through imports and indirectly through enhanced competition, which forced domestic food companies to improve standards.

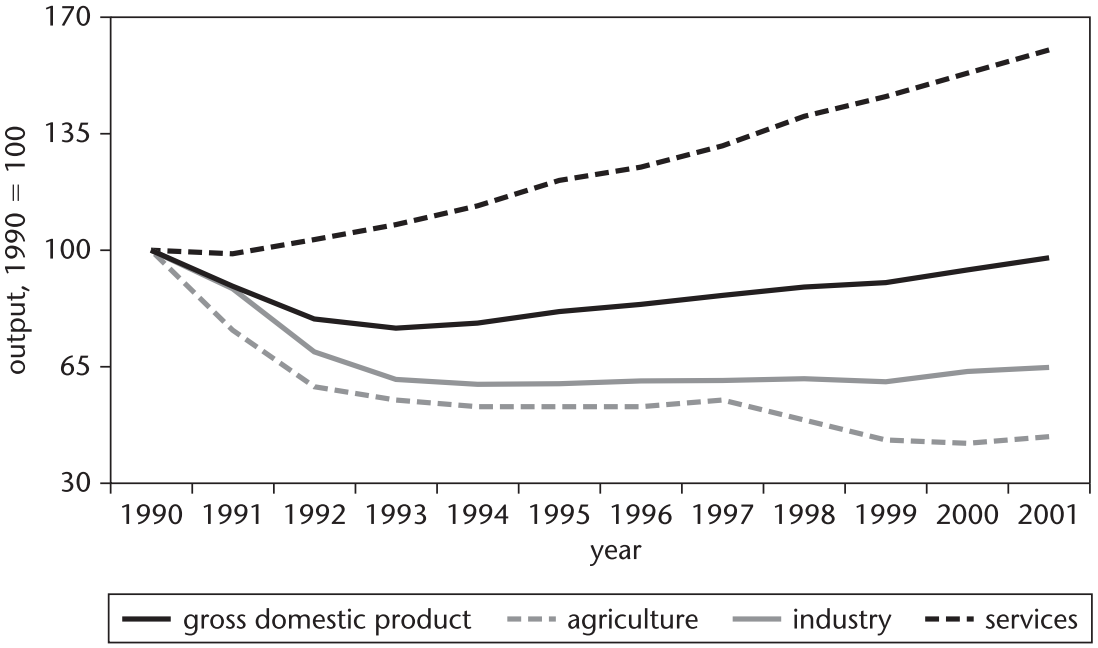
The impact on producers was more dramatic. Farm input prices increased strongly relative to producer output prices, causing a substantial decline in agricultural terms of trade and, hence, in agricultural output in the early 1990s (figure 2.1). Macours and Swinnen (2000) estimate that the terms of trade effect alone caused 40–50 percent of the decline in crop outputs in the subregion over 1989–95.

The liberalizations caused a contraction in agricultural production, but also a decline in the industrial sector. By contrast, output expanded rapidly in services because services were now freed from the constraint of Communist regulations (figure 2.2).

Phase Two: Fire-Brigade Policy Making

The decline in farm incomes and the soaring food prices caused social conflict, which led to political demands for government intervention and support and state regulation. During the transition's second phase, in the early to mid-1990s, governments in Central and Eastern Europe responded to the pressures by introducing or reintroducing price and trade interventions to protect consumers and

Figure 2.2. Changes in Sectoral Output, EU-10, 1990 to 2001



Source: Author calculation based on data from OECD and Sandri, Valenzuela, and Anderson 2007.

producers against the negative real income effects of the liberalization and other reforms.[2] However, many of these interventions were undertaken in an ad hoc fashion because the governments were inexperienced in implementing policies in the emerging market economy. Governments reacted to unanticipated policy effects by introducing more ad hoc regulations, adding to the uncertainty induced by general economic reforms. The nature of this response has been described as fire-brigade policy making.

Phase Three: Policy Consolidation

In the third phase, from the mid-1990s, governments in Central and Eastern Europe attempted to formulate more comprehensive agricultural policies for long-term interventions in agriculture. Some introduced policy instruments that already resembled (at least in design) the CAP prior to the MacSharry reforms. Such CAP-style agricultural policy packages included guaranteed prices, production quotas, export subsidies, and (variable) import levies. Most of the policy regimes passed through various degrees of reinstrumentation to address domestic policy objectives, comply with international agreements, or, later, bring agricultural policies more in line with the policies of the EU. For example, some of the countries in the first wave of applicants for accession to the EU soon modified their policy regimes to include a greater share of direct payments and other subsidies and somewhat less reliance on market price support (Hartell and Swinnen 1998).

The Pre-EU Accession Period, 2000 to 2004

In many respects, EU enlargement into Central and Eastern Europe effectively began several years before 2004, the year when eight of the countries in the subregion acceded to the EU (Swinnen 2002). Trade integration and foreign investment grew rapidly; already by the late 1990s, the gap in product quality and prices in Eastern and Western Europe was gradually narrowing, and policy convergence started when many countries in the subregion started implementing CAP instruments or, at least, preparing to put them in place.

Preparing for accession through policy was often referred to as trying to hit a moving target. This was because there was considerable discussion of CAP reform within the EU in anticipation of enlargement, and important EU decisions were taken in 1999 and again in 2002. In 1999, the first financial framework for 2000–06 was adopted, including assumptions about the agricultural policy framework appropriate for enlargement. In 2002, important changes were introduced partly as a result of pressure from countries in Central and Eastern Europe, and, in December 2002, the final accession framework was adopted.[3] This gave EU-acceding country governments a much clearer path for policy adjustment, and they were able to start preparing for the implementation of the *acquis communautaire*—the laws, regulations, and instruments required for entrance to the EU. This implementation procedure called for the adjustment of the agricultural policy systems of these countries to make them consistent with the CAP.

Accession to the EU in 2004

In May 2004, eight Central and Eastern European countries joined the EU. (Cyprus and Malta joined at the same time; these accessions are not discussed here; for our purposes, the group is therefore known as the EU-8.) The accession process involved additional, last-minute negotiations on farm subsidies and production quotas, but the agricultural sectors in the acceding countries are now integrated into the CAP even though, during the first years of accession, farmers in the EU-8 received lower subsidies than farmers in the EU-15 (the EU members prior to 2004: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom).

The extension of substantial subsidies to acceding-country farmers, especially given local income standards, had an important impact on farm incomes and rural market distortions. On average, agricultural incomes in the eight new EU member states in 2004 were 61 percent higher than they had been in 2003 (table 2.1). Only part of this increase was due to poor weather in 2003.

The equity and efficiency effects of these higher payments depended on existing factor market imperfections, particularly the functioning of the land market (Ciaian

Table 2.1. Real Agricultural Income per Annual Work Unit in the EU-10 after Accession

Country or group	2004/2003 (% change)
Czech Republic	60
Estonia	55
Latvia	74
Lithuania	69
Hungary	55
Poland	95
Slovenia	51
Slovak Republic	28
EU-8[a]	61
EU-15[a]	3

Source: European Commission 2005.

Note: The annual work unit is the statistical equivalent of the labor of one person working full time in agriculture during one year.

a. Author calculation; for the EU-8, this represents the simple average over the eight countries in the table.

and Swinnen 2006). In all the new EU member states, the subsidies led to rapid land price increases that benefited landowners. Land prices approximately doubled in, for example, the Czech Republic, Poland, and the Slovak Republic between 2002 and 2006 (Swinnen and Vranken 2007). However, because farm and landownership structures differ widely among countries, the effects of the subsidies on farm incomes vary among the new EU member states. In countries such as the Czech Republic and the Slovak Republic, farming is concentrated among large-scale corporate farms that rent most of their land from the many fragmented landowners, many of whom live in urban areas. In contrast, in countries such as Poland and Slovenia, farming is dominated by small family farmers who own most of the land they farm. The other countries, such as Bulgaria and Hungary, have a mixed structure.

The high transaction costs on the land market are constraining the restructuring required to increase the competitiveness of the farm sector in the new EU member states, and the higher subsidies in these states over 2007–13 are exacerbating this problem, possibly outweighing the gains in transaction cost reductions (Ciaian and Swinnen 2006).

Changes in Trade Policy and Trade Agreements during the Transition

International trade was strongly regulated under the centrally planned system. The Communist countries were integrated within the system of the Council for Mutual

Economic Assistance, the intercountry planned trading regime that involved trade mainly with other Communist countries. One might think of the council as the international version of the domestic central planner. The countries of Central and Eastern Europe were less well integrated than the countries of the former Soviet Union in the trading system. Nonetheless, a large part of the trade volume of Central and Eastern Europe still went through the system. The system collapsed in the early 1990s because of the macroeconomic liberalization and the liberalization in trade policies. This led to important changes in trade and financial flows.

Effects of Trade Liberalization

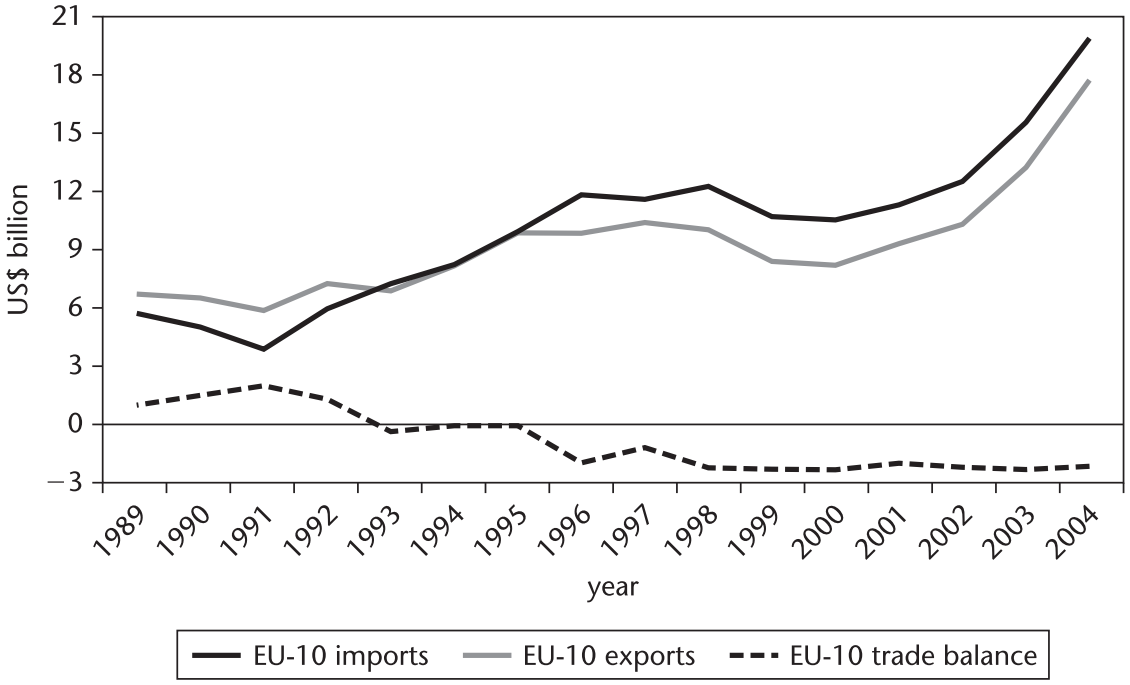
Trade liberalization reinforced the trend toward the reallocation of production that accompanied the elimination of central planning. Traditional international production allocations were no longer possible because trade had to be financed using hard currencies, and inputs were accounted at real cost. The liberalization also permitted imports of high-quality Western products, which had previously been restricted. The result was a major international reorganization in production activities. Initially, this had a negative impact on producers in Central and Eastern Europe because traditional export markets in the former Soviet Union dwindled for the lack of hard currency and because Western countries remained closed to agricultural exports from the subregion. Meanwhile, the reduction in the import constraints in the subregion opened local markets to Western imports. In combination, these factors led to a worsening in the balance in agricultural trade in the subregion during the first half of the 1990s (figure 2.3).

Later on, however, trade between the subregion and the EU-15 intensified, and growing exports to Western markets contributed to recovery in the subregion. In particular, trade flows in agricultural and food products between the EU-15 and the subregion have been increasing strongly since 1990 in both directions.[4] Early predictions that the EU markets would be flooded by cheap eastern imports have turned out to be wrong. True, the EU's agrifood imports from the subregion doubled over the 1990s, but exports from the EU to the subregion rose by a factor of 10.

Another important development was the shift from centrally imposed extreme specialization (for example, dairy production in the Baltic states and cotton production in Central Asia) to more diversified production systems, thereby increasing the domestic production of staple foods and reducing the dependence on single commodities in these countries.

Possibly even more important than the trade effects was the massive inflow of Western foreign direct investment in the food industry in the subregion. This contributed to a major restructuring of the subregion's food industry and to improvements in food quality and productivity (Dries and Swinnen 2004). More recently, the wave of foreign investments in the retail sector has caused additional

Figure 2.3. Agricultural Trade, EU-10, 1989 to 2004



Source: FAOSTAT Database 2007.

Note: Data are available for Estonia, Latvia, Lithuania, and Slovenia only from 1992.

restructuring in the agrifood system, which has had important implications for producers and consumers (Dries, Reardon, and Swinnen 2004).

New Trade Agreements

Since the collapse of the Council for Mutual Economic Assistance around 1990, the countries of Central and Eastern Europe have been part of several other trade agreements. However, these have generally had limited direct effects on agricultural policy interventions in the subregion. The Czech Republic, Hungary, Poland, Romania, the Slovak Republic, and Slovenia have been members of the WTO since the creation of the organization in 1995. Bulgaria joined soon afterwards, and Estonia, Lithuania, and Latvia joined in 1999 and 2001. The tariff structure in the EU-10 shows that both applied and bound tariffs in the agrifood sector were considerably higher in the EU-10 than in the EU-15. In the EU-10 in 2001, the weighted average of bound tariffs was 21.4 percent, and the weighted average of applied tariffs was 13.1 percent, compared with 6.5 and 5.4 percent, respectively, in the EU-15 (Ciaian and Swinnen 2007). The large difference between bound and applied tariffs suggests that countries in the subregion have not been constrained by WTO agreements (Bacchetta and Drabek 2002). This is especially the case of the countries in the subregion that joined the WTO early because their

commitments were based on the high support levels of the 1980s and therefore represented few constraints on their policies in the 1990s; for the other countries, the restrictions were more severe.[5] The latter countries liberalized their trade regimes unilaterally and were able to negotiate the terms of their WTO accession within the scope of the measures they had already taken. As a result, their WTO commitments are less liberal than the measures they had already applied.

There were also new trade agreements, most importantly the Central European Free Trade Agreement (CEFTA) and the Baltic Free Trade Area. However, the impact of these agreements in reducing agricultural policy distortions was generally limited, since the agreements included many exceptions for agricultural and food products, especially for so-called sensitive products that made up a substantial share of production.

However, the most important trade agreements were the (pre-)accession treaties with the EU and, later, the effective integration of the EU-10 into the EU.

Measuring Assistance to Agriculture

Methodology and Approach

The methodology used in this chapter to calculate the assistance to agriculture follows the methodology explained and documented in the appendix. We have calculated the NRA in both agricultural and nonagricultural production, as well as the consumer tax equivalent on food consumption.

The calculation of the NRA is much more accurate in agriculture than in the nonagricultural sector for several reasons, which are mostly related to data issues. The two most important sources of indirect distortions in agriculture are exchange rate distortions and subsidies and taxes on other sectors of the economy. Regarding the former, we do not have (even reasonably) accurate measures of exchange rate distortions.[6] We only have indicators of black market exchange rates for some countries for some years. We use these to illustrate the possible extent of the distortions caused by exchange rates (which is large). However, since black market exchange rates are not ideal measures of distortion, and since they are not consistently available, we have not included them in the NRAs. What is included in the nonagricultural NRAs is the trade-weighted average of tariffs in the rest of the economy (including food processing), as a rough indicator of subsidization in the import-competing part of the rest of the economy. Clearly, this is an imperfect measure, but it is the only measure we could calculate consistently across countries for (at least) the most recent time period.

The NRA for agriculture includes direct payments such as subsidies per animal or subsidies per hectare, as well as variable input subsidies. The per unit value of product-specific direct payments and of input subsidies are divided

by the undistorted price and added to the market price support component of the NRA.

There are also non-product-specific subsidies. These include government payments for research and development, agricultural schools, inspection services, infrastructure, marketing and promotion, public stockholdings, and miscellaneous. Because some of these, it may be argued, are public goods and because their impact on agricultural incomes depends on the elasticity of demand, they are included, but separate from direct assistance to individual products (see Alston, Edwards, and Freebairn 1988; Swinnen and de Gorter 1998, 2001).

More generally, some policy instruments are more distorting than others. Using OECD data and setting market price support at a benchmark of 100 percent, Dewbre, Antón, and Thompson (2001) conclude that variable input subsidies are the most distortive instrument (around 130 percent), followed by output subsidies and market price support (100 percent), area payments that require the planting of crops (around 35 percent), and area payments that do not require the planting of crops (around 10 percent). It is therefore necessary to look at both the total calculated assistance and the composition of assistance before drawing conclusions about distortions caused by policies.

The rest of this section is organized as follows. To highlight the main effects and the changes in the effects over the years, we present average indicators for the EU-10. However, there is considerable variation in the extent of policy distortions, the level of support, and the type of policy instruments used across countries and commodities. To demonstrate the differences among countries and commodities and to understand the factors causing these differences, we focus especially on indicators for the year 2000. By 2000, there had been almost a decade of experience with reform, institutional change, and knowledge-accumulation about policy making in a market environment, and EU accession was a prospect in many countries.

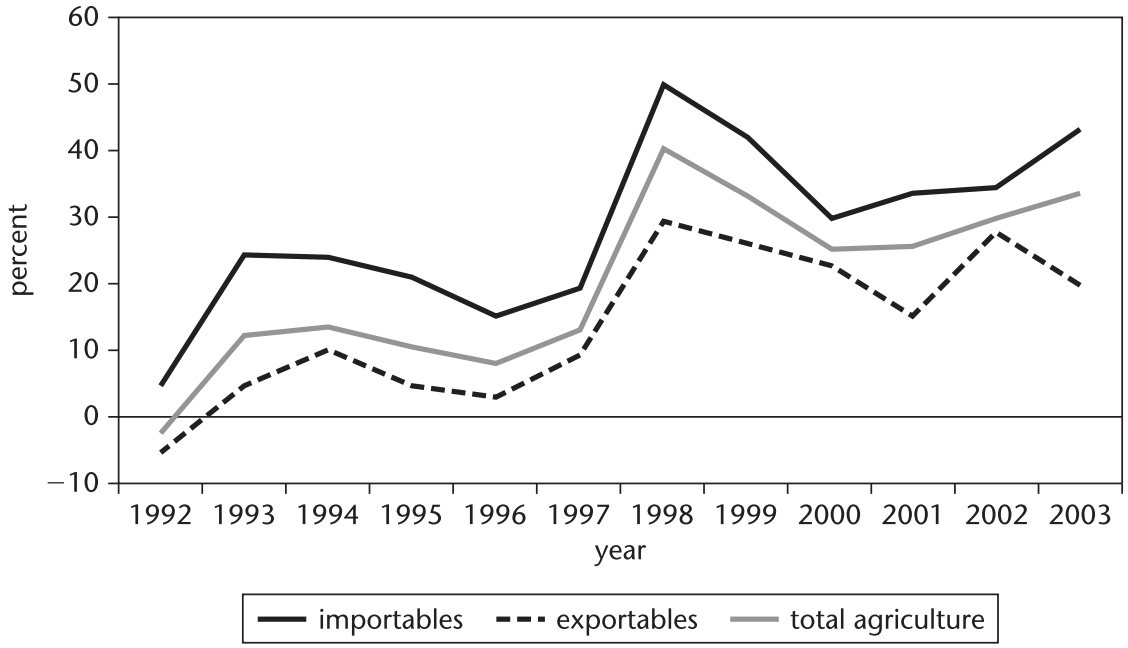
Indicators of Assistance and Taxation

We first consider distortions in producer incentives and then turn to distortions faced by food consumers.

Assistance to Agricultural Production

Liberalization first led to major reductions in direct assistance to agriculture. The decline in assistance was especially dramatic in the countries where the support had been the most substantial, particularly the former Soviet republics of Estonia, Latvia, and Lithuania and in Bulgaria. By 1992, the average agricultural NRA among the EU-10 was close to zero, including non-product-specific subsidies. But, soon after the initial liberalizations, new interventions were undertaken, and these had been consolidated into government intervention systems by the

Figure 2.4. NRAs for Exportable, Import-Competing, and All Agricultural Industries, EU-10, 1992 to 2003



Source: Author calculations based on data of OECD, FAOSTAT Database 2007, United Nations, and Eurostat.

Note: The NRA for the EU-10 is the simple average of the 10 countries. The NRA includes product-specific subsidies, but does not include non-product-specific subsidies.

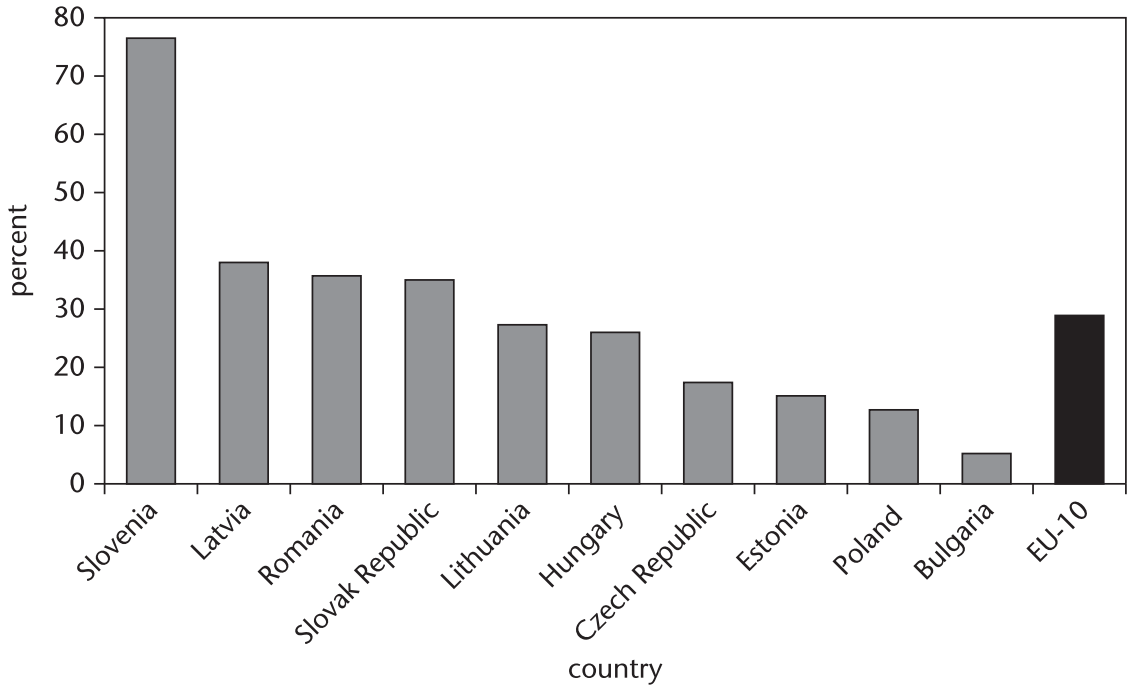
mid-1990s. The outcome of this new series of interventions was an increase in farm support to around 40 percent by 1998, followed by a decline over the next two years to 25 percent and then a rise to 33 percent by 2003, excluding non-product-specific supports (figure 2.4). This is slightly below the comparable estimate for the EU-15 in 2003 of 37 percent (Josling 2007).

By 2000, the NRA was 25 percent, excluding non-product-specific supports, but 29 percent if non-product-specific supports are included. That year, the highest level of producer assistance occurred in Slovenia, at 76 percent, and the lowest occurred in Bulgaria, at only 4 percent; Latvia (38 percent), Romania (36 percent), and the Slovak Republic (35 percent) showed NRAs that were somewhat above the 29 percent average (figure 2.5).

Figure 2.6 illustrates the differences in NRAs across commodities in the region in 2000. The average for most commodity NRAs was between 10 and 50 percent. Sugar stands out as the most protected commodity, with an NRA of around 80 percent. At the other extreme, sheep meat and soybeans received slightly negative NRAs in 2000. Table 2.2 summarizes the full time series for the product NRAs in the EU-10 from 1992 to 2003.

To obtain a more nearly complete assessment of the policy distortions, we must also look at other distortions affecting agriculture. Input price regulations were, to a large extent, abandoned in the early 1990s. This contributed to the initial reduction

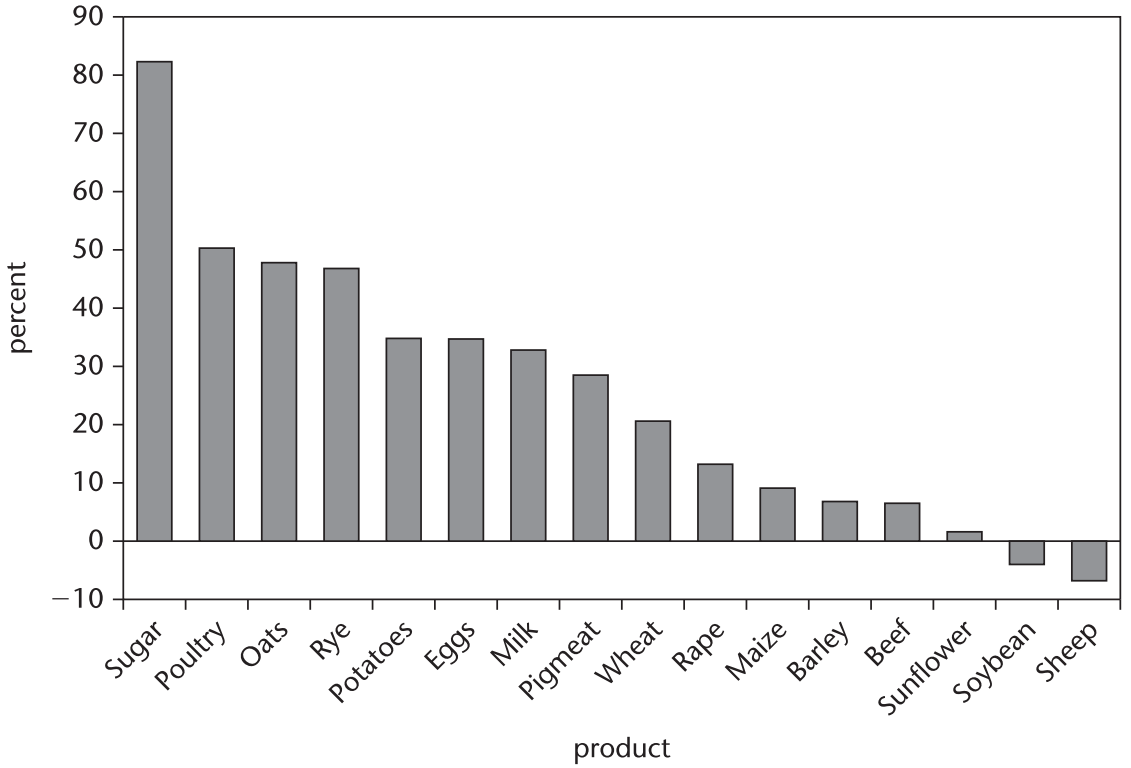
Figure 2.5. NRA in Agriculture, EU-10, 2000



Source: Author calculations based on data of OECD, FAOSTAT Database 2007, United Nations, and Eurostat.

Note: The NRA for the EU-10 is the simple average of the 10 countries. The NRA includes product-specific subsidies, but does not include non-product-specific subsidies.

Figure 2.6. NRAs for Various Agricultural Products, EU-10, 2000



Source: Author calculations based on data of OECD, FAOSTAT Database 2007, United Nations, and Eurostat.

Note: The NRA includes product-specific subsidies.

Table 2.2. NRAs for Agricultural Commodities, EU-10, 1992 to 2003
(percent)

Crop	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Wheat	3.3	16.7	9.3	−8.4	1.6	5.1	21.0	24.6	20.6	15.4	13.7	20.3
Rye	5.5	−15.3	−0.5	22.6	11.5	23.6	63.8	71.4	46.8	23.5	−8.6	7.8
Maize	21.1	36.2	9.5	0.4	−0.4	1.0	1.6	−1.5	9.1	12.3	−2.9	28.0
Milk	3.7	25.0	25.4	27.2	21.6	35.3	79.4	45.2	32.8	29.6	48.8	61.0
Other grains	2.7	26.5	9.2	5.5	25.9	24.7	22.7	24.5	28.9	6.3	4.7	14.5
Barley	−5.8	36.6	17.5	−11.1	−1.4	6.0	34.9	15.9	6.8	12.7	21.3	17.3
Potatoes	23.0	15.5	−6.7	−2.0	16.9	51.9	3.4	9.3	34.8	20.5	82.6	86.2
Oats	−37.3	−18.5	−15.6	−5.3	12.8	46.1	29.3	47.5	47.8	35.3	−7.4	26.0
Sunflower	−16.7	−19.5	−22.9	−16.8	−12.2	−14.8	−15.4	−13.3	1.6	−11.3	−9.3	−7.7
Rape	17.8	−3.7	−17.8	−10.9	−9.8	−10.7	13.9	4.5	13.2	14.7	6.6	7.4
Soybean	24.4	89.0	45.0	20.3	21.6	0.4	−14.9	−8.8	−4.0	27.5	19.3	−6.6
Sugar	71.4	65.5	49.1	42.7	51.4	59.6	81.0	102.6	82.3	66.1	95.7	136.0
Beef	5.9	−9.3	−3.0	0.5	−0.9	−1.9	19.6	9.5	6.5	39.0	38.5	23.1
Pigmeat	−20.1	11.8	29.3	15.2	2.3	−0.9	39.0	54.4	28.5	29.7	27.7	20.1
Poultry	17.2	33.6	52.9	53.1	43.7	43.7	62.3	52.9	50.3	55.2	80.9	66.9
Eggs	11.4	15.1	26.8	45.7	26.2	39.7	58.6	62.5	34.7	31.1	18.4	2.7
Sheep	82.7	34.0	35.9	86.5	52.0	40.3	59.0	6.8	−6.8	6.2	4.0	10.4
Importables[a]	4.6	24.5	23.8	20.8	15.2	19.1	49.8	42.0	29.8	33.3	34.4	43.0
Exportables[a]	−5.6	4.4	10.0	4.6	3.1	9.3	29.3	25.9	22.6	15.0	27.7	19.7
Total agriculture[a]	−2.6	12.1	13.5	10.4	8.0	13.1	40.3	33.0	25.0	25.7	29.7	33.3
Standard deviation	33.2	29.2	23.0	29.5	22.6	22.4	27.6	30.6	23.1	17.9	30.7	34.8
Share of above products in the gross value of agricultural production	65	65	63	62	64	65	64	62	65	66	63	62

Source: Author calculations based on data of OECD, FAOSTAT Database 2007, United Nations, Eurostat, and UNCTAD Trains Database 2007.

Note: Weights based on the gross value of agricultural production at undistorted prices.

in farm assistance, but this factor has played almost no role since 1992. Exchange rate regulations, too, were either removed or substantially reduced in the early 1990s (Ciaian and Swinnen 2007). One sign of this is the disappearance, by the mid-1990s in Hungary and Poland and a few years later in Romania, of the large black market exchange rate premiums of the mid-to-late 1980s (Ciaian and Swinnen 2007). The effect of these changes was a substantial reduction in the indirect taxation of agriculture and other tradable sectors through the exchange rate. We do not include this effect in the calculations below, however.

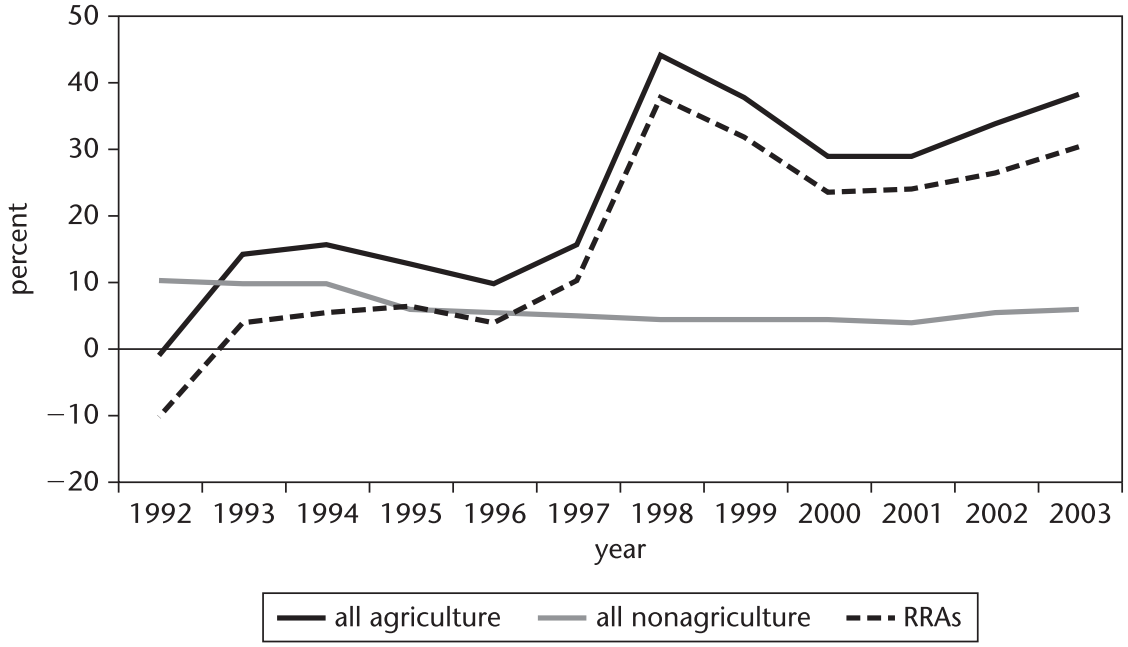
Another important source of indirect distortions to agriculture is assistance to other sectors of the economy. For our purposes, it is assumed that the service sector receives no net assistance and that the tariff protection provided for processed food and nonagricultural import-competing goods is an indicator of the level of assistance to all other tradable sectors. There is significant variation in tariff levels among commodity groups. According to the UNCTAD Trains Database, tariffs in Central and Eastern Europe in 2001–03 averaged 21 percent for processed foods, 6 percent for other manufacturing products, and 2 percent for nonagricultural primary products. (These rates compare with 11 percent for primary agricultural products.) We use these trade-weighted average tariffs as a proxy for the NRA in the tradable nonagricultural part of the economy (including the processed food industry), call this NRA $NRAnonag^t$.[7] Together with the $NRAag^t$, we are then able to calculate a relative rate of assistance (RRA), defined as:

$$\text{RRA} = 100[(1 + NRAag^t/100)/(1 + NRAnonag^t/100) - 1] \qquad (2.1)$$

where $NRAag^t$ and $NRAnonag^t$ are the average percentage NRAs for the tradable parts of the agricultural and nonagricultural sectors, respectively. Since the NRA may not be less than −100 percent if producers are to earn anything, then neither may the RRA. This measure is useful in that, if it is below zero, it provides an internationally comparable indication of the extent to which a country's policy regime has an antiagricultural bias, or, if the RRA is positive, the extent of a bias in the other direction.

The estimated RRAs for the EU-10 are shown in figure 2.7 and table 2.3. According to these data, the NRA in agriculture is offset only slightly by the NRAs in other sectors in recent years; in the early years of the transition, it almost completely offset assistance via farm programs. So, the conclusion that assistance to farmers became positive by 1993 and steadily rose still holds: the RRA increased in the EU-10 from −10 percent in 1992 to 30 percent by 2003. And this upward trend is generally true for each of the 10 countries in the subregion, as shown by Ciaian and Swinnen (2007), even though there is a wide range in mean values (in 2003, from close to zero in Bulgaria to nearly 90 percent in Slovenia).

Figure 2.7. NRAs in Agricultural and Nonagricultural Tradable Sectors and RRAs, EU-10, 1992 to 2003



Source: Author calculations based on data of OECD, FAOSTAT Database 2007, United Nations, and Eurostat.

Note: The NRA for the EU-10 is the simple average of the 10 countries. See at equation (2.1) for an explanation of the RRA. The NRA in agriculture includes both product-specific subsidies and non-product-specific subsidies.

Taxation of Consumers

The consumer tax equivalent, calculated using the methodology described in the appendix, increased from around −8 percent in 1992 to around 17 percent in 2000, suggesting that there was a relative increase in the taxation of food consumers. The 2000 consumer tax equivalents vary importantly between countries in roughly the same way as the NRAs (table 2.4).

However, the net effect on consumers of changes in transition policy is different from the effect indicated by this change in the consumer tax equivalent. First, the reduction of exchange rate distortions and the removal of price fixing and subsidies at the wholesale level reduced consumer assistance (and thus increased relative taxation). Nonetheless, there are important benefits for consumers from the reforms associated with opportunity costs in acquiring food. Under the Communist regime, consumers were unable to buy all they wanted at low prices and had to incur high search and queuing costs. These costs were removed with the reforms in the 1990s. Furthermore, consumers benefited from greater access to a much wider variety of higher-quality food products. By restricting foreign imports and regulating trade, the Communist regime had prevented consumers from accessing quality food products. This element in consumer taxation is typically not captured by distortion indicators, but may be important. Huffman

Table 2.3. NRAs in Agricultural and Nonagricultural Sectors and RRAs, EU-10, 1992 to 2003
(percent)

Sector	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Covered products	−2.6	12.1	13.5	10.4	8.0	13.1	40.3	33.0	25.0	25.7	29.7	33.3
Products not covered	−2.6	12.1	13.5	10.4	8.0	13.1	40.3	33.0	25.0	25.7	29.7	33.3
All agricultural products[a]	−2.6	12.1	13.5	10.4	8.0	13.1	40.3	33.0	25.0	25.7	29.7	33.3
Non-product-specific assistance	1.8	2.0	2.4	2.3	2.0	2.5	3.7	4.5	3.8	3.4	4.0	4.7
Total agriculture, including non-product-specific assistance[b]	−0.8	14.2	15.9	12.6	10.0	15.6	43.9	37.5	28.9	29.1	33.6	38.0
Tradables												
All agriculture[b]	−0.8	14.2	15.9	12.6	10.0	15.6	43.9	37.5	28.9	29.1	33.6	38.0
All nonagriculture	10.4	10.0	10.0	5.9	5.6	4.8	4.6	4.4	4.4	4.3	5.5	5.8
RRA[c]	−10.1	3.8	5.3	6.4	4.2	10.3	37.6	31.8	23.5	23.8	26.7	30.4

Source: Author calculations based on data of OECD, FAOSTAT Database 2007, United Nations, Eurostat, and UNCTAD Trains Database 2007.

a. Includes product-specific subsidies.
b. Includes product-specific subsidies, non-product-specific subsidies, and decoupled supports.
c. See at equation (2.1) for an explanation of the RRA.

Table 2.4. Consumer Tax Equivalent for Food Products, EU-10, 1992 to 2003
(percent)

Country	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Bulgaria	−34	−9	−26	−21	−35	−11	7	−2	5	−5	−9	13
Czech Republic	15	26	17	0	1	1	27	17	7	17	22	22
Estonia	−37	−22	−8	2	6	4	25	5	5	6	11	13
Hungary	9	22	18	3	3	2	12	17	15	17	20	19
Latvia	−41	−16	9	0	3	11	37	38	28	32	32	16
Lithuania	−39	−16	−16	2	5	13	42	43	24	21	30	24
Poland	−7	9	13	6	15	12	26	20	6	4	0	−6
Romania	2	28	16	5	5	2	47	30	26	65	46	62
Slovak Republic	2	16	14	1	−6	2	21	16	7	4	11	13
Slovenia	48	50	48	49	37	45	72	75	46	39	43	47
EU-10	−8	9	8	5	3	8	32	26	17	20	20	22

Source: Author calculations based on data of OECD, FAOSTAT Database 2007, United Nations, Eurostat, and UNCTAD Trains Database 2007.

Note: The consumer tax equivalent in the EU-10 is the simple average of the 10 countries.

and Johnson (2004) estimate that the welfare losses were equivalent to between 50 and 75 percent of the direct subsidy benefits among consumers under the Communist regime, and, hence, equivalent gains arose because of the trade liberalization in the 1990s. In combination, while the transition reforms have generally increased food prices (and thus hurt consumers in this way), they have importantly benefited consumers by reducing the labor opportunity costs of acquiring food and by making available a much wider choice of food options in terms of both quantity and quality.

Agricultural Policy Instruments and the Composition of Assistance

The policy instruments that had been used under the Communist regime—discussed by Liefert and Swinnen (2002)—were changed dramatically after 1990. In a survey of agricultural policy instruments in Central and Eastern Europe during transition, Hartell and Swinnen (1998, 2000) identify several phases in the choices and in the changes among agricultural policy instruments (see Ciaian and Swinnen 2007).

By 1990–91, most EU-10 countries had removed or substantially reduced nontariff import and export barriers on a wide range of commodities and reduced or eliminated production subsidies. Import tariffs thus became the primary instrument for market intervention. However, following the decline in the agricultural terms of trade, a series of nontariff import interventions were introduced on a wide range of crops. Some EU-10 countries also introduced nontariff food export barriers following occasional internal shortages. In the most advanced countries, these nontariff interventions evolved into a market organization system implemented to provide long-run support to and interventions in agriculture. This included variable import levies, in combination with minimum guaranteed producer prices. Some countries installed production controls, in combination with price support, although implementation of the Uruguay Round Agreement on Agriculture later resulted in the tariffication of variable import levies and some other nontariff barriers.

In the second half of the 1990s, market price support in many EU-10 countries became somewhat less important because of the increase in direct support. These direct payments, usually in the form of area or headage payments, were quite often targeted on less-favored parts of the subregion. Most countries also introduced credit subsidies for agriculture because the supply of rural credit was heavily constrained during the transition. Other input subsidies included fuel tax reimbursements, wage subsidies, capital investment subsidies, and production input subsidies.

By 2001, many highly interventionist policies such as fixed or minimum guaranteed prices, intervention purchases, threshold triggering, and deficiency payments might be found throughout the EU-10. Export subsidies played a prominent role in some countries. Several governments announced the intention to reform agricultural and farm policies to align them more closely with the CAP. This would include the adoption of tariffs, interventions, export subsidies, guarantees, and a variety of direct payments.

These policy changes are reflected in the composition of the assistance that farms received. While there was a significant decline in all forms of producer support in the early 1990s, there were important changes in the forms of support over the period considered here. Under the Communist system, price supports and output subsidies had been the main component in the EU-10. After the reforms in the early 1990s, the share of market support and output subsidies declined substantially, falling to below 50 percent. Since then, it has grown again, to around 60 percent of the NRA.

The other important components of the NRA in the EU-10 were input subsidies, direct payments, and non-product-specific subsidies. The share of input subsidies in the total NRA varied between 10 and 30 percent during the transition. Input subsidies included interest rate subsidies, credit guarantee schemes, fuel subsidies, and support for the purchase of breeding materials.

In the later 1990s, there was a significant shift to less-distortionary assistance such as direct payments based on area planted and animal numbers. The share of this assistance in the total NRA increased during the transition from almost zero to 16 percent by 2000, which was still far from the share in the EU (35 percent). Decoupled payments (payments based on historical entitlements) were almost zero in both the EU-10 and the EU before 2004, but this will change substantially in the coming years as the CAP is switched to single farm payments in the EU-10.

Finally, non-product-specific subsidies represented a relatively large share in the NRAs. In 1995, they accounted for around 20 percent, and, in 2003, around 10 percent (table 2.3).

As with total assistance, there are substantial variations in the composition of NRAs within the EU-10. The share of price supports and output subsidies is high in Lithuania, Poland, and Romania and low in Bulgaria and Estonia. Input subsidies were more important in Bulgaria and Estonia partly because problems in rural credit continued to be a major issue there until recently and partly because price support is so low in Bulgaria and Estonia. There is strong variation among countries in the use of subsidies based on area planted and animal numbers, but, in most of the EU-10, these subsidies were not limited to fixed levels of area planted or animal numbers; so, they were highly distortive. An exception was the

Czech Republic. There, they were limited to fixed levels of area planted and animal numbers, similar to the situation in the EU after the 1992 reform and the Agenda 2000 reforms, whereby the CAP began moving away from price supports and output subsidies to area and animal payments that were limited to reference period levels. Decoupled payments based on historical entitlements were almost zero in both the EU-10 and the EU when the Czech Republic introduced them. Decoupled payments accounted for 20 percent of the total Czech NRA in 2000.

Political Economy

The causes of the changes in policy instruments and in support levels in the EU-10 that are mentioned in studies and discussions of this issue include irrationality and imperfect information in decision making by EU-10 governments, constraints imposed because of WTO membership, efforts to align policies in preparation for EU membership, and domestic political and economic conditions. In our view, these various causal factors should be considered complementary rather than competing in any explanation of policy development and changes in policy in the EU-10. Furthermore, the political economy factors may have different impacts on the protection level as distinct from the instrument choice. In this section, we analyze the extent to which political economy factors may explain the changes and the variations among countries in the level and nature of support.

Structural Causes of Agricultural Policy Distortions

After an initial period of market liberalization, many governments in Central and Eastern Europe moved to intervene to varying degrees in the market, primarily and increasingly for the benefit of producers at the expense of food buyers and taxpayers. Swinnen (1996) argues that the explanation for the overall pattern of agricultural protection in the EU-10 is largely consistent with political economy theory and predictions.[8]

Political economy explanations of agricultural protection patterns point to the impact of the structure of the economy on the distribution of the costs and benefits of agricultural protection, as well as the impact of changes in the relative income situation of farmers, as the primary causes of variations in agricultural protection during economic development and of shifts in political organizational costs (Anderson 1995; Swinnen 1994; Olson 1985). Changes in the structure of the economy affect the distribution and the size of the political costs and benefits of agricultural protection and thus the political incentives of governments in decision making.

Table 2.5. Political Economy Regression Results, EU-10
(percent)

Indicator	Model 1	Model 2
Constant	−30.9	−213***
	(0.161)	(0.004)
Gross domestic product per capita (US$)	0.007***	0.02***
	(0.000)	(0.002)
Agricultural trade balance	−0.26***	—
	(0.005)	
Real exchange rate	23.9**	85.8**
	(0.011)	(0.010)
Arable land per person	18.6	267***
	(0.466)	(0.001)
R-squared	0.29	0.09

Source: Author calculations based on data of OECD, FAOSTAT Database 2007, United Nations, and Eurostat.

Note: The data are an unbalanced panel for the period 1990–2003. The dependent variable is the NRA. — = excluded from the regression.

** Significant at 5 percent.
*** Significant at 1 percent. The *p*-values are in parentheses.

The pattern of agricultural protection and taxation worldwide that emerges from numerous studies is summarized in the now well-known development pattern of protection and taxation and the antitrade pattern of protection and taxation.[9] In addition, studies find that agricultural protection rises if farm incomes fall relative to the rest of the economy. There is evidence that, despite the influence of a variety of other factors, the policy developments in the EU-10 described here are also consistent with these patterns.

Table 2.5 reports the results of a simple regression model correlating the levels of the NRA with indicators of the structural factors reflecting these patterns (GDP per capita, agricultural trade balance, real exchange rate, agricultural land per capita).[10] Agricultural land per capita is often used to indicate a country's comparative advantage in agricultural production. The real exchange rate is included as an indicator of the relative income effect, because changes in exchange rates—whether policy induced or the result of structural changes—have an important impact on the relative profitability of farms.

Absolute Income (the Development Pattern)

The development pattern of protection and taxation is observed frequently. It is characterized by a gradual shift from taxation to the protection of agricultural producers as a country develops economically. There is evidence that such a

pattern exists in the EU-10. On average, protection is positively correlated with higher incomes across countries and over time. This is consistent with the observation that protection was more substantial in Slovenia (the richest country among the EU-10 in relative terms) than in any other country and least substantial in Bulgaria, one of the poorest countries among the EU-10. It is also consistent with the statistical correlation results in table 2.5.

Relative Income and Comparative Advantage

Related to this development pattern, political economy models show theoretically and empirically that agricultural supports will increase if farm incomes, excluding the supports, are falling (for example, see de Gorter and Tsur 1991; Swinnen 1994; Swinnen, Banerjee, and de Gorter 2001). This is because farmers will pressure politicians for the supports, and the politicians may gain the political backing of farmers by reacting to this pressure and raising the subsidies. Hartell and Swinnen (2001) find strong evidence for this impact in agricultural protection in the EU-10. They conclude that the most important factor explaining changes in the supports for farmers in the EU-10 over 1992–96 was the changes in the relative income position of farmers.

Our own calculations in table 2.5 also confirm that, in 1990–2003, increases in the nominal assistance to agriculture were inversely related with changes in the exchange rate. When the strong revaluation in the mid-1990s had negative incentive effects on agriculture in Central and Eastern Europe, governments reacted by increasing the assistance to farmers. The reductions in agricultural incentives caused by the course of the exchange rates in 1993–98 were associated with increasing NRAs, and the NRAs did not continue to rise when the exchange rate effect on incentives was relatively stable in 1998–2003 (see Ciaian and Swinnen 2007).

Also an aspect of the political economy mechanism, sectors with less (or declining) comparative advantage will pressure politicians for protection, and the resulting political calculus leads to higher equilibrium subsidies for sectors with less comparative advantage. Hartell and Swinnen (2001) provide evidence based on data from the Czech Republic and Hungary that, within countries, sectors with a low comparative advantage receive more assistance.

The Antitrade Pattern

The antitrade pattern of protection and taxation is characterized by a tendency for import-competing products to be more well assisted (or taxed less) than exportable products.[11] The distortions (deadweight costs) and transfer costs of a policy intervention typically increase with a commodity's trade balance, that is, when the net exports of the commodity rise. Protection of the sector is thus found in many countries to decline with increases in the trade surplus. Our data indicate

that such an antitrade pattern is also present in the EU-10: on average, greater protection goes to import-competing commodities, while less protection goes to exported commodities (table 2.5).

The Role of International Agreements

International agreements had an impact on the choice and scope of agricultural policies in the EU-10. The regime of the Council for Mutual Economic Assistance affected policies until the start of the transition. Since then, the countries of the EU-10 have been part of several multilateral, regional, and bilateral trade agreements, such as membership in the WTO and regional free trade agreements and the association agreements with the EU.[12]

WTO

In general, in the EU-10, as elsewhere, WTO negotiations have tended to reduce the level of tariffs, increase market access, and prohibit certain instruments such as variable levies and quantitative restrictions. Nonetheless, the impact has been quite different among the countries. In terms of WTO commitments, the EU-10 may be divided into two groups. The first group includes the Czech Republic, Hungary, Poland, Romania, and the Slovak Republic, which made commitments as part of the Uruguay Round negotiations (pre–Uruguay Round members) and those that joined the WTO after the Uruguay Round negotiations (post–Uruguay Round members). The second group includes Bulgaria, Estonia, Latvia, Lithuania, and Slovenia.

The implications of joining before or after the Uruguay Round agreement are substantive (Kazlauskiene and Meyers 2000). The EU-10 countries that were members of the General Agreement on Tariffs and Trade prior to the Uruguay Round were conducting more distorting, more protectionist, and less transparent policies. The base period for the reduction commitments among this group was prior to 1990, when production was still high, support for agriculture was quite strong, and the use of nontariff measures was extensive. Countries that joined the WTO after the Uruguay Round already had as a starting position more liberal, less distorting, and more transparent policies. These policies resulted from post-1990 policy reforms, as well as the conclusion and implementation of a number of multilateral and bilateral trade agreements and economic memorandums with international financial institutions (such as the International Monetary Fund and the World Bank). The base period for the commitments of this group was the second half of the 1990s, when production was already considerably lower than in the pre-1990 period and structural, institutional, and policy reforms were already well under way. Since tariff bindings are generally lower for the post–Uruguay Round accession group, there are also relatively few products in these countries for which tariff rate quotas are included in the commitments.

Pre–Uruguay Round WTO members were also able to negotiate nonzero commitments on export subsidies for major commodities. Among the post–Uruguay Round group, Bulgaria was the only country that (for political reasons: a United Nations embargo on trade with the former Yugoslavia) succeeded in joining the WTO with nonzero export-subsidy commitments for its main exports, including cereals, oilseeds, cheese, beef, pork, and poultry (Kazlauskiene and Meyers 2003).

Regional Agreements: CEFTA and the Baltic Free Trade Area

CEFTA and the Baltic Free Trade Area were negotiated in the 1990s. These regional trade associations and agreements imposed rules and restrictions on the use of trade barriers and encouraged greater regional policy coordination. However, the impact of the agreements in reducing agricultural policy distortions was generally limited because the agreements included many exceptions for agricultural and food products, especially for the so-called sensitive products that made up a substantial share of production and that were often exempted from substantive liberalization.

Still, agricultural trade liberalization within regional trade agreements was stronger than EU-10 agricultural trade liberalization outside the agreements. The tariffs were lower among the CEFTA countries than between the CEFTA countries and the EU. CEFTA countries had almost the same tariff rates with the EU as with the Baltic countries (Ciaian and Swinnen 2007).

In some cases, these free trade area agreements create pressure for participating countries to harmonize agricultural policies to avoid arbitrage in trade. In the case of the Baltic Free Trade Area, Kazlauskiene and Meyers (1999) argue that this was the reason Lithuania, in 1997, began to abandon the system of minimum purchase prices introduced in 1995 for most farm products. Lithuania, unlike Estonia and Latvia, gave significant emphasis to price policies. In a free trade area, this government policy reduces firm competitiveness if it leads to domestic producer prices that are higher than the prices in other countries in the free trade area, and it reduces the effectiveness of intervention purchases given that the support also goes to other member countries because of the free flow of products across borders within the free trade area.

CEFTA was weakened because it mainly covered the least sensitive products. In addition, EU-10 governments regularly violated the spirit of the agreement by invoking national safeguard clauses in the face of strong domestic pressure. Despite the agreements, domestic political economy considerations played an important role in overall EU-10 policy development, including in the choice of instruments and the reactions of countries to economic shocks and cycles.

This is illustrated by the reactions of EU-10 governments to spillover effects from the 1998 Russian crisis. In 1998 and 1999, following the Russian crisis, difficulties in agriculture induced the EU-10 governments to favor satisfying domestic

producers in their demands for protection. EU-10 producers had been experiencing major income losses because of low world prices, the pressure of imports, and the loss of important export markets in Russia and elsewhere in the Commonwealth of Independent States (CIS), especially for the major temperate commodities and several livestock products. The extreme reactions of the producers prompted several EU-10 governments, over the objections of the Czech Republic and Hungary, to suspend CEFTA trade liberalization in agricultural products indefinitely. In addition, some negotiated bilateral arrangements were scrapped, preferential tariff rates revoked, and tariffs raised. The response to these steps often involved retaliatory tariff measures and the greater use of export subsidies by some countries. EU-10 governments invoked a safeguard clause in the treaty, though this was normally forbidden under the CEFTA rules. The clause gave them wide latitude to respond to emergencies in the agriculture and food sector. Romania even considered withdrawing from CEFTA. The incidents soured trade relations among the countries of the EU-10, eroded the credibility of CEFTA, spurred some governments to legislate insulating and distortionary instruments that were based more on contingency, and damaged efforts to liberalize trade in agricultural products.

EU Enlargement and Policy Alignment

The EU accession agreements had an obvious and profound impact on agricultural policy settings and distortions, but the impact became most noticeable primarily after 2000 and especially as countries grew closer to EU accession in 2004. A preintegration strategy of imitating EU policy instruments reduced adjustment costs at the time of EU accession. Preparations for EU accession became increasingly important in EU-10 domestic trade and price setting, but primarily in the choice of instruments. This was formally adopted in the association agreements, whereby the EU-10 undertook to align policy and fulfill the requirements of the *acquis communitaire* as a condition of membership. During the preparation phase, the EU provided assistance in legal and institution development, which also contributed to policy alignment.[13]

Several experts argued in the mid-1990s that more reform would be required to make the CAP consistent with enlargement and WTO constraints, but it was uncertain until immediately before enlargement whether reform would actually occur. Before this information was available, EU-10 policy makers, who wished to base their strategy on minimizing the adjustment costs of integration with the CAP, could only try to hit a (slowly) moving target. In fact, the final accession agreement was characterized by last-minute negotiations on farm subsidies and production quotas. The negotiations involved demands for equal treatment and equal support for EU-10 farmers within an enlarged EU that faced budgetary constraints and WTO constraints.

The goal of alignment was apparently more important in the choice of policy instrument than in the level of protection. The level of protection seems to have been primarily determined by political economy factors, wherein domestic pressures, political incentives, and budgetary constraints played an important role. This may also be seen in the evolution of the gap in the NRAs between the EU-10 and the EU and in the differences in the NRAs among countries of the EU-10. The differences within the EU-10 did not diminish significantly over 1998–2003. Moreover, while there was a reduction in the EU–EU-10 gap in average NRAs between 1992 and 1998, there was no significant change in this gap during the next years leading up to enlargement. The gap was slightly under 4 percentage points in 1998 and in 2003 (for example, see Josling 2007). This is consistent with the conclusion that the level of assistance to farmers was determined primarily by domestic forces, such as those captured by our structural variables analysis (see above) and the budget constraints (see below), even during the years leading up to enlargement.

The Budget and Human Capital Constraints

Budgetary constraints played an important role in setting policy in the EU-10 during the transition in the choice of the instruments and in the level of the interventions.[14] In general, budgetary constraints often limit the level of the interventions and are the source of many reform proposals; this has been the case, for example, in the recent experience of many OECD countries. This was also the situation in many countries of the EU-10 during the early transition when, because of a lack of budgetary resources, minimum guaranteed prices were often set at or below the cost of production, as well as below market price. The low threshold prices, in combination with the selective use of border controls, ensured that intervention was needed infrequently and, if needed, was always subject to specific quota limitations (Hartell and Swinnen 1998).

The major institutional changes that took place in the early 1990s also had serious implications for the ways government interventions might or might not work. The inexperience of EU-10 policy makers in this area had an important effect on policy choices in the early 1990s. Policy initiatives undertaken by various EU-10 governments shortly after liberalization seemed ill timed, contradictory, and unnecessarily painful and were often rapidly overturned. This period of stopgap policy making may be explained as the outcome of temporary human capital constraints. The administrative skills and the understanding of policy effects in a command economy were inadequate in the new market environment. During this period of learning by doing in a new and difficult economic context, policies were implemented and then reversed when they produced unanticipated and unwanted effects (Swinnen 1996).

Likewise, later during the transition, even though EU-10 policy choices frequently appeared similar to the choices made with the prereform CAP, the policies, in fact, often operated differently. For example, despite the widespread use of minimum prices, variable import levies played a small role in maintaining internal producer prices. Unlike the administration of variable import levies in Western Europe, the variability was not high, and adjustments were usually made on a monthly or less frequent basis. In this sense, the levies acted as an additional fixed import tariff. With experience, increasing sophistication, and increasing economic rewards to skill and education, this constraint became less binding in the choice and implementation of policy instruments (Swinnen 1996; Orazem and Vodopivec 1997).

Lessons and Prospects for Reforms and Reducing Distortions

There have been major reductions in the distortions in agricultural incentives in Central and Eastern Europe over the past two decades. Much has been accomplished in removing the distortions, and dramatic changes have removed the most distortionary policy regimes. The liberalization of prices and trade led to relatively low rates of assistance in the early and mid-1990s.

However, there is still substantial room for addtional reduction in the distortions. In fact, countries in Central and Eastern Europe have introduced new distortions or reintroduced old ones. Some have done this as part of the EU accession process; others started doing it earlier.

Improving policies and reducing distortions may be accomplished through various means: overall reductions in support policies, shifts in support to less distortive policy instruments, a focus in budget resources on investments in public goods rather than farm subsidies, and so on.

Such reforms are not inconsistent with EU accession. The EU has moved in recent years to more decoupled farm support and has given more policy attention to improving the efficiency of farms and food companies.

From this perspective, it is important to point out other avenues, such as macroeconomic and regulatory reforms to stimulate food industry investment, labor market reforms to enhance off-farm employment opportunities, and credit reforms to facilitate enhanced access to rural credit.

A crucial component of this effort should be a shift in the policy paradigm from policies focused on quantity and minimum standards to policies focused on quality and high standards. Safety and quality standards are becoming key features of modern food chains domestically and internationally. The demand for traceability and high quality standards will increase given the rapidly emerging

technologies and the growing influence of large retail and processing chains. This will also pose new policy challenges in terms of equity (exclusion and rent extraction) and efficiency (contracting problems, safety and standard disputes, and so on). Traditional agricultural policies are not appropriate for dealing with the challenges posed by these modern chains.

Competition and antitrust policy is an important area for policy attention. In supply chains in which farms must sell their produce to trading, processing, and retailing companies, the ability of farmers to choose freely among competing companies is essential to achieving better farming conditions. The market concentration in agribusiness and the food industry, for example, in the increasing dominance of large retail chains in Central Europe, exerts pressure on contract negotiations and contract terms for farmers.

An important policy finding is that changes in exchange rates have an important impact on farmer incentives. These exchange rate effects have been caused or influenced by policy (for example, governments under the Communist regime routinely set exchange rates, and pegged exchange rates still apply in some countries today) or they have been a consequence of macroeconomic developments. In either case, over the past two decades, both before and during the transition, exchange rate distortions and adjustments have had substantial impacts on incentives. The influence of this factor will change after EU accession. While the number of countries of Central and Eastern Europe that will join the euro area is unclear, the exchange rate policies of these countries in relation to the euro and the appreciation of the euro against the dollar affect the international competitiveness of farms in the subregion.

It is important to realize that the political economy forces identified above may constrain the prospects for reducing the distortions in agricultural incentives appreciably in the foreseeable future because of changes in the pressure for and the constraints on policy reform.

Overall income growth induces the political economy pressures on governments to increase their assistance to agriculture. This is indicated by the positive relationship between agricultural protection and economic development, which this study also finds in Central and Eastern Europe. In the late 1990s, governments in the subregion were in a stronger position in bargaining with international institutions such as the International Monetary Fund and the World Bank because growth and the improved fiscal position made countries less likely to become beholden to conditionality by international institutions.

The role of international institutions, such as the World Bank, the International Monetary Fund, and the European Bank for Reconstruction and Development, was important at the start of the transition because these institutions provided guidance on policy reform in all these countries. However, in later years, this

advice proved less effective. For the countries in the subregion wanting to join the EU, EU accession (or wider European integration) had taken priority. Moreover, the countries benefited substantially from private inflows of capital, know-how, and technology, for example, through large foreign direct investment in local food industries in the late 1990s and 2000s.

The accession of countries in the subregion to the EU has increased the levels of farm assistance in the subregion, although the countries of the EU-10 now face more competition from within the enlarged EU. Reducing farm assistance in the EU-10 in the future will not occur without reducing EU protection levels. However, important improvements may take place if there is a shift to less distortive policy instruments. Reforms have been implemented or are under way in the EU that have important implications for distortions in Cental and Eastern Europe such as reforms in some of the commodity regimes and the switch from per hectare payments to single farm payments. The latter will be implemented in Central and Eastern Europe in coming years.

From the perspective of additional reforms and the consolidation of reforms, the ongoing WTO negotiations are key in imposing discipline on agricultural policy distortions. Indirectly, the WTO agreements have already had major effects on distortions in Central and Eastern Europe because they have imposed constraints on the policies and the distortions that an enlarged EU, with 27 members, might implement. The agreements thus contributed to the EU policy reforms in 2000 that are now lowering distortions in the subregion to a level that would otherwise not have been achieved.

Notes

1. The policy focus is on price, trade, and subsidy policies. Policy distortions and reforms in other areas, such as property rights and land reform, that played an important role in these countries in the 1990s are not discussed in this chapter.

2. Also, see Valdés (2000), who analyzes agricultural support in 1994–97 in, among other countries, Bulgaria, Poland, and Romania.

3. The debate on how to extend the CAP to the accession countries and, more specifically, on the budgetary and trade implications of such an extention played a prominent role throughout the enlargement debate. In 1999, the EU-15 agreed on the so-called Agenda 2000 reforms of the CAP, at least partly in anticipation of enlargement. These reforms shifted the support supplied through market interventions to direct (per hectare or per animal) payments and provided a policy framework for the subsequent six years, including during enlargement.

The financial framework for EU enlargement, also adopted in 1999, made several assumptions regarding eastern enlargement, including the assumption that six new member states would join by 2002 and that farms in the new member countries would not qualify for direct income support. Despite much opposition from the EU-15 to an extention of the direct payments to farmers in Central and Eastern Europe, the candidate countries were united in their insistence on the equal treatment of their farmers from the moment of accession, that is, they demanded the same subsidies for farmers in EU-acceding countries and EU-15 farmers, including direct payments.

When it became clear that enlargement would occur after a delay, but would involve more countries, the European Commission made new proposals. The decisions of the Council of the European Union during the Brussels and Copenhagen Summits in the fall of 2002 supported a revised financial framework for the enlargement process and for future CAP reform. First, the ministers composing the council followed the commission proposal to phase in the direct payments. The EU-acceding countries would receive the equivalent of 25 percent of the direct payments in the EU-15 in 2004, 30 percent in 2005, 35 percent in 2006, and, rising steadily, 100 percent in 2013. Later, following strong pressure by the Central and Eastern European–acceding countries, the Council of the European Union agreed to increases in direct payments to farmers in these countries up to 55 percent of the EU level already in 2004, increasing steadily to 100 percent by 2010. However, the funding for these increases, the so-called national top-up, was to come from the acceding countries themselves directly or indirectly (Swinnen 2004).

4. That trade integration is occuring is clear in figure 2.3. The removal of nontariff barriers as part of EU accession was an important factor in stimulating trade between the EU and the countries of Central and Eastern Europe. Chevassus-Lozza et al. (2005) analyze the effect of nontariff barriers on the EU-10's agrifood exports to the EU in the period immediately before enlargement. Despite preferential trade agreements, the EU-10 countries were essentially subject to the same access regulations in the EU market as any third country. Nontariff barriers include sanitary and phytosanitary standards, quality, and import licensing. In principle, import licences became obsolete only when the EU-10 joined the EU. The other two groups of measures, however, cease to represent trade barriers the moment they are satisfied by producers. Still, Chevassus-Lozza et al. (2005) show (using a gravity model, for the EU-8, which joined the EU in 2004) that sanitary and phytosanitary standards, indeed, acted as a significant entry barrier to exports from Central and Eastern Europe to the EU in 1999. In 2003, they still constrained trade, but the effect was smaller than it had been in 1999, indicating that the number of firms fulfilling the standards had increased. Regarding quality regulations, they also restricted EU-10 exports in 1999, but to a lesser extent than the sanitary and phytosanitary standards. In 2003, quality restrictions did not constrain EU-10 exports to EU anymore, as the EU-10 succeeded in adopting EU standards. Finally, import licensing increased the transaction costs of trade and significantly restricted EU-10 exports in 1999 and 2003; these barriers were removed only after EU accession by the EU-8 and then the EU-10.

5. However, some of the restrictions became important later during the EU accession process. In terms of the General Agreement on Tariffs and Trade, the accession of the EU-10 to the EU involved the enlargement of a customs union. There are rules for such cases laid down in article 24 of the agreement. Essentially, these rules apply to tariffs. However, as the rules preceded the Uruguay Round Agreement on Agriculture, they do not relate to the new types of commitments established under the Uruguay Round (Tangermann 2000). Regarding tariffs, the EU and the EU-10 had to satisfy other members of the WTO that the overall level of agricultural protection and support in the enlarged EU would not violate the aggregate commitments that had applied before enlargement. Tariff bindings in the EU-10 in many cases were significantly below those bound and applied in the EU; so, negotiations would have to be held in the WTO on how to compensate other countries for the increase in tariffs on their agricultural and food exports to the EU-10. How to treat commitments in agricultural export subsidies and domestic support is not covered in the provisions of the General Agreement on Tariffs and Trade. However, there was the precedent of the EU northern enlargement in 1995 (Burrell 2000). For domestic support commitments, those of the original 12 EU members and those of the three new member states in 1995 were simply added together.

6. For attempts to capture distortions induced by exchange rates and protection, see Bojnec and Swinnen (1997); Bojnec, Münch, and Swinnen (1998); OECD (1994a, 1994b, 1995a, 1995b).

7. This would be an overstatement if the exporting and nontrading parts of the nonagricultural sectors received less support than the import-competing parts, but it is assumed that nontariff import barriers are still in place and exactly offset this bias.

8. For discussions of the importance of political economy factors in explaining general trade policies in Central and Eastern Europe, see Hillman (1994) and Hillman and Ursprung (1996). See de Gorter and Swinnen (2002) and Swinnen and van der Zee (1993) for surveys of the political economy literature related more specifically to agricultural policy.

9. See Anderson and Hayami (1986) and Lindert (1991) for countries in East Asia, Europe, and North America; Krueger, Schiff, and Valdés (1991) for a survey of developing countries; and Tracy (1989) and Swinnen, Banerjee, and de Gorter (2001) for the specific evolution of protection in Western European countries.

10. Several factors are not included here, such as the share of food in consumer expenditures, farm structure (for example, large versus small farms), and the implications in terms of effectively influencing government. See Swinnen (1996), for instance, for a discussion of the factors.

11. The long-term observed trend, however, masks strong occasional fluctuations in protection levels, generally coinciding with periods of general macroeconomic depression and severe food shortages. These fluctuations demonstrate how sensitive and responsive agricultural protection (income transfers) may be to the welfare position of taxed groups. These fluctuations in the support for agriculture are clearly visible in studies utilizing long time series data such as Lindert (1991) and Swinnen, Banerjee, and de Gorter (2001).

12. In general, such agreements may tend to improve political credibility and the acceptability of trade policies that diverge from the short-run political optimum (Giavazzi and Pagano 1988). By tying a government's hands, such institutional arrangements reduce the government's set of choices and alter the government's incentives in decision making.

13. However, as explained in greater detail in Hartell and Swinnen (1999), the big picture may obfuscate some important and complex differences in apparently similar policies; so, care should be taken in interpreting the observations.

14. Part of the political economy literature focuses explicitly on explaining the choice in government policy instruments. Changes in the structural conditions of political institutions and economies affect not only the preferred level of interventions, but also the political costs and benefits of the use of various policy instruments (Campos 1989; Rodrik 1994). For example, the implementation costs of farm programs have an important influence on government choice in policy instruments and can vary considerably with farm size and structure (Munk 1995; Sarris 1994). Exogenous factors often place limits on the scope, form, and operations of many support programs. A structural change that reduces implementation costs enlarges or alters the set of choices among instruments. This helps explain the path dependency often observed in agricultural policy. For example, Ray (1981) finds that, among many OECD countries, the introduction of tariffs and nontariff barriers is nearly always sequential, which is what we also observe in the EU-10.

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3

TURKEY

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This chapter provides an overview of the evolution of Turkey's agricultural policies in recent decades, examines the extent to which these policies may have distorted incentives, and attempts an explanation of the underlying forces that have driven the process and conditioned the results. The review period for the assessment begins in 1961 and continues up to 2007. To explain the situation prevailing at the start of this period, various trends and policy preferences are traced to earlier decades.

Turkey experienced rapid population growth in the second half of the 20th century. Although the population more than tripled between 1950 and 2004, heavy out-migration to urban areas and overseas meant that the rural population grew at half that rate. The agricultural workforce fell from 84 percent of the working population in 1950 to 60 percent in 1970 and 34 percent in 2004.

Despite healthy real growth rates for the economy as a whole, the economic performance of agriculture was poor. Average annual real growth rates in agriculture were around 1.6 percent in the 1970s, 0.6 percent in the 1980s, and 1.5 percent in the 1990s. In 1950, agriculture's share in gross national product was 41 percent, but, by 2004, it stood at only 12 percent. In the past 25 years, agriculture has experienced negative real growth in more than one year out of every three years. In 2002, nearly 20 percent of the rural population showed consumption levels 50 percent or more below the national average, and 36 percent of the population dependent on agriculture was living below the food and nonfood poverty lines (SIS 2004).

And, yet, Turkish agriculture was highly supported throughout the closing decades of the 20th century. Total support to the sector exceeded 5 percent of gross domestic product (GDP) in some years. This chapter attempts to throw light on this enigma.

Overview of the Turkish Economy and Agricultural Sector

This section first summarizes developments in Turkey's macroeconomy over the past half-century and then looks more specifically at the agricultural sector.

Macroeconomic Developments

Trends in agricultural policy over the review period are closely linked to the evolution of the economy as a whole and may not be assessed in isolation from the macroeconomic context. The period from the 1930s to 1950 was characterized in Turkey by state control of the economy and public services (etatism). The 1950s saw a shift toward more liberal domestic and external economic policies. This led to macroeconomic instability, which required strong stabilization measures before the end of the decade. Five-year economic plans were first undertaken in the early 1960s, and, for two decades, import substitution policies were followed.

After a severe economic crisis in the late 1970s, there was a switch to export-led growth policies and progressive trade liberalization. Thereafter, four subperiods may be distinguished: 1980–88, 1989–94, 1994–99, and 2000–07. The 1980s began with a period of postcrisis rehabilitation under a three-year military government. The 1980 stabilization package included a large devaluation, together with stringent measures to curb inflation (running at more than 100 percent) and reduce a public sector borrowing requirement of 10 percent of GDP. Policies throughout the economy were targeted on export promotion and structural adjustments, the burden of which fell heavily on wage labor and agriculture. The share of manufactures in exports rose sharply, and manufacturing profit margins increased (Taymaz 1999). It was a period of low growth, but relative stability in agriculture. During this period, the strict import controls that had operated under the previous import substitution program were gradually relaxed, including the controls on agricultural commodities.

Macroeconomic changes in response to populist pressures improved real wages significantly in 1988–94. Agriculture shared in this trend; border protection and output subsidies for agriculture were significantly increased. Currency convertibility and the deregulation of the capital market in 1989 allowed the authorities to resort increasingly to international capital markets to finance chronic budget deficits. Interest payments on escalating foreign debt pushed up total spending requirements. As Demir (2002) points out, distributional conflict, whereby groups disadvantaged by postcrisis measures attempted to restore their income shares, was not new to Turkey in the 20th century, but, for the first time, it took place in the context of full capital account liberalization. The result was that the period from the later 1980s until 2001 was marked by more unstable macroeconomic cycles, two major currency collapses, and deep recessions.

Growing deficits and exchange rate pressure continued until the economic meltdown of early 1994, which involved a massive currency devaluation and a new stabilization package. International agencies downgraded Turkey's creditworthiness, thereby restricting the country's external borrowing. From 1994 to 1999, the rest of the economy entered another period of export promotion built on a low-wage policy. This time, the agricultural sector did not bear the heaviest burden of adjustment. Border protection was increased for a number of key products, and spending on the sector appeared to run out of control. In fact, during this particular cycle, the budgetary burden of spending on agriculture actively contributed to the impending macroeconomic collapse.

During the second half of the 1990s, the government resorted increasingly to Central Bank borrowing for financing, which fueled inflation and spiraling interest rates. Before long, the government had also returned to the international money market. By 2000, the ratio of interest payments on government debt to tax revenues was 77 percent, and, in 2001, public debt was 91 percent of gross national product (OECD 2002).

Starting in 1999, several financial crises triggered another program of structural adjustment for the economy as a whole, and reform in agricultural policy had a prominent role.[1] In early 2001, the three-year exchange-rate-based stabilization program backed by the International Monetary Fund collapsed. It had been launched only 14 months earlier. The crawling peg was also abandoned, and the Turkish lira was floated. In 2002, Turkey experienced its deepest recession since World War II (Demir 2004; Akyüz and Boratav 2003).

The underlying causes of these cyclical patterns are complex. One is the apparent difficulty of establishing a secure, broadly based source of tax revenue. Various authors have documented the consequences of the tax impotence of successive Turkish governments (see, for example, Candemýr 1994; Harrison, Rutherford, and Tarr 1993). In particular, an inability to tax corporate profits and capital appropriately has meant that lower- and middle-income groups are taxed disproportionately. This has discouraged labor force participation, and participation rates have been below 50 percent of the working-age population. Furthermore, more than half the workforce operates in the informal (unregistered) economy, thereby reducing the tax base additionally (OECD 2004). Another consequence is that methods of public finance, together with inefficient credit allocation, have, for years, crowded out private investment and held back productivity growth and job creation. This has impeded mobility out of agriculture and deepened rural poverty.

A precondition for coherent agricultural policies is macroeconomic stability. Without macroeconomic stability, prices cannot act as reliable signals, and longer-term strategies for investment and development are thwarted. This precondition was not consistently met in recent decades. Macroeconomic instability also has implications for the measurement of sectoral distortions. Against such a

background, conventional methodologies for measuring distortions are unable to distinguish easily between, on the one hand, intended policy-induced effects or the desired outcomes of successful lobbying and, on the other hand, the fortuitous or unplanned results generated by unpredictable or uncontrollable cyclical movements. One should bear this in mind in reading the following sections of this chapter.

Turkey's Agricultural Sector

Turkey uses 38 million to 41 million hectares of land for agriculture, of which 22 million to 26 million hectares are cultivated, while the rest is permanent pasture, including common grazing lands. A wide variety of agricultural commodities may be produced in the diverse climatological and topographical conditions typical of Turkey. Fruits and vegetables account for over 40 percent of the value of sectoral output, and field crops for one-third. Over half the cultivated land is used for cereals. High-value protected crops are grown on about 50,000 hectares. Livestock products comprise less than a quarter of total output value.

Structural and resource weaknesses have hampered the performance of the sector for decades. Nearly two-thirds of farms are smaller than 5 hectares. Farms at all points in the size spectrum tend to be fragmented; nearly one-quarter consist of six or more disjointed parcels. Average parcel sizes have continued to decline in recent decades. Turkish inheritance law is a major factor in this trend. The investment per worker and per hectare is low, and yields for field crops and livestock are comparable with those in extensive farming systems in Argentina and Australia. In 2003, 18 percent of the agricultural workforce was illiterate (8.5 percent among men, and 28.5 percent among women), and only 11 percent of the people working in agriculture had progressed beyond primary school (OECD 1994; Derviş et al. 2004).

Regional economic inequalities are notable in Turkey and have been increasing. Average per capita GDP is over five times greater in the richest of Turkey's 26 regions than in the poorest region; prosperity tends to decline as one moves from the northwest toward the east and southeast. This is matched by inequality in educational attainment, health status, health care provision, and life expectancy. The World Bank (2000) has found that the low incomes in the poorest regions are due mainly to the large share of agriculture in local economies. However, whereas productivity appears to be improving more rapidly in nonagricultural sectors in the poorer regions, the reverse is true for agriculture in areas where the productivity gap between poorer and richer regions has been increasing. Rather than helping to redress this imbalance, agricultural support throughout the period has been biased toward richer regions and larger farms.

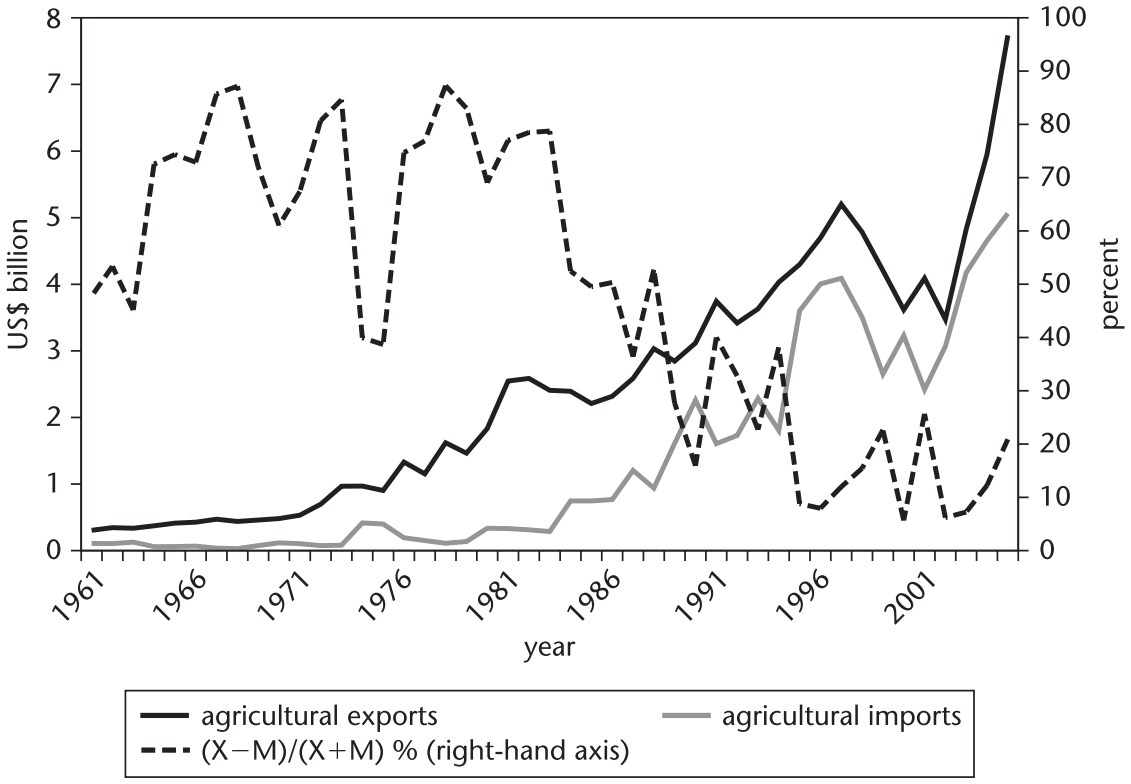
Although the majority of holdings produce for subsistence and for local informal markets, some areas and subsectors are fully integrated into national or international markets. The horticultural sector, concentrated in the southern and western coastal areas, competes successfully in export markets.[2] Poultry

production has increased more than fourfold since 1980, and the sector is characterized by modern production units operating to European Union (EU) standards.

A similar duality is observed in the food supply chain. A significant share of output, particularly in livestock products, bypasses formal marketing channels altogether. Traditional marketing chains typically have a number of intermediate stages operated by small enterprises with weak financial structures and lacking modernized handling facilities. The processing sector suffers from low capacity utilization. The marketing channels for some commodities have been dominated by inefficient parastatal enterprises for decades. At the same time, supermarkets and discount stores are gaining ground (Sirtioglu 2004; van Berkum 2005), although producer contracts and integrated chain management are not yet widespread.

Figure 3.1 shows the evolution of Turkey's agricultural trade flows. The agricultural trade balance is always in surplus (the left-hand axis: exports exceed imports), but net exports (X − M) as a percentage of exports plus imports of farm products (X + M) has been on a downward trend since the early 1980s (right-hand axis: 100(X − M)/(X + M)). Agriculture's shares in national exports and imports were 88 and 21 percent, respectively, and fell steadily to 9 and 5 percent in 2004. These sharply declining shares are consistent with more rapid growth in the rest of the economy.

Figure 3.1. Agricultural Trade, Turkey, 1961 to 2005



Sources: FAOSTAT Database 2007; Turkey, Ministry of Industry and Trade.

Note: The right-hand axis refers to net exports (X − M) as a percentage of exports plus imports of farm products (X + M).

Agricultural Policies

Agriculture has been heavily supported in Turkey for decades. The main policy instruments have traditionally been output price support and input subsidies against a background of high border protection. This section describes the institutional setting, the trade measures used, and the domestic policy instrumentation.

The Institutional Setting

The aims of Turkey's agricultural policies, as set out in successive five-year development plans, have focused on securing the availability and stability of food supplies, enhancing output and yield growth, raising self-sufficiency, exploiting export potential, providing stable and sustainable income levels in agriculture, and fostering rural development. Each plan has included targets and guidelines for achieving the targets. The formal authority for the formulation of annual programs involving specific agricultural policy measures resides with the Council of Ministers, in consultation with the ministries, the State Planning Office, and the Treasury. The prime responsibility for implementation belongs with the Ministry of Agriculture and Rural Affairs, while some responsibilities have been allocated to the Ministry of Industry and Trade and the Ministry of Finance.

State economic enterprises (SEEs) have been a key group of institutional players in the agricultural policy arena. It is important to note that SEEs have flourished extensively throughout the Turkish economy during most of the period under review, until the recent wave of full or partial privatizations.[3] In agriculture, the earliest SEEs date from the 1930s (TMO for grains, TSFAS for sugar) and the 1940s (TEKEL for tobacco, agriculture, and salt; TZDK for fertilizer and other inputs). EBK (meat and fish, later also poultry) and the Feed Industry Corporation were created in the 1950s; SEK (milk), in 1963; and Çaykur (tea), in 1971. The Organisation for Economic Co-operation and Development (OECD) estimates that, for the period 1980–92, the state-owned sector purchased 100 percent of the stock of sugar beets, 40 to 85 percent of the tobacco supply depending on the year, 10–40 percent of the marketed output of wheat, and up to two-thirds of the marketed barley. Purchase prices were fixed by the government, and the SEEs were subject to rigid protocols on trading operations.

The SEEs carried out manufacturing and commercial activities on behalf of the state in line with strategic plans and annual directives from relevant government bodies. Beginning in the early 1980s, some SEEs lost their monopoly or monopsony powers, and there was a move to allow the SEEs more autonomy in fixing prices. However, because of the soft budget constraints on the SEEs, the politically appointed SEE management, and the government's retention of its right to set prices, the SEEs were administered according to political rather than

commercial principles until recently. SEEs have also played a significant role in providing social services (social security, pensions, housing, guaranteed employment) (Demir 2002).

The trading losses and capital needs of these organizations were regularly covered using public funds. In 1991–95, the annual average duty losses of TMO, TEKEL, and TSFAS, taken together, were US$622 million, and they rose to an annual average of over US$1.7 billion in 1996–2001. In addition, the government began writing off the debt of agricultural SEEs in the mid-1990s. The average annual debt write-off for TMO, TEKEL, TSFAS, and Çaykur was US$550 million during 1996–2001, while equity injections from the Treasury to agricultural SEEs averaged US$150 million during the same period. The pricing policies of agricultural SEEs tended to reflect the political cycle. In preelection periods, increases in selling prices were held below the rate of inflation and caught up only months later. Such practices were one of many factors contributing to SEE losses.

For most of the second half of the 20th century, agricultural sales cooperative unions (ASCUs) also played a key role in the implementation of agricultural policy. The ASCUs date from the 1930s. Each ASCU generally covers only one product, including important crops such as cotton, hazelnuts, sunflowers, olive oil, raisins, and sultanas. They provide warehousing, primary or secondary processing, packaging, and marketing services to their members. According to the OECD (1994), during 1980–92, the three cotton ASCUs purchased between 24 and 92 percent of the annual marketed output. For hazelnuts, sunflower seeds, and soybeans, the share of the relevant ASCUs reached 60–70 percent during the period. In 1993, there were 17 ASCUs with 387 member cooperatives, and 685,000 individual members. The member cooperatives were controlled by their respective ASCUs and acted as the ASCUs agents. They had little autonomy or direct farmer control. By 2000, the number of ASCUs had fallen to 16, and the member cooperatives to 330, whereas individual membership stood at 750,000, and the ASCUs and their member cooperatives, together, had over 16,500 employees.

In the early 1960s, the state began to use ASCUs as agents in the support purchasing of a few commodities, and product coverage increased in the following years. The relevant legislation was amended to formalize this role of the ASCUs in 1985. The ASCUs were able to obtain subsidized credit for part of the cost of support purchasing, and any duty losses were covered by the government. The ASCUs were also instrumental in channeling subsidized inputs to farmers. After 1994, the ASCUs still declared prices to their members, although these prices were not set by the government, and purchasing was no longer carried out on the government's behalf. However, the government still appointed the ASCU directors and key staff. Budget transfers to the ASCUs in 1995–2000 averaged over US$600 million per year.

Agricultural credit cooperatives and the state-owned Agricultural Bank also played a role in policy implementation by providing concessional credit to the industry. The Agricultural Bank dealt mainly with large farmers, SEEs, and ASCUs, while the credit cooperatives focused on smaller farmers. In 2000, the Agricultural Bank was restructured as a joint-stock company with the structural and operational characteristics of a private sector concern, but with state-owned capital (Ziraat Bank 2003). The network of the agricultural credit cooperatives extends throughout rural Turkey. Its main role over the period was to supply farm inputs, usually on credit. Losses due to repayment default and inefficient management were covered by payments channeled through the Agricultural Bank.

Agricultural Trade Policy

A crop failure in 1954, coupled with difficulties in expanding agricultural output and in monetary expansion, led the government to introduce a stabilization program in 1958. A military intervention in May 1960 terminated democratic party rule, and the new era of five-year plans began. With the start of the first five-year plan (1963–67), import substitution became the official development strategy. Under the import substitution regime, most agricultural products could only be imported by an SEE. Moreover, only SEEs could import agricultural inputs such as fertilizer and pesticides, often at an advantageous (that is, overvalued) exchange rate. In January 1980, the first steps toward liberalizing this regime were taken. Two sets of products that might be imported were designated. Products not appearing on these liberalization lists were still controlled by quotas, which were abolished in 1984. The liberalization lists were then replaced by three lists that designated, respectively, prohibited imports, goods requiring import permits, and goods that could be imported without restriction. Agricultural products were on each of the three lists.

A system of product-specific customs duties was set up, complementing several umbrella levies (such as the support and price stabilization fund or DFIF levy) that had already been introduced in the early 1980s with a revenue-raising objective.[4] Additional special levies were added later in the decade, including the so-called mass housing fund levy.[5] By the early 1990s, in addition to regular customs duties, agricultural imports were generally subject to a stamp duty (at 10 percent of the value, including cost, insurance, and freight), a wharf tax (at 5 percent of the value, as above, and including customs duty and some other charges), the so-called municipality share tax (a 15 percent surcharge on the customs duty), the DFIF levy (at 10 percent of the value, including cost, insurance, and freight), and the mass housing fund levy (OECD 1994).

This complex structure, together with frequent changes in rates and coverage, characterized border protection over the period up to 1995. It is unclear to what

extent the main purpose was to manage domestic markets, help producers cope with fluctuating adverse circumstances, or raise revenue. The lack of transparency in such a system makes the net extent of border protection difficult to evaluate, but, for many products, the applied most favored nation (MFN) tariff provided only a small part of total border protection.

In 1990, the list of goods requiring permission for import was abolished, and, in theory, all but six agricultural products could be freely imported. In fact, nonautomatic, time-delimited import licenses were still required for a wide range of sensitive agricultural products.

At the start of the implementation of the Uruguay Round Agreement on Agriculture in 1995, all border levies were converted to tariff equivalents and bound.[6] Although import licenses are now no longer formally required for most products, import approval procedures and inspection controls continue to apply.

Nontariff barriers against red meat were intensified in the early 1990s, first, by restricting imports to unprocessed meat in 1990 and, then, in 1992, by requiring slaughterhouses shipping red meat and poultry to Turkey to be inspected by Turkish officials (OECD 1994). Since August 1996, Turkey has operated an outright ban on red meat imports. Restricted imports of breeding cattle have been allowed since 1999, but the ban remains in force for meat, feeder, and slaughter animals. This ban has been challenged on various occasions in the World Trade Organization (WTO) and is officially defended on sanitary grounds, in particular with respect to the risk of bovine spongiform encephalopathy (mad cow disease) (Burrell 2005). Turkey's per capita consumption of all meat (including poultry) is about one-quarter that of the EU-15 (the EU members prior to 2004: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom).

Under Turkey's import substitution program of the 1960s and 1970s, exports were strictly controlled. During the 1980s, regulations pertaining to agricultural exports were gradually simplified. Export levies on high-value products like angora wool, dried fruit, and nuts, for which Turkey has a large world market share, had been brought in during the 1960s with the aim of raising revenue. These levies were gradually abolished or allowed to erode in value and had completely ceased by 1995. During the 1980s, the exports of a few products (cotton and some cereals, including wheat) were alternately taxed or subsidized, apparently according to domestic supply management criteria. Commodities traded by the SEEs regularly received implicit subsidies because the Treasury covered the duty losses (including losses on external trade operations). The implicit export subsidies paid in this way in 2000 are estimated at €8 million for barley, €225 million for sugar, €10 million for tea, and €100 million for tobacco (Grethe 2004). Other products received subsidies on an occasional basis. In addition,

exporters of unprocessed or processed agricultural products were able to receive export credits of up to 50 percent of the value, free on board, of the consignment at interest rates that were often well below the rate of inflation.

Turkey's schedules for the Uruguay Round Agreement on Agriculture list 44 products on which export subsidies may be given, subject to volume and expenditure bindings. In recent years, subsidies have been paid on only 16 products, with the aim of developing export potential. Subsidies are paid on a fraction of each consignment, ranging from 18 percent (biscuits) to 100 percent (fish). Subsidies are not provided to exporters in cash, but in the form of deductions in payments to public bodies and corporations for items such as social security, insurance, and telecommunications. Exporters have to present the necessary documentation to the Ministry of Industry and Trade, which arranges the refund with the public organization from the central budget.

In January 1996, Turkey and the EU formed a customs union. Because over half of Turkey's agricultural exports are destined for the EU, while about one-third of its agricultural imports come from the EU, the arrangements for agricultural trade with the EU need to be taken into account in assessing the border protection for Turkey's agriculture. Unprocessed and processed agricultural products, as well as fishery products, remain outside the customs union. Turkey has set up tariff rate quotas for a large number of agricultural imports from the EU, but, for most of them, the in-quota tariff reductions are small. For those products for which the in-quota tariff is significantly reduced or eliminated, fill rates tend to be over 100 percent; so, these imports pay the MFN tariff at the margin. For imported processed products with an agricultural and an industrial component, the industrial component is treated in line with the provisions of the customs union, whereas the agricultural component is taxed according to Turkey's own schedule for that product.

In 2001, Turkey's agricultural exports to the EU comprised products with no MFN barrier (7 percent by value); products with an MFN barrier, but for which Turkey receives no preferential treatment (2 percent); products with an MFN barrier that has been reduced for Turkey (36 percent); and products for which the MFN barrier is completely waived for Turkey (54 percent) (Grethe 2004). Turkey continues to subsidize exports to the EU in products that are not in free circulation within the customs union.

Domestic Agricultural Policies

For decades, the main agricultural policy instruments were input subsidies and price supports for crop products. Input subsidies were used heavily beginning in the early 1960s when the government started promoting agriculture through

subsidies for credit, agricultural chemicals, seeds, and irrigation. In the early 1970s, fertilizer was added to the list of subsidized inputs. By contrast, livestock production has been supported mainly through border measures.

Although the rates of support for products and input use fluctuated considerably prior to 2000, there were no fundamental changes in the kinds of policies and delivery mechanisms applied. In 2000–01, an ambitious program to restructure domestic agricultural policy began that involved policy reinstrumentation and reduced budget outlays. The following paragraphs describe the policies in place up to 2000. The most recent period is then discussed.

The intervention buying of commodities at support prices began in the early 1930s with wheat. Other grains, cotton, and tobacco were added in the 1940s. With the first five-year plan (1963–67), the number of crops supported in this way rose to 9, and, by the early 1970s, it had reached 30. The reforms introduced in 1980 brought the number back to 17, and the share of price supports in agricultural gross national product declined. By 1990, only 11 commodities were covered (wheat, barley, rye, maize, oats, sugar beets, tobacco, mohair, silk cocoons, and poppy seeds), but, by 1992, with the addition of some horticultural crops and pulses, soybeans, groundnuts, sunflower seeds, and rice, the total number of crops with price supports was up to 25 (OECD 1994). In 1992, the total cost of agricultural subsidies was US$3.1 billion. The greatest shares were taken by wheat (13 percent), cotton (22 percent), tobacco (18 percent), sugar beets (17 percent), hazelnuts (9 percent), and sunflower seeds (8 percent). By 1999, the total cost of commodity price supports alone was over US$4 billion (about 2.2 percent of GDP) (World Bank 2001).

Intervention buying was operated by the SEEs (grains and pulses, sugar, tobacco, tea) and the ASCUs (horticultural crops, cotton, oilseeds, nuts, olive oil). Support prices were announced *after* planting, and payments were usually made one year or more after harvest and delivery. The short-run production incentives provided by these payments were weakened by the timing of the price announcement and because the high rates of inflation throughout the period eroded their value and exacerbated real price uncertainty. However, the sustained use of these measures over time undoubtedly distorted regional cropping patterns, supported inefficient production structures, and shielded the sector from competitive forces.

Once announced, support prices could not be adjusted for changes in market conditions during the growing season or postharvest, and many did not reflect differences in product quality. The SEEs had to act as the guaranteed buyer of last resort so that, if purchases exceeded storage or processing capacity, the SEEs conducted distress sales on the world market. The statutory conditions regulating the operations of TMO prevented this SEE for grains from passing on transport, handling, and storage costs when grain was resold on the domestic market. Such

constraints, plus overstaffing and the lack of incentives to operate efficiently induced by soft budget constraints, help to explain the huge losses of the parastatals.

Controls on areas planted were introduced for three commodities (hazelnuts, tobacco, and tea) in the mid-1980s under the authority of the relevant ASCU or SEE. They worked badly because of ineffective enforcement (OECD 1994). Stricter controls and compensation-backed incentives were adopted in 1994. From 1994 onward, tea growers were also required to cut back part of their plantation each year to improve the quality of the leaf. A pruning premium was introduced to compensate tea growers for lost volume. In 1996–2000, tea pruning payments averaged US$17 million annually. In addition, informal area controls operated for sugar beets.

In contrast, the livestock sector has seen little direct intervention. Since 1986, producers delivering milk to dairies that are certified for meeting certain technical standards have received extra payments per liter. This milk incentive premium is currently less than 10 percent of the domestic milk price and is paid on around 25 percent of total production. Otherwise, support for dairy products has been provided by border measures. Currently, tariffs on most dairy products are bound at 180 percent (lower for some cheeses). Applied MFN tariffs were significantly below these bindings in the late 1990s, but moved closer to bound levels in the early 2000s.

Apart from the temporary intervention buying of live animals during the drought of 1989, support for bovine meat has relied on border measures. In 1995, MFN tariffs on red meat stood at only 15 percent, but, shortly thereafter, were raised to 165 percent and are now at their bound levels of 225 percent. Since the ban on red meat imports in 1996, the insulation of the domestic red meat market is virtually total. A meat incentive premium was paid in 1990–91 and, again, in 1994–95, per kilogram of beef and sheep meat on animals delivered to abattoirs satisfying modern hygiene standards.[7]

Support for input use has been extensive. Incentives for capital investment were paid to farmers during 1980–85 largely in the form of reductions in customs duties on imported machinery and other tax deductions. From 1985 onward, grants were paid for various investment projects, such as the establishment of feedlots. This form of aid ceased in 1994. The Ministry of Agriculture and Rural Affairs also funded on-farm development work (field leveling, soil improvements, and so on); costs averaged US$23 million in 1986–90, US$52 million in 1991–95, and US$63 million in 1996–2000. This expenditure has continued at similar levels into the 2000s.

Until 1999, credit to farmers was heavily subsidized and was delivered either directly by the Agricultural Bank (or to sugar beet growers through the Sugar Bank, which, at that time, was owned cooperatively) or indirectly through the agricultural credit cooperatives and ASCUs. The government also provided cheap

credit to agricultural input industries. Rates to farmers tended to be 40–60 percent below commercial rates, and, from the late 1970s until 1998, real interest rates on loans to farmers were negative. From 1986 onward, larger interest concessions were given for livestock production. In 1992–93, for example, the real rate of interest on loans for crop production was −16 percent and, for animal husbandry, −24 percent. In 1994, the average real interest rate on agricultural loans reached −45 percent (OECD 1994; Lundell et al. 2004). The use of credit subsidies for agriculture peaked in 1994–99, averaging over US$1.3 billion per year. And, yet, at the end of the 1990s, the ratio of agricultural lending to agricultural GDP averaged only 14 percent, well below the 30 percent typically observed in comparable countries (Lundell et al. 2004). The Turkish Competition Authority has estimated that two-thirds of small farms were using informal credit from illegal brokers.

Lundell et al. (2004, p.23) note that, from the mid-1990s, cheap and abundant credit encouraged credit delinquency, which, in turn, stimulated vote-seeking political parties to promise debt rescheduling schemes that amounted to debt write-offs. It has been estimated that only 80 percent of the implicit subsidies reached farmers because of the high administrative costs and the inefficiency of the delivery agencies.[8]

Subsidies for the domestic production and consumption of fertilizers began in 1961 (see elsewhere above). Until 1986, ex-factory and farmer prices were controlled by the state at levels above and below the world market price, respectively (Niron 1986). Fertilizer distribution was in the hands of the SEEs TZDK and (for sugar beet growers) TSFAS, and their duty losses were met from government funds. In 1986, all restrictions on fertilizer imports were lifted, and prices were determined competitively in domestic markets, albeit still protected by tariffs. TZDK's share of the fertilizer market fell from 90 percent in 1985 to 10 percent in 1992 (OECD 1994). At the end of the 1990s, 35 percent of the fertilizer sold to farmers was marketed by the agricultural credit cooperatives.

From 1986 onward, fertilizer subsidies were paid by the government to fertilizer distributors via the Agricultural Bank. For a brief period (1994–97), subsidies were paid directly to farmers upon presentation of sales invoices, but this was reversed due to the scheme's administrative burden and susceptibility to fraud (Lundell et al. 2004).

During 1990–97, annual expenditures on fertilizer subsidies averaged US$363 million. The fertilizer subsidy was 39 percent of the market price in 1993 and 50 percent in 1997. The ratio of the farmer price to the import price over the period did not reflect these high rates of subsidy, *except* in 1996–97, when subsidies were paid directly to farmers. In fact, during 1990–95, the farmer-import price ratio fluctuated between 78 and 108 percent. In 1997, the government began phasing out the fertilizer subsidy, and the subsidy ceased completely at the end of 2001 (Lundell et al. 2004).

Agriculture's use of pesticides has been supported in two ways. First, the government assumes the cost of protective measures taken when epidemic crop diseases or pest infestations occur. Second, from 1987 onward, the Agricultural Bank was authorized to pay a rebate of 20 percent on the value of pesticides bought by farmers themselves. In 1996–2001, the annual disbursements by the government on this item averaged US$26 million.

Starting in 1985, a subsidy was paid to certified producers of hybrid maize, hybrid sunflowers, soybeans, and nitrogen-fixing bacteria (OECD 1994). Total payments under this scheme fell during the 1990s from a peak of US$31 million in 1987 to low levels in the early 2000s. Subsidies have also been paid to farmers, at various times, for seeds and animal feed.

Ownership and exploitation rights for water are vested in the state. There has been considerable public investment in irrigation since the 1960s, which has expanded the irrigated area by about 800,000 hectares per decade. More than 4.9 million hectares are now irrigated. Irrigation schemes are under the responsibility of the General Directorate of State Hydraulic Works (DSI) for large-scale schemes and the Ministry of Agriculture and Rural Affairs for smaller schemes. During the review period, the management of the smaller schemes was generally transferred, on completion, to village cooperatives. In contrast, at the start of the 1990s, the Ministry of Public Works and Settlements was operating most of its schemes itself and attempting to recover operating costs, together with a contribution to capital costs, from farmers. It is difficult to obtain data on the full cost of providing irrigation or the amount of subsidy that farmers have received over the years for this. OECD (1994) describes how farmer payments for irrigation use were fixed too low in money terms, were further eroded by inflation, and then undermined by poor recovery rates.[9]

In 1993, the Ministry of Public Works and Settlements began transferring the operation and maintenance of its schemes to water users associations, semipublic bodies that are set up under municipality law and are managed by elected members and local officials. Most of the 1.6 million hectares transferred by the Ministry of Public Works and Settlements to water users groups have gone to such associations. After transfer, the associations are expected to recover all operating and maintenance costs from farmers. Where such management transfers have taken place, operation and maintenance costs have fallen by about 40 percent, and yields from irrigated land are reported to have risen by 60 percent (Lundell et al. 2004).

Agricultural Policy Reform, 2000 to 2005

In 2000, as part of the seventh five-year development plan, the Turkish government adopted an ambitious program of agricultural policy reform. This involved not only the reinstrumentation of policy and a change in policy delivery systems,

but also the dismantling or fundamental reform of failing agricultural sector institutions. Price-fixing by the government was discontinued. Product and input subsidies were phased out and replaced by direct income support (DIS). The SEEs were to be restructured and privatized, and the ASCUs would become financially autonomous member-controlled cooperatives. To underpin this reform, a World Bank loan of US$600 million was secured to help fund DIS payments and incentive payments to shift farmers out of the production of surplus commodities (World Bank 2001). Activities under this loan agreement constitute the Agricultural Reform Implementation Project (ARIP).

The initial impacts of the reform were substantial. On the output side, real agricultural prices fell by 13 percent between 1999 and 2002 alone and by 22 percent relative to nonagricultural prices (Lundell et al. 2004). Surprisingly, the price falls were greater in the livestock sector, which had previously received virtually no price subsidies, than in the crops sector. This is a reminder that not all the price fall was due to agricultural policy changes: the demand for livestock products was more vulnerable to the deep economic recession of the early 2000s because of the closed markets for these products and the higher income elasticity of demand associated with them.

Subsidies for fertilizer and pesticides disappeared in 2001 and 2002, respectively. The phasing out of credit subsidies was completed by 2002. After a temporary drop, the aggregate use of fertilizer and credit rebounded to or exceeded previous levels despite the subsidy phase-outs.

Farm incomes fell by 16 percent between 1999 and 2002.[10] Four-fifths of this drop was due to subsidy removal, and the remainder to a 4 percent reduction in output (Lundell et al. 2004). The DIS payment was not intended to compensate producers fully for price cuts, nor to relieve rural poverty, but rather as a transitional measure to cushion the immediate impact of reform on farm incomes. It has been estimated that, on average, DIS payments compensated farmers for about half their short-term income losses (Lundell et al. 2004). The DIS is inadequate to compensate the income losses of many intensive fruit and vegetable producers whose areas are small and who have lost disproportionately on fertilizer and pesticide subsidies. However, the DIS compensation has been more adequate for farmers in the poor regions of the east and southeast, where prereform incomes and subsidized input use were lower, and farm sizes tend to be larger (Bayaner and Bor 2006). Table 3.1 gives an overview of the scheme up to 2005.

The implementation of the DIS program has been slowed because the national land registry is not complete in rural areas. To implement the scheme, the Ministry of Agriculture and Rural Affairs has built up its own farm registry system. Not all the 17 million hectares registered in the system are covered yet in the national land registry. Inability to prove ownership of land and disputes concerning ownership

Table 3.1. The DIS Scheme, Turkey, 2001 to 2005

Characteristics	2001	2002	2003	2004	2005
Payment per hectare (new liras)	100	135	160	160	—
Area ceiling (hectares per farm)	20	50	50	50	50
Participating hectares (million)	11.8	16.2	16.5	16.7	16.7
Share of agricultural area (%)	48	66	67	68	68
Farming households participating (million)	2.2	2.6	2.7	2.7	2.7
Share of farming households	54	75	87	87	87
Total cost (new liras, billion)	1.18	2.19	2.64	2.66	—

Sources: Lundell et al. 2004; Turkey, Ministry of Agriculture and Rural Affairs.

Note: — = no data are available.

are given as reasons for the incompleteness of the registration systems and the resulting incomplete coverage of the DIS scheme. The ceiling for payments (50 hectares) has caused some larger farms to be divided among family members (Bayaner and Bor 2006).[11] Thus, this relatively decoupled measure, the distortionary potential of which was considered small, may nevertheless introduce unexpected secondary distortions.

Hard budget constraints were imposed on the SEEs and ASCUs. TMO now functions as a commercial organization in the grain sector; its annual price declarations are based on domestic and world market expectations and are independent of the government. Real producer prices for cereals had been falling since their peak in 1996, but this trend appears to have bottomed out in the postreform period. At the start of the reform, sugar and tobacco support prices fell by 20–25 percent. Since the early 2000s, the prices for these commodities have been set by agreement between growers and processing factories. For sugar beet, a quota scheme similar to that of the EU—with A, B, and C quotas (for export only, amounting to 1–2 percent of production)—was introduced in 2001; quota rights are allocated to factories and transferred to individual farmers. Sugar beet deliveries fell by 25 percent in the first two years of the reform and have fluctuated since then. Tobacco area restrictions are more strictly enforced than hitherto, which, together with the price falls, has brought production down to less than half of its 1993 peak of 340,000 tons. Çaykur now has a reduced role as a tea-processing enterprise. Despite the intention to discontinue the tea-pruning payment, it was stopped for the 2004 crop only. Prices for cotton, sunflower seed, and soybeans were less affected because price premiums continued for these products, although it was initially intended that they, too, would be removed (World Bank 2001).

Restructuring measures have been less successful. The ARIP incentive scheme to shift farmers out of surplus crop production was applied to the tobacco and hazelnut sectors. In both cases, the uptake was poor. Tobacco farmers had already

reacted to price falls by switching 60,000 hectares out of tobacco in 2000–01, before the ARIP compensation payments became available. Hazelnut producers have been reluctant to grub up established orchards, and less than 1 percent of the target 100,000 hectares was abandoned (World Bank 2004). In the second installment of the ARIP loan, the scope of funds earmarked for farmer transition was broadened to cover village-based participatory investments under the new rural development plan (for example, small-scale cooperative processing, storage, village cooling facilities) and capacity building among farmer organizations and farmers in environmentally fragile areas who want to switch out of crops in oversupply.

Privatization among some of the largest SEEs has been slow. For example, by the end of 2006, of the five original units of TEKEL (including alcohol, tobacco, and salt), only the alcohol enterprise had been sold, and the cigarette enterprise had gone for tender twice unsuccessfully. Only two of TSFAS's initial 27 sugar factories had been privatized, and another three were included in the privatization program in 2007. The infant private sugar processing sector had only six factories, operating with more modern technology and flexible marketing strategies. In contrast, the factories remaining in the state sector have old technology and low capacity. Because of the expected expansion of the private sector, it might be rational simply to scrap some existing TSFAS capacity. However, the least viable production units tend to be in the poorest areas, and their disappearance would have a high social cost. This situation exemplifies some of the difficulties encountered in attempts to reduce distortions by dismantling an outdated state sector.

The early budgetary impact of this reform program was spectacular: a net cut in agricultural subsidies (after DIS payments) of 2.3 percent of GDP (US$5.5 billion) (Lundell et al. 2004). As expected, it has not been possible to sustain this rate of cuts because the coverage of the DIS payments has increased, and the financial burden of cleaning up the parastatals is continuing.

In its assessment of the ARIP loan, the World Bank (2001) identified two sets of concerns related to the project's aims. Regarding the transition of the ASCUs to fully fledged market-oriented trading companies, it was uncertain whether farmer members would want to take over control or whether some ASCUs might prove unfit to survive in competitive markets. As of 2006, all 16 ASCUs were still operating commercially and independently of the government, and the ASCU directors were being appointed by owner-members. Overstaffing was lower, and existing ASCU debt was still being rescheduled in exchange for restructuring compliance.

The World Bank appraisal also identified as substantial the risk of a political backlash as long-standing support was withdrawn from well-established client groups, creating pressure for the reversal or the nonimplementation of measures or for starting new subsidy schemes. The reform program has entered a phase where the risk of the accumulation of such pressures is greater, and recent developments are not wholly encouraging. Price premiums are still being paid on

cotton, oilseeds, and olives and are scheduled to continue until 2010 (see elsewhere above). Maize started receiving a premium in 2006, and other payments based on output were introduced for cereals in 2007. In 2004, some concessional credit became available again (about US$30.5 million in 2004), albeit under strict conditions that target producers aiming for higher-quality output, such as those producing according to GlobalGAP protocols or using higher-quality livestock breeds. In 2006, a new insurance subsidy was introduced that is open to all producers regardless of the commodity produced. Under this scheme, the state reimburses 50 percent of the insurance premiums directly to the insurance providers. In 2006, the scheme was operating in only 90 of the poorest districts (of a total of 950 districts). The agricultural strategy adopted at the end of 2004 as part of the next five-year development plan appeared to recouple some of the DIS payments to particular schemes and targets, although details were not offered; fertilizer payments, which are based on land area and provide for rates varying by product groups that were introduced in 2007, are in line with this intention. As of May 2006, the rate of DIS payments for 2005 had still not been announced, which suggests that there may be a drop in this commitment to farmers that may harden attitudes against the continuation of the reform. It is unclear whether these departures from the general principles of the reform might be initial signals of the backsliding that the World Bank identified as a risk.

Estimates of Distortions since 1961

Inflation of the Turkish lira (TL) averaged about 40 percent per year during 1960–2004, which hampers the interpretation of nominal values. Monetary amounts reported in this section have been converted to constant 2004 values using the GDP deflator. In January 2005, Turkey reformed its currency, replacing the lira with the new Turkish lira (YTL) at a conversion rate of 1 YTL = 1,000,000 TL. To facilitate interpretation, figures in constant 2004 values are expressed in their YTL equivalent, although the YTL was not the official currency until 2005.[12]

Annual producer and border prices and nominal rates of assistance (NRAs) are reported in Sandri, Valenzuela, and Anderson (2007), wherein the Food and Agriculture Organization of the United Nations is the source up to 1985 and the OECD thereafter.

Import Protection and Support for Agricultural and Other Products

First, we give a snapshot of recent average protection rates for agrifood products relative to other sectors. In 2004, average trade-weighted MFN tariffs were 40 percent for primary agricultural products, 18.9 percent for processed food products

and beverages, 1.9 percent for other primary products, and 3.2 percent for manufacturing (Togan 2005).[13] In 1996, on forming a customs union with the EU, Turkey aligned its tariffs for nonagricultural commodities with the common external tariffs of the EU, which have been stable over the period at low levels. Thus, for the last 10 years, there has been little offsetting protection in other sectors to take into account in assessing the distortions in the agricultural sector due to agricultural tariffs.

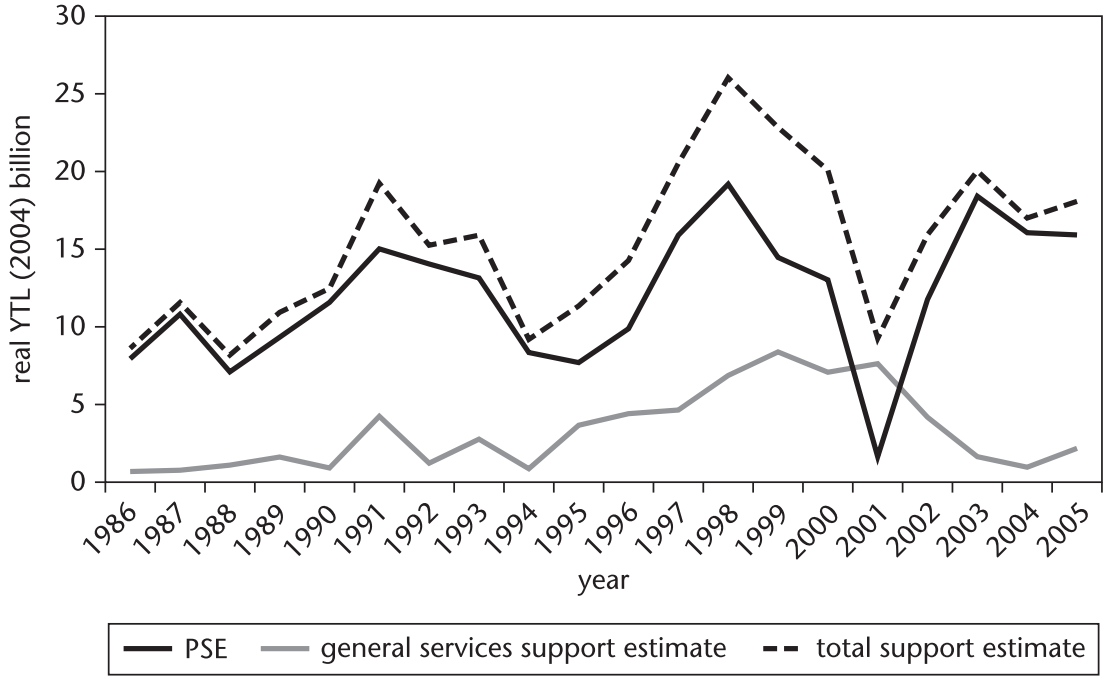
We next examine intersectoral distortions as captured by the producer support estimates (PSEs) and the total support estimates that have been calculated by the OECD for Turkish agriculture since 1986. The PSE represents the transfers from consumers and taxpayers to agricultural producers caused by agricultural policies and comprises market price support, *plus* all direct payments by the government to farmers. It is derived by calculating the PSEs for individual products, which are then aggregated. The standard PSE products account for less than 50 percent of Turkey's agricultural output by value (Kasnakoğlu and Çakmak 2000). To reflect the greater share of field crops and horticultural products in Turkey's output mix, potatoes, tomatoes, tobacco, grapes, apples, and cotton are added into the calculation of aggregate market price support, which is then grossed up to represent market prices for the sector as a whole. This extended product selection covered about 58 percent of output in the late 1980s and, thereafter, about 63–64 percent.[14] The total support estimate consists of the PSE and the general services support estimate, this last representing non-commodity-specific transfers to the agricultural sector as a whole that do not accrue directly to farmers.

Figure 3.2 shows that total agricultural support has fluctuated in line with macroeconomic cycles. The increase after 1988 reflects the shift in income distribution toward workers and farmers as Turkey emerged from the economic restraints set up after the 1980 crisis. The sharp falls in 1994 and 2001 correspond to macroeconomic crises, which were characterized by strong currency devaluations (63 and 49 percent, respectively, against the U.S. dollar) and negative real income growth (−4.7 and −7.5 percent, respectively). In most noncrisis years, the PSE accounted for 80 percent or more of total support (figure 3.2, chart a). However, for 1995–2001, the general services support estimate took up over 30 percent of the total.

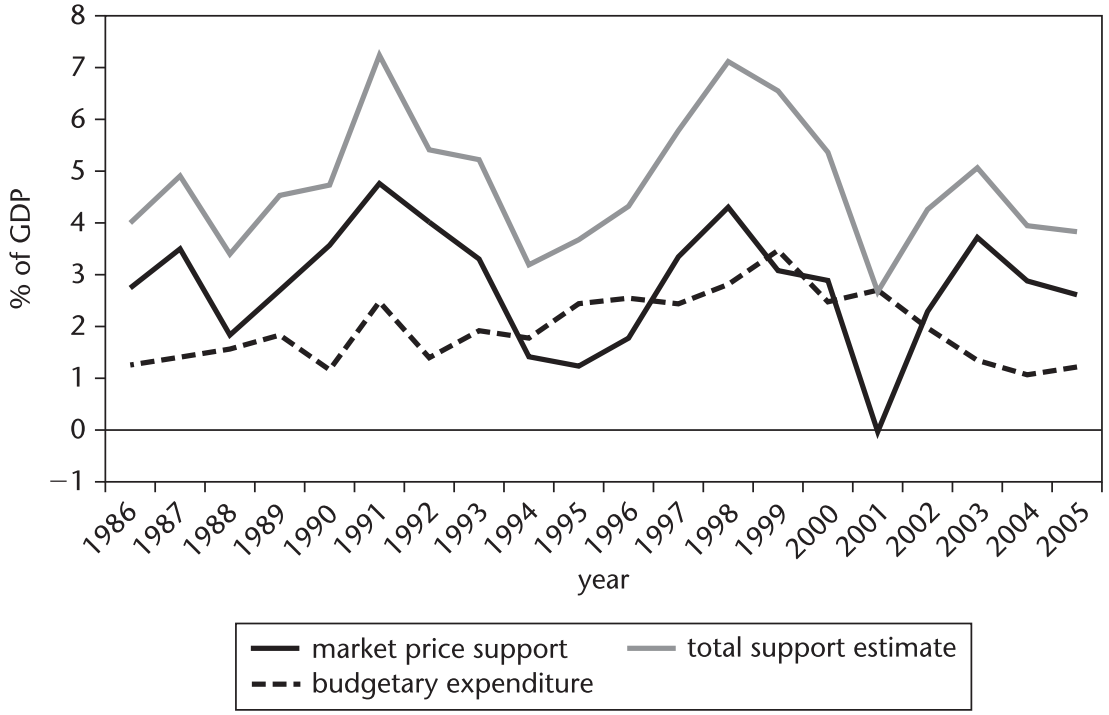
The general services support estimate involves transfers of which the aim is to improve the functioning of the sector. Measures include investments in research and development, agricultural schools, infrastructure, marketing and promotion, and public stockholding. For the OECD countries as a whole, these measures contribute almost 20 percent of total support. These are considered relatively benign transfers; their potential for distortion is undefined, but is thought to be low. By contrast, in Turkey, the general services support estimate has consisted largely of bailout payments to the SEEs and ASCUs. During 1995–2002, these payments

Figure 3.2. Agricultural PSEs, Turkey, 1986 to 2005

a. The PSE, general services support estimate, and total support estimate



b. Market price support, total support estimate, and budgetary expenditure on agriculture



Source: OECD PSE-CSE Database 2007.

never fell below 85 percent of the general services support estimate, and, over the same period, they averaged one-third of total support. Even since the 2000–01 reform, the cost of sanitizing these organizations has continued to require considerable transfers.

How distortionary these transfers to the SEEs and ASCUs were and whose incentives they distorted are difficult issues to resolve. To the extent that duty losses arose because the SEEs were required to act noncommercially to assist farmers (for example, absorb transport costs and accept all produce offered), then the losses amount to hidden producer subsidies. However, the soft budget constraint on parastatals and the recurrent political interference in the functioning of these entities encouraged overstaffing and inefficiency (Olgun 1991; Demir 2002), and undoubtedly acted as a catalyst for rent-seeking and nonmarket-oriented behavior in the food supply chain. Moreover, the size of the transfers in the later 1990s meant that the transfers were not neutral with respect to the macroeconomy. Thus, the distorting impact of this component of total support in Turkey has not been confined to agriculture, but it probably distorted *agricultural* incentives less than the total amounts would suggest.

The low farm support levels in 1994 and 2001 occurred primarily because market price supports were squeezed from above by falls in domestic producer prices, rather than by sharp increases in border prices due to currency devaluation or by marked changes in border protection. This raises the question of what is actually measured by this price gap and what factors determine the extent of the gap. The evidence suggests that, in these crisis years, domestic prices may have been affected by lower demand because of reduced incomes (certainly the case for livestock products, which have high income elasticities of demand) or that payments to farmers were reduced to soften the impact of the crisis on consumer food prices or because of cash flow problems among the parastatals. If the squeezing of the price gap is in fact caused by internal demand phenomena or slippage between announced policy measures and implementation, it is striking and informative that such large internal price movements were not corrected by price arbitrage between domestic and foreign markets. Whatever the case, one must be cautious in interpreting these gaps and the changes in them as solely the result of official policies and under the control of policy makers.

Relative to GDP, the peak in support in the early 1990s was slightly higher (7.3 percent) than the one in 1998–99 (around 7 percent) (figure 3.2, chart b). However, it was the latter peak that triggered fundamental policy reforms. During the 1990s, there was a shift in the relative shares of support coming from (less visible) market price supports and from the government budget (consisting of more visible direct subsidies to farmers, *plus* general support to the industry). In 1998–99, this general sector support reached historic levels both in real terms and

as a percentage of GDP and accounted for more than half the total support.[15] Given the government's severe deficit financing problems, the situation was unsustainable. The need to control agricultural spending was yet another trigger for the urgent reform of public finance that began in 1999.

NRAs for Agricultural Commodities

In accordance with the methodology outlined in the appendix, NRAs for key products have been calculated based on price gaps. The price gap for an unprocessed commodity at the farm level is defined as the domestic producer price at the farm level, *plus* all transport costs, handling costs, and marketing margins incurred in getting the domestic product to port, *minus* the relevant free on board price or the costs, insurance, and freight price of the equivalent exported or imported product. Production subsidies and support granted for the use of intermediate inputs, such as fertilizer, are also taken into account. The price gap thus calculated is assumed to pick up the effect of all tariff and nontariff barriers associated with an imported product or of all export subsidies and other aids for an exported product. The resulting product-specific NRA represents the price gap expressed as a percentage of the border price. An NRA reflecting the protection or taxation at play in a country's total agricultural sector is calculated via a weighted average of the NRAs for individual products and the guesstimated NRA for the aggregate of the remaining commodities using the undistorted gross value of production as weights. The NRA for total agriculture also includes non-product-specific support payments.

Because of the government's regulation of the foreign exchange market, a black market rate arose parallel to the official rate. In the 1960s, the black market premium amounted to about 45 percent, but it declined subsequently and, after the mid-1980s, remained at low levels. To account for these irregularities, an equilibrium exchange rate was calculated as the weighted average of the official and the black market rate, with the weights based on an estimate of the proportion of foreign currency that is sold on the parallel market (see the appendix). The exchange rate distortion as part of the protection for import-competing goods is then the difference between the exchange rate the importer faces and the equilibrium exchange rate. With regard to exportable products, the exchange rate distortion is measured as the difference between the exporter's exchange rate and the equilibrium rate.

The data for calculating the NRAs for individual products stem from two sources. For 1961–85, all information on prices and quantities is taken from the FAOSTAT Database of the Food and Agriculture Organization of the United Nations. For this time period, no data on distortions with regard to intermediate input use, non-product-specific payments, or production subsidies were available.

Thus, the NRAs for 1961–85 reflect a pure price wedge between the domestic producer price and the border price. Information for the remaining period, 1986–2005, comes from the OECD PSE-CSE Database, and, so, output subsidies and payments based on input use are included in the calculation of product-specific NRAs. More precisely, these include payments based on the use of variable inputs (fertilizer, hybrid seed, pesticides, and so on), as well as supports, coupled with the use of on-farm services and investments. Non-product-specific subsidies, such as payments based on the area planted and animal numbers, historic entitlements, input constraints, overall farm income, and, finally, miscellaneous payments, are included only in the NRA for the total Turkish agricultural sector. Rice and hazelnuts are the only products not covered by the OECD PSE-CSE Database. The data for these two commodities come from the FAOSTAT Database even for the post-1985 period.

The data used for the calculation of the equilibrium exchange rate have been obtained from the Global Development Network Growth Database, which provides the official exchange rate and the black market premium for various countries in 1960–2005. In the absence of other information, the proportion of the foreign currency sold on the parallel market is assumed to be 50 percent in the years when the market was active because the official exchange rate was overvalued.

NRAs for Nonagricultural Commodities

For the purpose of intersectoral comparative evaluation, an NRA for the total nonagricultural tradables sector has been calculated, in addition to the NRA estimate with regard to overall agriculture. This indicator is determined via NRA guesstimates for the import-competing, exportable, and nontradable parts of the total nonagricultural sector. The exchange rate distortion applying to importable and exportable goods, as explained above, is then added to the corresponding NRA guesstimate.

The data on nonagricultural distortions come from various sources. For 1960–83, they were taken from the precursor of this study, which was conducted by Krueger, Schiff, and Valdés (1991). Krueger, Schiff, and Valdés use the average tariff on nonagricultural products as an approximation for the distortions in the nonagricultural import-competing sector, while, for exportables and nontradables (services), an NRA of zero is assumed. For 1986–2005, additional tariff information was taken from the World Development Indicators Database. Since a complete time series of tariff data is not available, interpolation was used from one data point to another. The division of the total nonagricultural sector into importables, exportables, and nontradables is based on assumed shares for importables and exportables, while, for nontradables, we have used the share of services in GDP.

Relative Rate of Assistance and the Trade Bias Index

The relative rate of assistance (RRA) provides an indication of the assistance to agriculture relative to the rest of the economy. As explained in the appendix, the RRA compares the total NRA for tradable agriculture with the total NRA for the tradable nonagricultural sectors.[16] A negative RRA indicates that agriculture is either less subsidized or more taxed than nonagricultural industries, suggesting that an antiagricultural bias is in place, and conversely for a positive RRA. The trade bias index (TBI) is calculated by comparing the NRA for agricultural exportables with the NRA for agricultural import-competing products.[17] Typically, this has been negative, reflecting a trade policy bias against agriculture.

Our calculated NRAs fluctuate considerably over the period. If the only support is via border measures and if horizontal and vertical price transmission is good, then the price gap represents the tariffs and the nontariff barriers. In countries such as Turkey, which has less well-integrated markets and poor marketing and processing infrastructures, the component representing distribution costs and marketing margins for farm products may be substantial. If this component is underestimated, part of these costs will be confounded with the price distortion caused by border measures. However, these margins are probably relatively constant or slowly trending, and it is unlikely that they have generated the sharp swings observed in the calculated price gaps for Turkey.

The domestic price-fixing mechanisms used by the Turkish government until 2000 might be expected to have distorted the relationship between domestic and border prices if administered prices diverged from world market price trends. The extent of this distortion would depend on the degree of monopsony exercised by the state-controlled purchasing bodies (the SEEs and ASCUs) and on whether their market share varied sharply from year to year. If state purchasing bodies had only weak monopsony powers, then either the link between domestic and border prices would be quite strong (assuming good transmission between the border and domestic markets) or domestic prices would reflect internal market conditions (assuming weak price transmission).

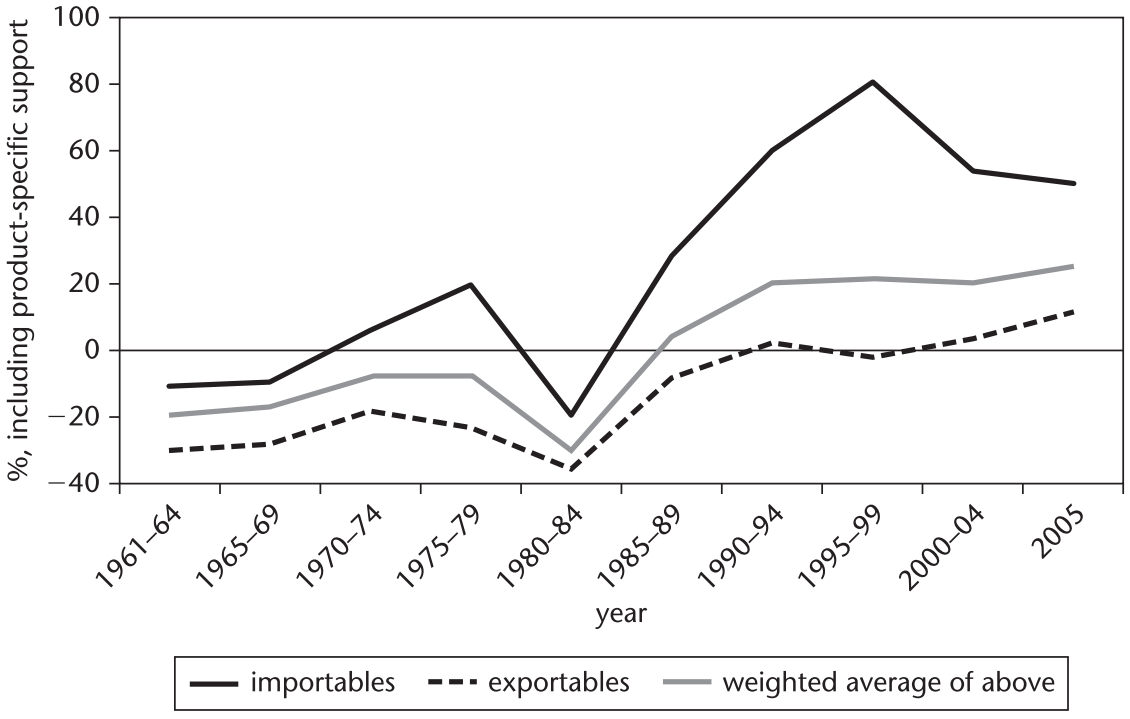
For the data, the price gap instability comes at least as much from producer prices as from border prices and, for the most part, is unrelated to any changes in tariff levels. For tomatoes and grapes, which are export commodities, there is considerable movement in both border and producer prices, and the price gap fluctuates on both sides of zero. For wheat, oilseeds, and poultry, the domestic price shows some response to the border price during some subperiods, but, even then, the response is weak and with a variable lag. Less surprisingly, for beef and sugar, the movements of the two prices are unrelated. Little and then no foreign trade in beef meant that the domestic market for this product was completely isolated, whereas, for sugar, there was little foreign trade, *and* the first-round purchasing

conditions were close to a perfect monopsony. In general, the transmission from border price to producer price is poor. It is unclear the extent to which this is because policies themselves have acted effectively to cut the link with border prices and the extent to which it is caused by exogenous factors such as poor, but variable price arbitrage within the country.

Figure 3.3 shows the development of the aggregate NRAs of import-competing products, exportables, and all products covered by this study. From 1961 to 1979, agricultural interventions experienced a steadily increasing trend, which is in line with the pattern of interventions in agricultural prices described above. In 1961, when the government's first five-year plan was adopted, increased intervention in agricultural pricing followed. In addition to price interventions, the government also expanded the coverage under the support purchase program and increased subsidies on inputs. From the beginning of the 1970s, subsidies to users of fertilizer were implemented. Within the 1970–74 period, import-competing agricultural sectors changed; instead of being slightly taxed, they were protected. This protection peaked with an NRA of 20 percent in 1975–79.

The taxation of agricultural exports, shown by a negative NRA in figure 3.3, also decreased during 1961–74, while, in the following period, a stronger negative trend may be observed again. The implicit taxation on agriculture as a whole was approximately 20 percent in the 1960s, but decreased to 7 percent during the

Figure 3.3. NRAs for Exportable, Import-Competing, and Total Agriculture, Turkey, 1961 to 2005



Source: Author calculations.

Table 3.2. NRAs in Agricultural Industries, Turkey, 1961 to 2005
(percent)

Sector	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04	2005
Importables										
Rice	—	—	—	—	—	27	246	111	98	—
Wheat	−11	−19	−12	−7	−26	39	45	47	26	39
Maize	—	−33	−13	—	−45	12	45	55	40	68
Sunflower	—	−6	−20	−27	−61	15	37	54	19	23
Sugar	—	—	—	—	—	15	36	113	116	136
Milk	—	38	47	73	7	62	125	127	57	29
Beef and veal	—	—	—	—	—	20	65	120	133	102
Exportables										
Barley	−15	−44	9	−21	−37	22	59	63	23	51
Potatoes	—	7	3	12	−7	23	27	32	118	315
Poultry	—	—	—	—	—	34	57	62	50	66
Sheepmeat	—	—	—	—	—	14	22	31	11	14
Eggs	—	—	—	—	−23	21	32	73	51	121
Grape	—	−11	2	−7	−11	6	19	5	29	44
Apple	—	−27	−40	−53	−52	−13	−16	6	0	92
Cotton	−26	−21	−11	−7	−31	−54	−47	−49	−36	−45
Tobacco	−46	−47	−38	−38	−68	0	37	49	−12	16
Tomatoes	—	−39	−41	−37	−36	34	9	−13	−10	−31
Hazelnuts	—	—	—	−22	−57	−47	−40	−31	−4	—
Importables	−11	−10	6	20	−20	28	60	81	54	50
Exportables	−30	−28	−18	−23	−35	−8	3	−2	3	11
Weighted average of above	−19	−18	−7	−8	−30	4	20	21	20	26
Standard Deviation	19	33	33	41	27	41	71	62	57	92
Share of above products in total gross value of agricultural production[a]	—	64	63	60	58	50	53	55	54	57

Sources: Author calculations based on data of the Food and Agriculture Organization of the United Nations to 1986 and data of the OECD thereafter.

Note: — = no data are available.

a. The share is calculated in terms of undistorted prices.

1970s. The increase in taxation in the following five-year period (down to a rate of about 30 percent for agriculture as a whole) was predominantly the result of the acute macroeconomic stabilization phase between January 1980 and July 1981. This period was characterized by a heavy currency devaluation and the reduction of input and production support programs (see elsewhere above). However, the proagricultural policy that emerged after November 1981 reversed that trend so that, in 1985–89, agriculture experienced positive assistance again; the NRAs for import-competing commodities averaged 28 percent, while exportables were only slightly taxed (by 8 percent). Protection for agriculture overall averaged 4 percent and increased to slightly over 20 percent throughout the 1990s and into the present decade, before rising to 26 percent in 2005.

The development of NRAs for individual commodities is shown in table 3.2. Total agriculture was taxed from 1961 to 1980. The products subject to the highest levels of taxation were maize, tomatoes, tobacco, hazelnuts, and apples (36–45 percent). Other crops, such as sunflowers, barley, eggs, and cotton, also experienced negative NRAs, but to a lesser extent (19–24 percent), while wheat and grapes show the lowest taxation (6–15 percent). The only products that received protection during this period were potatoes and milk (4–41 percent). Furthermore, table 3.2 shows that, over 1985–2005 as a whole, the NRAs for dairy, beef, and sugar were the highest (above 70 percent), followed by barley, eggs, poultry, and potatoes (42–52 percent), and sunflowers, maize, and wheat (32–39 percent). Finally, tomatoes, grapes, tobacco, and sheep meat received the lowest levels of support (5–20 percent).

With some low positive or negative NRAs, apples, hazelnuts, and cotton (all export crops) were subject, on average, to taxation (6–46 percent) over 1985–2005.[18] The NRAs for beef, potatoes, eggs, and sugar rose significantly, while protection and taxation for dairy and apples fell.

Table 3.3 summarizes the overall sectoral results with respect to agriculture and the nonagricultural sectors. We follow the OECD's assumption that agricultural products not covered in this study have been subject to the same level of protection or taxation as the commodities analyzed individually (see elsewhere above). Thus, for the years when no non-product-specific supports were in place, the NRA for the total agricultural sector is identical to the NRA of the covered products. As table 3.3 shows, agriculture received non-product-specific support in 2000–05, reaching 5 percent in 2005 (following the adoption of the DIS in 2001). Accordingly, for this period, the NRA for agriculture as a whole (including product-specific and non-product-specific measures) is higher than the total NRA for the commodities covered.

Table 3.3 also reports the TBI for Turkey, which is negative over the whole period, while showing erratic movement. From 1961 to 1984, the reason for this antitrade bias was the heavy taxation of agricultural exports, whereas imports

Table 3.3. NRAs in Agriculture and Nonagricultural Sectors and RRAs, Turkey, 1961 to 2005
(percent)

Sector	1961–64	1965–69	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99	2000–04	2005
Covered products	−19	−18	−7	−8	−30	4	20	21	20	26
Non-covered products	−19	−18	−7	−8	−30	4	20	21	20	26
All agricultural products[a]	−19	−18	−7	−8	−30	4	20	21	20	26
Non-product-specific input assistance	0	0	2	1	0	0	0	0	3	5
Total agriculture including non-product-specific assistance[a,b]	−19	−18	−5	−7	−29	4	20	21	23	31
Importables[a]	−11	−10	6	20	−20	28	60	81	54	50
Exportables[a]	−30	−28	−18	−23	−35	−8	3	−2	3	11
Trade bias index (TBI)[c]	−21	−16	−17	−35	−17	−28	−35	−44	−32	−26
Tradables										
All agriculture[a,b]	−19	−18	−7	−8	−30	4	20	21	23	31
All nonagriculture	61	141	50	56	35	20	10	2	1	0
RRA[d]	−46	−64	−37	−36	−50	−13	9	19	22	30

Source: Author calculations.

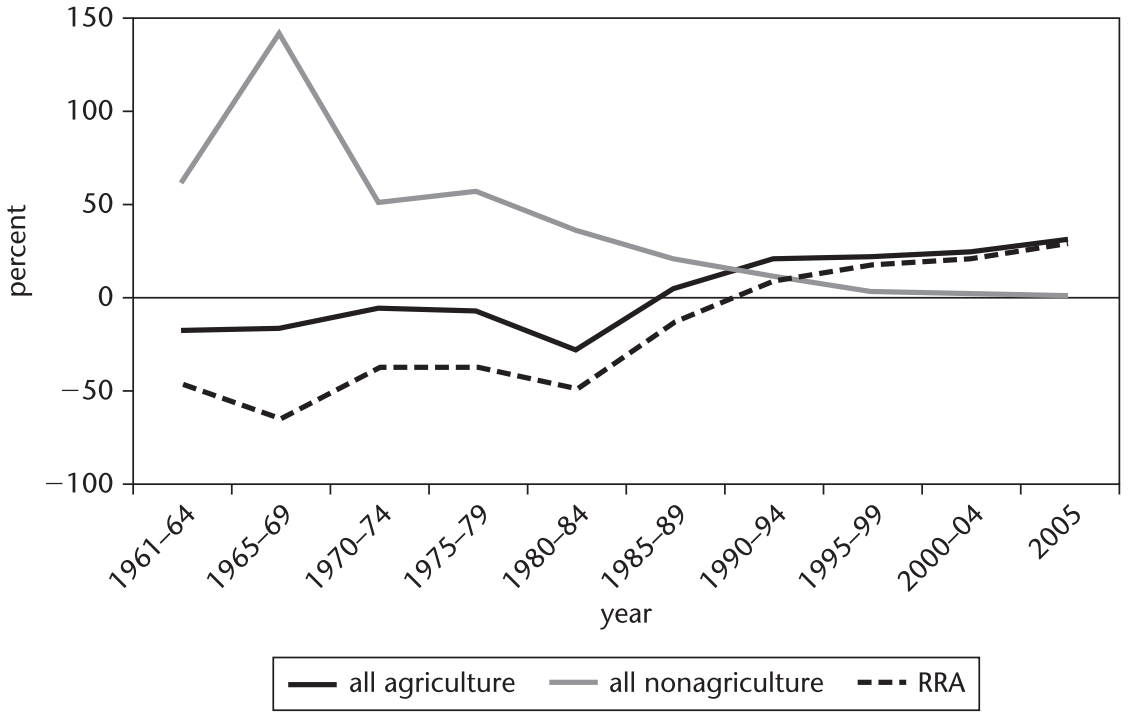
a. NRA including product-specific input subsidies.
b. NRA including other (including decoupled & non-product-specific) subsidies.
c. Trade bias index is TBI = $(1 + NRAag^t/100)/(1 + NRAag^t/100) - 1$, where $NRAag^t$ and $NRAag^t$ are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector.
d. The RRA is defined as $100*[(100 + NRA_{agt})/(100 + NRA_{nonagt}) - 100]$, where NRA_{agt} and NRA_{nonagt} are the average percentage NRAs for the tradables part of the agricultural and nonagricultural sectors, respectively.

were either taxed less or slightly subsidized. The TBI remained strongly negative over the remaining periods even though taxes on exportables decreased significantly and even became subsidies. The negative trend in the TBI persisted because, from the mid-1980s, importables also became increasingly protected so that exportables were still discouraged relative to import-competing products.

With regard to nonagricultural industries, table 3.3 shows a high level of protection, particularly in 1961–79. The peak in the later 1960s reflects the high tariffs on importable nonagricultural products. Thereafter, nonagricultural protection declined gradually and almost reached zero in 2000–05. The RRA in agriculture compares the level of taxation or protection in the agricultural sector with that in the overall nonagricultural sector. Table 3.3 and figure 3.4 show a negative RRA of about 50 percent in 1961–84. During this time, agriculture was heavily taxed not only directly, but also indirectly via high nonagricultural protection through significant import tariffs. Then, when nonagricultural protection came down and agricultural taxation declined, the RRA had become virtually zero by the end of the 1980s, reflecting an equal rate of assistance to the agricultural and nonagricultural sectors. The trend toward stronger support for agriculture led to a positive RRA in 1990–94. For 2000–04, the RRA averaged about 20 percent, and it reached 30 percent in 2005.

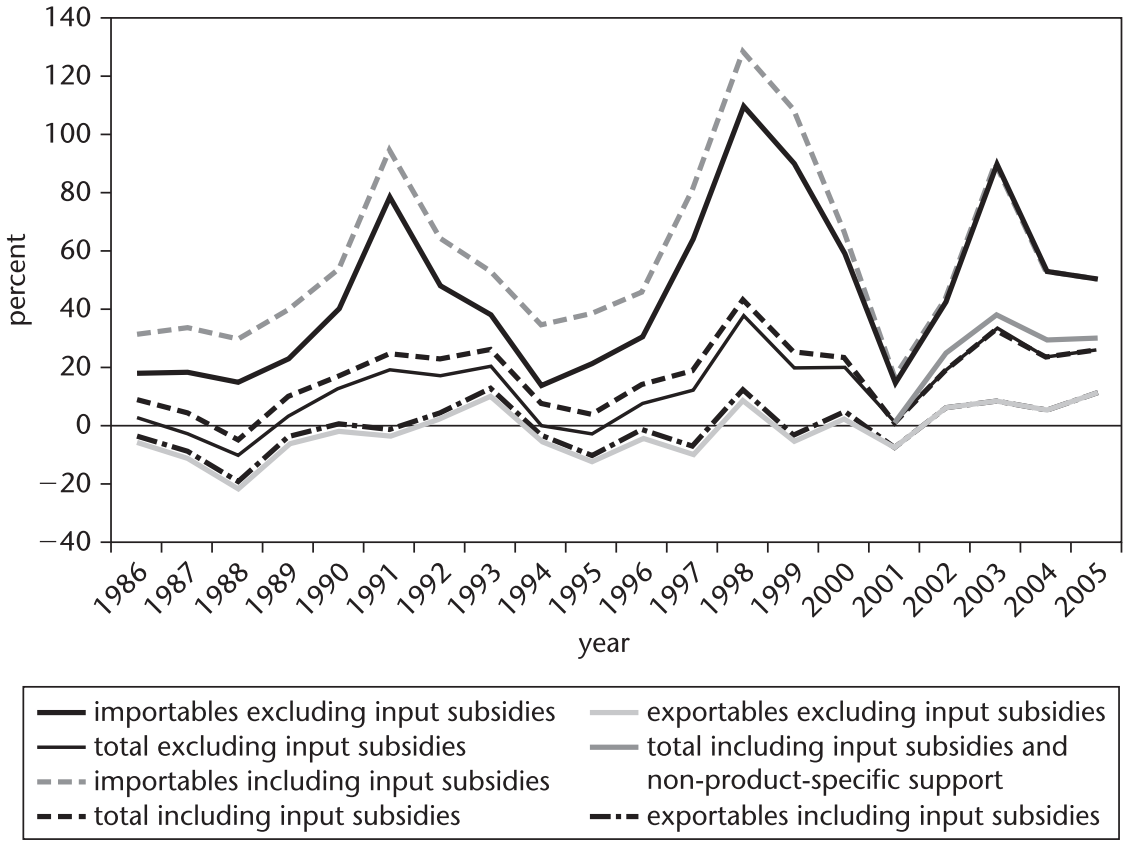
Information on product-specific input subsidies and non-product-specific support measures has been available since 1986. Figure 3.5 depicts NRAs for

Figure 3.4. RRA in Primary Agriculture, Turkey, 1961 to 2005



Source: Author calculations.

Figure 3.5. NRAs Including and Excluding Product-Specific and Non-Product-Specific Support, Turkey, 1986–2005



Source: Author calculations.

importables, exportables, and total agriculture, including and excluding product-specific input support. This reveals that subsidies for intermediate input use were higher for import-competing products than for export goods. Fertilizer initially took the highest share of product-specific input support, but, in line with a government decision to reduce fertilizer subsidies, this share steadily decreased. Concessional loans became the input support measure with the highest share. As figure 3.5 shows, NRAs that include product-specific input subsidies and NRAs that exclude them converge with the start of the ARIP reform in 2000. This is a reflection of the drop in coupled production support under the ARIP reform program. In 2001, the DIS began; it more than replaced the direct product-specific support of the late 1990s.

Other Studies Measuring Distortions to Agriculture

To complete the picture on protection rates, we refer to the work of Togan, Bayaner, and Nash (2005). They have calculated nominal rates of protection (from import competition) and effective rates of protection by aggregated commodity groups and industries for 2002 using a 1996 input-output table. The main

conclusions from their analysis are as follows. First, the nominal rates and the effective rates are relatively close for primary agricultural production, which is consistent with the high share of nontraded items in the cost structure of Turkish agriculture. Second, for the food processing industries, the nominal rates and the effective rates diverge considerably; the effective rate usually exceeds the nominal rate. This is what would be expected given the relatively high rates of protection on many of these processed products and the much lower rates of protection on other inputs, assuming relatively small cost shares of raw materials.[19]

The precursor of the present study was conducted by Krueger, Schiff, and Valdés (1991), who examined the evolution of distortions in agriculture in 16 countries in 1960–83. Turkey was part of that study. The study covered seven agricultural commodities. The nominal rates of protection obtained by Krueger, Schiff, and Valdés represent an index comparable to the NRA, although their study is based on a slightly different methodology and different data. One main methodological difference is the distinction between direct and indirect interventions. Krueger, Schiff, and Valdés defined effects caused by agricultural policies as direct effects (for example, price controls, border measures, and production subsidies), and they defined the effects resulting from nonagricultural and economy-wide policies as indirect effects. Another issue that is handled differently is the exchange rate used to convert border prices into local currency. In the present study, following the methodology clarified in the appendix, an equilibrium exchange rate has been determined, and exchange rate distortions are included in the NRA of each product. Consequently, our commodity-specific NRAs are not identical to those estimated by Krueger, Schiff, and Valdés. However, the overall trends in agricultural protection and taxation show the same pattern in both studies.

Finally, the OECD's percentage PSE offers another indicator comparable to the NRAs resulting from this study. For 1986–2004, the price and quantity data used to calculate NRAs for most products have been taken from the OECD PSE-CSE Database (see elsewhere above). Nevertheless, although the same data have been used, neither the commodity-specific NRAs and PSEs nor the NRA and PSE for total agriculture are absolutely identical. The reason for the discrepancies lies again in the methodological approach. In contrast to the methodology outlined in the appendix, the OECD converts the U.S. dollar border prices at the official exchange rate and thus does not consider the influence of the parallel market rate. In addition, the PSE is expressed as a percentage of distorted prices, whereas our NRA is expressed as a percentage of the undistorted border prices.

The Distortionary Impact of Policies

In an environment with variable rates of double-digit inflation, imperfect or incomplete markets, and high levels of uncertainty, the extent to which the price information received by farmers reflects government policy intentions is unclear.

Moreover, if policies change from year to year, as in Turkey, short-run supply responses are likely to be cautious.

Presumably risk-averse farmers reacted to such a climate of uncertainty by adopting risk-minimizing strategies, such as the underuse of variable inputs in the short term and underinvestment in the medium term. Investigating the supply responses of Turkish wheat producers during 1960–2002, Bayaner and Bor (2006) find that output price has no explanatory power in their model, but that lagged gross wheat revenue and current fertilizer price have the expected effects, although elasticities are low. This supports the idea that output support in Turkey probably raised the medium-term trend level of output, but that annual supply fluctuations (to the extent they are controlled by farmers and not caused by the weather) are a response to changes in variable input prices.

Table 3.4 summarizes the various policy-related influences affecting Turkish agriculture over recent decades. Statistics such as the NRA are designed to measure distortions of type 2 in contexts relatively free of other interference. The NRA also includes the effects of exchange rate policies (type 1). However, the effects of distortions of type 3 on incentives are barely captured by our measures, or, if they are contained therein, they are difficult to disentangle from the effects of formal policy measures. The exogenous influences may also be picked up to an unknown extent by these measures. Furthermore, the degree to which these exogenous influences have themselves distorted the intentions of policy makers in legislating policies is unknown.

Distortions of type 4 arise from the way support is distributed *within* agriculture. This is not picked up by our sector-averaged measures. Poverty is a feature of the lower end of a (usually highly skewed) income distribution. The distribution of support among Turkey's agricultural producers has been very unequal. In the early 2000s, the bottom two-thirds of producers with less than 5 hectares of land used only 22 percent of the land (30 percent of the irrigated land), 35 percent of the tractors, and had less than 45 percent of the sheep and little more than 50 percent of the cattle (Çakmak 2003). Larger farmers used more inputs, and, until the abolition of input subsidies, they had better access to subsidized inputs or subsidized credit to obtain the inputs. Consequently, yields have been significantly higher on larger farms, and support delivered through market prices still favors the larger, richer farmers. Now that most subsidies have been replaced by the DIS paid per hectare of the landholding, a bias still exists in favor of larger farms, although there is a cap of 50 hectares in the DIS system aimed at limiting the extent of payment concentration.

Historically, poverty has given farmers an incentive to leave farming and rural areas to provide cheap labor for other sectors of the economy. However, the transferable human capital of Turkey's farmers is low, and unemployment in other

Table 3.4. Summary of the Influences on the Agricultural and Food Sectors of Turkey

Type	Policy-induced distortions	Exogenous influences
1.	*Macroeconomic policies* Exchange rate policy Monetary policy (inflation)	• Fragmentation of food supply chains • Poor market infrastructure, including poor transport and storage facilities, weak information transmission, and so on • Market imperfections • Endemic rent seeking and corruption • Lack of sufficient education, training, and job creation policies
2.	*Agricultural policies, instruments* Tariffs, nontariff barriers Product, input subsidies; taxes on market transactions Product, input subsidies; taxes direct to farmers Supply quotas Area controls Area payments	
3.	*Agricultural policies, delivery mechanisms* Inefficient state enterprises Long information and feedback channels Implementation delays and inconsistencies Weak supervision of implementation protocols Weak enforcement of conditions for eligibility	
4.	*Incidence of agricultural policy within agriculture* Bias in favor of larger, richer farmers Bias with respect to products or farm types Regional bias	

Source: Author compilation.

sectors is high because of long-term underinvestment in job creation, effectively narrowing this escape route.

In considering the impact of agricultural support on poverty levels *within* agriculture, one should remember that the transfer efficiency of agricultural support policies for the sector as a whole has been low. The delivery systems used for transfers in the past created opportunities for a high rate of leakage, and this continues to a lesser extent. Therefore, measured support and transfers overestimate the amounts that actually reached farmers, even before the distribution within agriculture is considered.

Consumers have been the source of 70–80 percent of the transfers to agriculture, and this burden is particularly regressive. In the late 1990s, the share of average

Table 3.5. The CTE for Food Products, Turkey, 1986 to 2005
(percent)

Year	Wheat	Maize	Barley	Other grains	Apples	Grapes	Potatoes	Tomatoes
1986	6	5	4	4	−9	13	−1	22
1987	35	9	5	5	3	1	48	43
1988	57	9	−1	−1	10	−4	22	56
1989	31	7	0	0	−29	46	40	65
1990	16	15	4	4	−12	13	61	21
1991	64	20	5	5	−23	2	9	32
1992	18	18	4	4	0	38	44	15
1993	10	10	7	7	−14	20	30	12
1994	11	−4	2	2	−23	35	10	−18
1995	−12	3	0	0	12	−6	47	−31
1996	3	6	1	1	6	−17	70	10
1997	30	12	1	1	3	15	2	7
1998	50	14	3	3	0	24	17	−19
1999	51	12	3	3	1	0	14	−36
2000	19	11	2	2	3	26	32	−1
2001	−5	1	0	0	−19	−8	46	−16
2002	13	6	1	1	−1	30	174	−19
2003	56	13	2	2	−1	30	145	5
2004	22	13	3	3	16	67	194	−20
2005	35	13	4	4	92	44	315	−31

Source: Author calculations, based on OECD 2007.

Note: The CTE is the negative of the OECD's (2007) consumer support estimate, expressed as a percentage of undistorted prices.

household expenditure on food, beverages, and tobacco was 36 percent for Turkey, but, for the poorest 20 percent of households, it was 45 percent in urban areas and 56 percent in rural areas (Çakmak 2003). The tax burden of the direct transfers to farmers and agricultural parastatals from government revenue also falls heavily on lower- and middle-income groups. It is true that many of the lowest income workers are in the informal sector and therefore do not pay direct taxes. However, the tax take from the highest income groups in Turkey is also disproportionately low for various reasons.

The consumer tax equivalent (CTE) on food in Turkey's agricultural policies has been high for a developing country. The average CTE of slightly over 25 percent in the 1990s (table 3.5) was similar to the share in the EU, but, since then, the EU has moved farther away from price supports and toward direct income payments to farmers. Thus, by 2005, the CTE was only 17 percent among the 25 EU members (as of May 2004), whereas it was 27 percent in Turkey.

Sunflowers	Sugar	Tobacco	Beef, veal	Sheep meat	Poultry	Eggs	Milk	Weighted average
24	17	21	45	14	4	19	186	19
24	16	22	23	28	19	13	122	26
−7	−1	−15	−11	9	10	9	69	14
23	−13	−9	1	22	24	47	95	21
22	17	8	46	25	53	29	530	30
41	50	63	124	24	42	9	508	43
45	62	24	67	13	63	76	207	37
30	50	33	57	26	81	36	146	29
1	−18	38	0	25	29	17	100	9
25	40	46	43	28	66	96	64	9
46	44	64	23	−7	29	44	81	12
56	117	51	88	0	23	55	135	28
37	123	36	148	26	73	69	113	36
29	183	−4	146	33	54	74	95	28
28	120	−20	131	27	52	78	79	27
23	37	−48	79	−15	19	32	−5	1
6	90	−16	118	9	47	36	55	21
12	150	6	194	21	53	19	61	35
12	167	2	113	7	75	87	51	26
23	136	16	96	14	66	121	27	27

Taking all these factors into account, one may not assume that reforming Turkey's agricultural policies in a way that lowers farm prices must have a commensurate, positive impact on poor food-consuming households. For this to occur, price reductions must be transmitted along the supply chain to consumers. The relevance of this warning may be illustrated in Turkey by the case of milk. Turkish farmgate prices for milk for most of 1990–2001 were about 75 percent of the EU milk price. At the same time, wholesale prices for butter and skim milk powder were considerably higher than EU prices, double or more in some years, indicating large inefficiencies and high transaction costs downstream from the farmgate (Grethe 2004). No evidence is available on wholesale-retail margins, but the weak structure (fragmented, many stages) and poor performance (overcapacity, inefficiency) of the food distribution chain suggest that this margin is also significant. Thus, the chance that a fall in the price of raw milk will fail to reach the consumer of dairy products is strong. Since most agricultural commodities undergo storage, grading, processing, and transportation before reaching the consumer, the effectiveness of the whole downstream sector in passing on policy reforms is crucial.

Conclusions

Measured transfers to the agricultural sector in Turkey have been high relative to GDP throughout the review period. They reached historic levels in the second half of the 1990s. However, the institutional channels for delivering support to agriculture siphoned off or wasted a significant portion of the transfers captured from other economic sectors, and little benefit reached poor farmers.

Agricultural policy reform, begun in 2000, has reduced the budgetary cost of agricultural support. The inefficient state marketing sector has been partly restructured, and its role in the marketing and distribution of agricultural commodities has diminished. Furthermore, the switch from coupled input and output subsidies to direct income support has reduced the potential for farm support to distort production decisions. As the most recent figures suggest, the level of support granted to agriculture since 2000 is lower relative to that of the 1990s. This is particularly true with respect to import-competing products. Even though, in the beginning of the new century, there was a slight increase in subsidies, the level of support for exportables and total agriculture remained stable at rates of around 5 and 20 percent, respectively. However, estimates for 2005 show a small increase in support for exportables and for agriculture as a whole, while support for import-competing products remains high, at 50 percent.

The massive agricultural support structure, consisting of state-owned and state-controlled enterprises, which dominated agricultural markets for most of the review period, had its origins in the etatist policies of the early decades of the Republic (1923–60). The role of the state-owned sector was enhanced when it became an indispensable agent of the government in implementing successive five-year plans, from the 1960s onward. It seems to have flourished under both the import substitution regime of the 1960s and 1970s and the export promotion policies of the 1980s. The agricultural parastatals were among the most influential lobbyists on behalf of the sector and were already successful in capturing transfers from other sectors when Turkey's income was far lower than it is at present. These organizations also played a role in providing social benefits (conspicuously lacking from the central government) and thus enjoyed support in local rural areas. The OECD (1994) estimates that, in the early 1990s, the state-owned sugar corporation, TSFAS, alone affected the livelihoods of 3 million people and was involved economically with 7 percent of the voting public.

Much has been written about the distributional conflict that is endemic in Turkey. Virtually all occupational and interest groups (except for government employees and consumers) are organized, and the various distributional coalitions all operate effectively politically (Olgun 1991). As Olgun notes, rent-seeking is pervasive in Turkey, and it is accepted that the success of politicians and political parties has often apppeared to depend on maximizing support among

these powerful interest groups, if not simultaneously then sequentially (see, for example, Demir, 2002). The political economy of Turkey's agricultural policies has to be seen in this general context. Given that agricultural interests found their most powerful (and successful) proponents and lobbyists in the agricultural parastatals and in agribusinesses, it is not surprising that, even when the pendulum was swinging in favor of agriculture, the small farmer (that is, the majority of primary producers) was not well served. Furthermore, the dismantling or disempowering of these well-entrenched interest groups is problematic in countries that are in transit to parliamentary democracy or have relatively fragile political coalitions. Electoral mandates are required for reform, but this may depend politically on the groups that will lose from the reform (Demir 2002).

It is also clear that macroeconomic stability is a necessary condition for setting agricultural policy on a more consistent and effective future path. Taking the previous 20 years' experience in Turkey as a starting point, Rodrik (1999) argues that the greater the latent distributional conflicts among social groups and the weaker the political institutions for managing these conflicts, the greater is the (negative) impact of external shocks on the internal growth process. An external shock, such as the oil price crises of the 1970s, requires adjustment processes that are rarely without distributional consequences. When the latent rivalry among different social groups is strong, such a shock may trigger an outbreak of distributional conflict with repercussions that may take years to stabilize. When this occurs, inadequate adjustment may, indeed, condemn the country to foreign exchange bottlenecks, import compression, debt crises, and bouts of high inflation. In the resulting chaos, some interest groups will fare better than others for reasons that lie outside the realm of economic analysis. A prime casualty is the medium-term rate of growth. This theory sheds light on general macroeconomic developments in Turkey over the last 30 years, developments that have consistently overshadowed the design, implementation, and outcomes of sectoral policies.

However, the reinstrumentation of agricultural policy and the liberalization of markets introduced in 2001 represent important, necessary conditions for the reduction of rural poverty in Turkey. A revision of economy-wide conditions will improve the prospects for agriculture and the rural population by establishing a basis that allows sectoral policy changes to be more effective. Even though the OECD (2004) describes the recovery from the 2001 crisis as job-poor, the recent legislation aiming for greater flexibility in labor markets may be seen as a first step. The need to broaden the tax base and encourage private investment, not least foreign direct investment, are also regularly cited as preconditions for the kind of growth that would provide a background against which Turkish agriculture may modernize and restructure.

In October 2005, Turkey began negotiations for EU membership. Negotiations are still at an early stage. It is expected that Turkey will align its border protection for agriculture and its domestic agricultural policies more closely with those of the EU, but not necessarily immediately and possibly not until nearer the end of the negotiations. Also, inflows of foreign direct investment, triggered by the prospect of EU entry, may stimulate job creation in other sectors that would absorb some of agriculture's surplus labor. In addition, preaccession EU funds might be used to finance programs that would lift parts of the rural population out of the poverty trap. The initiative must come from the Turkish authorities themselves to prioritize this expenditure so that it maximizes the longer-term prospects of the sector.

In conclusion, the distortions that impoverish Turkish farmers are structural and institutional and are compounded by the low level of human capital throughout the sector. Distortions elsewhere in the economy (rigid labor markets and persistent low rates of job-creating private investment because of distorted financial markets resulting from large public borrowing requirements), together with a high birth rate, have created a situation where it is impossible for agriculture to shed population rapidly enough and to achieve any degree of spontaneous restructuring independently. Distortionary agricultural policies cannot be singled out as the main cause of rural poverty in Turkey. But recent development toward a lower level of intervention represent a step in the right direction. Since the reduction of agricultural support does not represent a panacea for ameliorating entrenched poverty in Turkey's rural areas, however, it is also necessary to promote macroeconomic stability and reform to provide a more conducive context for sectoral policy liberalization.

Notes

1. According to Demir (2002), the structural adjustment program was the 17th International Monetary Fund rescue package implemented in Turkey in 54 years.

2. For many years, Turkey has been the world's third largest exporter of fruits and vegetables, after the United States and the EU-15 (the European Union members prior to 2004: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom).

3. In the 1950s, SEEs had a 50 percent share of value added in Turkey's manufacturing and a virtual monopoly in other sectors (Flam 2003). Collectively, SEEs had nearly 600,000 employees in 1990 (Candemýr 1994).

4. The support and price stabilization fund was an extrabudgetary fund that, among other purposes, was used to support export subsidies and subsidies for agricultural inputs.

5. The mass housing fund was a specific import tax, varying by product, created as a source of extrabudgetary funding following the housing fund law of 1984.

6. Under the Uruguay Round Agreement on Agriculture, Turkey's tariff bindings had to fall by an average of 24 percent over 10 years, with a minimum 10 percent reduction per tariff line. Turkey opted

for the minimum 10 percent reduction on many products, including a number of animal products, tea, most grains, flours, cereal preparations, a few vegetables and nuts, fishery products, sugar, and unprocessed tobacco.

7. It was paid again in 2006 to boost low producer incomes, which have been hit by high feed prices and weak demand.

8. World Bank (2000) cites a claim by a farmer association (TZOB) in 1997 that one in three or four borrowers of subsidized agricultural credit might not be farmers at all.

9. The OECD PSE-CSE Database shows the value of subsidized electricity and water use related to irrigation schemes varying between about US$8 million and US$33 million in 1986–96, between about US$40 million and US$60 million in 1997–2002, and falling thereafter to under US$2 million in 2003–04.

10. The fall was by US$2.7 billion, or US$1.25 billion after payment of the DIS (Lundell et al. 2004).

11. Since farms above 50 hectares are required to keep books and be assessed for income tax instead of paying a flat rate, this incentive already existed.

12. The official dollar exchange rate for 2004 (2005) (annual averages) was US$1 = YTL 1.426 (1.341).

13. For all agricultural products (WTO definition), the average trade-weighted MFN tariff was 21.4; the average applied tariff for agricultural products from the EU was 19.8 and, for other preferential trading partners, 21.2 (Togan 2005).

14. Although OECD member countries in Europe and Oceania show a coverage well above 70 percent, the current PSE coverage in Japan and the United States is on a par with that in Turkey.

15. In 1999, the general services support was 3.5 percent of GDP. For comparison, we note that Turkey's total educational spending was 3.5 percent of GDP in 2005, when over 20 percent of the population was between 5 and 15 years of age. Meanwhile, as a percentage of total expenditure from the consolidated budget, agricultural spending was 44, 37, and 42 percent in 1997, 1998, and 1999, respectively.

16. The RRA is defined as follows: RRA = $100[(1 + NRAag^t/100)/(1 + NRAnonag^t/100) \_ 1]$, where $NRAag^t$ and $NRAnonag^t$ are the average percentage NRAs for the tradables parts of the agricultural and nonagricultural sectors, respectively.

17. The TBI is defined as follows: TBI = $100[(1 + NRAag_x/100)/(1 + NRAag_m/100) - 1]$, where $NRAag_m$ and $NRAag_x$ are the average percentage NRAs for the import-competing and exportables parts of the agricultural sector.

18. Exportable surpluses are about 4, 11, and 60 percent per year of production for apples, tomatoes, and cotton, respectively, but export subsidies were used for tomatoes and apples for a few years in the late 1990s only.

19. Togan (2005) gives averages for 2005 of 75 percent for products made from meat, fish, and so on; 93 percent for sugar and sweets; and 31 percent for cereal products, flour, and so on.

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PART III

COMMONWEALTH OF INDEPENDENT STATES

4

THE RUSSIAN FEDERATION

William M. Liefert and
Olga Liefert

This chapter examines and measures policy distortions to producer and consumer incentives in agriculture in the Russian Federation. The empirical scope is from the mid-1980s (of the Soviet planned period) to the mid-2000s. Two general types of distortions are investigated: direct and indirect. Direct distortions result from policies specific to the agrifood economy that include budget subsidies, the pricing of inputs, and market price support (MPS). Indirect distortions result from policies outside agriculture; the main such distortion examined in this chapter is trade policy (specifically, import tariffs) for nonfarm products.

A special focus of the chapter is the explanation of the strong fluctuation in observed producer support during the transition. The main cause of the fluctuation is movement in Russia's exchange rate, combined with the policies and the poor market institutions and infrastructure inherited from the Soviet period. The latter impede the transmission of changes in the exchange rate to domestic prices, thereby contributing to gaps between domestic and border prices. The policy implication is that strengthening macroeconomic stability and improving domestic institutions and infrastructure might accomplish as much or more in reducing price gaps and the related distorting effects as would liberalizing agricultural and trade policies.

To examine and measure the exchange rate–transmission effect for Russian agriculture during transition, we use a method from Liefert (2007) for decomposing changes in agricultural producer prices. The key variables in the decomposition are world prices, the exchange rate, and agricultural import tariffs. The

method allows one to determine which of these variables is dominant in changing domestic prices and, thereby, incentives to produce, consume, and trade goods. The method also allows one to measure the degree to which the incomplete transmission of changes in exchange rates and world prices affects domestic producer prices.

The chapter is organized as follows. The first section examines agricultural policies and the magnitude of assistance to producers and consumers during the Soviet planned period. The subsequent section examines the policies and levels of assistance to producers and consumers during the transition period. The policy set includes budget subsidies, input pricing, border measures, and the indirect assistance (or taxation) that results from border measures for nonagrifood products. This section will also examine the issues discussed in the previous paragraphs: how fluctuating exchange rates have combined with incomplete transmission to contribute to domestic-to-border price gaps. The final section discusses the likely future direction of Russian agricultural policies and incentive effects and, in so doing, draws on political economy theory.

Agricultural Policy and Assistance during the Soviet Planned Period

Serfdom ended in the Russian Empire in 1861. After emancipation, however, the gentry and state retained over half of all agricultural land. Although the newly freed peasants were given plots to farm, they had to redeem their plots with payments that typically lasted for decades. Until they wholly paid off their land, the peasants had to belong to their village commune, or *mir*. The mir imposed strong constraints on its members, such as collective responsibility for all debts and the periodic redistribution of plots that households farmed. These restrictions and the huge debt the peasants carried for their land made it difficult for the peasants to become independent producers. Although the Stolypin reforms of 1906 and 1910 tried to weaken the communal agriculture imposed by the mir and promote independent landholdings, World War I and the revolution intervened before a strong tradition of profitable independent farmers could be established.[1]

When the Bolsheviks came to power in 1917, they redistributed all land held by the gentry to the peasants. During the civil war against their various internal enemies, however, the Bolsheviks imposed the harsh economic policy of War Communism. For agriculture and the peasants, the policy essentially involved the confiscation of most output with little compensation.

After the Bolsheviks secured their power in the early 1920s, they abandoned War Communism and created the milder New Economic Policy. Peasants were allowed to buy and sell inputs and outputs under fairly free market conditions, and taxation was not onerous. Incentives to produce improved so that, by 1928,

agricultural output was about 10 percent higher than it had been in 1913 (immediately before World War I). The New Economic Policy helped generate a class of relatively prosperous and independent peasant producers, the kulaks.

In 1929, soon after Stalin had achieved dominance within the Soviet leadership, the Soviet Union began the collectivization of agriculture. The land, livestock, and equipment of the peasants were confiscated, and large new farms that the peasants had to join were formed from the assets. Many peasants resisted, often by slaughtering their livestock, such that animal numbers in the mid-1930s were down by about 40–50 percent compared with 1928. The state responded brutally, targeting the more prosperous kulaks. The chaos and repression led to a serious famine, which the government abetted to punish and cow the peasantry. Conquest (1986) puts total peasant deaths from all collectivization-related events—executions, imprisonment, resettlement, and the famine—at 14 million. Although the famine and repression were centered in Ukraine, the most agriculturally rich part of the Soviet Union, Russia was also severely affected.

One motive for collectivization was the state's desire to extract forced savings from agriculture to promote rapid industrialization. This was to be achieved by paying farms low prices for agricultural output, resulting in low wages for farm labor. Yet, during the 1930s, agriculture also received considerable investment and input allocations. Researchers disagree about whether agriculture as a producing sector provided substantially more output and resources to the rest of the economy than it received. There is agreement, however, that farm workers were exploited by the low wages set for them. By 1933, the per capita income among farm workers was only about half the level of 1928, and, by the late 1930s, it was still only about three-quarters this level.[2]

Collectivization integrated agriculture into the country's planned economy and created rural structures and institutions that remained largely intact for the rest of the Soviet period. The collective farms received input allocations and output targets directly from state planners. Large state farms also existed and steadily grew in number after World War II, though, over time, the differences between them and collective farms became slight. Various agricultural reforms and organizational changes both at the farm level and above were attempted during the postwar period, but always with only minor effect on the basic system of farm management and incentives and on productivity.

Beginning in the mid-1960s, state investment and subsidies in agriculture began to increase substantially. According to Treml (1982), agricultural subsidies grew from 2 billion rubles in 1965 to 37 billion rubles in 1980, so that, by 1980, subsidies equaled 54 percent of the value of the national income produced by agriculture. Farm worker incomes also rose substantially, such that the income gap between agricultural and nonagricultural workers narrowed. Although

output also grew during this time, productivity growth was poor (Johnson and Brooks 1983). Output rose mainly because of the large rise in investments, subsidies, and input use rather than because of the more productive use of resources.

The rise in investment and subsidies centered on increasing the production of livestock products, which was a major part of the leadership's program to improve consumer standards of living. Consequently, from 1970 to 1990, Soviet (and Russian) livestock herds and output rose by about 50 percent. The increase in feed requirements also stimulated the crop sector such that, by the late 1980s, the output of feed grain was up by about half compared with the situation two decades earlier. In 1990, primary agriculture accounted for about 13 percent of Russian gross domestic product (GDP) and employment (table 4.1).

By 1990, the Russian (Soviet) per capita consumption of livestock products and foodstuffs in general compared favorably with levels in many rich Western countries. For example, Soviet per capita meat consumption was 75 kilograms, compared with 62 kilograms in Finland and 72 kilograms in the United Kingdom. Since Soviet per capita GDP was less than half that of most countries of the Organisation for Economic Co-operation and Development (OECD), the Soviet Union was producing and consuming high-cost livestock products at a much greater volume than one would expect based on the country's real income (Sedik 1993).

To support the high levels of production and consumption in livestock products and animal feed during the 1970s and 1980s, high rates of assistance to both

Table 4.1. Importance of the Agrifood Sector in the Economy, Russia, 1990 and 2003

(percent)

Indicator	1990	2003
GDP		
Primary agriculture	13.2	4.6
Food processing[a]	—	2.8
Employment		
Primary agriculture	13.2	11.0
Food processing	2.1	2.3
Trade[b]		
Exports	2.1	2.1
Imports	20.3	21.6

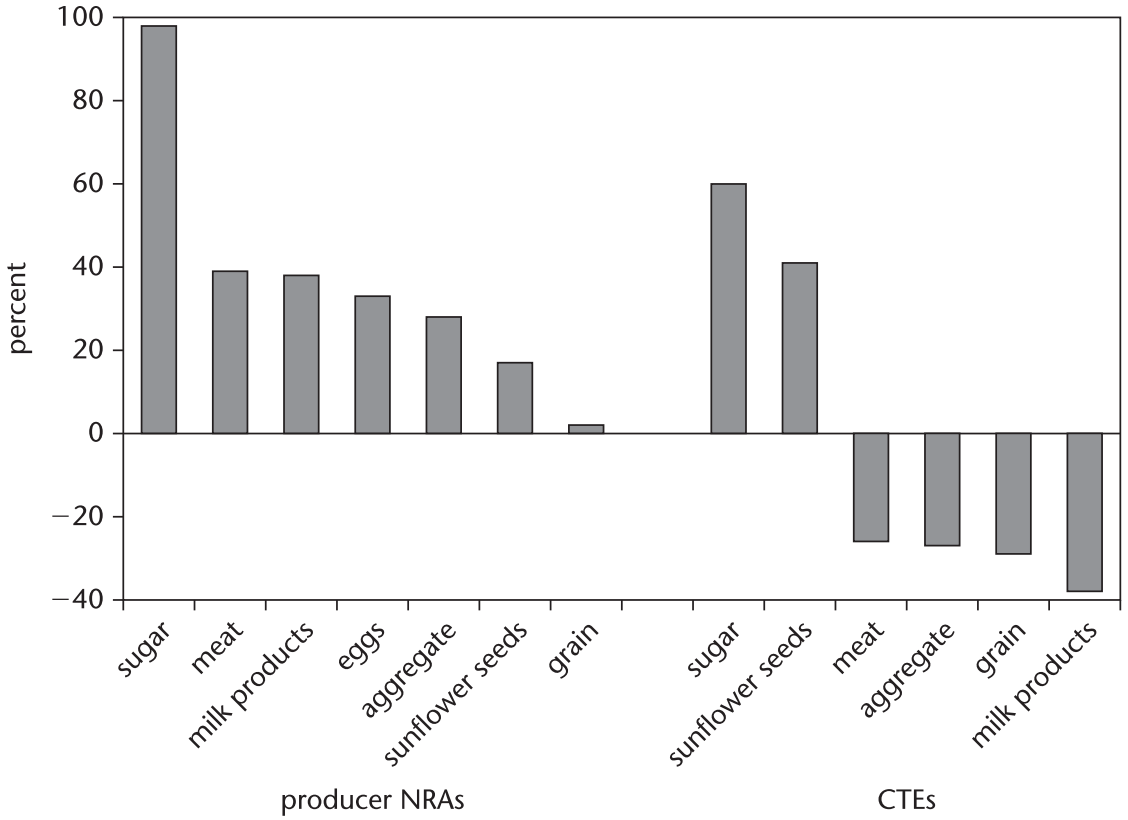
Sources: FSSS, various; State Customs Committee, various.

Note: — = no data are available.

a. The figure for 2003 is based on the assumption that the share of the food processing industry in the value of total industrial output and in the value added by all industries is equal.

b. The figures give the share of primary agriculture, plus the food processing industry, in total exports and imports.

Figure 4.1. Producer NRAs and CTEs, Soviet Union, 1986



Source: Calculated from data in Cook, Liefert, and Koopman 1991.

Note: The NRA and the consumer tax equivalent (CTE) are expressed as the percentage by which undistorted prices have been altered by agrifood policies. Aggregate values are based on the assumption that the NRA (CTE) calculated from commodities for which Cook, Liefert, and Koopman (1991) compute PSEs (or consumer support equivalents [CSEs]) gives the aggregate NRA (CTE) for those commodities for which Cook, Liefert, and Koopman do not compute PSEs (CSEs).

producers and consumers were necessary. Figure 4.1 presents the nominal rates of assistance (NRAs) for Soviet agricultural producers in 1986. The NRA is the percentage by which receipts by farmers are greater (or less) than the corresponding receipts had there been no agrifood policy interventions. The NRAs in this case are calculated from producer support estimates (PSEs) for the Soviet Union by Cook, Liefert, and Koopman (1991). Although the NRAs in the figure cover the entire Soviet Union rather than only Russia, Russia accounted for 46 percent of Soviet agricultural output in 1986 (Goskomstat 1989). The commodities for which Cook, Liefert, and Koopman compute PSEs accounted for 80 percent of Russia's agricultural production in 1986.

Like the PSEs, the NRA estimates cover two types of support to producers: budget transfers and the MPS. The latter is the difference between the domestic and border price that results from price and trade policies. Computing the MPS requires an exchange rate so that border prices may be converted from foreign to domestic

values. In their PSE calculations, Cook, Liefert, and Koopman (1991) do not use the official Soviet exchange rate of 0.6 rubles to the U.S. dollar, which strongly overvalued the ruble. Use of this exchange rate would overstate the support for producers by pushing down border prices for commodities measured in ruble values, which, in turn, would push the PSE (and NRA) values up. Rather, Cook, Liefert, and Koopman (1991) estimate and use a shadow exchange rate of 1.9 rubles to the dollar.

In figure 4.1, the producer aggregate NRA value is based on the assumption that the NRA calculated from those commodities for which Cook, Liefert, and Koopman (1991) present PSEs also gives the aggregate NRA for those commodities for which Cook, Liefert, and Koopman do not present PSEs. This means that the aggregate NRA computed from the Cook, Liefert, and Koopman PSE commodities gives the NRA for total agricultural output.

The results in figure 4.1 indicate that Soviet agricultural policies in the 1980s heavily supported producers. If the aggregate NRA is accurate, producers in 1986 received revenues from production that were about 30 percent higher than those they would have received if no budget transfers or agricultural price and trade policies of the market intervention type had existed. Sugar producers received extremely high support, and livestock producers above average support, while producers of sunflower seeds and, especially, grain received below average support. About three-fifths of the assistance to agriculture was represented by budget transfers; the main transfer subsidy was for input use. The other two-fifths of assistance involved MPSs.[3]

Besides budget transfers and the MPS, Soviet (and Russian) agricultural producers in the planned period were supported in a third way through the pricing policy for physical capital inputs, such as tractors, combines, and trucks, as well as for material inputs, such as fuel and fertilizer. Farm purchase prices for these inputs were set below the real cost of domestically producing them or the prices at which the Soviet Union exported the products (as in the case of fuel and other energy). Evidence for the argument that Soviet input price policy subsidized agricultural producers is derived from the fact that, when Russia liberalized prices and trade at the beginning of the transition in the early 1990s, producer output prices rose much less than producer input prices. This meant that the domestic terms of trade of agricultural producers (output prices, divided by input prices) deteriorated. For example, from 1990 to 1994, the terms of trade of Russian producers worsened by about 75 percent (OECD 1999).

The PSEs of Cook, Liefert, and Koopman (1991) on which the producer NRAs are based do not include the subsidy that producers received from input price policies. The input subsidies included in the PSEs and NRAs cover only direct budget transfers. The reason for the omission is that PSEs, as conventionally defined, measure the effect of policies that are *specific to agriculture*, while all users of fuel and other forms of energy in the Soviet Union, not merely farmers, paid prices below the country's export prices for the products. Nonetheless, input price

policies did increase the real level of support for agricultural producers, especially if the support is assessed using world trade prices as the opportunity cost values of tradable inputs. Like subsidies targeted on agriculture, Soviet input price policies contributed to the distorted excess resource use and agricultural overproduction in the planned period.

Figure 4.1 indicates that, during the Soviet period, consumers of agrifood products were also generally supported. The consumer tax equivalents (CTEs) in the figure are based on consumer support estimates (CSEs) for Soviet consumers in 1986 that are calculated by Cook, Liefert, and Koopman (1991) using a shadow exchange rate of 1.9 rubles to the U.S. dollar. As with the producer NRAs, the aggregate CTE value is based on the assumption that the CTE calculated from commodities for which Cook, Liefert, and Koopman present CSEs also gives the aggregate CTE for those commodities for which Cook, Liefert, and Koopman do not present CSEs. For CTEs, positive values indicate taxation, while negative values indicate assistance. For example, the aggregate CTE value of about −25 percent means that consumers were paying prices for agricultural goods a quarter lower than the border price.

The CTEs in figure 4.1 are for the final consumers of food purchased at retail. The reason both producers and consumers of agricultural products could be supported during the Soviet period is that food consumers were subsidized at the processing level. Food processors sold their output to retailers at prices below the production costs and received state subsidies to cover the difference. The figure shows that, although food consumers in general were subsidized, especially the consumers of livestock products and grain, the consumers of sugar and sunflower seeds were taxed by paying prices above border prices. In the Soviet Union, the retail purchasers of sugar, in particular, paid high sales taxes. Yet, the CTE values in figure 4.1 understate the real support to consumers (or overstate the level of taxation for specific commodities) given that the Soviet input price policies discussed elsewhere above subsidized consumers by lowering food prices.[4]

On the other hand, the Soviet economy involved certain costs to consumers that could be viewed as systemic taxation. Retail prices for most foods were set below not only the full cost of production and opportunity-cost border prices, but also below the internal market clearing price.[5] Consequently, excess demand existed and created artificial market shortages. The excess demand led to allocation by queuing and other search costs for food. This means that the prices used by Cook, Liefert, and Koopman (1991) to compute CSEs understate the full cost to consumers of obtaining food, which, in turn, overstates the real subsidy that consumers received by paying low prices. More generally, by determining the volumes and mix of all consumer goods that were to be produced, the Soviet-planned economy taxed consumers by depriving them of consumer sovereignty. The population was consuming a suboptimal mix of goods compared with what

they would have purchased and consumed had a market-oriented economy been responding to their demand for goods and services. From a narrow point of view, Soviet food consumers were subsidized. From a larger point of view, the subsidy is less than that revealed by the CTEs in figure 4.1.

Although the results in figure 4.1 are specific to 1986, Soviet (Russian) agricultural and food policies did not change substantially during the last years of the Soviet Union through to 1991 (although there were some minor steps toward policy liberalization). In 1990, budget subsidies to the Soviet agrifood system alone equaled about 10 percent of GDP. Large subsidies were continuing to support both ends of the food chain.

Assistance during the Transition

Although minor economic reforms began in Russia during the late planned period, the major reforms of the transition began in 1992. The planned economy was replaced by a market-oriented one, although, in agriculture, the state continued, to a diminishing degree, to help farms obtain inputs and to purchase a nontrivial share of the output of certain commodities (such as grain). Before examining key transitional agricultural policies and their effects, we identify the main types of producers during the reform period.

By the mid-1990s, there were three types of agricultural producers, and these have remained throughout the transition. They are the former state and collective farms, family farms, and household plots (Liefert 2001). During the early transition years, most of the former state and collective farms were reorganized as joint stock companies owned by their management and workers. They produce most of the country's bulk crops, including grain, sunflower seeds, and sugar. Family farms are a creation of the reform period, but have not flourished. The 260,000 or so family farms existing in the mid-2000s average about 75 hectares in size and account for no more than 5 percent of the country's agricultural land and output (FSSS 2004). The household plots are tended by families associated with large farms. By the mid-2000s, though averaging only half a hectare in size, the plots were producing about half of the country's total agricultural output and most of its livestock products, potatoes, and vegetables (FSSS 2006). One reason the plots account for such a disproportionate share of total agricultural output is because they specialize in high-value products relative to their land use.

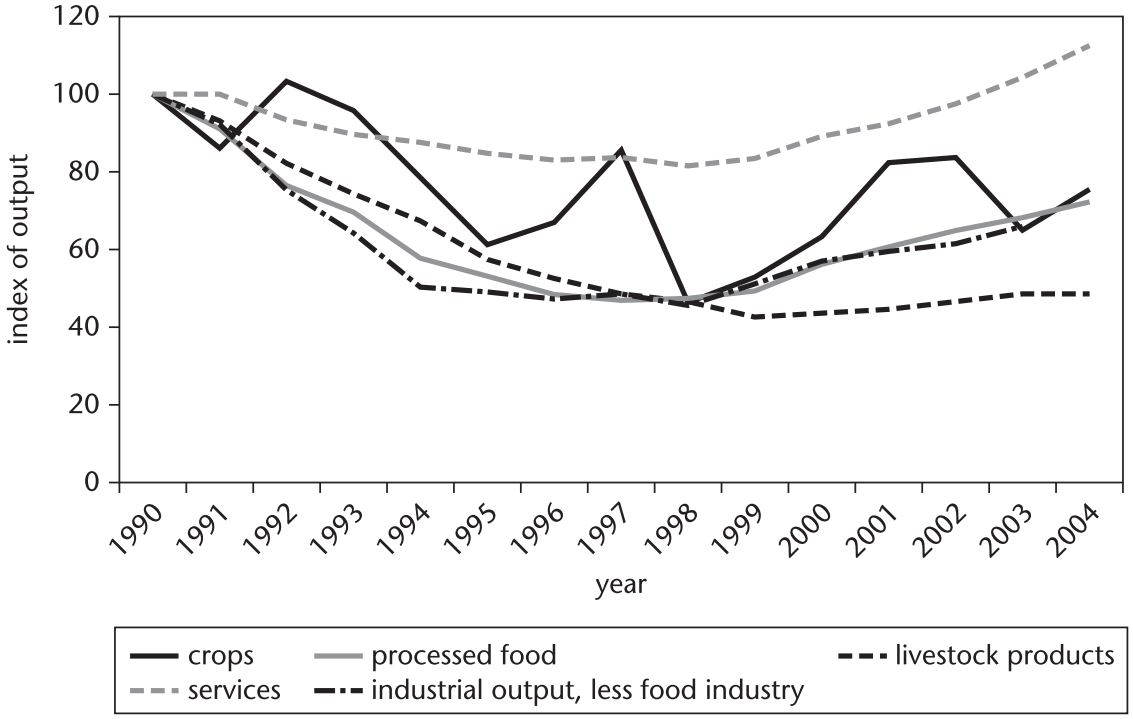
There were three main transition policies that affected agricultural production and consumption: the severe reduction of budget subsidies, price liberalization, and trade liberalization. Each of these policies may be matched with one of the three main types of support during the planned period: budget subsidies, input price policy, and MPSs. In each case, the transition policy substantially reduced

the support maintained during the planned period. (See elsewhere below for a more detailed discussion of these three policies.) What follows is a brief examination of the effect of the major transition policies on agricultural output.

Price liberalization caused prices for agricultural outputs and inputs to jump to reflect the high cost of production. Input prices rose substantially more than output prices, such that the terms of trade among farmers worsened (see elsewhere above). Trade liberalization reduced the MPS of the planned period; the isolated effect was a drop in real output prices for most commodities. Trade liberalization also caused the domestic prices for tradable agricultural inputs, such as fuel and fertilizer, to rise more closely to Russian export prices. These developments hurt the terms of trade of domestic producers relative to inputs even more (Liefert and Swinnen 2002). The deterioration in the terms of trade resulted in a plunge in input use. For example, Russian farms used only about a quarter as much gasoline and diesel fuel in 2000 as in 1990. Also, over this time span, mineral fertilizer use per hectare of sown land fell from 88 to 19 kilograms (FSSS 2006).

The slashing of budget subsidies and the worsening of the terms of trade of producers led to a severe drop in agricultural output, especially in the livestock sector (figure 4.2).[6] Crop production has fluctuated throughout the transition

Figure 4.2. Changes in Output during Transition, Russia, 1990 to 2004



Source: Author compilation based on data of the Federal State Statistics Service; PlanEcon, various.

Note: For livestock products, processed food, and industrial output, 1990 = 100. For crops, the average annual output over 1989–91 = 100. For services, 1991 = 100.

Table 4.2. NRAs and RRAs, Agricultural Producers, Russia, 1992 to 2005
(percent)

Indicator	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Covered products[a, b]	−48	−27	−8	14	23	38	19	−3	0	13	16	11	22	17
Products not covered	−48	−27	−8	14	23	38	19	−3	0	13	16	11	22	17
All agricultural products[b]	−48	−27	−8	14	23	38	19	−3	0	13	16	11	22	17
Non-product-specific input assistance	4	7	16	10	6	3	7	4	3	4	3	3	3	3
Total agriculture, including non-product-specific input assistance[b, c]	−45	−20	9	24	29	42	26	1	3	17	19	14	25	20
Importables[b, c]	−48	−27	−7	19	25	44	22	−2	2	27	43	23	32	26
Exportables[b, c]	−50	−26	−11	−24	−22	−6	−30	−10	−22	−14	−29	−16	0	−4
Tradables														
All agriculture[b, c]	−45	−20	9	24	29	42	26	1	3	17	19	14	25	20
All nonagriculture	2	8	9	9	10	12	12	12	12	9	9	9	9	9
RRA[d]	−46	−25	−1	14	17	27	13	−10	−7	7	9	4	15	10

Source: Author compilation based on OECD PSE-CSE Database 2007; author calculations.

a. Products for which individual NRAs are computed.

b. NRA, including product-specific input subsidies.

c. NRA, including other (decoupled and non-product-specific) subsidies.

d. The RRA is defined as $100*[(100 + NRAag^t)/(100 + NRAnonag^t) - 100]$, where $NRAag^t$ and $NRAnonag^t$ are the average percentage NRAs for the tradables part of the agricultural and nonagricultural sectors, respectively.

period, reflecting the vagaries of weather in Russia. The trend through 1998, however, was clearly negative, though with some rebound thereafter. Table 4.1 shows that, from 1990 to 2003, agriculture's share in GDP fell from about 13.2 to 4.6 percent. The decline in primary agricultural output in the 1990s was matched by a big drop in food processing.

Figure 4.2 shows that industrial output decreased substantially during the transition, which suggests that the planned economy also subsidized industry relative to the way a market-driven economy would have behaved. The major sector of the economy that did not decline much was services. Ad hoc evidence suggests that many services not provided by the planned economy came into being during the early transition years; Russia's statistical system had difficulty reporting on these new services. Thus, figure 4.2 might overstate the initial drop in services and understate the later growth in services. This suggests that the planned economy subsidized both agriculture and industry relative to the service sector. Whether agriculture was assisted more than other tradable sectors prior to the transition is unclear.

Tables 4.2 and 4.3 present producer NRAs for the transition period. The row on total agriculture, including non-product-specific input assistance, in table 4.2 gives the annual aggregate NRA for agricultural producers. Table 4.3 gives commodity-specific producer NRAs, as well as aggregate NRAs for (net) imported and exported commodities, thereby providing the data for figure 4.3. The relative rate of assistance (RRA) at the bottom of table 4.2 expresses the assistance to agricultural producers relative to the assistance to producers of tradable nonagricultural goods (see elsewhere below).

The NRAs are calculated mainly from the OECD's PSE-CSE Database on Russia. Covered products in table 4.2 refer to those commodities for which we compute individual NRAs. As the bottom row of table 4.3 shows, these products cover 77 percent of all Russian agricultural output in 1992, although the share falls to 65 percent by 2005. The coverage for traded agricultural products, however, is higher. The commodities for which we calculate individual NRAs are those for which the OECD provides commodity-specific budget subsidies and computes the MPS.[7] The aggregate NRAs presented may cover all agricultural production under the assumption that the annual aggregate NRA computed from our covered commodities gives the NRA for uncovered commodities as well.

When Russia began its major economic reform in 1992, the country abolished the official exchange rate of the Soviet period and moved to a system of largely market-determined exchange rates. Thus, since 1992, the OECD's Russian PSEs for the transition period have no longer been based on overvalued official exchange rates.

The negative value for producer assistance in 1992 reveals a plunge in producer support from the positive assistance during the planned period. In fact, producer

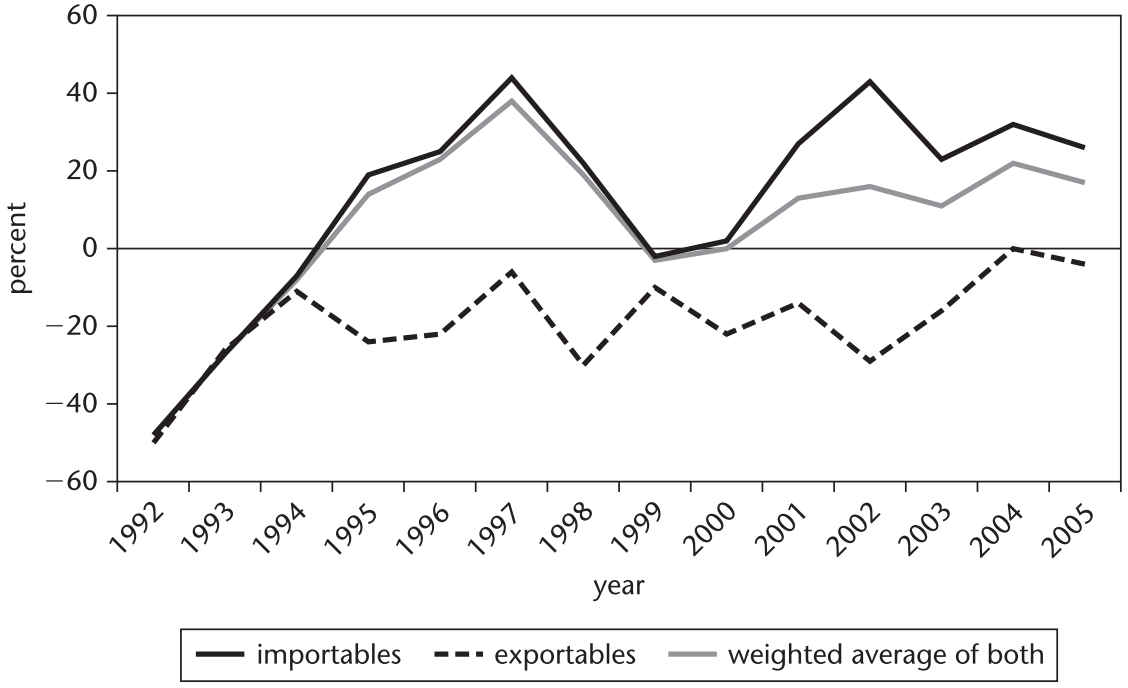
Table 4.3. NRAs, Agricultural Producers, by Commodity, Russia, 1992 to 2005
(percent)

Indicator	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Importables														
Pork	−70	−11	20	32	27	46	46	39	3	46	59	31	42	72
Beef	−73	−50	−42	−30	−8	51	0	−19	18	48	72	47	20	15
Poultry	−57	−9	27	49	55	71	31	12	51	110	73	46	79	114
Milk	−55	−29	−3	63	63	79	52	24	11	9	40	43	40	10
Sugar	16	96	65	63	93	105	88	7	22	42	71	85	98	64
Corn	−34	−3	95	47	62	43	12	−14	9	35	−19	−14	−24	−29
Mixed trade status														
Eggs	−64	−38	10	50	31	46	29	6	−17	−1	−8	−32	5	7
Sunflower seeds	−40	−51	−17	−6	−22	−26	−30	−33	−34	2	−22	−22	9	−2
Rye	−25	−29	1	25	38	27	−12	−23	30	−8	−44	−41	11	−5
Oats	−32	−28	−12	−16	28	16	−5	−33	−7	−38	−66	−57	−29	−21
Barley	6	−14	−12	−37	−2	0	−10	−41	−16	−17	−25	−22	−12	−4
Wheat	−46	−20	−11	−11	5	7	−21	−28	−21	−10	−21	−8	3	−5
Importables	−48	−27	−7	19	25	44	22	−2	2	27	43	23	32	26
Exportables	−50	−26	−11	−24	−22	−6	−30	−10	−22	−14	−29	−16	0	−4
Weighted average of above	−48	−27	−8	14	23	38	19	−3	0	13	16	11	22	17
Standard deviation	30	40	42	37	35	37	35	26	25	41	51	44	39	43
Share of above in gross value of agricultural production[a]	77	72	63	62	63	65	59	59	61	65	62	60	64	65

Source: Author compilation based on OECD PSE-CSE Database 2007; author calculations.

a. The share is calculated in terms of undistorted prices.

Figure 4.3. NRAs, Agricultural Importables, and Exportables, Russia, 1992 to 2005



Source: Author compilation based on OECD PSE-CSE Database 2007.

assistance during the transition, as measured by the aggregate NRA, has fluctuated considerably, with definite turning points: (1) a huge decline in 1992, resulting in taxation; (2) a steady, but large rise over 1993–97, such that producers in the aggregate were being assisted during 1994–97; (3) a major decline over 1998–99, such that aggregate support was almost nil by the latter year; and (4) a rebound beginning in 2001, such that assistance equaled 20 percent by 2005.

Although the commodity-specific producer NRAs show some variation from the movement in the aggregate NRA, they support the general pattern as revealed in table 4.2, with largely the same turning points.[8] The NRA for importables in figure 4.3 also generally follows the pattern of table 4.2. Net imported agricultural products throughout the transition include milk, sugar, corn, and all the meats, while the remaining grains, sunflower seeds, and eggs have switched during the transition between net export and import status (though sunflower seeds have been a net export in almost all years). Figure 4.3 shows that exportables have not closely followed the NRA pattern of table 4.2. Rather, the relevant NRA has tended to oscillate more on a yearly basis. This is largely because the exportable commodities are mainly crops, and the annual output of crops is heavily affected by weather. The weather-induced fluctuation in production results in fluctuating domestic prices, which, in turn, causes the NRA to oscillate. Yet, table 4.4 shows that, during the transition, Russia has been a much larger agricultural importer

Table 4.4. Agricultural Trade, Russia, 1992 to 2004
(annual average)

Indicator	1992–95	1996–2000	2001–04
		US$, billion	
Agrifood trade [a]			
Imports	12.39	9.81	10.35
Exports	1.17	1.17	1.87
Balance	−11.22	−8.64	−8.48
		tons, million	
Commodity trade balance			
Grain	−12.05	−3.08	6.56
Sunflower seeds	0.34	1.06	0.18
White sugar	−3.80	−4.21	−4.17
Meat	−1.03	−1.67	−2.48
Milk	−1.57	−1.33	−1.51

Source: FAOSTAT Database 2007.

Note: A positive value means there are net exports.

a. Covers primary agriculture and processed products.

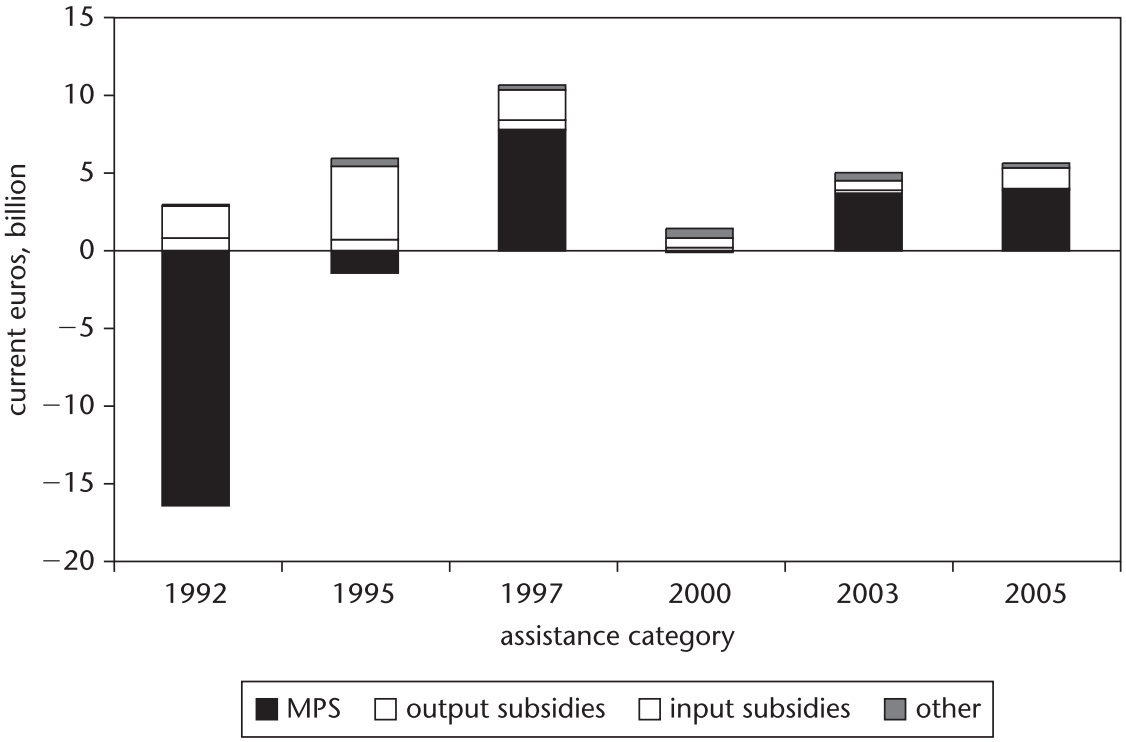
than exporter. For example, over 2001–04, the average annual value of agrifood imports was US$10.4 billion, while the corresponding value of exports was only US$1.9 billion.

The following subsections examine how assistance for agricultural producers has changed during the transition. They focus on three types of support policies: (1) budget subsidies, (2) input pricing, and (3) border policies that may generate MPSs. Special attention is paid to explaining the large fluctuations in assistance observed in figures 4.3 to 4.5.

Budget Subsidies

During the transition, budget subsidies for agricultural producers have fallen substantially. (See figure 4.4, in which budget subsidies equal output, input, and other subsidies.) For scale reasons, figure 4.4 does not include any year of the planned period. In 1990, however, budget transfers to producers equaled about €30 billion (computed using the official Soviet exchange rate and the 81 percent share of agricultural output covered by the OECD's PSEs for Russia), which dropped to €3.2 billion in 1992.[9] After this huge decline, the subsidies rose a bit in the mid-1990s, but then fell again in the last years of the decade, largely because of the economic crisis of 1998. From 2000 to 2005, budget subsidies rose only slightly in euro values. The OECD-calculated budget transfers to Russian producers in 2005 equaled only €1.8 billion (OECD PSE-CSE Database 2007). The bulk of the transfers has

Figure 4.4. Decomposition of the Nominal Assistance to Agricultural Producers, Russia, 1992 to 2005



Source: Author compilation based on OECD PSE-CSE Database 2007.

continued to be input subsidies, which accounted for three-quarters of total budget subsidies in the early 2000s.

Budget transfers plunged during the transition period not because of the desire of the agricultural and political establishments to reduce them and downsize the sector, but rather because of the shortage of federal funding during the transition. As federal budget subsidies to agriculture fell, the oblast (regional) governments had the option to substitute their own subsidies. By 2005, 76 percent of all budget transfers to agriculture came from regional and local governments. (The OECD includes these subsidies in its PSE estimates, which means our NRA calculations also capture them.) However, some of the regional support for agriculture indirectly comes from the federal government through its subsidies to regional budgets.

As direct budget subsidies for agriculture declined during the transition, the government began to subsidize farms through a policy of soft loans from state or parastatal lenders, with periodic debt write-offs. In computing PSEs, the OECD includes these soft loans and debt forgiveness in its budget transfers under the category of input subsidies. The OECD allocates the debt write-off in a given year by treating the relevant loans in each preceding year as a budget transfer for that year.

Input Pricing

Price and trade liberalization quickly reduced the large subsidy that agricultural producers and consumers received because of the pricing policies for inputs during the planned period. For example, Russian farms had to produce 38 tons of grain to purchase a tractor in 1990, while, in 2003, they had to produce 186 tons. Likewise, a ton of diesel fuel cost farms 0.4 tons of grain in 1990, compared with 3.5 tons in 2003 (FSSS 1998, 2004).

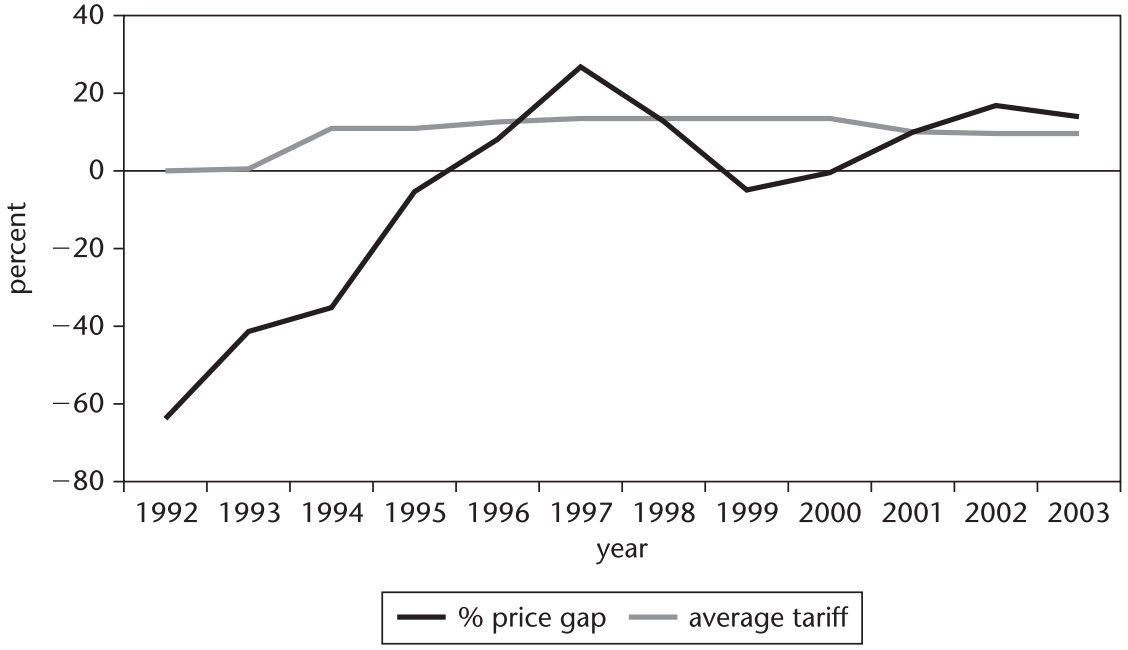
At various times during the transition, farm purchase prices for fertilizer, fuel, and other energy have been below world prices and, specifically, Russia's export prices for these products, resulting in some continuation of this type of subsidy after the Soviet period. This, for example, was generally the case in 1999–2000 (Liefert 2005). By 2003, however, this form of subsidy appeared to have diminished substantially. For most oil products, Russian farms were, in fact, paying prices above those at which the country exported. The difference represented the taxes assessed on the domestic purchases.[10] The one exception is that, throughout the transition, natural gas has been sold to farms (as well as all other domestic users) at prices far below the gas export price. In 2003, for example, the domestic price for natural gas was only about a quarter of the export price. Although natural gas is not a major input in agricultural production, it is a key input in producing fertilizer. With the surge in world oil prices in the mid-2000s, Russian farms returned to the situation of paying prices for fuel that were below world prices.

Neither the change in budget subsidies nor the decline in implicit subsidies that resulted from price liberalization explains the severe fluctuation in producer NRAs during the transition. The budget subsidy levels did not fluctuate much (after the big initial drop), and the subsidies from input pricing policy are not captured by the NRAs calculated from the OECD PSE-CSE Database (2007) for Russia. (Like the PSEs computed by Cook, Liefert, and Koopman [1991] for the Soviet Union, the OECD's PSEs for Russia include input subsidies that take the form of government budget subsidies, but not implicit support through input pricing.) The explanation therefore appears to lie in the calculated MPS.

Border Measures and the MPS

In 1990, the MPS for Russian producers was about €70 billion (as computed by the OECD for those commodities for which it calculates an MPS), and, in 1992, it fell to negative €17 billion (figure 4.4). The OECD uses the overvalued Soviet official exchange rate in computing PSEs for the planned period, which results in a high MPS estimate (see elsewhere above). That point notwithstanding, one may conclude that reform substantially reversed the Russian MPS. Figure 4.4 shows that the MPS, as conventionally computed, continued to fluctuate throughout the

Figure 4.5. Agricultural Price Gaps and Tariffs, Russia, 1992 to 2003



Sources: Price gaps: author calculations based on OECD PSE-CSE Database 2007; tariff data: WITS Databases 2007.

transition. Figure 4.5 supports this conclusion. The percentage price gap in that figure is computed as the domestic value of agricultural production in producer prices (V^d), minus the value of production measured in border prices (V^b), divided by the value of production in border prices, that is, the percentage price gap = $100 * (V^d - V^b) / V^b$.[11] The percentage price gap moves considerably over the transition period, although the fluctuations are in multiyear cycles, not annual oscillations.

Table 4.4 shows that, during the transition, Russia has been mainly an agricultural importer. Tariffs have been the main border measure; the key exception is the tariff rate quotas created for meat imports in 2003 (discussed elsewhere below). Figure 4.5 reveals that, since 1994, the average (trade-weighted) tariff on agrifood imports has been fairly steady, ranging between 10 and 14 percent. The figure shows that import tariffs do not explain the magnitude or fluctuation of the observed price gaps. Likewise, no other conventional border measures existed that might account for the price gaps and their movement.

One possible cause of the price gaps is market interventions by regional authorities. Because federal budget subsidies for agriculture fell during the early years of the transition, regional governments became the principal source of budget subsidies. With control of the purse strings, regional governments became active in setting agricultural policy within their jurisdictions, and policies became

fragmented across regions. The policies, however, tended to be ad hoc and nontransparent. One common regional policy during the transition has involved fixing price margins between the wholesale and retail levels, mainly for food staples such as bread and milk. Another common policy, especially for grain, has involved restrictions on product outflows. One motive for this policy appears to be concern for local food security during poor harvests. A less benign motive might arise because local officials wish to profit from the price arbitrage opportunities that the flow restrictions create among regions. By affecting prices within regions, these policies may affect the price gap (MPS) for commodities.

Another cause of the price gaps and, especially, the fluctuation in prices does not revolve around agricultural policies: the interaction of the poor market infrastructure for agriculture and the movement in Russia's exchange rate.

Poor Infrastructure, the Exchange Rate, and Transmission

When Russia began its economic transition, it had inherited from the Soviet Union a deficient system of physical infrastructure for agriculture, while the commercial and institutional infrastructure that the new market-oriented agrifood economy needed was virtually nonexistent. Poor physical infrastructure involved deficiencies such as weak transportation and storage, while the shortcomings in commercial and institutional infrastructure involved systems for supplying or establishing market information, credit, and commercial law (among others). Building these from scratch has been one of the country's main challenges in undertaking agricultural reform. Wehrheim et al. (2000) conclude that weak commercial and institutional infrastructure is the main problem facing the Russian agrifood sector.

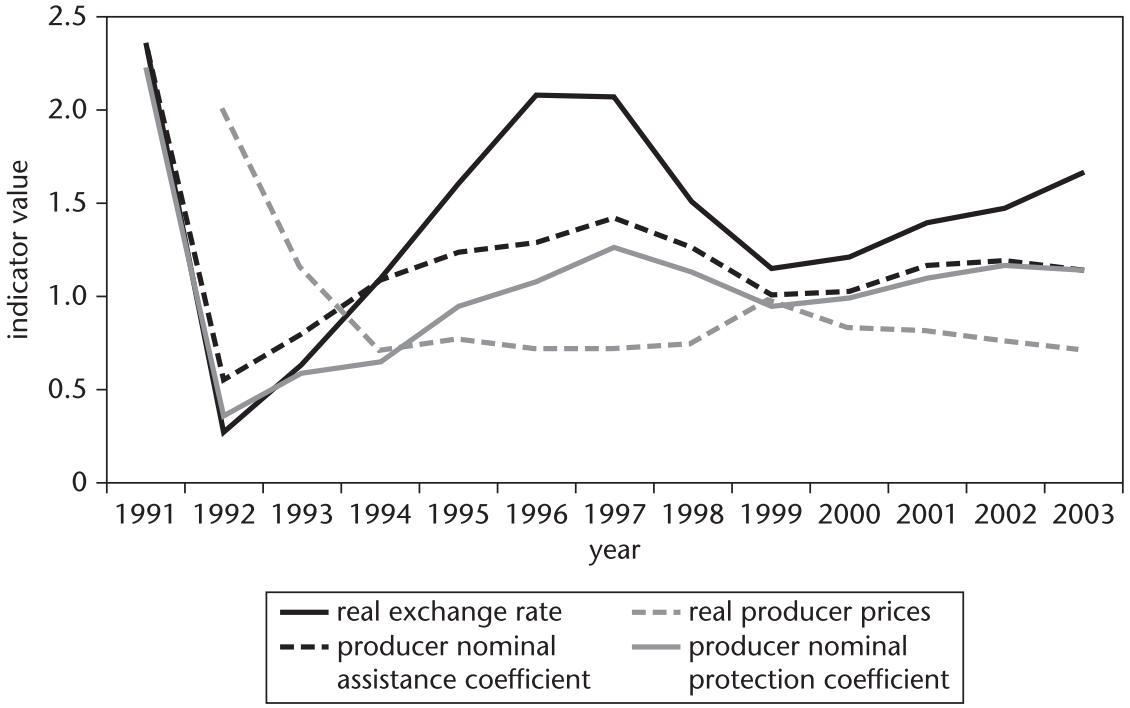
Poor infrastructure may have two main effects. The first is that it may result in high internal transport and transaction costs. These high costs, however, do not explain the fluctuation in Russia's producer NRAs. One reason is that these costs should not change much in the short run. Also, in computing the MPS part of the PSEs for Russia (which we also use in calculating our producer NRAs), the OECD subtracts out these costs, making some assumptions in doing so. If the adjustment is done sufficiently well, these costs should not explain much of the remaining gap between domestic and border prices.

The second effect of poor infrastructure is that it may create the market imperfection of incomplete information (Barrett 2001; Barrett and Li 2002; Fackler and Goodwin 2001). In particular, producers in isolated areas might be unaware of prices (and, especially, price movements) outside of their region. More specifically, incomplete information may reduce the transmission of changes in border prices to domestic prices. Weak market infrastructure may also create localized

market power by processors and distributors and hold-up problems, such as delayed payments to farms that reduce prices (especially when inflation is high; see Gow and Swinnen 1998). All these problems may lead to gaps between domestic and border prices that may not be explained by high internal transport and transaction costs or market intervention policies.

During the transition, Russia's exchange rate has fluctuated considerably (figure 4.6). In 1992, the first year of the transition, both the nominal and real exchange rate depreciated substantially because the overvaluation of the Soviet ruble during the planned period had been (over)corrected. From 1993 to 1997, the ruble appreciated in real terms. Real appreciation occurred largely because the inflation rate exceeded the ruble's nominal depreciation rate, thereby correcting the ruble's undervaluation from the exchange rate plunge of 1992. In 1998–99, the ruble again depreciated strongly in real terms because of the economic crisis that hit Russia in August 1998. The cycle continued as the ruble has appreciated in real terms during the 2000s.

Figure 4.6. The Foreign Exchange Rate, Agricultural Producer Assistance, and Producer Prices, Russia, 1991 to 2003



Sources: Real exchange rate: PlanEcon, various; Haver Analytics Economic and Financial Databases—U.S. Federal Reserve Bank. Coefficients of assistance and protection and real producer prices: author compilation based on OECD PSE-CSE Database 2007; PlanEcon, various.

Note: The exchange rate is measured in U.S. dollars per ruble. Thus, in the figure, a rise in value shows a real appreciation of the ruble, while a fall shows a real depreciation. The real exchange rate is indexed to the value of the producer nominal assistance coefficient in 1991. Real producer prices are indexed to a value of 2 in 1992.

Figure 4.6 also compares the movement in the ruble's real exchange rate during the transition with the fluctuation in the aggregate nominal assistance coefficient for agricultural producers. The nominal assistance coefficient for a commodity equals the sum of the domestic price, plus per unit budget transfers, divided by the border price. This coefficient differs from the NRA in that it does not subtract out the border price from the numerator. This means that the values of the coefficient cannot be negative. A value greater than 1 now indicates assistance for producers, while a value less than 1 indicates taxation. The fact that the coefficients cannot be negative means that comparing the changes in the real exchange rate and the changes in the values of the coefficient is easier than comparing the real exchange rate and the NRA values.

A strong correlation appears to exist between changes in the real exchange rate and the values of the producer nominal assistance coefficient. This correlation might be explained by the fact that changes in the real exchange rate are only partially transmitted to domestic producer prices. The main element (in value terms) in the nominal assistance coefficient for most Russian commodities is the ratio of the domestic price to the border price. (The latter is the trade price in foreign currency converted to domestic currency via the exchange rate.) If there were no transmission of the change in the exchange rate to domestic prices, the real exchange rate and the nominal assistance coefficient would change by the same percentage (ceteris paribus). This apparently came close to occurring in 1992. If there had been complete transmission of the change in the real exchange rate to domestic prices, the nominal assistance coefficient would not have changed in response to a movement in the real exchange rate (because both the numerator and the denominator of the nominal assistance coefficient would change by the same percentage). What appears to have happened is that changes in the real exchange rate were partially transmitted to domestic prices so that the real exchange rate and domestic producer prices moved in tandem, though prices changed by a smaller percentage relative to the real exchange rate.

A qualification to the above arguments is that the producer nominal assistance coefficient contains budget transfers in the numerator, and this would mean that the percentage change in the NRAs would be smaller than the percentage change in the real exchange rate (because the transfers would not change in response to a change in the real exchange rate). Figure 4.6, however, also contains the nominal protection coefficient for producers. This coefficient is the pure ratio of the domestic price to the border price. (Unlike the nominal assistance coefficient, it contains no budget subsidies.) The correlation between the change in the real exchange rate and the change in the nominal protection coefficient is as strong as that between the real exchange rate and the nominal assistance coefficient. This shows that the transmission from the real exchange rate to domestic prices has been far from complete.

The policies and behaviors of regional and local governments might account for some of the incomplete transmission; this is less the case of Russian federal policies.[12] Wehrheim et al. (2000) conclude that weak commercial and institutional infrastructure is the main problem facing the Russian agrifood economy (see elsewhere above). This supports the argument that poor infrastructure could be the dominant cause of the incomplete transmission, at least during the 1990s. To some extent, policies and institutional infrastructure are interrelated. For example, is it corrupt behavior by officials that affects markets policy or is it weak governance and institutions?

Harley (1996), Liefert et al. (1996), Melyukhina (2003), the OECD country studies on Russian and Ukrainian agriculture (OECD 1998; World Bank and OECD 2004), the OECD (2007), and Shick (2002) discuss how the relationship among the exchange rate, market infrastructure, and transmission may affect the calculation and interpretation of support in Russia and other transition economies. Harley (1996) argues that the effects of poor infrastructure may be viewed as a measure not of policy support or taxation, but rather of policy failure. Liefert et al. (1996) argue that the effects may be viewed as part of the systemic legacy from the Soviet period among countries. In computing PSEs for Russia and other transition economies, the OECD acknowledges that deficient infrastructure that impedes transmission is a cause of some of the estimated MPS part of the PSEs.

Russian regional and local agricultural policies that affect markets are largely ad hoc and nontransparent. Eliminating these policy interventions would require a fundamental reform of Russia's political system, including a transformation of the attitudes and behaviors involving governance. No overnight policy changes, including any changes that might result from Russia's accession to the World Trade Organization (WTO), would have much effect on regional policy interventions in the short to medium term. Also, the incomplete transmission is not mainly the result of federal policies targeted on agriculture. Most of the incomplete transmission effect therefore involves behaviors and conditions that, at least in the short run, lay beyond the influence of Russian federal policy makers.

An important relationship exists among incomplete transmission (whatever its cause), conventional measures of protection and support, and a country's domestic prices. If the border price for a commodity changes (or, more specifically, the world price or exchange rate), and there is incomplete transmission of the change to the domestic producer price, then standard measures of protection and support will usually move in the opposite direction than will the producer price. This relationship has strong implications for the interpretation of a change in assistance. For most trade and support policies, such as budget subsidies and import tariffs and quotas, a positive relationship exists between the measured support generated by the policies on the one hand and the producer price,

producer welfare, and incentives to produce on the other. For example, if the tariff for a commodity rises, both measured support (the price gap, or MPS) and the domestic producer price will also rise so that producers are more well off and have an incentive to increase production.

Assume, however, that price gaps result mainly from the incomplete transmission of changes in border prices to domestic prices. In this situation, the expected positive relationship between protection-support and domestic prices usually will not hold; rather, the relationship will be negative.[13] In turn, this means that changes in assistance will be inversely related to changes in incentives to produce and producer welfare.

The following example demonstrates this relationship. Assume that the border and domestic producer prices for a commodity initially are identical, such that the nominal protection coefficient equals 1. The border price then rises. If there is some transmission between the border price and the domestic price, the latter will also increase. If the transmission is incomplete, however, the border price will rise by more than the domestic price. With the producer price now below the border price, the nominal protection coefficient drops to less than 1. Incomplete transmission has meant that the nominal protection coefficient and the producer price have moved in opposite directions.

The incomplete transmission results in a percentage change in the domestic price that is smaller than percentage change in the border price. The domestic price and support measure move in opposite directions because the incomplete transmission has a mitigating effect on the move in the domestic price. (For further analytical discussion of this relationship, see Liefert 2008.)

This relationship appears to have held during Russia's transition. Beginning in 1993, high domestic inflation exceeded the nominal depreciation of the exchange rate. This meant that the ruble appreciated in real terms. By raising the prices of nontradables relative to tradables, the inflation reduced real domestic prices for tradable agricultural products. In figure 4.6, the real producer price curve gives the real aggregate price for agricultural goods (indexed for convenience to the value of 2 in 1992). The figure shows a major decline in real prices during 1993–94. The price drop contributed to the large decline in agricultural output during the early transition years.

The change in the real exchange rate, however, was incompletely transmitted to domestic prices. This meant that real domestic prices rose relative to border prices (or, in other words, incomplete transmission meant that producer prices followed domestic inflation to some degree rather than only border prices). The gap resulted in an increase in measured support despite the fact that real producer prices were dropping. The support ensued because incomplete transmission entailed a fall in real prices that was not as sharp as the fall in border prices,

thereby creating a price gap. Although inflation eroded real producer prices, incomplete transmission resulted in rising producer NRA values so that calculated assistance became positive in 1994–97 (figure 4.6).

During Russia's crisis years of 1998–99, however, Russian support measures fell, but real producer prices rose. Although inflation was high during the crisis years, the severe depreciation of the ruble raised nominal agricultural producer prices by more than the inflation rate. Thus, real producer prices increased (figure 4.6), which motivated more production. (The major depreciation of the ruble during the crisis is considered one of the main reasons why the overall Russian economy has grown at a fairly high rate during the 2000s.) Yet, the depreciation of the ruble was incompletely transmitted to domestic prices. This meant that border prices rose by a greater percentage than domestic prices, which, in turn, moved measures of agricultural protection and support in a negative direction. This is shown in figure 4.6 by the drop in both the nominal assistance and nominal protection coefficients. Measures of protection-support and real prices again moved in opposite directions.

During the early 2000s, measures of support rose again, but real producer prices fell. Annual domestic inflation was 10–20 percent, which reduced real agricultural producer prices. The inflation also appreciated the ruble in real terms, given that the nominal exchange rate was fairly stable. Measures of support increased moderately, indicating incomplete transmission between border and domestic prices (that is, domestic prices still followed domestic inflation to some degree rather than being wholly determined by border prices). Once again, measures of support and real prices moved in opposite directions.[14]

This discussion shows that, for Russia during the transition, support measures have been misleading indicators of the direction of change in incentives to produce and producer welfare. The possible negative relationship between measures of protection and support and domestic producer prices requires that changes in these measures be interpreted carefully.

Decomposing Changes in Agricultural Producer Prices

Liefert (2007) has developed a method for decomposing changes in agricultural producer prices within countries. The method allows one to measure the degree to which changes in all of the following affect prices and thereby producer incentives: (1) world prices; (2) the exchange rate, which represents macroeconomic policy; (3) transparent commodity-specific trade policy (such as import tariffs); and (4) incomplete transmission caused by either nontransparent policies or poor market infrastructure. We use this method to examine changes in Russian producer prices during the transition.

Let P^d be a commodity's domestic producer price, P^w the world price in foreign currency, E the exchange rate, and t an import-export tax. If domestic transport-transaction costs have been subtracted out, markets within the country work well, and no market-distorting policies exist, then:

$$P^d = P^w * E \tag{4.1}$$

Any deviation of P^d from this value might be considered a distortion. If a trade tax exists, then:

$$P^d = P^w * E * (1 + t) \tag{4.2}$$

where the right-side term is called the tariff-included *landed price*. The decomposition method measures the degree to which a change in P^d can be attributed to changes in the three right-side variables.

Table 4.5 gives decomposition results for various commodities. The periods over which the decomposition calculations are made were chosen mainly to coincide with movements in the exchange rate: (1) major appreciation of the ruble over 1994–97, (2) severe depreciation in 1998–99, and (3) little change over 2001–02, –03, to provide examples from a more tranquil time. Before examining the general results, we demonstrate the decomposition procedure using the results for wheat over 1994–97. Columns 1, 2, and 4 present the change in the real world price (in foreign currency), the real exchange rate, and the real producer price for each commodity over the period. Given that the exchange rate is expressed as rubles per U.S. dollar, the 56 percent fall in the rate over 1994–97 shows that the ruble appreciated substantially in real terms. Column 3 gives the price transmission elasticity between the change in the commodity's landed price (equation 4.2) and the commodity's domestic producer price, in this example a low 6 percent.[15]

Columns 5 and 6 are based on the assumption that the transmission between the landed price and the domestic price is complete (the transmission elasticity equals 1). Based on this assumption, the direct price effect measures the contribution that the changes in P^w and in E make to the change in P^d. In the wheat example, ΔP^w and ΔE result in a fall in P^d by 39 percent. The tariff effect measures the effect on P^d of a change in the tariff, as well as the implicit effect of the tariff on P^d that results from the interaction between the changes in P^w and E and the existing tariff. In this example, the total tariff effect increases P^d by 2 percent. Column 7 measures the sum of the direct price and tariff effects. It shows that, if the transmission between the landed price and P^d were complete, the combined and interactive changes in P^w, E, and t would decrease P^d by 37 percent.

Column 8 measures the incomplete transmission effect on P^d. In the wheat example, P^d would fall by 37 percent with complete transmission, but, because of incomplete transmission, the drop is only 2 percent. The incomplete transmission prevents the other 35 percent potential decline from occurring, which means the

Table 4.5. Changes in Real Agricultural Producer Prices, Russia, 1994 to 2002
(percent change)

Commodity	1. World price[a]	2. Exchange rate	3. Price transmission elasticity[b]	4. Producer price	5. Direct price effect	6. Tariff effect	7. Combined effect (5 + 6)	8. Incomplete transmission effect	9. Net effect (7 + 8 = 4)
1994–97									
Wheat	37	−56	6	−2	−39	2	−37	35	−2
Sunflower seeds	−4	−56	87	−50	−58	0	−58	8	−50
Beef	−25	−56	−38	25	−61	−3	−64	89	25
Pork	25	−56	−8	3	−42	1	−41	44	3
Poultry	20	−56	−9	4	−41	−1	−42	46	4
1997–99									
Wheat	−19	138	39	33	88	−3	85	−52	33
Sunflower seeds	−5	138	105	112	128	−22	106	6	112
Beef	9	138	29	41	139	4	143	−102	41
Pork[c]	−5	67	13	5	50	−3	47	−42	5
Poultry	−16	138	37	29	77	−1	76	−47	29
2001–02									
Wheat[d]	−8	6	61	−2	−3	0	−3	1	−2
Sunflower seeds	22	1	−14	−3	31	−6	25	−28	−3
Beef	−18	1	30	−5	−15	...	−15	10	−5
Pork	−15	1	79	−10	−13	...	−13	3	−10
Poultry	14	1	−49	−6	11	...	11	−17	−6

Source: Author compilation.

Note: Columns 1, 2, and 4 give the percent change in the variable over the period. The values in columns 5–7 are based on an assumption of complete transmission between the landed price and producer price. The net effect column (9) gives the net effect on the producer price and therefore has exactly the same value as column 4. . . = negligible change.

a. In foreign currency.

b. The transmission elasticity between the landed price and the producer price.

c. Computed for 1997–2000.

d. Computed for 2001–03.

incomplete transmission effect is +35 percent. The net effect in column 9 is the sum of the combined and incomplete transmission effects and gives the actual change in P^d.

Table 4.5 shows that the real exchange rate moved much more strongly during the 1990s than world prices (though changes in the latter were also nontrivial), such that the exchange rate was the dominant variable driving changes in domestic producer prices. The tariff effects are not large, which mirrors the general stability of agricultural tariff rates from the beginning of the transition through the early 2000s. Most of the tariff effect arises from changes in world prices and the exchange rate interacting with existing tariff rates rather than from changes in the rates themselves. The incomplete transmission effects, on the other hand, are very big. In many cases, less than half of the potential change in the producer price occurs because of incomplete transmission, and, in a number of cases, the transmission is negative, such that landed prices and producer prices move in opposite directions.

Producer Assistance in the 2000s

The discussion above on assistance and price gaps for agricultural producers centers on the main trends following the onset of the transition. The discussion hereafter examines assistance in the more recent period since 2000 and gives more attention to specific commodities. Although changes in border prices (especially the exchange rate), combined with incomplete transmission, likely account for some of the price gaps and measured assistance during the 2000s, our discussion focuses on the effects of policies targeted on agriculture.

Table 4.2 shows that, since 2000, aggregate assistance to producers has been positive to a nontrivial degree; the aggregate annual NRA has been between about 15 and 25 percent. Table 4.3 shows, however, that the aggregate NRA masks considerable differences in support-taxation among commodities. In the 2000s, livestock products (meat and milk) and sugar have been heavily assisted, while grain and sunflower seeds, Russia's dominantly produced and traded oilseed, have been generally taxed.

Of Russia's major agricultural commodities, sunflower seeds have been the most consistent net export during the transition period (table 4.4). In 2000, Russia imposed a 20 percent export tax on the commodity. The tax may explain the negative NRA in 2002–03 of 22 percent, though not the NRA values for 2001, 2004, and 2005 of 2, 9, and −2 percent, respectively.

During the 2000s, grain has also been generally taxed, especially in 2002–03, and the aggregate grain NRA in 2002 was −29 percent. One reason for the negative values is the interaction of weather and infrastructure. Both 2001 and 2002

were good weather years, resulting in big grain harvests. Although this generated large exports, mainly through the Black Sea ports, the infrastructure (including port export capacity) was strained handling the movement of so much production. Better infrastructure would probably have allowed higher exports. The surplus product drove domestic prices down (though with some lag). The ensuing drop in prices resulted in taxation relative to border prices, even after adjusting for domestic transport and transaction costs.

Livestock production in the 2000s, especially meat production, has been heavily assisted (with the exception of eggs). One reason is that, because grain and sunflower seeds are used to produce animal feed for livestock production, the taxation of the former that results because domestic prices are below border prices means that there is a subsidy for the latter. In computing the MPS for livestock products, the OECD incorporates this subsidy, which means that we also incorporate it into our NRA calculations.

Table 4.4 shows that, in the 2000s (as well as in most of the transition period), Russia has been a large net importer of livestock products, especially meat. In 2003, the Russian government created restrictive tariff rate quotas for imports of beef and pork and a pure quota for poultry. The annual quota for poultry was set at 1.05 million metric tons, and the low tariff quota for beef and pork at around 0.45 metric tons. In comparison, poultry, beef, and pork imports in 2002 equaled 1.37, 0.50, and 0.60 million tons, respectively (according to the PSD Database 2007). The low in-quota tariff for beef and pork was kept at the previous tariff rate of 15 percent, while the out-of-quota tariffs were set at 60 and 80 percent, respectively. The tariff for quota poultry imports was maintained at the existing 25 percent level. In 2005–06, the government liberalized the meat import policy moderately mainly by converting the pure quota for poultry to a tariff rate quota. Also, for all three meats, the low tariff quota was to rise gradually from 2006 to 2009, while the out-of-quota tariff was to fall gradually.

Although the meat import tariff rate quotas (and poultry pure quota) created in 2003 contributed strongly to the MPS, the assistance rates for meat were high in preceding years as well. One explanation specific to poultry revolves around the fact that, in 2001, the Russian government began to restrict imports from the United States, the dominant foreign supplier, on sanitary grounds. This helps explain the big jump in the poultry NRA from 51 percent in 2000 to 110 percent in 2001, which helped drive up the calculated NRA for meats.

Another product that has been highly supported since the late 1990s is sugar. Russia's sugar trade policy has been complicated, involving different import rates depending on the exporting country and a tariff-free import quota from Ukraine from 1997 to 2004 (OECD 1999). The policy's overall effect in the 2000s, though, has been strong support.

Indirect Assistance for Producers and the RRA

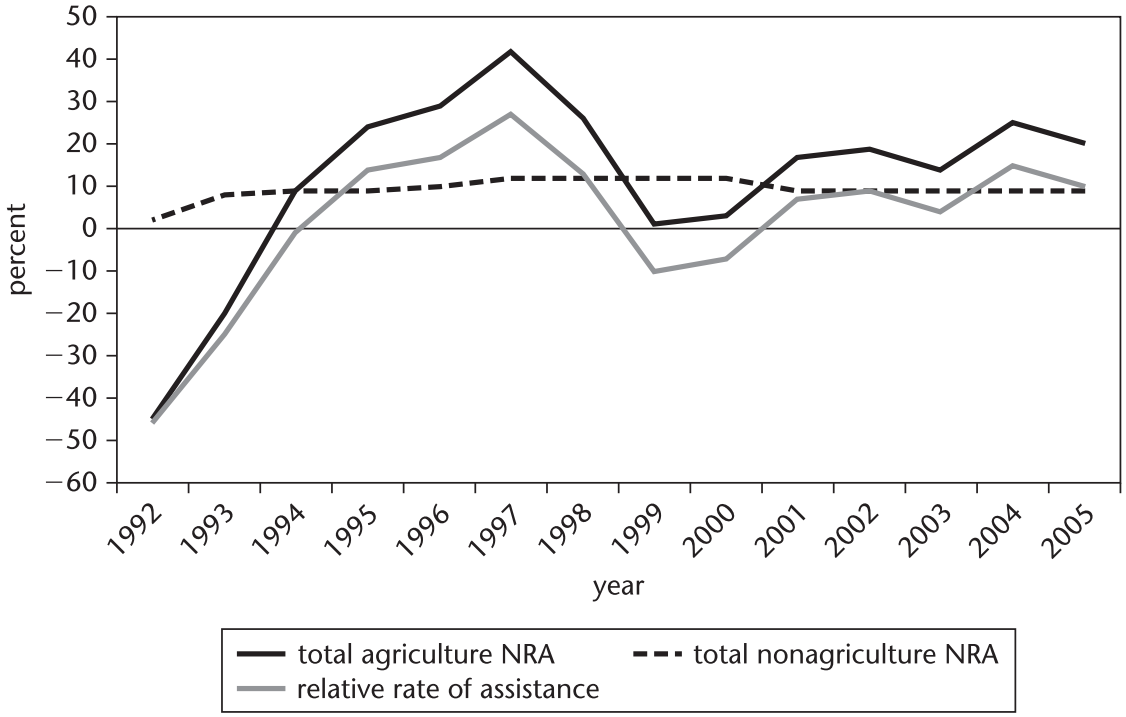
We next examine the indirect assistance and taxation for agricultural producers during the transition that results from tariffs for other imported goods. Import tariffs for nonagricultural tradables hurt agricultural producers by raising the domestic prices for the tariffed goods, which, in turn, bids up prices for the inputs used for both agricultural and nonagricultural products. But, more importantly, they bid up and attract mobile resources out of the agricultural sector, thereby reducing the rewards of farming.

The bottom rows of table 4.2 provide the information needed to compute the RRA for agricultural producers during the transition years and supply the values for figure 4.7. The NRA for tradable nonagriculture (the row All nonagriculture in table 4.2) is based on import tariffs for nonagricultural products. We use that trade-weighted average tariff as a proxy for the NRA in the tradable nonagricultural part of the economy (including the processed food industry).[16] Call it $NRAnonag^t$. Together with $NRAag^t$, we are then able to calculate an RRA that is defined in the appendix as:

$$\text{RRA} = 100[(1 + NRAag^t/100)/(1 + NRAnonag^t/100) - 1] \qquad (4.3)$$

where $NRAag^t$ and $NRAnonag^t$ are the average percentage NRAs for the tradable parts of the agricultural and nonagricultural sectors, respectively. Since the NRA

Figure 4.7. RRAs in Agriculture, Russia, 1992 to 2005



Source: Author compilation based on OECD PSE-CSE Database 2007; data of the World Bank.

cannot be less than −100 percent if producers are to earn anything, then the RRA cannot be less than −100 percent either. This measure is useful. If it is below zero, it provides an internationally comparable indication of the extent to which the policy regime has an antiagricultural bias, or conversely when the RRA is positive. Given the steadiness of the NRA for tradable nonagriculture, the RRA follows the fluctuation in the NRA for tradable agriculture. During the first half of the 2000s, the assistance for agriculture was somewhat higher than the assistance for the rest of the tradable economy, resulting in a moderate RRA of around 5–15 percent.

Assistance to Consumers

Recall that, during the planned period, the final consumers of agrifood products were supported. Large subsidies to food processors allowed consumers to pay food retail prices that were below domestic production costs, as well as below border prices. During the early years of the transition, these subsidies were phased out, and, by 2000, they were nonexistent. Recall also that the OECD's CSEs for Russian agriculture cover the effect only of farm-level policies. However, given that consumer subsidies largely did not exist during the transition, the CTEs become a strong measure of assistance-taxation not merely at the farm level, but also at the retail level.

For consumers, a positive CTE for a commodity indicates taxation (because the consumer price exceeds the border price), while a negative CTE indicates support. Comparing tables 4.3 and 4.6 shows that the CTEs generally follow the producer NRAs; the main difference is that producers have continued to receive budget subsidies to some degree during the transition. Although the CTEs for most agricultural products were already negative during the planned period (figure 4.1), the CTEs fell substantially with the beginning of reform in 1992, resulting in large support. The rise in the CTEs over 1993–97 led to moderate taxation (in aggregate). The drop in 1998–99 (coinciding with Russia's economic crisis) eliminated the consumer taxation, and the slight rebound in the CTEs in the 2000s resulted again in moderate aggregate taxation. Although the aggregate CTE in 2005 was 8 percent, the CTEs for grain and sunflower seeds were negative; those for meat and sugar were highly positive; and those for milk were slightly positive (although much higher in previous years). Negative grain and sunflower seed producer NRAs and CTEs indicate that producers were taxed to the benefit of consumers, including livestock producers who used animal feed. Likewise, the positive meat, milk, and sugar producer NRAs and CTEs indicate that the consumers of these products were taxed to the benefit of producers.

Given that direct consumer subsidies during the transition have been almost nil, the CTEs are determined almost completely by the relationship between domestic and border prices. The main cause of the change in assistance-taxation

Table 4.6. CTEs for Various Foods, Russia, 1992 to 2005

Commodity	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Grains	−28	−24	−22	−15	−1	2	−14	−20	−11	−9	−20	−13	−3	−7
Wheat	−39	−30	−28	−17	−3	1	−19	−22	−17	−8	−16	−8	0	−7
Corn	−35	−14	17	9	26	12	3	−8	1	10	−7	−4	−6	−8
Barley	−3	−10	−14	−21	−4	−1	−6	−15	−6	−7	−11	−9	−5	−4
Rye	−26	−37	−31	3	21	17	−14	−22	20	−9	−38	−39	7	−10
Oats	−15	−15	−13	−10	3	2	−4	−19	−3	−16	−36	−31	−14	−12
Sunflower seeds	−52	−60	−40	−18	−29	−30	−32	−34	−35	−1	−24	−24	7	−6
Sugar	−3	59	17	35	73	93	80	4	20	39	68	81	94	59
Meats	−87	−57	−49	−25	−3	38	10	−8	10	49	52	28	34	45
Beef	−87	−66	−64	−45	−20	37	−6	−26	12	41	61	37	15	9
Pork	−88	−44	−28	−1	9	34	32	20	−6	35	41	16	35	61
Poultry	−83	−44	−25	4	26	47	14	−6	37	89	55	31	69	100
Milk	−76	−54	−40	26	38	59	38	15	6	2	30	34	34	3
Eggs	−81	−59	−29	16	13	34	19	−5	−24	−8	−18	−38	0	−1
Weighted average[a]	−62	−38	−31	−6	5	18	7	−5	−1	8	11	8	13	8

Source: Author compilation based on OECD PSE-CSE Database 2007.

a. Weights based on the value that the consumption of the listed products would reach at undistorted prices.

for consumers is therefore the same as for producers: fluctuation in the exchange rate, combined with incomplete transmission to domestic prices.

Future Policy Direction and Political Economy Analysis

During most of the transition, Russia's assistance policies for agriculture have not been extreme. Budget transfers have been low. The main border measure has been tariffs, which averaged 10–15 percent annually from the early 1990s to the early 2000s. The major exceptions to these moderate policies have been the special protectionist policy for sugar, the 20 percent export tax imposed on sunflower seeds in 2000, the restrictive tariff rate quotas for imports of beef and pork, and the pure quota for poultry created in 2003 (recently also converted to a tariff rate quota).

Russian budgetary support in agriculture fell during the initial transition years not because of the government's desire to reduce support, but rather because funding was tight. Since 2000, however, government revenues have been rising substantially for two reasons. The first reason is that GDP has grown at an average annual rate of 6–7 percent (PlanEcon, various). The second reason is that the bulk of Russia's export earnings arise from energy (crude oil, oil products, natural gas), and these earnings have surged because of the rise in world energy prices in recent years.

Despite the government's improving financial condition, budget subsidies for agriculture increased only slightly (in euro values) from 2000 to 2005. In 2005, however, the government designated health, education, housing, and agriculture as national priority project areas that would receive increased funding. Although specific figures are not yet available, the budgetary support for agriculture since 2005 has risen to reflect this priority status and should continue to do so (Interfax, various). The government has also stated that the main goal of agricultural policy would be to revive the livestock sector. The government apparently wishes to reverse the large drop in production and the surge in imports of livestock products that have occurred during the transition.

Russia officially initiated its bid for accession to the WTO in 1995 (to the General Agreement on Tariffs and Trade in 1993) and has concluded bilateral negotiations with almost all countries (including the United States and the European Union). How might accession constrain Russia's future agricultural policy? We examine the question with respect to the three main pillars of the Uruguay Round Agreement on Agriculture: market access, export subsidies, and domestic support. Russia's current negotiating positions with respect to export subsidies and domestic support as identified in this chapter are derived from the WTO (2008), while the bargaining position concerning market access is derived from OECD (2002).

Russia's existing behavior with respect to all three Uruguay Round pillars is relatively moderate. (The main exception is the meat import tariff rate quotas.) Thus, in all areas, Russia in its accession negotiations is asking for bound commitments above the current levels. The aggregate trade-weighted tariff for agrifood products in 2003 was 10 percent. In comparison, the average bound tariff on agricultural products for WTO members exceeds 60 percent (Gibson et al. 2001).[17] As of 2002, Russia was asking for an initial average bound tariff of 35 percent, which would fall over six years to an average of 25 percent.[18] Although Russia has not used any agricultural export subsidies during the transition period and although many countries in the current Doha Development Round of trade negotiations want to ban such subsidies altogether, Russia is asking for annual bound export subsidies of US$0.7 billion. On domestic support, Russia is asking for annual bound support of US$9.5 billion, which compares with its 2004 actual support level of US$2.7 billion (FSSS 2004).[19]

With respect to tariffs and domestic support, although WTO members have resisted Russia's requests, the final negotiated levels may lay somewhere between Russia's current behaviors and the bound levels it is requesting. If so, Russia's accession would not liberalize its agricultural policies. (In similar fashion, any reduction of the bound levels of countries in the Doha Round that leaves these levels above current behaviors would not liberalize the trade of these countries.) Russia would thereby have license to increase actual support and protection for agricultural producers. Yet, the negotiated bound levels would provide limits to future Russian support and protection.

In the early 2000s, Russia used health (sanitary) arguments to ban imports of poultry from the United States (see elsewhere above). By 2005, Russia was using sanitary arguments to ban meat imports on an ad hoc basis from many other countries as well (including Brazil, Canada, Denmark, France, Mongolia, Poland, and Romania). This raises the concern that the country might be using sanitary issues as a protectionist pretext. Thus, the main benefit to other WTO members of Russia's accession might be that it would give them an official forum for challenging the country's sanitary and phytosanitary import restrictions.

We now examine the political economy considerations behind Russian agricultural policies during the transition. First, however, it would be helpful to reidentify the main types of producers: the former state and collective farms, family farms, and household plots.[20]

The transition process has created fundamental problems that have no simple solution for policy makers (both federal and regional). The main problem is that agriculture in the planned period overproduced relative to the economy's real income and consumer purchasing power and relative to the economy's comparative advantage with respect to the world market. Correcting these imbalances

would require shutting down unprofitable farms and, in particular, shedding unproductive labor. An aggressive policy along these lines, however, might create large-scale rural unemployment, especially given the limited opportunities for alternative employment in rural areas and the impediments to labor mobility within the country (for instance, in cities such as Moscow that have established official hurdles to relocation). One might, in fact, argue that the main economic challenge of transition not only for agriculture, but economy-wide has been reallocating labor from old to new viable employment, while avoiding serious unemployment.

The main policy response has been to minimize rural unemployment by shielding large former state and collective farms from termination (though governmental bodies have had limited resources to pursue this policy). Given that most farms have been unprofitable during the transition, the main discretionary policy used to avoid farm bankruptcies has involved soft loans provided through state or parastatal lenders with periodic debt write-offs. Labor has not been forced out of agriculture, but, rather, has been given the choice of seeking alternate employment.[21] A secondary motive for preserving farms could be local food security, especially given the deficient market infrastructure that tends to segment regional markets.

Within this overall policy context, one may examine other, more specific political economy motives behind policies. The analysis is based on the conclusion that the restrictive meat import tariff rate quota regime created in Russia in 2003 and the decision in 2005 to increase funding for agriculture, which has especially helped the livestock sector, show that support for agriculture in general and the livestock sector in particular is on the rise. One political economy hypothesis is that commodities that have low or declining comparative advantage receive support. Russia's agricultural trade patterns during the transition, as well as work by Liefert (2002), indicate that Russia has a comparative advantage in producing grain and sunflower seeds and a comparative disadvantage in livestock products and sugar. Yet, the NRAs for the 2000s show that policy and market conditions combine to tax the former and assist the latter. Specific border measures have taxed sunflower seeds (export taxes) and supported meat (import tariff rate quotas) and sugar (a complex policy involving varying tariff rates). The government's announcement that additional funding for agriculture will favor the livestock sector is further evidence that Russia is more interested in reviving this sector than in capitalizing on its potential as a bulk crop exporter.

Another political economy hypothesis is that agriculture will be supported more, the more farm incomes fall relative to incomes in the rest of the economy. In 1990, average monthly earnings by agricultural workers equaled 95 percent of economy-wide earnings, but, by 2003, the figure had dropped to 39 percent (FSSS

2004). The assistance-increasing budget and the border policies of the 2000s support this hypothesis.

The two preceding hypotheses concern the neediness of agriculture for special assistance and are consistent with the neediness policy of supporting agriculture to avoid major rural unemployment. The following two hypotheses involve the cost of support. The first is that, as agriculture's share in GDP and employment falls, support rises. This is because, with fewer farmers to support, assistance becomes more affordable. During the transition, agriculture's share in GDP has fallen substantially, from about 13 percent in 1990 to 4.6 percent in 2003 (see table 4.1). Agricultural employment has fallen less, from 13 percent in 1990 to 11 percent in 2003. The larger drop in GDP compared with employment shows that labor productivity in agriculture has declined relative to the rest of the economy, with negative consequences for farm profitability. Thus, the evidence does not support the hypothesis that falling farm employment is motivating more support by making it more affordable. Rather, falling labor productivity raises the specter of unemployment, which buttresses the neediness argument for farm support.

The second cost-related hypothesis is that an inverse relationship exists between the share of food in consumer expenditure and the support to agricultural producers. The smaller the share, the less support policies that affect prices will tax consumers. From 1990 to 1999, the share of home food consumption in expenditure rose from 32 to 52 percent. By 2004, however, the share had dropped back to 36 percent (reflecting mainly growth in consumer incomes; see FSSS 2005). The government's decision in the 2000s to increase border protection and budget transfers for livestock producers is therefore consistent with this hypothesis. Russia appears to be following the path of many other countries in that assistance increases as agricultural commodities become import-challenged, the economy's ability to afford agricultural subsidies rises, and consumers feel less of the tax they pay for the support for producers.

Russian officials might be tempted to use the increased funding for agriculture to expand production, defend existing farms from liquidation, and protect the current levels of employment. Pursuing such goals would largely freeze the structure of resource use in agriculture, but not necessarily motivate changes in farm management and resource use to raise productivity. An alternative goal would be to use funding to promote productivity growth, which would improve the ability of Russian farms to compete with imports or to export to global markets.

Productivity growth, especially of the labor-saving type, would require the continued exit of unskilled labor from farms and the termination of chronically unprofitable farms. To mitigate the ensuing social costs, the Russian government could adopt the following policies. First, it could speed up the transfer of the responsibility for providing social welfare services for workers—health, education,

housing, recreation—from large farms to local governments. This would mean that workers who leave farms would not immediately lose access to these necessary services (and it would relieve farms of this financial burden). Second, subsistence farmers who work only their household plots could be given the legal status of economically employed, which would give them the right to pensions, medical insurance, unemployment benefits, and other forms of social protection. Third, to increase rural employment opportunities, the government could promote the growth of small businesses through credit facilities, tax breaks, and simplified administrative requirements for creating small businesses. Fourth, governmental bodies throughout the country could remove whatever official impediments exist to labor mobility.

Although many farms continue to have a surplus of older and unskilled workers, many also suffer from a shortage of skilled workers (Liefert et al. 2005). A disproportionate share of the labor migration out of agriculture during the transition has come from younger and more-well-educated workers. Increased funding for agriculture could be used to attract and train workers in such deficit skills as machinery use and repair, animal care (including knowledge of modern breeding and feeding practices and veterinary care), and low- to middle-level management activities. Such policies could increase productivity by substituting human capital for unskilled labor.

A last policy-relevant observation is that much of this chapter has focused on the argument that a major cause of price gaps in Russian agriculture has been the incomplete transmission of changes in border prices and, especially, changes in the exchange rate to domestic producer prices and that the incomplete transmission is not caused mainly by policies targeted on agriculture, but rather by weak infrastructure. State investment in improving both hard (physical) and soft (institutional) infrastructure would reduce the high transport and transaction costs and also improve transmission between border and domestic prices. Improving infrastructure takes time, effort, and expense. In the long run, however, strengthening macroeconomic stability and improving domestic infrastructure might do as much or more to reduce price gaps and their distorting effects as would liberalizing agriculture and trade policies.

Notes

1. For a good review of Russian agricultural policy and developments during both the immediate pre-Soviet and Soviet periods, see Gregory and Stuart (1990), which is the source of most of the specific figures given in our discussion of these periods.

2. Industrial workers were also exploited because of low real wages, though probably not as strongly as farm workers. During the 1930s, the share of investment in GDP soared at the expense of consumption.

3. The OECD has computed annual PSEs for Russian agriculture during the Soviet period from 1986 through 1991, as well as for the subsequent transition years. Producer NRAs could therefore be calculated based on these PSE values. However, in its Russia PSE calculations for 1986–89, the OECD uses the official Soviet exchange rate of 0.6 rubles to the dollar, while, for 1990–91, the OECD adjusts the official rate to reflect market-influenced rates. The OECD's aggregate agricultural PSE for Russia in 1986 is 83 percent, which contrasts with the aggregate PSE for Soviet agriculture of 26 percent in Cook, Liefert, and Koopman (1991). Recognizing that the official exchange rate overstates the value of the ruble, the OECD also experiments in computing PSEs with exchange rates adjusted by using the World Bank Atlas conversion factor (OECD 1998). The adjusted exchange rate for 1986 is 1.24 rubles to the U.S. dollar. Use of this exchange rate reduces the Russian aggregate PSE for 1986 to 65 percent, which is still high relative to the 1986 Cook, Liefert, and Koopman PSE for the Soviet Union (based on an exchange rate of 1.9 rubles to the U.S. dollar).

4. The OECD has also computed annual CSEs for Russian agriculture from 1986 through 1991 on which CTE calculations may be based. As with its PSE estimates, however, the OECD uses the official Soviet exchange rate, though it also experiments using an exchange rate adjusted by the World Bank Atlas conversion factor. In addition, the CSE estimates do not measure the support for food consumers at retail, but rather at the farm level, that is, the CSEs cover the effect on consumers from *farm-level policies alone*. The CSEs therefore do not capture the large support for consumers that arose through the budget subsidies provided to the food processing industry. For these reasons, the OECD's CSEs for the planned period show heavy taxation rather than support for consumers; the aggregate CSE for 1986 is −72 percent. This contrasts with the aggregate CSE of Cook, Liefert, and Koopman (1991) of +34 percent. (One should bear in mind that, with conventionally computed CSEs, a positive value means that consumers are supported, while a negative value means they are taxed. This contrasts with the CTEs calculated through this World Bank project in which a negative CTE value means support, and a positive value means taxation.)

5. Soviet consumer prices were set low not only for food, but also for many other goods and services, such as most clothing, shoes, toiletries, other personal items, housing, and transport.

6. The large drop in the production of livestock goods resulted in a substantial decline in the per capita consumption of these goods. The consumption of staple foods such as bread and potatoes, however, did not fall much or even increased (Liefert and Swinnen 2002). This means that the big decline in agricultural output did not create serious problems for overall food security. Crop output fell mainly because the large decrease in livestock production reduced the demand for feed grain. The drop in crop output therefore did not reduce the food available for human consumption.

7. Until recently, for all member and nonmember countries for which it computed PSEs, the OECD calculated PSEs for individual commodities, as well as an agricultural aggregate PSE. In 2007, however, the OECD stopped calculating commodity-specific PSEs for all countries (members, as well as nonmembers). A major reason was the difficulty in allocating input subsidies and decoupled support, such as direct income payments, among specific commodities for many countries. Yet, the OECD continues to compute commodity-specific budget subsidies directly linked to production and commodity-specific MPSs.

8. Liefert and Liefert (2007) also give annual producer NRAs and CTEs calculated for all commodities for which the OECD provides product-specific budget subsidies and MPSs for the transition period.

9. The official Soviet exchange rate highly overvalued the ruble, which inflated the euro-denominated value of subsidies in 1990. Yet, even if the exchange rate estimated by Cook, Liefert, and Koopman (1991) for 1986 (1.9 rubles to the U.S. dollar versus the official rate of 0.6 rubles to the dollar) is used to convert to foreign currency values, budget subsidies were much higher in the planned period than in the early transition years.

10. This conclusion is based on a comparison of farm purchase prices for inputs (FSSS 2004) and export unit values for the inputs (State Customs Committee, various).

11. The percentage price gap is equivalent to the nominal rate of protection for total agriculture. The numerator of the percentage price gap also equals the MPS as conventionally calculated, with one

qualification. In computing the MPS for livestock products, the OECD includes a feed adjustment coefficient that captures the difference between domestic and border prices for animal feed. For example, if Russia supports its feed producers such that domestic feed prices are above border prices, the feed adjustment coefficient measures the tax on livestock producers that occurs because they have to pay higher prices for feed.

12. In 1992, little of the change in the real exchange rate was being transmitted to domestic agricultural prices (see figure 4.6). Although poor infrastructure that hindered transmission might account for part of the incomplete transmission in that year, policy also played a key role. The negative NRA for 1992 shows that domestic prices were below border prices so that there were incentives to export. Yet, export taxes as high as 70 percent existed for most agricultural products, and other export restrictions also existed, such as quotas, licenses, and complete bans (OECD 1998). In trade policy, Russia was still behaving as if it were a planned rather than a market economy, whereby the emphasis was on keeping products within the country for domestic consumption rather than trying to sell abroad. These export controls, however, did not long survive the transition process and, by the mid-1990s, had largely disappeared.

13. The negative relationship between changes in support and producer prices in a context of incomplete transmission is most easily proven analytically if support is measured using the nominal protection coefficient (because it includes no budget subsidies). The negative relationship will hold if the price transmission elasticity between the border price and the domestic price lies between 0 and 1. If the elasticity is less than 0 or greater than 1, a positive relationship will exist between a change in the nominal protection coefficient and the producer price. These relationships hold whether one uses nominal or real values for the border and domestic prices.

14. If we added to figure 4.6 the aggregate annual percent PSEs for Russian agriculture for the 1990s as computed by OECD, we again would get a generally negative relationship between the change in the percent PSE and real producer prices.

15. The price transmission elasticities identified in table 4.5 are not econometrically estimated. Rather, the values are computed as simply the ratio of the percent change in the domestic producer price to the percent change in the landed price for each commodity over the specific period of calculation. The elasticities are thereby implicit in the price changes over the period.

16. This would be an overstatement if the exporting and nontrading parts of the nonagricultural sectors received less support than the import-competing parts, but it is assumed that nontariff import barriers are still in place and exactly offset this bias.

17. This comparison overstates tariffs for WTO members relative to Russia's tariffs. The +60 percent figure for members is a simple average of bound tariffs, while the Russian tariff figure of 10 percent is a trade-weighted average. The member tariff calculation based on bound tariffs ignores products for which no tariff exists, while Russia's trade-weighted aggregate tariff covers all products and assigns a tariff value of 0 for goods for which there is no tariff. An agricultural trade-weighted tariff computed for all WTO members would therefore be lower than the figure computed in Gibson et al. (2001). Nonetheless, the large disparity between the +60 and the 10 percent figures indicates that agricultural tariffs in members in the aggregate are high relative to Russia's tariffs.

18. This is the latest publicly available information we have been able to find concerning Russia's bargaining position on agricultural import tariffs (OECD 2002).

19. Karlova (2005) examines the effects on Russian agriculture of various policy liberalization scenarios, some related to WTO accession.

20. A fourth type of producer has arisen in the 2000s, the new operators (Rylko and Jolly 2005; Uzun 2005). These are large, vertically integrated enterprises that combine primary production, processing, distribution, and, sometimes, retail sales. They are not mutually exclusive with respect to the former state and collective farms in that an enterprise typically contains a number of these farms.

21. Although workers in general have not been completely forced off farms, Bogdanovskii (2005) finds that, among many farms and their workers, a compromise arrangement of limited detachment has been reached. Millions of workers and their families have become subsistence producers in that

they no longer work on and receive wages from the farms, but are left to live off their household plots. The workers, however, still receive some benefits from their former employing farms, such as continued access to social welfare services (health, education, housing) and use of the farms as conduits for inputs for plot use. Many of these subsistence farmers are elderly or past their prime working years. For the rest, such a grim life provides strong motivation to find an alternative. This is the apparent solution to Russia's problem of excess agricultural labor.

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5

UKRAINE

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The aim of this chapter is threefold: to provide an overview of the evolution of agriculture and agricultural policies in Ukraine, to quantify the resulting distortions to agricultural incentives, and to discuss the political economy of past agricultural policy choices with a view to sketching the probable future course of agricultural policy in the country. Emphasis is placed on the period since Ukraine's independence in 1991, but the historical narrative extends back to the early 20th century to capture several unique features of Ukraine's agricultural development.

Why consider Ukraine? Ukraine's agroclimatic endowment and its comparatively low population density combine to create a large potential for agricultural production and exports. Over the last five years, Ukraine has produced an average annual harvest of 33 million metric tons of grain on roughly 14.5 million hectares of land. On average, 8 of these 33 million tons have been exported. Experts agree that, in an appropriate policy environment, yields could be doubled, from 2.3 tons per hectare to between 4 and 5 tons per hectare produced at internationally competitive costs. The result would be some 60 million to 70 million tons of annual production and, ceteris paribus, an export potential of 35 million to 45 million tons. Hence, distortions in agricultural incentives in Ukraine are of interest because they have implications not only for the well-being of millions of farmers and consumers in Ukraine, but also for world agricultural markets and, by extension, poverty and nutrition worldwide.

What constitutes Ukraine's agroclimatic potential? Over 40 million hectares of agricultural land, of which roughly 33 million hectares are arable (World Bank and OECD 2004), provide an excellent basis for the production of temperate crop and animal products. Over half of Ukraine's arable land is composed of black chernozem soils, which are ideally suited for field crop production. Indeed, roughly one-third of the worldwide stock of these soils is located in Ukraine. Ukraine's Black Sea harbors remain ice-free year round and provide direct access to world markets, and Ukraine is close to important import markets in the European Union (EU), the Middle East, and North Africa.

These natural advantages are moderated by several factors. Precipitation is often a limiting factor in crop production, falling from average levels of around 700 millimeters a year in the northeast to as low as 300 millimeters a year as one moves toward the southeast. Winters can be harsh and are not always accompanied by enough snow to protect winter crops and provide sufficient moisture in the spring. On average, drought and winter-kill will have a significant impact on agricultural production every three to five years; the last examples of this were the poor and very poor harvests recorded in 2000 and 2003.

Another limitation is, perhaps surprisingly, soil fertility. The rolling landscape that characterizes much of Ukraine's agricultural heartland is susceptible to erosion. Penkaitis (1994) cites Ukrainian sources that refer to the fact that over 12 million hectares of arable land are significantly affected by erosion. As a result of distorted incentives, the vaunted chernozems have, in many locations, been mined of their nutrient and humus content over decades, exacerbating problems with moisture retention in years of low precipitation (see also Breburda 1990; Spaar and Schuhmann 2000). The Chernobyl nuclear accident created additional limitations in the form of radioactively contaminated farmland. As the prevailing winds were blowing from south to north when the catastrophe occurred, much of this contamination affected regions in what is now Belarus (for example, Gomel) and Russia (for example, Bryansk). However, 4 of the 10 most affected regions in the Soviet Union (Kyiv, Zhitomir, Chernigov, and Cherkassy in descending order of contamination) are in Ukraine (Penkaitis 1994).

Finally, as agriculture becomes increasingly sophisticated and competitiveness is increasingly determined by transformations that take place postharvest in a complex food web, the importance of purely production-based natural conditions is declining. Ukraine's most important agricultural handicap is that it combines its bundle of high-potential agroclimatic inputs with insufficient amounts of human capital, marketing systems, and sustainable policy facilitation.[1] This is a result of both the difficult legacy that Ukraine inherited from the Soviet Union and inadequate policies since independence.

History of Growth and Structural Change in the Economy

To put the detailed discussions of Ukrainian agricultural policy and distortions in the body of this chapter into context, this section begins with a brief overview of major economic structures and trends in the country. The period prior to independence is considered where possible, but data availability is often constrained by Soviet secretiveness, the fact that Ukraine did not exist as an independent country until 1991, and the fact that many variables of interest were defined differently or not considered relevant in the Soviet system.

Traditionally, Ukraine was the breadbasket of the Soviet Union, producing almost 60 percent of its corn, 50 percent of its sugar beets, over 40 percent of its wheat and sunflower seeds, and 25 percent of its pork on only 15 percent of the Soviet Union's arable land (World Bank 1995). This importance of agriculture was reflected in a share of agriculture in total Ukrainian gross domestic product (GDP) that exceeded 25 percent in 1990 (table 5.1). This share has fallen to roughly 11 percent in recent years. Most of agriculture's falling GDP share has been taken up by trade and transport, services that were neglected in Soviet times. The shares of industry, construction, and other services for which consistent data on sectoral shares are available have fallen slightly over the period since 1995 (table 5.1).

Ukraine's population grew rapidly in the 1960s and 1970s and grew at a slower rate up to 1992, when it peaked at 52.2 million. Since then, it has fallen by 0.4 million to 0.5 million individuals per year, one of the most rapid rates of population decline in the world. The share of the population living in rural areas was over 50 percent in 1960, but fell to roughly 33 percent in the early 1990s. This share has since remained more or less constant, as subsistence agriculture provided a haven for many who had lost employment in the rest of the economy during the transition crisis of the 1990s. The share of agriculture and food processing in total employment increased from 19.1 percent in the early 1990s to 21–22 percent in 2000–01 (table 5.1).

Table 5.1 also provides information on the transition crisis. Real GDP growth in Ukraine was negative between 1990 and 1999. Inflation topped 4,700 percent in 1993, 890 percent in 1994, and 370 percent in 1995 and remained in double-digits until 2001. Per capita GDP in constant 1995 purchasing power parity dollars fell by more than half, from US$7,800 in 1990 to US$3,500 in 1997–99. Economic growth resumed in 2000, and, by 2005, per capita GDP had increased to US$5,500 in constant 1995 purchasing power parity dollars. Putting the pieces together, agriculture's share of a shrinking GDP fell in the course of the 1990s, while agriculture's share of employment increased. It therefore follows that relative wages in agriculture fell strongly over this period, from 76 percent of average wages in the

Table 5.1. Major Economic Indicators and the Production of Key Agricultural Products, Ukraine, 1960 to 2005

Indicator	1960	1970	1971–75[a]	1976–80[a]	1981–85[a]	1985	1990	1991	1992	1993
Major economic indicators										
Population (million)	42.9	47.4	48.4	49.7	50.6	51.0	51.9	52.1	52.2	52.1
Rural population (million)	22.8	21.5	20.9	19.7	18.5	18.0	16.9	16.8	16.8	16.7
Nominal GDP (US$ billion)	—	—	—	—	—	—	81.5	77.5	73.9	65.6
Real GDP growth (%)	—	—	—	—	—	—	−6.4	−8.4	−9.7	−14.2
Per capita GDP[b]	—	—	—	—	—	—	7.8	7.2	6.6	5.8
Inflation[c]	—	—	—	—	—	—	—	—	—	4735
GDP shares (%)										
Agriculture	—	—	—	—	—	—	25.2	22.7	20.2	21.5
Industry	—	—	—	—	—	—	—	—	—	—
Construction	—	—	—	—	—	—	—	—	—	—
Trade and transport	—	—	—	—	—	—	—	—	—	—
Other services	—	—	—	—	—	—	—	—	—	—
Crop products (million tons)										
Grains and pulses	21.8	36.4	40.0	43.1	39.3	37.5	51.0	38.7	38.5	45.6
Wheat	6.5	15.5	19.7	21.9	18.8	18.1	30.4	21.2	19.5	21.8
Corn	5.5	6.3	5.9	4.4	6.5	6.5	4.7	4.7	2.9	3.8
Rye	1.4	1.2	1.3	1.3	1.2	—	1.3	1.0	1.2	1.2
Oats	1.2	1.7	1.5	1.5	1.2	—	1.3	0.9	1.2	1.5
Barley	4.3	8.0	8.2	10.6	7.9	7.7	9.2	8.0	10.1	13.6
Sugar beets	31.8	46.3	46	53.9	43.9	39	44.3	36.2	28.8	33.7
Sunflower seeds	1.7	2.7	2.7	2.4	2.3	2.3	2.6	2.3	2.1	2.1
Potatoes	19.5	19.7	21	20.5	20	20	16.7	15.6	20.3	21
Vegetables	4.9	5.8	6.6	7.6	7.4	7.4	6.7	5.9	5.3	6.1
Fruits and berries	1.1	2.4	2.6	3.1	3.2	2.6	2.9	1.5	2.1	2.8
Animal products (million tons, except eggs)										
Meat	2.1	2.8	3.3	3.5	3.7	3.7	4.4	4.0	3.4	2.8
Beef and veal	0.7	1.2	1.3	1.5	1.6	1.6	1.5	1.5	1.3	1.1
Pork	1.0	1.3	1.6	1.3	1.4	—	1.3	1.1	0.9	0.8
Poultry	0.2	0.2	0.3	0.5	0.6	—	0.7	0.7	0.5	0.4
Milk	14	18.7	20.4	21.8	21.9	—	24.5	22.4	19.1	18.4
Eggs (billion)	7.2	9.2	11.2	13.5	16.0	16.6	16.3	15.2	13.5	11.8

Sources: IMF, various; Penkaitis 1994; Perspective Monde Database 2007; Statistical Information Online Database 2007.

Note: — = no data are available.

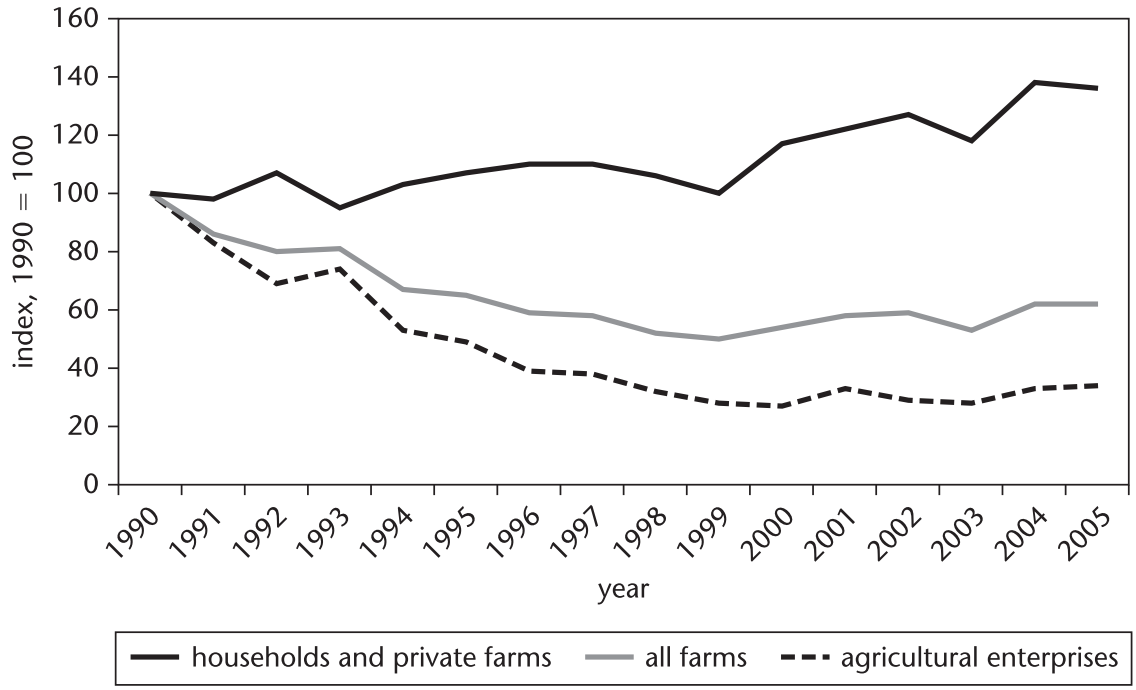
a. Five-year averages.
b. In thousands of constant 1995 purchasing power parity US$.
c. Average percent change in the consumer price index over the period.

1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
51.7	51.3	50.8	50.4	49.9	49.4	48.9	48.5	48.0	47.6	47.3	46.9
16.6	16.5	16.4	16.3	16.2	16.1	16.0	15.9	15.7	15.5	15.3	15.1
52.2	48.2	44.6	50.2	41.9	31.6	31.2	37.8	42.6	49.5	65.1	83.1
−22.9	−12.2	−10.0	−3.0	−1.9	−0.4	6.0	9.2	5.2	9.6	12.1	2.6
4.4	3.9	3.6	3.5	3.5	3.5	3.8	4.1	4.3	4.8	5.3	5.5
891.2	376.7	80.3	15.9	10.6	22.7	28.2	12.0	0.8	5.2	9.0	13.5
16.2	14.5	11.8	11.8	11.9	11.7	14.4	14.4	13.0	10.9	10.8	10.8
—	30.9	29.4	24.7	25.2	26.5	26.6	26.1	27.4	27.2	28.3	29.6
—	7.3	5.5	5.4	4.8	4.1	3.6	3.6	3.4	3.9	4.3	3.9
—	14.5	19.6	20.4	20.6	19.7	21.3	23.0	23.1	25.0	24.7	26.8
—	25.5	26.8	25.8	23.3	21.2	19.9	21.2	23.6	24.6	22.6	28.9
35.5	33.9	24.6	35.5	26.5	24.6	24.4	39.7	38.8	20.2	41.8	38.0
13.9	16.3	13.5	18.4	14.9	13.6	10.2	21.3	20.6	3.6	17.5	17.9
1.5	3.4	1.8	5.3	2.3	1.7	3.8	3.6	4.2	6.9	8.9	6.6
0.9	1.2	1.1	1.3	1.1	0.9	1.0	1.8	1.5	0.6	1.6	1.3
1.4	18.4	18.1	16.5	15.3	13.4	13.5	13.0	12.0	12.0	13.0	13.0
14.5	9.6	5.7	7.4	5.9	6.4	6.9	10.2	10.4	6.8	11.1	8.8
28.1	29.7	23	17.7	15.5	14.1	13.2	15.6	14.5	13.4	16.6	15.6
1.6	2.9	2.1	2.3	2.3	2.8	3.5	2.3	3.3	4.3	3.1	4.3
16.1	14.7	18.4	16.7	15.3	12.7	20.2	17.3	16.6	18.5	20.8	19.5
5.1	5.9	5	5.2	5.5	5.3	5.7	5.9	5.8	6.5	7.0	7.3
1.2	1.9	1.9	2.8	1.1	0.8	1.5	1.1	1.2	1.7	1.6	1.7
2.7	2.3	2.1	1.9	1.7	1.7	1.7	1.5	1.6	1.7	1.6	1.7
1.1	0.9	0.8	0.8	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.5
0.7	0.7	0.7	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.5
0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.7
18.1	17.3	15.8	13.8	13.8	13.4	12.7	13.4	14.1	13.7	13.8	13.8
10.2	9.4	8.8	8.2	8.3	8.7	8.7	9.7	11.3	11.5	12.0	13.0

economy in 1996 to 48 percent in 2000, a value that has increased only slightly since then (Zorya 2006).

Agricultural production has mirrored the general pattern of significant contraction in the 1990s followed by partial recovery since 2000 (figure 5.1). The production of most major agricultural crops increased rapidly in the 1960s, increased less rapidly and, in some cases, stagnated in the 1970s and 1980s, fell in the 1990s, and began to recover in 2001–02 (table 5.1). Meat and milk production also followed

Figure 5.1. Gross Agricultural Output by Farm Type, Ukraine, 1990 to 2005



Source: Statistical Information Online Database 2007.

this general pattern, but contracted more strongly than crop production in the 1990s and has not—with the exception of poultry—recovered notably since then.

For political and ideological reasons, the existence of phenomena such as unemployment, inflation, and poverty was denied in the Soviet Union. Household budget surveys were kept secret, and few data on poverty in Soviet times are available, making it difficult to analyze trends (Revenko 1997). The 1990s clearly increased the incidence of poverty in Ukraine. Households were affected in three ways (World Bank 1996). First, as a result of weak demand for labor, the real wage fell precipitously (by 60 percent between 1990 and 1993). Second, hyperinflation wiped out household savings. Finally, social benefits—poorly targeted in the first place—fell in real terms (for example, see German Advisory Group 2006).

According to some estimates, the incidence of poverty was as high as 29.5 percent in 1995, based on a poverty line defined in terms of per capita household consumption and equivalent to roughly US$24 per person per month, and 30.9 percent in 2001 (35.2 percent in rural areas and 29.0 percent in urban areas), based on the US$1-a-day poverty line (World Bank 1996, German Advisory Group 2006). However, the incidence of poverty has fallen as a result of economic growth in recent years (Galushko and von Cramon-Taubadel 2004). Recent estimates by the German Advisory Group (2006) using the US$1-a-day poverty line indicate a poverty incidence of roughly 7.9 percent in 2004 (11.2 percent in rural areas and 6.4 percent in urban areas).

History of Agricultural Policy Evolution prior to Independence

For most of the 20th century, the development of Ukrainian agriculture took place under planned economy conditions. The leaders of the Bolshevik Revolution were somewhat uncertain in their dealings with agriculture. The theories upon which they intended to build a new society had much to say about relations between labor and capital in an industrial setting, but comparatively little about relations in agrarian settings such as Russia, where industrialization had barely begun (Wädekin 1990a). The great majority of the population of the Soviet Union was agrarian, and agriculture was of vital importance both as a source of food and nutrition and as a source of resources that could be channeled into the modernization of an otherwise backward Soviet economy. Hence, a solution for integrating agriculture into the socialist economy had to be found.

Immediately following the Bolshevik Revolution, strict state control of agricultural markets (requisition of surplus production above subsistence minima from peasants, coupled with the centralized rationing and distribution of food) prevailed under War Communism. This policy led to a dramatic drop in food production and added to the many war-related hardships already burdening the population. The result was unrest in the form of worker and peasant revolts culminating in the Kronstadt rebellion of Soviet sailors in February and March 1921. This rebellion was crushed, but startled the Bolshevik leadership under Lenin into implementing the so-called New Economic Policy in March 1921. By allowing farmers to market a proportion of their surplus production for personal gain and to lease and hire labor, the New Economic Policy reintroduced elements of private enterprise into agriculture. It was successful in that it sparked a rapid and significant increase in agricultural production, which returned to pre-World War I levels by 1928. However, the New Economic Policy maintained capitalist structures and relations in agriculture, a betrayal of fundamental principles for many Marxists.

Following his rise to absolute power in the mid-1920s, Stalin implemented a policy of rapid industrialization and pervasive central planning, and the first five-year plan was introduced in 1928. Harnessing agriculture to this goal and eliminating the remaining capitalist elements in agriculture were accomplished by a policy of rapid and forced collectivization launched in 1929. The relatively wealthy agricultural producers and traders who had emerged as a result of the New Economic Policy—respectively, kulaks and NEPmen (from the acronym for New Economic Policy)—were stylized as exploiters and enemies of justice and reform; a class to be, in Stalin's word, liquidated. This was accomplished by means of economic and social pressure, culminating in executions and deportations. Ukraine was especially hit by forced collectivization and the liquidation of the kulaks. This may be attributed to the special importance of agriculture in Ukraine, but was also related to a

desire on the part of the Soviet leadership to crush nationalist sentiments in Ukraine (see Conquest 1986, a standard source on this period).

The brutal climax of this policy was reached in 1932–33. Agricultural production was already reeling from the impact of forced collectivization when Stalin decreed a 40 percent increase in Ukraine's grain procurement quotas. These quotas were enforced with the help of troops and secret police. The quotas had to be fulfilled before farms could provide their peasant members with grain, and they were so high that there was insufficient grain for survival. Peasants caught hoarding or stealing grain were executed or deported; those who appeared reasonably well fed were accused of hoarding or stealing, with the same outcome. Estimates of the death-toll attributable to the resulting man-made famine, which also affected the northern Caucasus and lower Volga regions, range from 5 to 7 million in Ukraine and as many as 11 million in the Soviet Union as a whole (see, for example, the list of estimates and sources compiled by White 2005). The memory of Stalin's famine remains alive in Ukraine and goes some way toward explaining the great political sensitivity of agricultural policy issues in general and grain policy in particular.

Following World War II, Soviet agricultural production recovered and continued to grow through the 1960s. In the late 1960s, the Soviet leadership launched an initiative to boost the production and consumption of livestock products. Measured in tons of meat and liters of milk, this initiative was successful; however, it was also costly. As reflected in the data for Ukraine in table 5.1, Soviet agricultural production largely stagnated in the 1970s. Food imports had to increase significantly to keep total availability in line with the demand of a growing population. All manner of programs, laws, decrees, and regulations were implemented in an attempt to boost production. For example, during some phases, collective farms were fused into larger units; during others, they were divided up once more. Private agricultural production on household plots was sometimes given more leeway, sometimes less. However, at no time were the basic tenets of socialist agriculture called into question (Penkaitis 1995).

Mikhail Gorbachev, an agricultural economist, assumed responsibility for agriculture in the Central Committee in 1978. He introduced a new food program in 1982 that aimed at increasing production via so-called agricultural collective contracts that were designed to strengthen the links between performance and remuneration on collective farms (Swinnen and Rozelle 2006) and provided for administrative reform to improve coordination among the many different ministries and state committees responsible for agriculture in the Soviet Union. This program had no significant effect, and when Gorbachev became general secretary of the Communist Party in early 1985, he began to design further changes as part of his perestroika or restructuring reforms (Wädekin 1990b). In

late 1985, the Central Committee approved a reform that provided for the creation of new state committees for the agroindustrial complex (Gosagroprom) at the union and republic levels, into which the previously existing multitude of ministries and state committees were devolved.[2] This was accompanied by a reorganization of the planning and administrative structures at the oblast (region) and rayon (district) levels and some fitful attempts at decentralization.

Reforms that marked a true departure from central planning were added in April 1989. The Council of Ministers decision on the fundamental restructuring of economic relations and administration in the nation's agroindustrial complex called for new forms of decentralized, voluntary cooperation in and administration of agriculture. At the same time, a limited right to private production that had been established in 1987 was broadened considerably to include land leased not only from the collective farm in which one was a member, but also land leased from other collective farms or individuals (Penkaitis 1994). These reforms, reminiscent of Lenin's New Economic Policy of some 65 years earlier, made it possible to establish private family farms.

We can only speculate about what impact these reforms might have had and how they might have evolved. They indicate that there was growing awareness in the final years of the Soviet Union that central planning and socialist agriculture had reached an impasse.[3] As it happened, the fall of the Berlin Wall in late 1989 and the final dissolution of the Soviet Union in 1991 interrupted these reforms, which were too little and too late to improve Soviet agriculture significantly and which, to the end, remained highly dependent on support in the form of direct budget transfers and subsidized input prices. The total budgetary cost of agricultural subsidies in the final years of the Soviet Union is generally estimated at around 10 percent of total GDP, a crushing burden on the rest of the economy. As an indication of the extent of input subsidies, the ratio of international urea prices to domestic urea prices in Ukraine was 43 in January 1991; similar ratios for triple phosphate were 6.7, for potassium 20.1, for diesel fuel 34.5, for formula feed 7.1, and for grain combines 193.8 (World Bank 1995). Technically outdated, lacking modern management methods, and addicted to highly distortionary state support, Ukrainian agriculture was in no condition to face the challenges of transition.

The Extent of Distortions in Incentives in Agriculture since Independence

Methods and Data

In this section, the methodology outlined in the appendix is used to quantify the extent of direct and indirect distortions faced by domestic producers and consumers of agricultural products between 1992 and 2005.

An important point of departure for this analysis are the producer support estimate tables of the Organisation for Economic Co-operation and Development (OECD) for Ukraine and the data on domestic and border prices, marketing margins, and fiscal support for agriculture that they contain (OECD PSE-CSE Database 2007). We have checked the data and assumptions in the OECD tables and have found, with very few exceptions, that they are accurate and plausible. Where we have found discrepancies, discussions with OECD experts have invariably shown that these are due to open questions of interpretation.[4]

Data quality is an important issue in Ukraine. The official institutions that are entrusted with collecting data are often underfunded and understaffed; they are required to collect new types of data that were not important in the past or are inherently difficult to measure (for example, transactions in the shadow economy); and, in some cases, there is reason to suspect that they are subject to political pressure.[5] Private institutions have developed only slowly. Hence, important information is often of dubious quality or, with increasing frequency as one goes back in history, is not available at all.

We have made several modifications to the OECD data. First, we have updated the estimates of fiscal support to agriculture since 2000. Second, we account for the fact that Ukraine was a net importer of wheat in 2000 and 2003. The OECD uses free on board border prices for wheat in these years, although producers were receiving the equivalent of import parity prices (distorted by import tariffs and inflated marketing margins). As a result, we suspect that the OECD overestimates the extent of support for wheat in these years. Third, we have updated OECD tables to include 2004 and 2005. Finally, we have attempted to include potatoes in our calculations. Potatoes are produced almost exclusively on household plots and are not subject to significant direct policy intervention. However, they represent an important staple food in Ukraine and an important source of income for many rural households. Potatoes are grown on roughly 1.5 million to 1.6 million hectares in Ukraine (approximately 5 percent of the country's arable land), and production has averaged some 17.7 million tons per year since 1992 (table 5.1). However, as potatoes are not widely traded and qualities vary widely, finding suitable border prices is difficult, and the results must be interpreted with caution.

As outlined by Shick (2005), the producer support estimate calculations and the measurement of the distortions in agricultural incentives in general are difficult in transition countries. Three issues are of particular concern in the present context. First, because Ukraine is a net exporter of many important agricultural products (grains and oilseeds), export parity prices prevail, and border measures do not play an important role (except when there is an export tax as in the case of sunflower seeds). Hence, it is imperative to measure fiscal support accurately (budget transfers, payments based on input use, tax exemptions, and so on). Second, border

prices must be appropriately adjusted for quality and marketing margins so that they are directly comparable with domestic prices; otherwise, measures of support will be biased. This is made difficult by the fact that Ukraine maintains some Soviet-era product standards (for instance, grain grades) that differ from international standards. Third, domestic prices must be measured correctly as well.

Regarding fiscal support, the volumes of spending that we use (table 5.2) are larger than those recently produced by the World Bank (Zorya 2006) because we consider not only spending by the Ministry of Agriculture but also spending by other ministries that benefits agriculture. We do not include spending by regional authorities, but this is probably not an important omission in Ukraine, where regional authorities have limited fiscal resources.[6] The treatment of different types of tax expenditures is an important issue. Unlike Zorya (2006), we include estimated benefits from the fixed agricultural tax in our estimates of tax expenditures.

Regarding border prices, inflated marketing costs in Ukraine increase import parity prices and depress export parity prices.[7] For most grains and oilseeds in most years, Ukraine has been in a net export position; so, inflated marketing costs have been passed on to farmers in the form of depressed farmgate prices. Inflated marketing costs have also increased price volatility for wheat, which has alternated between net export and net import positions in recent years. It is debatable, however, whether inflated marketing costs should be considered a distortion. To the extent that they are due to inflated risk premiums charged by traders who are worried (justifiably) that they may be subject to harassment by policy makers (such as through regional bans on the movement of grain, difficulties in securing export value added tax refunds, or recent grain export quotas), these inflated costs are clearly policy distortions that may be eliminated at a stroke of the legislators' pens.[8] However, a portion of these inflated marketing costs is due to outdated and inefficient infrastructure (transportation, poor port facilities, and so on), a systemic legacy of the Soviet period (Liefert et al. 1996). This infrastructure would be in much better condition today if policy makers had created a better investment climate and not insisted on propping up inefficient state and parastatal marketing monopolies in the years since independence (Harley 1996). Hence, part of the legacy effect might reasonably be considered a distortion. However, determining which part would require an appropriate counterfactual (how low would marketing costs be if policy had not distorted in the past?).

Regarding domestic prices, we are concerned that the producer prices reported in official Ukrainian statistics may be biased. The authorities might inflate these prices in an attempt to paint a better picture of the situation in agriculture for political reasons; they might also attempt to correct for suspected (and likely) underreporting by farm managers to improve tax collection. We have compared

Table 5.2. Nominal Rates of Assistance and Fiscal Support for Agriculture, Ukraine, 1992 to 2005

Indicator	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
NRAs for importables (%)														
Sugar	11.5	4.3	3.4	−48.5	181.4	21.0	−0.9	−0.1	14.9	27.7	42.8	63.2	28.6	73.9
Poultry	−48.4	6.0	14.6	−14.9	−1.4	45.4	69.9	0.2	53.1	43.9	93.8	66.2	58.9	95.3
NRAs for exportables (%)														
Wheat	−68.3	−34.1	75.2	−34.0	−45.2	103.8	16.1	−16.4	−43.1	−1.7	−9.3	−38.1	−21.4	−17.3
Maize	−19.4	76.0	44.6	−23.6	−8.6	−23.3	−15.8	9.1	−20.2	−5.6	−5.9	14.4	−25.0	−2.9
Rye	−40.0	8.5	161.3	49.3	30.4	8.4	17.7	40.8	11.5	37.2	−4.1	16.9	2.3	23.4
Barley	−59.3	27.9	16.7	−26.6	−8.2	−5.2	13.9	−21.4	−14.3	−18.0	−20.4	9.1	−9.9	−13.2
Oats	−61.1	−6.3	415.6	154.5	34.0	27.2	−23.2	43.1	39.8	11.6	3.1	83.9	11.9	69.4
Oilseeds	−46.7	15.4	12.7	−27.9	−21.4	−22.3	−31.5	−32.7	−28.9	4.8	−34.0	−24.6	−9.5	−19.4
Milk	−48.8	8.5	−33.8	−47.9	−35.9	−7.2	−3.5	−30.0	−35.1	−30.4	−31.8	−19.1	−17.2	3.5
Beef and veal	−18.9	40.8	−18.6	−48.8	−15.3	11.2	−14.4	−13.4	6.8	6.3	−7.5	10.1	−16.6	20.7
Pig meat	−63.4	−42.5	−36.0	−50.9	1.1	−9.4	36.9	16.5	1.0	38.7	12.8	−29.7	−5.6	48.2
Eggs	−40.1	−9.0	11.7	9.3	92.0	75.2	88.4	42.1	−8.7	−7.1	−30.2	−47.2	−38.0	−20.9
NRAs for nontradables (%)														
Potatoes	0.0	0.0	0.0	0.0	−3.4	−57.1	−75.5	−65.1	−56.8	−46.1	20.7	10.0	−20.0	−19.9
Aggregate NRAs (%)														
Importables	−22.1	4.8	6.1	−42.4	81.9	29.4	21.1	0.1	−27.3	34.6	64.1	4.0	43.4	86.6
Exportables	−49.8	−0.7	−6.7	−38.8	−23.1	8.9	5.3	−15.1	−17.2	−6.7	−18.2	−13.9	−17.9	−2.4
Nontradables	0.0	0.0	0.0	0.0	−3.4	−57.1	−75.5	−65.1	−56.8	−46.1	20.7	10.0	−20.0	−19.9
Weighted average	−47.5	0.1	−4.9	−39.4	−16.2	10.9	6.7	−13.8	−20.0	−3.8	−13.8	−11.4	−14.3	3.8
Standard deviation	25.5	30.3	129.3	62.7	66.5	42.4	42.5	33.8	33.6	27.7	37.9	44.9	26.4	42.3
Share of above products in gross value of agricultural production[a] (%)	64	74	66	57	82	84	82	82	78	74	67	75	68	72
Fiscal support for agriculture (Hrv million)														
Budget expenditure	5.4	81.4	1,086.5	8,999.7	1,269.1	872.5	943.2	935.1	1,035.7	1,741.5	1,473.1	2,827.8	3,250.5	4,379.1
Tax expenditure	0.01	0.06	232.6	696.5	501.6	774.3	1,261.8	2,768.0	1,771.0	1,941.0	3,349.7	3,424.6	3,563.7	5,677.7
Total fiscal support[b]	5.4	81.5	1,319.2	1,596.3	1,770.0	1,646.8	2,205.0	3,703.1	2,806.7	3,682.5	4,835.9	6,570.3	6,999.0	10,271.3
Fiscal support/GDP (%)	10.7	5.5	11.0	2.9	2.2	1.8	2.1	2.8	1.6	1.8	2.1	2.5	2.0	2.3

Sources: Nominal rates of assistance (NRAs): author calculations using the methodology outlined in the appendix. Fiscal support for agriculture, 1992–2001: World Bank and OECD 2004. Fiscal support for agriculture 2002–05: author calculations using data of the Ministry of Finance and budget laws.

a. Calculated at undistorted prices.

b. Includes expenditure on intervention measures (mainly grain), as well as expenditure on the agricultural machinery leasing program by the state enterprise Ukragroleasing in 2002–04.

official producer prices with detailed sets of prices reported by a large sample of individual farms (over 5,000 observations) and found that official prices typically overestimate. A case in point is wheat prices in 2003. According to official statistics, the average producer price for wheat was Hrv 635 a ton in 2003. However, the average of the individual producer prices in our sample is Hrv 605 a ton.[9] To the degree that this is a systematic problem, the estimates presented below will tend to overestimate the support provided to farmers in Ukraine.

Finally, it is important to note that aggregate measures will average away what might be significant differences in the support and distortions felt by individual farmers. Zorya (2006) shows that almost 75 percent of the production subsidies provided to livestock producers in Ukraine in 2004 accrued to only 7.2 percent of the livestock-producing agricultural enterprises in the country. Nivyevskiy (2007) demonstrate that, in 2005, 14.7 percent of the dairy farms in Ukraine, which accounted for 56.2 percent of the country's milk production, received 64.7 percent of the subsidies provided to milk producers. Moreover, different types of producers receive different average prices for agricultural commodities. For example, according to official statistics, large farm enterprises received, on average, Hrv 535 per ton for grains, Hrv 140 per tons for sugar beets, and Hrv 3,481 per ton for beef in 2003; corresponding prices for household plots were Hrv 495, Hrv 157, and Hrv 2,394 per ton. Finally, there are significant differences in the prices received by farmers in different regions. For example, according to official data, average producer prices for grain varied from as low as Hrv 330 a ton in eastern and southern oblasts to over Hrv 480 a ton in northern and western oblasts in each of the 2001/02 and 2002/03 marketing years. While regional differences in the types and qualities of grains produced may explain some of this variation, the evidence suggests that, in both of these years, while Ukraine as a whole was a net exporter of grain, parts of western Ukraine were importing grain from neighbors with grain surpluses such as Hungary and Romania. Hence, a given positive support estimate might mask the fact that some producers receive assistance, while others are taxed.

In summary, it bears repeating that much data on agriculture in Ukraine are of dubious quality, especially data from the early years of transition when exchange rates and inflation were volatile (see table 5.1). Estimates of support produced using these data must therefore be interpreted with caution. While we are confident that the estimates reported hereafter capture key trends and patterns, it would be dangerous to depend heavily on year-to-year point estimates.

Two further issues deserve mention. First, we make no attempt to account for exchange rate distortions because it has proved difficult to find a consistent methodology that may be applied to all countries and, especially, the transition countries, with their short and sometimes questionable time series data (see Sandri,

Valenzuela, and Anderson 2007). In the early years of transition in Ukraine, traders were subject to some restrictions on the use of foreign currency. However, these restrictions were applied in an uneven and opaque manner. In a thorough analysis of real exchange rate distortions in Ukraine between 1996 and 2001, Zorya (2003) estimates that the real exchange rate of the hryvnia was overvalued by 15–20 percent in 1996–98 until devaluation triggered by the financial crisis in late 1998 effected a major correction. The resulting taxation of tradable goods production represents a significant distortion of agricultural incentives that must be kept in mind when one considers the results presented hereafter.[10]

Second, to complement the support estimates presented here, detailed tariff estimates for the individual agricultural products covered in the nominal rate of assistance (NRA) calculations and for the big-5 aggregate groups of products—primary agriculture, processed food, nonagricultural food, other primary, and manufactures—have been prepared using the sources and methodology described in the appendix for the years 1993–2004. The results for the big-5 aggregates are presented in table 5.3 (and the corresponding results for 26 disaggregated agricultural products are presented in von Cramon-Taubadel et al. 2007). We have also calculated indexes of the intensity of nontariff measures as outlined in Movchan (2004a) for individual agricultural products and the big-5 aggregates over 1993–2004. The calculations, described in the appendix, are based on an inventory of 17 different types of nontariff measures. Of course, not all nontariff measures represent distortions; some—for example, sanitary and phytosanitary controls—may be seen as attempts to address legitimate producer and consumer safety concerns.

Results

Estimates of the NRA for agricultural and nonagricultural sectors from 1992 to 2005 are presented in tables 5.2 and 5.4, and the corresponding figures 5.2 and 5.3 present NRAs for major agricultural and nonagricultural aggregates. Again, estimates of support in the early 1990s must be treated with special caution because hyperinflation in these years make price and exchange rates difficult to grasp and compare.

Over the period between 1992 and 2005, the NRAs for agricultural products tended to climb, although there is considerable variation across products and time. After the collapse of the Soviet system in the early 1990s, Ukraine's NRA among agricultural producers fell to almost −50 percent (in 1992). It fluctuated around an increasing trend through the 1990s before settling at roughly −10 to −15 percent in the first years of the 2000s. Fiscal support has risen in recent years, and a positive NRA, the first since 1998, was estimated for 2005.

Table 5.3. Sectoral Tariffs and Nontariff Indicators, Ukraine, 1993 to 2004
(percent)

Indicator	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Simple average most favored nation tariffs												
Primary agriculture	7.8	7.3	7.2	9.7	22.9	24.2	28.7	24.8	29.3	30.6	49.8	51.2
Processed food	8.8	12.7	12.7	22.8	39.0	47.1	56.7	55.5	66.0	65.0	88.4	90.6
Nonagricultural food	8.5	10.8	10.7	18.1	33.2	38.8	46.6	44.4	52.8	52.6	74.5	76.4
Other primary	5.7	5.4	5.4	6.7	15.6	17.3	19.3	16.1	19.8	20.1	27.1	28.4
Manufactures	6.9	5.9	5.8	6.1	7.2	7.7	9.9	9.4	7.6	7.5	8.4	8.5
Weighted average most favored nation tariffs												
Primary agriculture	15.9	4.2	3.7	4.3	13.0	10.6	8.0	10.2	22.1	25.5	15.4	13.0
Processed food	10.4	16.2	16.2	27.0	49.5	46.7	55.3	45.9	51.4	57.9	73.8	62.5
Nonagricultural food	12.1	12.4	12.2	19.9	38.0	35.3	40.4	34.7	42.2	47.7	55.4	46.9
Other primary	2.8	0.4	0.4	7.8	8.6	8.4	1.1	0.9	1.5	1.6	1.2	1.1
Manufactures	6.4	4.1	4.1	4.0	5.9	6.1	8.4	8.0	7.3	7.3	7.6	7.5
Simple average full tariffs												
Primary agriculture	13.1	15.2	15.6	17.8	24.8	46.3	54.9	46.1	53.2	56.9	96.8	99.9
Processed food	16.8	36.0	36.0	48.5	42.8	91.3	96.0	97.9	115.1	113.2	147.2	150.0
Nonagricultural food	15.5	28.5	28.6	37.4	36.3	75.1	81.1	79.2	92.8	92.9	129.0	132.0
Other primary	10.4	11.7	11.8	13.2	18.4	31.4	34.8	27.6	36.2	37.3	51.2	53.4
Manufactures	12.5	14.0	13.9	15.0	14.4	15.0	16.6	16.7	17.3	17.2	18.2	18.3
Weighted average full tariffs												
Primary agriculture	26.6	28.5	29.1	29.5	32.4	39.2	11.1	14.0	26.5	29.6	21.7	20.4
Processed food	19.5	48.8	48.8	60.4	60.5	94.3	78.5	63.0	70.2	78.0	96.9	84.8
Nonagricultural food	21.8	42.4	42.6	50.6	51.6	76.9	57.2	47.6	56.4	62.8	73.2	64.5
Other primary	6.3	4.7	2.3	9.7	10.1	10.6	4.6	4.1	4.9	5.1	4.6	4.6
Manufactures	11.9	12.6	12.6	13.6	13.7	13.6	15.7	15.9	15.6	15.6	16.0	15.9

(*Table continues on the following page.*)

Table 5.3. (continued)

Indicator	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Simple average aggregate tariffs												
Primary agriculture	8.5	8.6	8.6	10.9	21.8	27.6	32.7	28.0	32.8	34.5	57.1	58.9
Processed food	7.4	12.4	12.4	20.0	28.4	39.9	46.0	45.6	54.1	53.2	71.4	73.1
Nonagricultural food	7.8	11.4	11.4	17.4	26.5	36.5	42.3	40.6	48.1	47.9	67.5	69.2
Other primary	0.8	0.8	0.8	1.0	1.7	2.4	2.6	2.1	2.7	2.8	3.8	4.0
Manufactures	5.2	4.6	4.5	4.7	5.5	5.8	7.3	7.0	5.9	5.8	6.4	6.5
Weighted average aggregate tariffs												
Primary agriculture	17.2	9.5	9.2	9.8	16.6	16.4	8.2	10.4	21.6	24.7	15.7	13.8
Processed food	8.7	16.2	16.2	24.0	36.8	40.1	42.7	35.1	39.3	44.1	55.9	47.7
Nonagricultural food	11.1	14.8	14.7	20.8	32.0	34.7	34.4	29.3	35.4	39.8	46.3	39.6
Other primary	0.4	0.2	0.0	0.9	1.0	1.0	0.3	0.2	0.3	0.3	0.3	0.3
Manufactures	4.8	3.4	2.7	3.3	4.6	4.7	6.3	6.1	5.6	5.6	5.8	5.8
Nontariff measures intensity index												
Primary agriculture	12.0	17.1	17.1	23.7	23.7	23.7	24.0	24.5	18.4	18.1	19.6	28.2
Processed food	9.8	15.7	15.7	23.5	24.2	25.8	30.0	30.0	23.7	23.8	25.9	32.2
Nonagricultural food	10.4	16.1	16.1	23.6	24.0	25.2	28.4	28.5	22.3	22.5	24.4	31.3
Other primary	10.7	14.9	14.9	22.2	22.2	22.1	24.3	24.7	18.7	18.8	20.8	26.0
Manufactures	6.2	7.0	7.5	14.7	14.8	15.3	16.2	16.3	10.6	11.0	12.4	12.9

Source: Based on von Cramon-Taubadel et al. 2007.

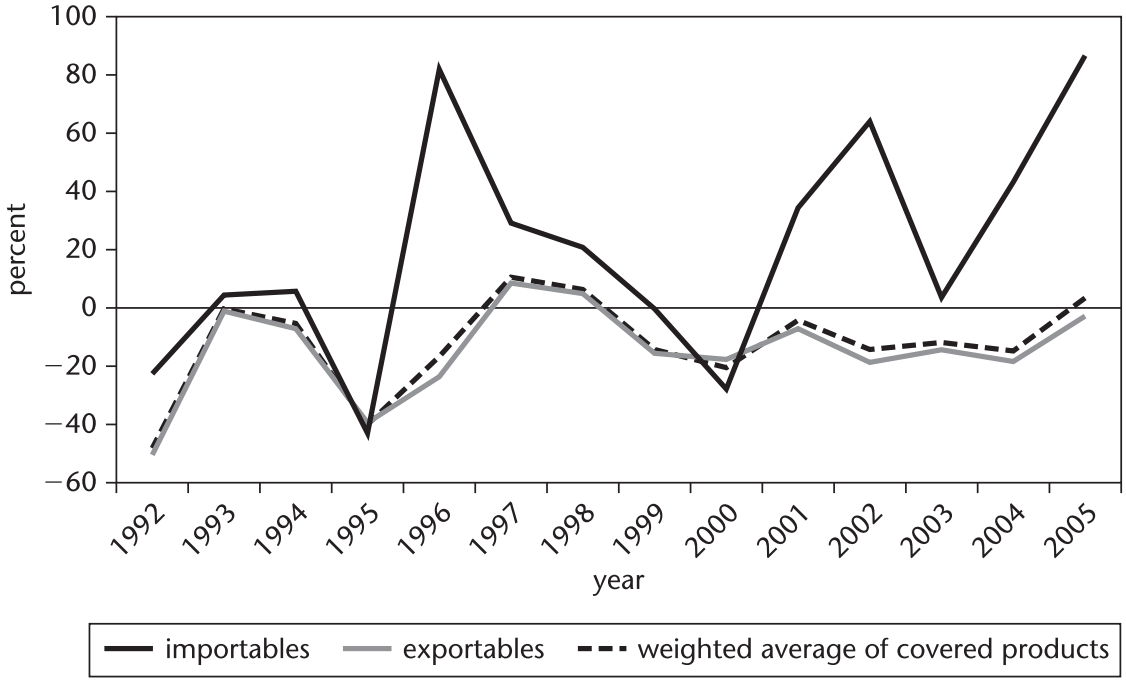
Table 5.4. NRAs for Agricultural and Nonagricultural Products, Ukraine, 1992 to 2005
(percent)

Product or indicator	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Covered products	−47.5	0.1	−4.9	−39.4	−16.2	10.9	6.7	−13.8	−20.0	−3.8	−13.8	−11.4	−14.3	3.8
Products not covered	−47.5	0.1	−4.9	−39.4	−16.2	10.9	6.7	−13.8	−20.0	−3.8	−13.8	−11.4	−14.3	3.8
All agricultural products	−47.5	0.1	−4.9	−39.4	−16.2	10.9	6.7	−13.8	−20.0	−3.8	−13.8	−11.4	−14.3	3.8
Non-product-specific input assistance	2.42	0.95	2.83	1.72	2.98	2.58	2.67	2.11	0.85	1.01	1.18	1.21	1.69	2.49
Total agriculture, including non-product-specific input assistance[a]	−45.5	1.0	−2.2	−38.0	−13.3	13.5	9.4	−11.8	−19.2	−2.8	−12.7	−10.2	−12.7	6.3
Importables	−22.1	4.8	6.1	−42.4	81.9	29.4	21.1	0.1	−27.3	34.6	64.1	4.0	43.4	86.6
Exportables	−49.8	−0.7	−6.7	−38.8	−23.1	8.9	5.3	−15.1	−17.2	−6.7	−18.2	−13.9	−17.9	−2.4
Nontradables	0.0	0.0	0.0	0.0	−3.4	−57.1	−75.5	−65.1	−56.8	−46.1	20.7	10.0	−20.0	−19.9
All agricultural tradables	−45.5	1.0	−2.2	−38.0	−13.3	13.5	9.5	−11.7	−19.1	−2.8	−12.7	−10.2	−12.7	6.3
All nonagricultural tradables	3.2	2.5	2.1	1.6	1.9	2.5	2.7	3.8	3.6	3.4	3.4	3.4	3.5	3.3
Relative rate of assistance[b]	−47.2	−1.4	−4.2	−39.0	−14.9	10.7	6.7	−14.9	−22.0	−6.1	−15.6	−13.2	−15.6	2.9

Source: Author calculations using the methodology outlined in the appendix.

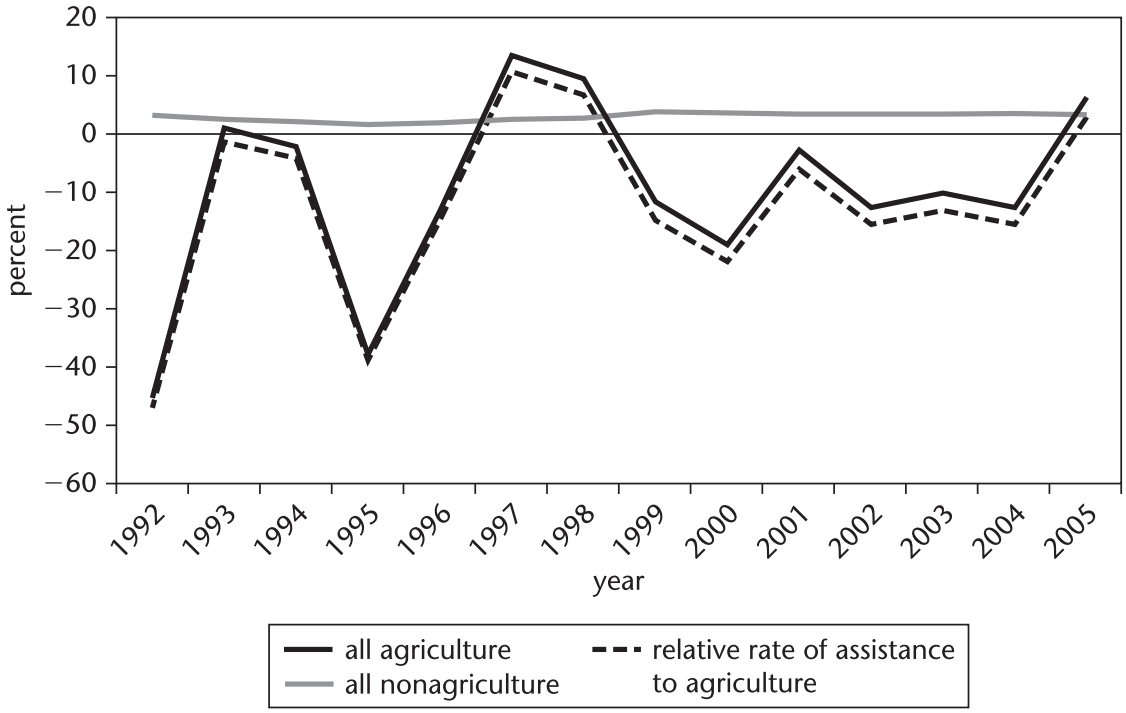
a. NRA including product-specific, decoupled, and non-product-specific subsidies.
b. The relative rate of assistance = [the ratio of (1 + NRA) for agricultural tradables to (1 + NRA) for nonagricultural tradables] − 1, in percentage terms.

Figure 5.2. NRAs in Agriculture, Ukraine, 1992 to 2005



Source: Derived from table 5.2.

Figure 5.3. NRAs in Agriculture and Nonagriculture and the Relative Rate of Assistance, Ukraine, 1992 to 2005



Source: Derived from table 5.4.

Exported agricultural products tend to be taxed, while imports tend to receive support. Important exceptions to this pattern may be observed in 2000 and 2003, when importables were taxed as well. This may largely be attributed to the impact of net import situations for wheat in those years that led to various measures to depress wheat prices and, by extension, bread prices, which are politically highly sensitive in Ukraine. Overall, because export products play a considerably larger role in Ukrainian agricultural production than do import products, the net taxation of exports dominates, and the weighted average NRA for agriculture is negative.

Fluctuations in NRAs over time may be attributed to a number of sources besides measurement error and noise. One is policy, which has been highly variable (see elsewhere below). Another is the unstable macroeconomic environment within which Ukrainian agriculture has operated. Hyperinflation in 1993–94, for example, meant that farms could repay budget loans received early in the year to finance seeding at extremely low rates at the end of the year; in effect, the loans were grants. Fluctuations in production—for example, the poor grain harvests in 2000 and 2003 mentioned above—are a further source of instability.

Tax equivalents on the purchased farm inputs used by agricultural producers in Ukraine are presented in table 5.5. For the most part, these have been positive, reflecting the taxation of agriculture, for example, arising from import tariffs on key inputs such as seeds and agrochemicals. These tax equivalents have fluctuated less than the corresponding NRAs. The sharp dip in 1994 is likely related to hyperinflation in that year, which makes it difficult to match cost and revenue streams that are staggered over time. Furthermore, input taxes have followed a clear downward trend, reaching an aggregate effective level of zero in 2005 as growing input subsidies in recent years increasingly offset tariffs on inputs, tariffs that themselves declined significantly in 2005 as legislation related to the requirements of the World Trade Organization (WTO) was adopted. As with the NRAs, there is a clear distinction between import and export products. High taxes on inputs for sugar beet and potato producers reflect high tariffs on sugar beets, potato seeds, and special machinery (Nivyevskiy and Strubenhoff 2006).

Overall, the tariffs for agricultural and processed food products have increased since the early 1990s and are significantly higher than the tariffs for other primary products and manufactures (table 5.3). Agricultural tariffs are especially high for livestock products, sugar, and processed oilseed products and comparatively low for the main export crops (wheat, barley, and sunflower seeds). Some tariff reductions were introduced in 2005 to prepare the way for WTO accession (see elsewhere below). The intensity of the use of nontariff measures has increased for all aggregates and most individual products over time. Of the big-5 aggregates, manufactures have the lowest nontariff measure index values. There are no striking differences among the indexes for individual agricultural products.

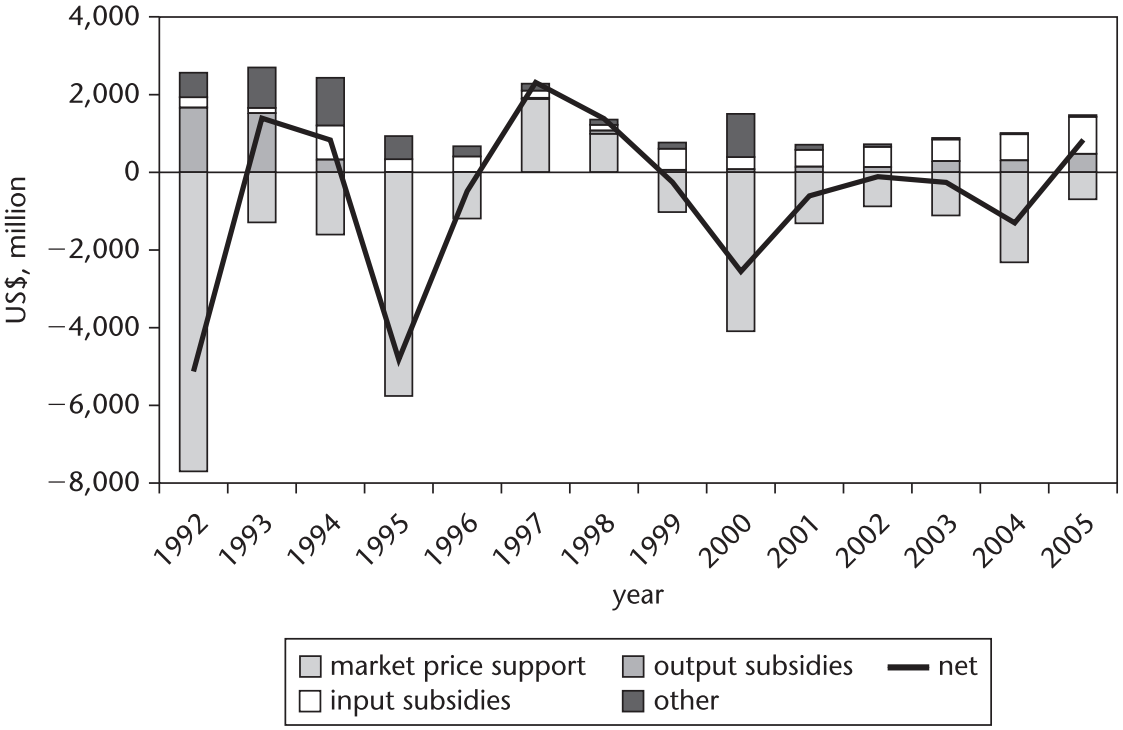
Table 5.5. Tax Equivalents on Prices for Inputs in Agricultural Production, Ukraine, 1992 to 2005
(percent)

Indicator	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Tax on inputs for importables														
Sugar	12.9	15.1	12.5	15.1	8.9	15.2	15.2	7.7	11.6	8.4	5.3	4.0	7.2	1.3
Poultry	5.9	6.3	3.5	5.3	4.6	5.4	5.0	2.3	2.1	3.0	−0.1	0.8	1.2	−3.1
Tax on inputs for exportables														
Wheat	5.0	5.5	−32.1	0.2	2.6	0.4	2.9	−1.3	3.9	0.6	−0.6	−2.7	0.9	−0.2
Maize	3.6	4.4	−8.3	3.6	2.8	5.1	3.7	−3.4	3.1	0.8	−0.8	−9.1	1.4	−1.8
Rye	4.2	5.0	−44.3	−6.8	−1.8	1.9	2.8	−6.1	1.9	−1.2	−0.9	−9.4	−1.5	−5.0
Barley	5.5	5.6	−11.5	3.5	3.2	5.5	3.6	−0.2	3.6	2.0	0.8	−7.8	0.1	0.3
Oats	5.2	5.6	−55.8	−2.9	1.8	4.5	4.3	−5.8	1.3	0.4	−0.9	−17.2	−2.3	−7.6
Oilseeds	5.1	5.4	−6.7	5.1	4.3	5.8	4.6	0.5	3.8	0.7	1.4	0.8	1.7	0.7
Milk	5.9	6.5	5.2	6.0	5.5	6.0	6.0	3.8	5.0	5.4	4.5	3.6	3.6	0.4
Beef and veal	5.5	6.3	4.7	6.1	4.9	5.8	6.2	3.1	3.7	4.3	3.7	2.7	3.9	−0.1
Pig meat	6.2	6.8	5.1	6.1	4.5	6.1	5.5	1.6	3.8	3.1	2.8	4.0	3.3	−1.2
Eggs	5.2	6.3	3.5	4.8	2.1	5.0	4.8	−3.8	4.1	4.5	4.3	4.5	4.3	1.3
Tax on inputs for nontradables														
Potatoes	0.0	0.0	0.0	0.0	13.3	13.3	13.3	13.3	5.3	8.5	3.6	4.5	8.6	3.3
Aggregate tax equivalents on purchased farm inputs														
Importables	10.2	12.8	10.0	12.3	7.6	11.2	10.6	5.1	5.0	5.8	2.6	0.4	3.9	−1.5
Exportables	5.4	6.0	−7.5	4.5	4.0	4.5	5.0	1.2	4.0	2.8	2.1	−0.2	2.3	0.0
Nontradables	0.0	0.0	0.0	0.0	13.3	13.3	13.3	13.3	5.3	8.5	3.6	4.5	8.6	3.3
Weighted average[a]	5.9	6.9	−5.2	5.5	4.5	5.2	5.6	1.6	4.2	3.1	2.2	−0.1	2.4	−0.2

Source: Author calculations using the methodology outlined in the appendix.

a. Weights based on values at undistorted prices.

Figure 5.4. The Composition of Farm Producer Support, Ukraine, 1992 to 2005



Source: Author calculations using OECD PSE-CSE Database 2007 and fiscal support data in table 5.2.

Figure 5.4 breaks the aggregate support for agricultural producers in Ukraine between 1992 and 2005 into market price support, input subsidies, output subsidies, and other support. The breakdown is based on OECD PSE calculations in millions of U.S. dollars. Since the underlying data are very similar, net support in figure 5.4 follows the same 1992–2005 trend as the aggregate NRAs for agriculture in figures 5.2 and 5.3. Market price support has been negative in most years, and other forms of support have generally not been sufficient to compensate. The reduction in input and output subsidies and other transfers in the early 1990s is clearly visible, as is the recent reemergence of budget support in the form of output and input subsidies. The high value of other subsidies reported for 2000 results primarily from significant debt write-offs that occurred in that year. Market price support has fluctuated considerably, reflecting unstable policies, fluctuations in world market prices that are not being transmitted fully to domestic markets, and terms-of-trade effects arising as Ukraine has alternated between net import and net export positions for key agricultural commodities such as wheat. The general trend toward more support for agriculture since economic (and agricultural) growth resumed in 2000 is confirmed because input (mainly credit) and output subsidies have increased steadily. Not yet available, data for 2006 and 2007 would presumably reveal a jump in negative market price support

because of the impact of grain export quotas (discussed below) and an additional increase in various forms of fiscal support.

Largely paralleling the changes in the support for farmers are changes in the consumer tax equivalent (CTE) on food consumption. Unless otherwise offset by a direct consumption subsidy, a tax or quota on trade alters consumer incentives to the same degree as it alters producer incentives. Hence, the CTEs on numerous foods have been negative in the past. In recent years, however, CTEs have been positive and high for sugar, pig meat, poultry, and eggs, while still negative for feed grains and oilseeds that are used in the livestock industry (table 5.6), that is, effective protection for livestock is boosted by these artificially low purchase prices for animal feedstuffs.

In the above calculations of assistance and taxation, note that energy subsidies provided to farm enterprises have been accounted for (primarily on the use of diesel fuel). However, an additional indirect subsidy may be seen in the fact that, over the years, Ukraine has been able to import energy, primarily from Russia, at prices often considerably below corresponding world market levels.[11] Much of Russia's natural gas exports to Western Europe flow through pipelines in Ukraine, and gas pricing between Russia and Ukraine is a complicated mix of negotiated prices, compensation for gas transit, and tolerated nonpayment or siphoning of gas by Ukraine. In early 2006, energy relations between Russia and Ukraine came to a head over the issue of nonpayment and siphoning, and a new (equally opaque) pricing arrangement was reached whereby prices are increasing, but are low by world market standards (Pavel and Poltavets 2006). However, natural gas is not a significant direct input into agricultural production in Ukraine. It is used, in particular, for electricity generation, and it may influence agriculture, especially via nitrogen fertilizer prices. Because fertilizer use in Ukraine is low, this effect is likely small. Hence, we are confident that cheap energy imports from Russia do not have a major impact on agricultural distortions in Ukraine.[12]

The Evolution of Policies and Distortions Affecting Agricultural Incentives

Four main phases of agricultural policy in Ukraine since independence may be identified. These phases divide the years since independence into the following periods: 1991–94, 1995–98, 1999–2000, and 2001 to date.

Phase I: 1991–94

In the years between independence and 1994, few market reforms were undertaken. Most key elements of the Soviet system (state procurement of key agricultural products; state provision of inputs; administrative control of product flows,

Table 5.6. CTEs for Various Foods, Ukraine, 1992 to 2005
(percent)

Food	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Wheat	−54	−21	22	−24	−26	49	11	−12	13	−1	−6	41	2	0
Maize	−9	21	10	−4	−5	−3	−9	1	−1	−2	−3	1	−16	−3
Barley	−24	5	1	−10	−2	0	8	−10	−5	−7	−10	1	−5	−6
Oats	−44	0	56	37	12	15	−11	11	11	5	1	20	1	8
Rye	−41	13	55	32	−4	23	28	−24	65	6	−26	13	6	−14
Sunflower seeds	−54	21	6	−23	−17	−17	−27	−32	−25	6	−33	−24	−9	−17
Sugar	2	19	16	−33	190	36	14	8	26	36	48	68	47	55
Beef and veal	−47	2	−22	−43	−10	16	−11	−14	7	5	−17	−24	−12	8
Pig meat	−67	−44	−32	−45	6	−4	31	8	−4	30	−2	−31	1	55
Poultry	−56	−3	16	−10	3	50	75	3	54	45	74	50	90	80
Eggs	−35	−3	15	14	94	80	93	38	−5	7	−19	−39	−3	24
Milk	−60	−17	−36	−42	−40	−7	−14	−15	−11	−18	−27	−17	−16	−11
Weighted average[a]	−54	−10	−10	−33	−13	13	7	−7	1	3	−12	−7	−3	8

Source: Author calculations using OECD PSE-CSE Database 2007.

Note: The table is based on the negative of the OECD consumer support estimate expressed as a percentage of undistorted prices.

a. The weights are based on the value the consumption of the listed products would represent if prices were undistorted.

prices and margins) were maintained. Senior agricultural policy makers, whose terms in office rarely lasted more than one or two years, tended to be members of a conservative old guard with backgrounds in agricultural production (such as zoo technicians and veterinarians) or bookkeeping. In 1992, the kolkhozes (collective farms) and sovkhozes (state farms) were transformed into so-called collective agricultural enterprises. This largely formal change led to little real restructuring in the farm sector. Input supply and food processing remained firmly in state hands. In 1991, a law made private farming possible. By 1994, 32,000 private farms had emerged. This number increased to roughly 43,000 by 2002. However, the private farms were small (with an average size of under 30 hectares in the 1990s, increasing to 66 hectares in 2002) and have been shown to be much less potent as a force shaping agricultural policy than the roughly 12,000 collective agricultural enterprises and their successor enterprises.

In the gold rush years following independence, some individuals and enterprises made large profits by purchasing agricultural products, such as grain and livestock, at low prices and selling them on world markets for considerably more. In 1992, according to Åslund (1999), roughly 40 percent of Ukraine's exports consisted of commodities, the prices of which were, because of the ongoing regulation of domestic markets, an average of roughly 10 percent of corresponding world market prices. Hence, rents of roughly US$4.1 billion, or 20 percent of Ukrainian GDP in 1992, accrued to a handful of individuals who had access to goods and export opportunities. Policy makers responded with a flurry of administrative measures designed to stem such exports (or redirect the proceeds), including, in 1993, export quotas and licensing. Significant rents were also distributed in the form of budget subsidies, including those to agriculture, and subsidized credits to enterprises. In 1993, when inflation exceeded 4,700 percent, state credits were granted at 20 percent rates of interest and, thus, essentially represented gifts to those who could quickly convert them into currency or tradable commodities. Here, too, the lines between private and public enterprise were often blurred.

Altogether, policy followed a very conservative course in this first phase, largely maintaining Soviet-style ownership structures, budget transfers, and the state regulation of markets. Farms continued to receive Soviet-level support in the form of direct budget transfers, low interest loans that were often rolled over or forgiven, and subsidized inputs. This slow pace of reform was not unique to agriculture, but rather common to all sectors. Furthermore, it was accompanied by (and, as Zorya 2003 demonstrates, contributed to) misguided macroeconomic policies, particularly the use of the printing press to finance burgeoning fiscal deficits. Coupled with a collapse of interrepublican Soviet trade, the result was significant macroeconomic destabilization, as outlined above.

As displayed in figure 5.1 and table 5.1, agricultural production and, especially, livestock production also declined dramatically in this first phase of agricultural development following independence, albeit at a slower rate than production in the rest of the economy. The reduction of subsidies led to a rapid increase in input prices and a corresponding deterioration in agriculture's terms of trade. As a result, input use and yields fell dramatically; between 1990 and 1996, mineral fertilizer applications fell from an average of 102.5 to 12.5 kilograms nitrogen equivalent per hectare, while average grain yields fell from 3.2 tons per hectare in 1988/90 to 2.3 tons per hectare in 1994/96 (Spaar and Schuhmann 2000; see also World Bank and OECD 2004). As the economy imploded, agriculture absorbed the labor shed during the contraction of industrial production, and subsistence production of food on household plots became the only feasible survival strategy for many Ukrainians. Household production therefore remained more or less constant through 1994.

Phase II: 1995–98

Following Leonid Kuchma's first election as president in late 1994, several promising reforms were implemented. These were mainly directed at achieving macroeconomic stabilization by reducing fiscal deficits and the related financing via monetary expansion. As a result of these efforts, budgetary transfers to agriculture in Ukraine contracted sharply after 1994, from as much as 11 percent to roughly 2 percent of GDP (table 5.2). A number of policy reforms specific to agriculture were also undertaken early in this phase; in late 1994, a legal basis for the distribution of land shares to collective agricultural enterprise members was created, and, by 1996, most quotas and licensing restrictions on agricultural exports had been eliminated.

Following this promising start, however, agricultural reforms lost momentum, and the years from 1996 to 1998 may accurately be described as wasted. The collective agricultural enterprises proved to be little more than the old kolkhozes and sovkhozes under new names. While members theoretically had rights to their individual land shares, they had few practical means of exercising these rights because the sale and rental of land were forbidden, and individual land parcels were not demarcated.

In the food processing industry, a privatization mechanism that gave supplying farms and the state 51 percent and 25 percent shares, respectively, with the rest going to employees and open sales, was introduced in 1996. In so-called strategic areas (for example, grain marketing), however, the state's share was often larger, and key enterprises were frequently exempted from privatization. As a result, much of the food processing and marketing sector remained monopolistic and inefficient. For key agricultural export products (for instance, grain and oilseeds),

inefficient processing and marketing (that is, transportation and storage) translated directly into depressed farmgate prices. It has been estimated that, in 1999, inefficient grain marketing structures were leaving Ukrainian farmers with only roughly 40 percent of the free on board export price, compared with 70 percent in the case of Germany, for example (von Cramon-Taubadel 2005).

In the area of trade policy, the elimination of quotas and licensing restrictions led to little effective liberalization (von Cramon-Taubadel and Koester 1998). Trade controls are valves that make it possible to channel trade flows and any associated rents. While export quotas and licenses were eliminated to comply with International Monetary Fund and World Bank conditionality in 1996, those who had benefited from these restrictions quickly developed alternatives. For example, so-called indicative and recommended prices (minimum export prices) were implemented for many products. Even if these were not officially binding, local customs officials could, depending on who was asking, insist on their application. To avoid costly delays, traders either had to resolve disputes locally with the customs officials in question, or they had to cultivate high-ranking contacts in Kyiv who might facilitate transactions.

Beginning with the 1996 harvest, a further valve was installed. Some oblast authorities declared bans on grain exports, ostensibly to secure payment for inputs that had been delivered in the spring and for tax debts. While these regional authorities had no right to impose such bans, the response of the central government in Kyiv was ambiguous; repeated statements that such bans were illegal were coupled with references to the need to keep the state reserves supplied and to collect taxes and debts. In each of the following three years (1997–99), regional export bans and confiscations of grain and oilseeds were employed in a similar manner, and, in each year, the same excuses were used to justify them.

Under these conditions, private input suppliers found themselves unable to secure payment for their deliveries (foreign agricultural chemical firms had accumulated receivables of roughly US$200 million by late 1999), and private input supply stagnated at low levels (World Bank and OECD 2004). Together with the government's inability to supply the right inputs at the right time to the right farms and the low farmgate prices mentioned above, this caused a rapid decline in crop production in Ukraine in the second half of the 1990s. Livestock production also continued to contract, and, by 1999, agricultural output had fallen to 50 percent of its level before independence. Household production (which accounted for 99 percent of the potato, 89 percent of the vegetable and fruit, 82 percent of the milk, and 69 percent of the meat production in Ukraine in 2004) remained more or less constant, but production among the collective agricultural enterprises (which accounted for over three-quarters of the grain, oilseed, and sugar beet production in 2004) fell by more than 70 percent in the 1990s (table 5.1 and figure 5.1).[13]

Altogether, this second phase of agricultural policy developments was characterized by an imbalance between macroeconomic and sectoral reforms. While a semblance of macroeconomic stability was regained in the mid-1990s as inflation rates dropped and economic contraction decelerated (table 5.1), macroeconomic reforms were not supported by structural reforms in agriculture and other sectors. Hence, macroeconomic stability formed a thin crust over a rotten core. The state attempted to prop up standards of living in the face of falling GDP, running foreign debt-financed budget deficits of 8.0, 4.6, and 7.1 percent of GDP in 1995, 1996, and 1997, respectively. A new currency, the hryvnia (Hrv), was introduced in 1996, and maintaining a stable nominal exchange rate in relation to the U.S. dollar was considered a policy priority. Against a background of continued double-digit inflation, however, this led to a revaluation of the real exchange rate, and a corresponding burden on the real economy (see endnote 10).

These imbalances culminated in a financial crisis in September 1998. This crisis was triggered by international developments (Latin America, Russia, Southeast Asia), but the extreme vulnerability of the Ukrainian economy was homemade, and some correction was inevitable. The hryvnia devalued by roughly 45 percent relative to the U.S. dollar between the third and fourth quarters of 1998 and by roughly 100 percent by the fourth quarter of 1999. This provided agriculture with an important impetus, setting the stage for the next phase in the evolution of agricultural policy in Ukraine.

Phase III: 1999–2000

The third phase in independent Ukrainian agricultural policy was brief but crucial. In the aftermath of the 1998 financial crisis and following his reelection in late 1999, President Kuchma recognized the need to speed up the reform process, including in agriculture. On December 3, 1999, he signed a presidential decree (1529/99 "On Urgent Measures for Accelerating Reformation of the Agrarian Sector of the Economy") that stipulated that all collective agricultural enterprises must distribute land shares and restructure to form new entities by no later than April 30, 2000. He entrusted Victor Yushchenko, a reform-oriented former chairman of the National Bank of Ukraine, with the formation of a new government. One of Prime Minister Yushchenko's first measures was the January 17, 2000 Cabinet of Ministers Resolution "On New Approaches to Supply Inputs to Farms," which stipulated that the government would henceforth supply inputs to farms only on a cash payment basis and which essentially put an end to the state order for grain and other agricultural products.

In March 2000, another law wrote off the debts of farm enterprises that had fulfilled the terms of decree 1529/99. Most former collective agricultural enterprises

had met these terms, and, in the process, the number of collective farms fell as new legal forms were adopted, primarily partnerships and cooperatives. The distribution of land shares stipulated in decree 1529/99 shifted the ownership structure of agricultural land in Ukraine in favor of private owners. By January 2002, only 4 percent of the arable land in the country remained in state hands; roughly 30 percent was privately owned and used by rural residents (private farms and household plots), and over 65 percent was owned by members of the former collective agricultural enterprises.[14] Altogether, almost 7 million Ukrainians became owners of land, with average land shares of 4.2 hectares. Accompanying measures to promote the development of a rental market for agricultural land (land rent had been formally legalized by a law passed in October 1998) led to the emergence of a rental market, providing landowners with a new source of income.

Finally, in July 2000, a new land code that abolished collective landownership and provided for the sale of agricultural land and its use as collateral passed first reading in the Ukrainian Parliament (the Rada). Although the land code was not finally adopted by Parliament until October 2001, its consideration was a further indication that Ukraine's agricultural policy makers were finally addressing important market-oriented reforms. A measure of constancy in policy leadership was also established at this time with the appointment of Ivan Kyrylenko as minister of agriculture in January 2000. Kyrylenko remained minister for over two years and shortly thereafter became vice prime minister responsible for agriculture, also for two more years, until December 2004. This is a remarkable degree of continuity given that there had previously been eight different ministers of agriculture between independence in August 1991 and Kyrylenko's appointment around eight years later.

Together, these decisions generated considerable optimism in Ukrainian agriculture, and, in 2000, much more capital flowed into farming than had been the case in earlier years. In 2000 and 2001, for the first time since 1995, Ukraine's agricultural enterprises generated an aggregate profit (World Bank and OECD 2004). Agricultural output increased in these years for the first time since independence (figure 5.1 and table 5.7). As table 5.7 demonstrates, the food processing industry also began to grow at this time. In both agriculture and food processing, employment began to fall and wages began to increase. The development of food processing—supported by significant inflows of foreign direct investment and showing a doubling in exports in five years—is especially impressive. While it is difficult to distinguish between the contributions of the postfinancial crisis exchange rate devaluation on the one hand and reform measures on the other, it is clear that the latter contributed significantly to the turning point in Ukraine's postindependence agricultural development at the beginning of the new millennium (Åslund 2001).

Table 5.7. Economic Indicators on Agriculture and Food Processing, Ukraine, 2000 to 2005

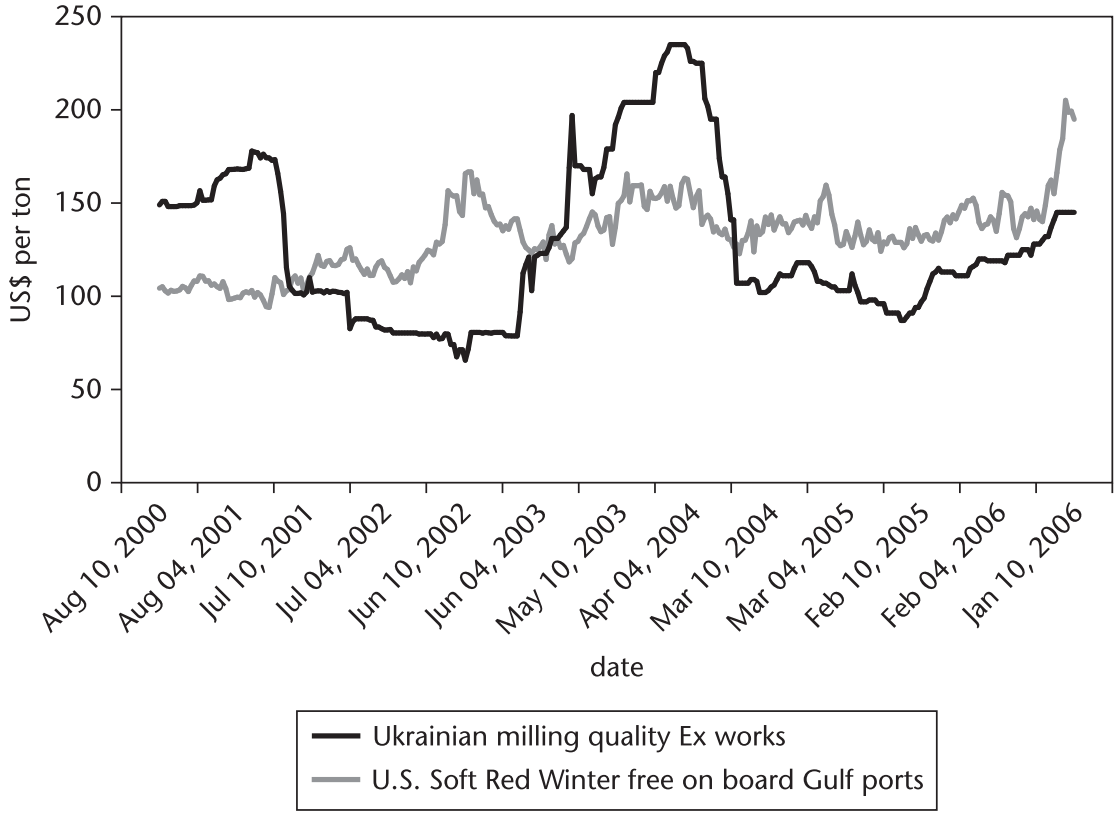
Indicator	Unit of indicator	2000	2001	2002	2003	2004	2005
Agriculture							
Gross agricultural output	Hva million	58,475	69,690	70,049	71,151	92,543	106,641
	% total output	13.5	13.3	12.2	10.3	10.1	9.6
Value added	% GDP	14.4	14.4	13.0	10.9	10.8	10.8
Value added/output	%	42.7	43.3	42.0	41.4	40.4	40.1
Structure of value added							
Compensation to employees	% sector value added	18.2	18.1	15.9	14.4	14.0	16.1
Profit, mixed income	% sector value added	75.4	76.7	80.6	81.9	84.7	80.1
Net taxes on production and imports	% sector value added	6.4	5.2	3.4	3.6	4.8	5.5
Employment	thousand people	2,549	2,206	1,877	1,537	1,174	1,038
	% total employed	18.6	17.1	15.3	13.1	10.4	9.1
Average wage	Hva	114	154	183	219	295	415
Exports	Hva million	4,963	5,758	7,361	4,052	8,262	9,441
	% total exports	4.7	5.1	5.9	2.6	3.9	4.1
	% sector output	8.5	8.3	10.5	5.7	8.9	8.9
Imports	Hva million	921	862	801	5,024	3,338	3,804
	% total imports	0.9	0.8	0.7	3.4	1.8	1.7
	% sector output	1.6	1.2	1.1	7.1	3.6	3.6
Exports/imports	index	5.4	6.7	9.2	0.8	2.5	2.5
Food processing industry							
Gross output	Hva million	48,892	64,810	68,973	84,470	103,221	116,639
	% total output	11.3	12.4	12.0	12.3	11.3	10.5
Value added	% GDP	7.8	7.7	7.9	8.2	4.2	7.8
Value added/output	%	27.3	24.2	25.8	25.8	24.1	26.0
Structure of value added							
Compensation to employees	% sector value added	30.9	26.3	24.7	25.5	34.1	39.5
Profit, mixed income	% sector value added	15.0	24.8	27.6	28.6	15.6	17.7
Net taxes on production and imports	% sector value added	54.1	48.9	47.6	45.9	50.4	42.8
Employment	thousand people	518	485	464	445	452	465
	% total employed	3.8	3.8	3.8	3.8	3.9	4.0
Average wage	Hva	281	364	423	496	597	779
Exports	Hva million	7,775	7,780	8,961	12,246	16,725	16,135
	% total exports	7.3	6.9	7.2	7.9	7.9	7.1
	% sector output	15.9	12.0	13.0	14.5	16.2	12.1
Imports	Hva million	3,456	5,005	4,903	6,701	6,648	9,700
	% total imports	3.5	4.6	4.3	4.5	3.6	4.3
	% sector output	7.1	7.7	7.1	7.9	6.4	7.3
Exports/imports	index	2.2	1.6	1.8	1.8	3.9	1.7

Source: Authors' calculations based on data from the State Statistics Committee of Ukraine.

Phase IV: 2001–today

The third phase of key reforms was short-lived and gave way to an ongoing fourth phase of stop-and-go reforms. Yushchenko was replaced as prime minister after less than two years, and, even as the reforms described above were being implemented, dirigiste measures were being introduced as well. These measures mainly represented attempts to regulate individual product markets such as those for grains, sugar, and oilseeds. Decree 832 (June 2000) and law 2238–14 (January 2001), for example, required the certification of grain exports, provided for mandatory crop insurance for grain producers, and enhanced the role of the state holding company Khlib Ukrainy (Bread of Ukraine), which had been founded in 1996 and continued to control a strategic chunk of Ukraine's grain marketing infrastructure (for example, elevators at key locations, harbor facilities). These measures were taken against the background of the poor wheat harvest in 2000, which led to a rapid jump in wheat prices from export parity to import parity levels (see figure 5.5 and the discussion in German Advisory Group 2000). Due to the political sensitivity of wheat and bread prices, policy makers reverted to their old planning ways and attempted to regulate prices and product flows

Figure 5.5. Wheat Prices, Ukraine and the International Market, 2000 to 2006



Source: UkrAgroConsult, various issues.

(von Cramon-Taubadel 2001). This pattern of market instability, dirigiste overreaction, and amplified instability was repeated following the poor grain harvest in 2003, in response to increasing meat and sugar prices in 2005, and, again, on grain markets as world market prices increased in late 2006.

Other measures taken in or after 2001 included minimum prices for sugar and a pledge price system for grains modeled along the lines of the loan rate system in the United States. (The latter has been underfunded and is therefore largely ineffective so far.) In September 1999, the decision had been made to introduce a 23 percent tax on sunflower seed exports, and neither the reform government under Yushchenko, nor later governments showed any intention of eliminating this tax. A July 2001 amendment did reduce this export tax from 23 to 17 percent, but it also closed loopholes that had provided exemptions, thus increasing the effective export tax burden (Kuhn and Nivyevskiy 2004).

The Orange Revolution, which followed controversial presidential elections in late 2004, led to a change of government, but to no major changes in the stop-and-go, generally nonmarket orientation of agricultural policy since 2000. Victor Yushchenko, who had implemented key reforms in 1999/2000 (see elsewhere above), emerged from the Revolution as president in early 2005. But the coalition government that he installed under Prime Minister Yulia Timoshenko was built on compromises that, among other outcomes, included a socialist minister of agriculture. Furthermore, Timoshenko herself responded to price hikes on meat, sugar, and gasoline markets in early and mid-2005 with price controls or threats thereof. And, in the summer of 2005, her solution to the problem of inflated marketing costs for grain (and the resulting low export parity prices at the farmgate) was to regulate the prices that Khlib Ukrainy and other state agents paid for transport, processing, and handling services, granting them privileges not shared by their commercial grain trading competitors.[15] On the positive side, a number of steps toward Ukraine's WTO accession were taken in 2005. In particular, important changes in tariff schedules were introduced in mid-2005, reducing tariffs for nonsensitive food and agricultural products, unifying most favored nation and full tariff rates, increasing the uniformity of tariffs, and dropping a number of mixed and specific tariffs.[16]

The government that emerged from the Orange Revolution under Yulia Timoshenko was replaced in late 2005 by a caretaker government under Yuri Yekhanurov pending parliamentary elections in March 2006. These led, in August 2006, after lengthy and controversial coalition negotiations, to a new government under Viktor Yanukovych, the beneficiary of the election fraud that had precipitated the Orange Revolution in 2004. Shortly after this government was formed, Yanukovych's minister of agriculture announced the introduction of a new system of licenses for grain exporters. This system was subsequently replaced with a quota system. The argument made to support these measures revolved around the contention that they were needed to guarantee food security and protect domestic

consumers from rising international wheat prices; many observers attributed them to rent seeking and, in particular, an attempt to recoup the costs of election campaigns and coalition agreements. The impact on international grain traders who were suddenly unable to fill ships and orders was catastrophic (von Cramon-Taubadel and Raiser 2006).

In April 2007, President Yushchenko dissolved Parliament and called for new elections, a move that was challenged as unconstitutional and sparked a power struggle in Kyiv. In late May, a compromise that would lead to parliamentary elections in September 2007 was reached between Yushchenko and his rival Yanukovych. In retrospect, the period since the presidential elections and the Orange Revolution in late 2004 has added up to almost three years of political turbulence during which policy makers have had little time and even less inclination to deal with fundamental reform issues in agriculture.

Explanations for the Evolution of Agricultural Policy since Independence

Agricultural policy is driven by the political and ideological orientations of those people who make the policy; by the institutional, administrative, and analytical capacities available to these people; and by the external constraints, domestic and international, that they face. We now review these factors and conclude that, in particular, rent seeking has driven the evolution of agricultural policy in Ukraine since independence.

Following independence, the political establishment in Ukraine was preoccupied with nation building. Åslund (1999) contrasts Ukraine with Estonia and Latvia, where economic reforms have been considered an integral part of nation building. In Ukraine, the first president, Leonid Kravchuk, was a former second secretary of the Communist Party who was responsible for ideology and had little interest in economics. Under the Kravchuk administration, transforming what had been regional institutions into national institutions in Kyiv (that is, creating a National Bank, and so on) received the highest priority, while "various ideas of a special Ukrainian economic model arose. They were not very original and can be described as a mixture of muddled Gorbachevian economic thoughts, that is, the last stage of Communist confusion, and surviving statist nationalist economic thinking from the 1930s about the need for a strong regulating state" (Åslund 1999, 6). Furthermore, partly because of Soviet fear of Ukrainian nationalism, Ukraine had been largely isolated from the outside world. Following independence, few Ukrainians spoke English, the country had only one, Communist-oriented economic journal, and there was neither an elite with training in (agricultural) economics, nor much appreciation of basic economic issues in the general population.

Finally, in Soviet times, policy was made in Moscow and merely implemented in republic capitals such as Kyiv. While many Ukrainians attained positions of responsibility in Moscow in Soviet times, the other side of the coin is that, for decades, individuals with a talent for creative, strategic policy formulation were drawn away from Kyiv, while the requirements of local planning administration and enforcement tended to favor individuals with a technocratic approach to policy. As Sundakov (1999, 113) argues, "ministers and other senior officials in the Soviet period were not selected on the basis of their strategic vision. Rather, they got there through their ability to keep production going, to deliver the funds and the inputs, and to extract outputs from the various enterprises under their control." It was from this cohort that the first generation of reformers in Ukraine had to emerge.

As a result of these postindependence conditions, an initial window of opportunity for economic reforms was missed. The new nation's leaders had little knowledge of how and why to implement economic reforms; their thinking was dominated by the perceived need to reduce political dependence on Russia. In the ensuing euphoria of nation building, all the trappings of an inflated bureaucracy and stifling regulation emerged. By 1996, Ukraine had approximately 70 ministries and state committees (Sundakov 1996).[17] Combined with a lack of economic expertise and the fact that the old establishment before independence (*nomenklatura*) in Ukraine had remained more or less intact, this created a fertile environment for rent seeking.

Ministers of agriculture in Ukraine have changed frequently since independence. There have been 13 different ministers serving over a period of 16 years. Furthermore, at various times, but not continuously, a vice prime minister specifically responsible for agricultural policy has served parallel to the minister of agriculture. Certain individuals have come and gone several times, rotating among different posts. The presidential administration has traditionally also included a senior advisor responsible for agricultural issues, and, under the old constitution up to January 1, 2006, the president was equipped with far-reaching powers to promulgate decrees. The result has been a multipolar, fragmented, and often competitive agricultural policy-making system, with an unclear and frequently contradictory delineation of responsibility.[18] Parliament, the Cabinet of Ministers, and the president promulgate laws, resolutions, and decrees, respectively. Additionally, the minister of agriculture, oblast authorities, customs authorities, various state committees, and state enterprises such as Khlib Ukrainy are able to exercise considerable control over the interpretation and practical implementation of these legislative acts. It is not clear how responsibility for different tasks is divided between these various officials and bodies, and the lack of personal continuity has not allowed a stable working relationship to develop.

Weak analytical and administrative capacities exacerbate this problem. Ministers and vice prime ministers responsible for agriculture have been primarily drawn from practical agriculture and have tended to have production-oriented backgrounds (tractor operators, agronomists, and so on). This type of background is common in the lower echelons of the ministry as well; so, there is little appreciation of macroeconomic issues and of general equilibrium links to the rest of the Ukrainian economy and world markets. That the system of agricultural education and research in Ukraine has remained firmly in the hands of an old guard of individuals who do not understand open-economy agricultural economics is a major deficit. Corruption in the education system is widespread, and there is much anecdotal evidence that more degrees are bought and sold than earned. Young agricultural economists who have gone abroad to obtain an education have generally found that the academic and research community in Ukraine is not willing to provide them with opportunities commensurate with their abilities when they return. The result is a scarcity of capable analysts and incisive economic analysis to inform the policy-making process.

This lack of analytical capacity and appreciation of what agricultural policy may or may not achieve given the domestic and international constraints has, until now, hindered the development of a clear vision of the key goals that agricultural policy in Ukraine should pursue and the instruments needed to pursue them. The fundamental tension that exists between the interest of farmers in higher farm product prices on the one hand and the interest of consumers in inexpensive food on the other has never been confronted squarely. Ministers have mainly engaged in firefighting, dealing with periodic crises on individual product markets as prices either fall or climb too much. Success still tends to be measured in tons of output.

Policy complacency is another theme. As illustrated in tables 5.1 and 5.6, the overall trend in Ukrainian agriculture and food processing since 1999/2000 has been positive; production, value added, and exports have increased. Reforms have been slow and uneven, but they have sufficed to generate positive results. Indeed, it might be argued that Ukrainian agriculture has managed to succeed despite policy, thanks to Ukraine's natural comparative advantages and a positive overall economic environment (stability and growth) over the last six years. In this sense, Ukrainian agriculture suffers from the curse of natural resource wealth that has been documented elsewhere (for example, Gylfason 2002; Gylfason and Zoega 2001).

This curse may operate through a variety of pathways besides policy complacency (for example, Dutch Disease mechanisms in certain contexts); perhaps the most important pathway in the context of Ukrainian agriculture is rent seeking. Endemic corruption and rent seeking have both benefited from and contributed to the maintenance of a disoriented policy. In the years following independence,

a powerful class of rent seekers emerged. If there had been little reason to expect market-oriented agricultural reforms immediately following independence, such reforms became even less likely as rent-seeking interests became entrenched in later years.[19] Rent seeking takes place at a national level when oligarchs (many of whom are members of Parliament) manipulate the size and distribution of tariff rate quotas to their own advantage.[20] It also takes place at the local and individual farm level when farm managers make side deals with local authorities to deliver to local processing enterprises instead of higher-paying enterprises elsewhere, or when they underinvoice sales of produce to traders, pocketing the difference and reporting a loss to the tax authorities and their employees. The agricultural growth recorded in recent years has provided an enticing stream of proceeds to be divided and distributed. More ambitious reforms could transform this stream of proceeds into a torrent, but one that would wash away the elaborate system of channels and sluice gates maintained by today's beneficiaries.

A final political economic theme in agricultural policy making in Ukraine concerns land markets. The Socialists and Communists have staunchly opposed the development of a land market in Ukraine, and, although they have not been able to hinder the emergence of a lease market and the adoption of a land code, they have succeeded in implementing and periodically extending a moratorium on land sales. It is reasonable to conclude that the Socialists' paternalistic rhetoric about the need to protect Ukraine's land and peasantry from rapacious capitalists masks more pragmatic motives. Land reform would lead to competition for land and rising land prices. The beneficiaries of the current system have little interest in a mechanism that channels agricultural profits into land rents, their ultimate destination under market conditions.

Implications for Desirable Versus Likely or Politically Feasible Policy Reform Paths

The defining characteristic of Ukrainian agriculture today is its heterogeneity. As numerous studies have demonstrated, the distributions of efficiency and competitiveness across farms in Ukraine are broad (for instance, see Nivyevskiy and Strubenhoff 2006; von Cramon-Taubadel and Nivyevskiy 2007). Some farms have managed to restructure and invest in physical and human capital. They have taken advantage of the opportunities provided by the brief phases of policy reform, and they have dynamic, capable managers who cultivate the necessary umbrella or network of contacts at the local administrative level. These, perhaps, 20 to 30 percent of Ukraine's farms are relatively efficient and internationally competitive, especially at current high world market price levels, and they are responsible for most of the growth in Ukrainian agriculture in recent years.

The remaining 70–80 percent of the farms in Ukraine and, especially, the lowest 40–50 percent of the efficiency and competitiveness distributions are in much worse condition. They are highly inefficient, and many might double or triple production with the same input set if they were managed properly.[21] These farms essentially act as anchors for the household production of their employees, providing machinery services, limited employment income (often in kind), and basic infrastructure. They have managed to survive despite their lack of profitability because of the tax exemptions provided to agriculture in Ukraine and because market mechanisms that would otherwise lead to their exit (land markets and, in the extreme case, bankruptcy) have not yet been permitted to function in Ukrainian agriculture.

Hence, the speed with which Ukrainian agriculture grows in the future depends on whether policy makers will create an environment of incentives and pressures that accelerates the hitherto sluggish rightward shift of the efficiency distribution of Ukrainian farms.

There is little reason to expect major changes in the nature of the agricultural policy-making process or of the actors involved in this process in the immediate future. The Orange Revolution has entrenched democracy in Ukraine; unlike several other countries of the Commonwealth of Independent States, Ukraine has a vibrant, perhaps somewhat chaotic multiparty system and a lively media landscape. While Western media tend to cast ongoing political turmoil as a clash between pro-Western and pro-Russian forces, it is safe to assume that the latter are not interested in the loss of power and freedom to operate that absorption into a much larger and centralized Russia would entail. A new constitution adopted on January 1, 2006 has increased the powers of Parliament and reduced those of the president. However, as the recent crisis over the dissolution of Parliament by President Yushchenko demonstrates, the new constitution is subject to contrasting interpretations, and it will take years to establish stabilizing precedents.

As has been the case repeatedly in the recent past, the Ministry of Agriculture will likely remain a bargaining chip in coalition negotiations, hampering the development of a long-term strategic policy focus. There is no recognizable new generation of market-oriented, open-economy agricultural policy makers and analysts waiting in the wings in Ukraine; the domestic agricultural education and research establishment is not producing such individuals, and there is no procedure or niche for the absorption and reintegration of individuals with foreign training. It thus appears likely that agricultural policy will continue to be designed and implemented by individuals who take a dirigiste and partial or sectoral view.

Because of its sizable agricultural lobby and enhanced powers under the new constitution, Parliament will likely attempt to increase its influence on agricultural policy making. A common demand in the past has been that a minimum level of agricultural support spending should be defined and fixed by law (for

example, 10 percent of total budget spending). However, the fiscal space that Ukrainian policy makers have enjoyed in recent years may shrink if the external economic environment (significant jumps in energy prices following the conflict over gas prices with Russia in early 2006 and increasing competition on world market for metals, which have been the dominant source of export revenue) and internal conditions (rapid increases in budget outlays caused by massive pension and minimum wage hikes granted in 2005 and 2006) were to worsen. According to simulations prepared by Movchan (2006), the gas price increase will, ceteris paribus, lead to a cumulative medium-term reduction in Ukraine's real GDP of roughly 5.5 percent.[22] Interestingly, the same general equilibrium simulations suggest that agriculture in Ukraine will benefit (a cumulative increase in real output of 16 percent over the medium term) as highly energy-intensive sectors (metallurgy, chemicals) contract strongly, releasing resources to less energy-intensive sectors. These results, a sort of reverse Dutch Disease phenomenon, indicate that the general equilibrium impact of low energy prices on agriculture in Ukraine are not as straightforward as they may seem at first glance.

Perhaps the most important factor disciplining agricultural policy makers in Ukraine in the future will be WTO membership. Ukraine first applied for membership in the WTO in 1994, but it was not until the early years of the new century that negotiations entered a serious phase, and Ukraine began to take steps to adjust its domestic policies accordingly. Ukraine has reached agreement with almost all of the members of its working party, and the outlines of an accession deal for Ukraine have taken shape (Zorya 2005).[23] In the area of market access, Ukraine will reduce its average tariffs in agriculture from roughly 30 percent to 13 percent.[24] To protect its sugar regime, an import tariff of 50 percent will likely be maintained. The Ukrainian government is confident that this will provide a sufficient margin of protection for the domestic sugar industry, but other calculations suggest that, if world market prices for sugar fall from their current highs back to the US$200 per ton range, imported sugar priced accordingly at roughly US$300 per ton in Ukraine might undercut domestic Ukrainian production (Nivyevskiy and Strubenhoff 2006).

In the area of domestic support, Ukraine appears to have secured an aggregate measurement of support allowance of US$613 million based on the 2000–02 period. Zorya (2005) estimates that Ukraine used roughly 40 percent of such an allowance of US$1.1 billion that was being discussed in 2005. This would not leave much scope for the expansion of support measures for agriculture in Ukraine, subject to fiscal constraints. Disciplines on the use of export subsidies will likely have the most important and binding implications for future agricultural policy in Ukraine. As Ukraine has made no use of export subsidies in the past, the likely outcome of its WTO accession negotiations is a bound ceiling of zero. This implies that Ukraine will not be in a position to engage in any form of price

support for agricultural products that it exports. It appears that some agricultural policy makers have yet to grasp this point.[25]

On the negative side, although membership has been around the corner and likely to happen by the end of this year for at least three years now, it is not clear, at the moment, when Ukraine will actually join the WTO. Here, too, political turmoil since the Orange Revolution has made it difficult to sustain a focus on substantive economic reform. Hence, the most likely path for Ukrainian agriculture appears to be one of continued muddling through, with WTO membership and fiscal constraints disciplining policy makers to some extent, and Ukraine's agricultural potential, enterprising farmers, and agribusiness entrepreneurs ensuring continued progress, albeit at a slower rate than might be possible with an appropriate policy mix.

Notes

1. Anderson (1993) illustrates that the former Soviet Union, at the onset of the transition, was endowed with a low stock of capital per worker and a high stock of natural resources per worker relative to the rest of the world. As agrifood systems become increasingly capital intensive, the comparative advantage in agriculture implied by this natural resource endowment will be eroded.

2. Penkaitis (1995) lists separate ministries of agriculture, of milk and meat production, of fruit and vegetable production, of the food industry, of agricultural construction, and of purchasing and procurement, as well as the state committee for agricultural machinery production and supply.

3. Swinnen and Rozelle (2006) contrast agricultural reform experiences in China and the Soviet Union. They conclude that a confluence of grassroots and top leadership support is needed for reforms to succeed under Communist rule. If true, this suggests that grassroots resistance to Gorbachev's reforms would have continued to hamstring the reforms even if they had been given more time.

4. We are extremely grateful to Olga Melyukhina for her expert and patient assistance.

5. For example, in the past, the Ministry of Agriculture has almost invariably released forecasts of upcoming grain harvests that were higher than those of private experts.

6. The situation is different in Russia, where some resource-rich oblasts subsidize agriculture heavily.

7. Some estimates of grain marketing costs in Ukraine are considerably higher than those used by the OECD. These estimates are provided for recent years by the Ukrainian Grain Association, an association of traders and processors who would have an interest in reporting high marketing costs to justify paying low farmgate prices to producers. To avoid this possible bias, we employ the marketing costs provided by the OECD. However, we use the rates of growth in marketing costs reported by the grain association to extrapolate the OECD estimates to 2004 and 2005.

8. The failure of the government to refund export value added taxes was a particular problem in 2003–05 and has reemerged recently. In 2004, grain traders reported that refunds could be secured against a bribe of about one-third of the refund due. In 2005, traders were apparently adding roughly US$6 per ton to their margins to compensate for the costs associated with securing export value added tax refunds. Estimating the resulting distortions is difficult because traders were not treated equally. The Ukrainian government claims that it is simply attempting to combat fraudulent applications for export value added tax refunds (simulated transactions and so on).

9. The variability of the prices in this sample is high, and the distribution includes many implausibly low and high prices. There is no definitive information available on how official average prices are determined, what raw data are used as a basis, how these data are filtered to account for outliers, and so on.

10. Anderson et al. (2008) question whether such misalignment should be considered a distortion, or merely as something that changes incentives. However, the mid-1990s overvaluation of the hryvnia was the subject of heated debate in Ukraine at the time. While inflation was running in the double digits, the International Monetary Fund insisted that a stable nominal exchange rate be maintained, arguing that this would not have any significant impact on the real economy. Others, such as the German Advisory Group, disagreed and called for gradual nominal devaluation in line with inflation differentials (see Möllers and Siedenberg 1999 and the references therein). The financial crisis in 1998 and the growth recorded by agriculture and other sectors producing tradable goods in the years thereafter appear to bear out the latter position.

11. Specifically, Russia has provided Ukraine with energy below the opportunity costs as measured by the prices it would have received for the same energy by shipping it on to Western Europe.

12. Moreover, note that Russia has been paying for this cheap energy in Ukraine, presumably for strategic reasons. Any resulting distortion is difficult to measure in the framework used here because it takes the form of a border price that is below other border prices in the world by more or less explicit agreement between the exporter and the importer and is not due to border or other measures of Ukrainian provenance.

13. Note that statistics on agricultural production by collective agricultural enterprises and household plots are biased in favor of the latter because much household production is based on inputs provided by or stolen from the enterprises.

14. See World Bank and OECD (2004). For more information on farm restructuring and land market reforms in Ukraine, see Lerman and Csaki (1999); Lerman, Csaki, and Feder (2002); and Puhachov and Puhachova (2001).

15. The problem of inflated marketing costs mentioned elsewhere in the text had not diminished. In 2005, as in 1999, Ukrainian grain farmers were receiving only roughly 40 percent of the free on board export price. This compares with the 70 percent in Germany, for example (von Cramon-Taubadel 2005).

16. According to estimates by the Ministry of Economy, the following reductions in average most favored nation rates were implemented: Harmonized System (HS) 01/05, from 35 to 21.9 percent; HS 06/14, from 31.7 to 19.7 percent; HS 15, from 26 to 10.8 percent; and HS 16/24, from 63 to 14.2 percent. However, these numbers clearly overestimate the actual tariff reduction because they only account for ad valorem tariffs or the ad valorem component of mixed tariffs and exclude specific tariffs that typically produce the highest rates.

17. State committees have a somewhat lower status than ministries, but their chairpersons generally have ministerial powers.

18. For example, it is reported that presidential decree 832, which called for the implementation of a price support system and export certification for grain in June 2000 (see elsewhere in the text), was prepared by the Office of the President without the knowledge of either the vice prime minister responsible for agriculture or the minister of agriculture.

19. For a discussion of this problem in transition economies, see EBRD (1999). On rent seeking and trade in Ukraine, see also Havrylyshyn (1994).

20. Striewe (2001) estimates the values of the rents associated with tariff rate quotas for sugar and wheat in Ukraine in 2000.

21. For a detailed comparison of farm types and efficiencies in Ukraine from a farm management perspective, see Lischka (2004).

22. Natural gas accounts for almost half of the total energy supply in Ukraine. As a result of a new energy agreement with Russia, the price of natural gas increased from US$60 to US$95 per thousand cubic meters in 2006 and will further increase to US$130 per thousand in 2007 (Movchan 2006; Pavel and Chukai 2006). However, the new agreement with Russia is controversial, and many observers believe that it is not sustainable. If this is so, gas prices will continue to increase in coming years (Pavel and Chukai 2006).

23. On the impact of WTO accession on the economy as a whole and on sectors other than agriculture, see Burakovsky, Handrich, and Hoffmann (2004), Copenhagen Economics (2005), and Pavel et al. (2004).

24. According to Copenhagen Economics (2005), simple average aggregate tariffs in agriculture and hunting may be expected to fall from 32 to 7 percent and in food processing from 53 to 10 percent.

25. In a personal communication (in 2006), a deputy minister of agriculture confidently predicted that Ukraine's quota and price support system for sugar would lead to an increase in Ukrainian sugar production and perhaps even a return to a net export position.

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6

KAZAKHSTAN

Richard Pomfret

The economic history of Kazakhstan since the country became independent at the end of 1991 divides sharply into two eras. From 1991 until 1998, the economy went through a severe recession, which was prolonged by the 1998 crisis in the Russian Federation and which turned around only in 1999. Post-1999 growth has been partly a recovery and partly stimulated by a large currency depreciation, but, most of all, it has been driven by oil exports. New discoveries, new pipelines that reduced transport costs, and soaring oil prices combined to increase the value of Kazakhstan's oil exports from US$1.6 billion in 1998 to US$7.3 billion in 2003 and fuel double-digit growth in gross domestic product (GDP) during the early years of the 21st century (Pomfret 2005).

The agricultural sector is a major part of Kazakhstan's economy. Even though it accounts for less than 10 percent of GDP, the farm sector involves perhaps a third of the population.[1] The agricultural sector experienced a severe decline in the 1990s. The annual growth rate of agricultural value added was −3.2 percent in 1990–2001. The decline was reversed toward the end of this period, and, from 1999 to 2004, agricultural output grew at over 5 percent a year, mostly because of increased crop production; meanwhile, livestock growth was more modest.[2] The decline in agriculture's economic importance has, however, continued, especially relative to the booming energy sector, which has displaced agriculture as the country's locomotive.[3]

The first two sections of this chapter examine the historical background and the evolution of policies since independence. The third section quantifies the distortions in agriculture. The emphasis is on three principal and distinct sectors of the farm economy: grains (which dominate agricultural exports), the livestock sector, and the regionally concentrated cotton sector. The last two sections analyze

the political economy of policy choices in Kazakhstan and the future paths of policy reform.

Historical Background

Agriculture in the territory of Kazakhstan was traditionally pastoral and nomadic. From the mid-1800s, as Russia exercised greater control over the territory, public policy encouraged sedentarization, and a growing proportion of nomads were planting winter grains by the end of the century. Russian farmers settled along the Syrdarya River in the south.

After the 1917 revolution, there was some return of pastoral land to Kazakhs. The most dramatic change in the years before World War II was, however, the enforced collectivization of 1928–29. Kazakhs slaughtered their animals or escaped with them to neighboring countries, while many animals that remained died because of the lack of winter feed. The result of the enforced collectivization was a huge loss of livestock and a great famine.

In the 1950s, the Virgin Lands Program brought around 25 million hectares into cultivation (that is, over 60 percent of the current arable land). Northern Kazakhstan became a major producer of wheat and barley, although a substantial portion of the land could not sustain long-term agriculture, and, given the variable climate, harvests were highly volatile (Pomfret 1995).[4] Agricultural production in Kazakhstan was carried out on large state or collective farms, the size of which averaged 35,000–40,000 hectares, and on over 3 million small private plots that produced over one-third of the total output (Green and Vokes 1997).

In 1991, just over one-quarter of the workforce was employed in agriculture, but agricultural output accounted for less than 15 percent of GDP (World Bank 1992). Grazing and rangeland occupied 140 million hectares, and the livestock sector comprised mainly cattle and sheep. Of 39 million hectares of cultivated land, 65 percent was devoted to cereals, and 33 percent to fodder crops. In the 1980s Kazakhstan exported up to 10 million tons of wheat, around 300,000 tons of meat, 250,000 tons of milk, and 150 million eggs a year to other Soviet republics (de Broeck and Kostial 1998). Other crops, while minor in terms of the overall area of cultivation, were regionally significant. In the south, rice and cotton were important crops, and, in 1991, cotton was Kazakhstan's third-largest export to non-Soviet markets after mineral fertilizers and coal. Oil crops (sunflower seeds, soy, rape, and so on), mainly grown in East Kazakhstan and Pavlodar Oblasts (regions), satisfied about two-fifths of domestic demand.

In the Soviet economy, agriculture received net support given that key inputs, such as fuel and fertilizers, were provided at below world prices. Some of these inputs would not have been used had they been fully costed (for example,

cotton-harvesting machines or fodder transported over large distances by rail). Under the state order system, there was considerable variation in the profitability of differing agricultural activities. In 1991, the purchase price of wheat was more than triple the production costs; the corresponding ratios were 156 percent for sunflowers, 98 percent for raw cotton, and 75 percent for potatoes, but less than 20 percent for sugar beets, poultry, or pigs (World Bank 1992). Comparative advantage is reflected in lower production costs, but these numbers also suggest that there were positive incentives for growing Kazakhstan's major crops, while import-competing items such as sugar beets and poultry were less favored. This incentive structure based on artificial prices would, of course, change during the transition to a market economy.

During the 1990s, output of all major agricultural products declined substantially (table 6.1). Recovery started around 1999, although the pattern is complicated by huge annual variations in the wheat harvest. In southern Kazakhstan, the turnaround started slightly earlier. Cotton output almost tripled between 1998 and 2003, as the area sown with cotton, which was more or less constant in the first half of the 1990s at 107,000–111,000 hectares, increased from 115,000 hectares in 1998 to 182,000 hectares in 2003.[5]

The level of agricultural trade, as well as the relative importance of food exports, has declined substantially since independence. In 1988, agriculture accounted for 17 percent of exports, and the food industry for 7 percent, but, by 2000, these shares had fallen to 6 percent and 1 percent, respectively (Freinkman, Polyakov, and Revenco 2004). In this period, the share of oil and gas rose from 10 percent of exports to 50 percent and that of metals from 19 percent to 32 percent. Oil accounted for an ever-increasing share after 2000 as both output and the world price increased.

The post-transition pattern of agricultural trade has been characterized by the exportation of primary products and the importation of processed food products of higher perceived quality.[6] Kazakhstan continued to be a substantial food exporter, selling grains, fruits, and vegetables primarily to Russia and other markets in the Commonwealth of Independent States (CIS), but a minor cotton exporter (table 6.2). Exports of livestock products declined substantially; dairy exports were negligible by the late 1990s, and meat exports continued to fall in value, from US$16 million in 1998 to US$5 million in 2001. In the early 2000s, meat, milk, and eggs—all important exports during the Soviet era—had almost become nontraded items. Kazakhstan was a net importer of sugar (from outside the CIS) and of chicken and dairy products (from Russia). Between 1998 and 2001, imports of dairy products rose substantially (from US$12.3 million to US$27.0 million for milk and cream and from US$6.6 million to US$8.4 million for butter), while meat imports fell (from US$32.1 million to US$18.2 million),

Table 6.1. Production of Key Agricultural Products, Kazakhstan, 1980 to 2005

a. 1980 to 1993

(crops, metric tons, 1,000s; eggs, millions; animals, 1,000s at end of year)

Product	1980	1985	1989	1990	1991	1992	1993
Wheat	17,548	14,191	10,784	16,197	6,889	18,285	11,585
Barley	6,405	6,357	5,727	9,303	3,412	9,482	7,909
Rye	129	144	784	889	506	568	889
Oats	691	570	283	681	265	831	906
Maize	414	598	479	442	330	368	355
Potatoes	2,238	2,197	1,783	2,324	2,143	2,570	2,296
Seed cotton	358	305	315	324	291	252	200
Sugar beets	2,223	1,901	1,188	1,134	726	1,276	925
Vegetables	1,134	1,085	1,254	1,136	955	985	808
Meat	1,069	1,133	1,573	1,560	1,524	1,258	1,312
Milk	4,597	4,763	5,563	5,642	5,555	5,265	5,577
Wool	103	97	110	108	104	97	95
Eggs	3,369	3,803	4,253	4,185	4,075	3,565	3,288

b. 1993 to 1999

(crops, metric tons, 1,000s; eggs, millions; animals, 1,000s at end of year)

Product	1993	1994	1995	1996	1997	1998	1999
Wheat	11,586	9,052	6,490	7,678	8,955	4,746	11,242
Rye	403	283	184	226	255	236	199
Barley	7,149	5,497	2,208	2,696	2,583	1,093	2,265
Oats	802	822	250	359	286	73	194
Rice	403	283	184	226	255	236	199
Soybeans	6	6	4	3	3	4	4
Potatoes	2,296	2,040	1,720	1,657	1,472	1,263	1,695
Sunflower seeds	86	97	99	64	54	83	104
Tobacco	4	3	2	2	2	9	8
Seed cotton	198	208	223	183	198	162	249
Vegetables	808	781	780	778	880	1,079	1,287
Meat	2,231	2,102	1,774	1,541	1,346	1,213	1,182
Milk	5,577	5,296	4,619	3,627	3,220	3,394	3,535
Wool	96	75	58	42	32	25	22
Eggs	3,288	2,629	1,841	1,263	1,242	1,388	1,512
Cattle	9,576	9,347	8,073	6,860	5,425	4,307	3,958
Sheep and goats	37,660	29,759	23,062	13,679	10,384	9,527	9,657
Pigs	2,591	2,445	1,983	1,623	1,036	879	892
Horses	1,742	1,649	1,521	1,310	1,083	986	970
Poultry	52,308	45,121	26,481	15,378	15,982	16,985	18,022

Table 6.1. (continued)

c. 2000 to 2005

(crops, metric tons, 1,000s; eggs, millions; animals, 1,000s at end of year)

Product	2000	2001	2002	2003	2004	2005
Wheat	9,073	12,707	12,700	11,537	9,937	11,300
Rye	48	43	106	42	20	23
Barley	1,664	2,244	2,209	2,154	1,388	1,600
Oats	182	220	183	171	130	150
Rice	214	199	199	273	276	310
Soybeans	4	7	25	38	47	45
Potatoes	1,692	2,185	2,269	2,308	2,261	2,300
Sunflower seeds	105	149	190	293	266	240
Tobacco	16	15	16	16	14	14
Seed cotton	287	418	361	480	467	350
Vegetables	1,544	1,782	1,867	1,938	2,058	1,939
Meat	1,140	1,155	1,191	1,243	inc	inc
Milk	3,730	3,923	4,110	4,317	4,557	4,713
Wool	23	24	25	27	28	29
Eggs	1,692	inc	inc	inc	inc	inc
Cattle	3,998	4,107	4,294	4,560	4,871	5,204
Sheep and goats	9,981	10,400	11,171	inc	inc	inc
Pigs	984	1,076	1,124	1,230	1,369	1,292
Horses	976	986	990	1,019	1,064	1,120
Poultry	19,700	21,300	23,800	inc	inc	inc

d. 2000 to 2004: value

(farmgate prices in tenge, billions[a])

Product	2000	2001	2002	2003	2004
Wheat	89.0	143.9	122.9	139.2	144.7
Rye	0.4	0.4	1.0	0.4	0.2
Barley	10.7	17.7	15.7	14.7	11.9
Oats	0.9	1.2	1.2	1.0	0.9
Maize	2.3	3.4	4.7	4.5	5.7
Sugar	11.2	18.6	22.2	25.1	26.1
Potatoes	31.2	36.0	35.6	48.2	47.4
Sunflower seed	1.8	2.8	4.9	7.0	6.7
Seed cotton	14.7	12.6	16.5	29.7	16.3
Beef and veal	42.3	49.4	57.5	65.6	76.8
Sheep and goat meat	10.2	12.4	28.1	32.6	38.2
Pig meat	34.9	42.1	26.4	27.5	31.8
Poultry meat	4.4	5.1	6.3	7.1	7.9
Cow milk	64.8	72.0	79.6	84.5	101.0
Eggs	9.0	10.7	11.6	13.6	16.5
% of total agricultural output	82	80	78	81	76

Sources: Panel a: de Broeck and Kostial 1998; panel b: data of the National Statistics Agency, FAOSTAT Database 2007; panel c: FAOSTAT Database 2007; panel d: data of the National Statistics Agency, FAOSTAT Database 2007.

Note: inc = inconsistent with earlier series.

a. In February 2007, US$1 = T 120.

Table 6.2. Exports of Key Agricultural Products, Kazakhstan, 1995 to 2004

a. 1995 to 2000

Product	1995	1996	1997	1998	1999	2000
Grains						
Volume (tons 1,000s)	3,484.1	2,808.9	3,577.5	2,905.2	3,816.2	5,612.4
Price (US$ per ton)	88.5	152.6	143.1	101.7	82.2	88.4
Value (US$ millions)	308.3	428.6	511.6	295.4	313.6	496.2
Cotton fiber						
Volume (tons 1,000s)	25.7	69.7	63.9	48.2	62.1	90.2
Price (US$ per ton)	1,425.3	1,388.1	1,213.6	1,077.3	796.8	945.7
Value (US$ millions)	36.4	96.7	77.5	51.9	49.5	85.3
Wool						
Volume (tons 1,000s)	51.7	31.2	41.7	12.0	15.7	10.6
Price (US$ per ton)	999.1	1,372.4	1,367.9	1,440.0	426.2	450.3
Value (US$ millions)	51.7	42.8	57.1	17.3	6.7	4.6
Total exports (US$ millions)	5,440.0	6,291.7	6,899.2	5,870.6	5,988.5	9,468.1

b. 2000 to 2004

Product	2000	2001	2002	2003	2004
Grains					
Volume (tons 1,000s)	5,612	3,336	4,311	5,835	2,929
Price (US$ per ton)	88	103	80	97	150
Value (US$ millions)	496	344	346	565	440
Cotton fiber					
Volume (tons 1,000s)	90	96	138	126	143
Price (US$ per ton)	946	864	763	1,110	1,190
Value (US$ millions)	85	83	105	139	170
Wool					
Volume (tons 1,000s)	11	8	8	10	7
Price (US$ per ton)	450	618	618	465	737
Value (US$ millions)	5	5	5	5	5
Total exports (US$ millions)	9,288	8,928	10,027	13,233	20,603

Source: IMF 2000, 2003a, 2005.

suggesting that there was some import substitution in the latter, but not the former case.[7]

Table 6.3 presents data on the value of Kazakhstan's agricultural trade in 2003, the latest year available from the UN Comtrade Database. The 27 two-digit agricultural and agroprocessing sectors sold US$998 million worth of exports

Table 6.3. The Value of Agricultural Exports and Imports, by Subsector, Kazakhstan, 2003

a. Exports and imports

(US$1,000s)

Code	Harmonized commodity description	Exports	Imports
01	Live animals	274	2,608
02	Meat & edible meat offal	668	28,321
03	Fish & crustacean, mollusk & other	18,292	10,304
04	Dairy products; birds' eggs; natural honey	8,817	61,957
05	Products of animal origin, nes	2,774	191
06	Live tree & other plant; bulb, roots	9	2,045
07	Edible vegetables and certain roots	15,927	2,767
08	Edible fruit and nuts	11,580	15,351
09	Coffee, tea, and spices	316	34,073
10	Cereals	564,599	4,831
11	Flour, meal, malt & starches	59,750	11,026
12	Oilseeds, roots & other vegetable matter	3,537	25,200
13	Gums, resins & other vegetable products	30	9,293
14	Vegetable plaiting materials, & vegetable matter nes	3,739	167
15	Animal/vegetable fats & oils & clarifying agents	8,451	51,392
16	Preparations of meat, fish or crustaceans	3,252	15,230
17	Sugars and sugar confectionery	38,670	156,496
18	Cocoa and cocoa preparations	825	49,335
19	Preparations of cereal, flour, starch/milk	6,248	45,028
20	Preparations of vegetable, fruit, nuts or olives	1,600	27,239
21	Miscellaneous edible preparations	1,157	41,885
22	Beverages, spirits and vinegar	4,382	39,381
23	Residues & waste from the food industry	3,206	7,873
24	Tobacco and manufactured tobacco	20,003	41,326
41	Raw hides and skins (other than furs)	74,325	3,744
52	Cotton	145,516	5,165
53	Other vegetable textile fibers	0	1,313
Total of above categories		997,947	693,541
Total trade		12,926,687	8,408,685

b. Exports valued at over US$10 million

(US$1,000s and percent)

Code	Harmonized commodity description	Exports	Share (%)[a]
030420 + 030379	Frozen fish filets and frozen fish nes	15,969	1.60
100100	Wheat and meslin	522,568	52.36
100300	Barley	37,107	3.72
110100	Wheat or meslin flour	57,678	5.78
170199	Cane or beet sugar, in solid form	37,540	3.76

(Table continues on the following page)

Table 6.3. (continued)

Code	Harmonized commodity description	Exports	Share (%)[a]
240110 + 240220	Tobacco & cigarettes containing tobacco	19,951	2.00
410121	Whole hides and skins of bovine animals	11,423	1.15
410422	Bovine leather	47,327	4.34
520100	Cotton, not carded or combed	140,298	14.06
Total		889,861	88.8

c. Imports valued at over US$7 million

(US$1,000s and percent)

Code	Harmonized commodity description	Imports	Share (%)[b]	Tariff (%)
020741	Frozen cuts and offal of chicken	22,284	3.21	23.75
0402	Milk and cream	34,764	5.01	12
040500	Butter and other fats and oils derived form animals	8,813	1.28	20
0902	Tea	31,228	4.50	5
110710	Malt not roasted	7,974	1.15	10
120600	Sunflower seeds	18,375	2.65	0
130219	Other vegetable saps and extracts	7,639	1.10	0
151190	Palm oil (excl. crude)	9,243	1.33	0
151219	Sunflower-seed and safflower oil	21,254	3.06	15
151620	Vegetable fats and oils	9,135	1.32	0
160100	Sausages and similar products	9,040	1.30	20
170111	Raw cane sugar, in solid form	120,273	17.34	0
170199	Cane or beet sugar, in solid form	11,888	1.71	12.5[c]
170490	Sugar confectionery	18,814	2.71	19
1806	Chocolate	43,336	6.25	0.6
1905	Bread, pastry, cakes	34,477	4.97	15
2101	Extracts and preparations of coffee	7,306	1.05	13.75
210500	Ice cream and other edible ice	9,601	1.38	15
210690	Other food preparations nes	10,001	1.44	2.14[c]
2203-2208	Alcoholic beverages	31,306	4.51	n.a.
	2203 Beer made from malt—15,458	n.a.	n.a.	0.6
	2204 Wine of fresh grapes—6,605	n.a.	n.a.	0.5
	2205/6 Vermouth & other fermented beverages—556	n.a.	n.a.	0.2/0.7
	2208 Spirituous beverages—8,687	n.a.	n.a.	2
2401	Unmanufactured tobacco; tobacco refuse	27,688	3.99	5
2402-2403	Cigars, cigarillos, cigarettes, & other manufactured tobacco	13,638	1.97	30
Total		508,077	73.23	n.a.

Sources: UN Comtrade Database 2007; UNCTAD Trains Database 2007.

Note: nes = not elsewhere specified. n.a. = not applicable.

a. Export shares in the agriculture total (US$998 million).
b. Import shares in the agriculture total (US$694 million).
c. Indicates a residual category with various tariff rates in the UNCTAD Trains Database that could not be matched to the precise import categories.

(7.7 percent of total exports), while the imports of these goods were valued at US$694 million. This was a record year for wheat exports and a good year for cotton exports (table 6.2); so, the total may be unrepresentative, but the first panel indicates the high level of concentration of farm exports. Wheat and wheat flour (58 percent), cotton (14 percent), and hides and leather (5 percent) accounted for over three-quarters of agricultural exports. Imports were more diverse, with only raw sugar accounting for over 10 percent of agricultural imports. Other substantial import categories tended to be semiprocessed items, such as tea and coffee, alcoholic beverages, dairy products and ice cream, edible oils, tobacco products, and chocolate and confectionary and bakery products.

The Evolution of Policies since 1991

The general policy stance toward agriculture was one of neglect in the 1990s, followed by more positive attention in the early 2000s. As an effect of this, relative prices shifted against the interests of farmers because agriculture was no longer a relatively favored economic activity as had been the case in the late Soviet period, but was suffering from net discrimination (or, at best, neutrality) by the late 1990s. The large currency depreciation in 1999 helped the traded goods sector, including the producers of the main farm exports (wheat and cotton). When government revenues were boosted because of the oil boom, budgetary assistance to the agricultural sector increased, especially through the billion-dollar Agriculture and Food Program of 2003–05, which had a variety of objectives, including the consolidation of farms, improvements in infrastructure, and the provision of public goods.

Prices and Subsidies

Following the dissolution of the Soviet Union in December 1991, Kazakhstan attempted to maintain traditional trade ties through bilateral agreements on interstate deliveries. The modified state order system underpinning these arrangements covered about three-quarters of the output in 1992, including most primary products. Delivery targets were, however, not met, and, in 1993, the government replaced state orders with a more flexible state needs system, covering about a fifth of output, mainly agricultural products. Compliance was poor, and, in 1994, the state needs system was downsized; by 1995, it only applied to grains. After state orders were abolished, the government continued to purchase grain for strategic reserves (700,000 tons in 1997, according to Csaki and Nash 1998), and this price was often used as a reference price.

The general price liberalization process was completed at the end of 1994 with the abolition of fixed prices for bread and for oil products. Foreign exchange

surrender requirements were abolished in July 1995, and most export restrictions had been lifted by 1996. Export taxes on grains were abolished in April 1996, and minimum export prices for farm products were ended in December 1996. Some agricultural exports (wheat, rice, and cotton) still had to be registered, but this requirement was abolished at the end of 1997.

The farm sector was in deep crisis throughout the 1990s (Gray 2000). Between 1992 and 1995, as prices were liberalized, input prices rose rapidly, but important output prices remained controlled or rose slowly because of monopsonistic markets (for example, many farmers sold their output to the single grain elevator or cotton gin in their district), leading to farm losses and resort to barter.[8] Subsidies for agriculture were substantially reduced, from 10–12 percent of GDP before 1991 to 2–3 percent in 1993.[9] The profit squeeze was accentuated in 1994 when directed credits dried up (subsidized credits to agriculture, which amounted to 5 percent of GDP in 1993, were abolished in February 1995) and when input subsidy programs were terminated (de Broeck and Kostial 1998). Fertilizer application rates in the wheat sector collapsed: 150,000 tons of nitrogen, 315,000 tons of phosphates, and 10,000 tons of potash were used in 1992, while, in 1994, the corresponding numbers were 65,000, 50,000, and 6,000 (Meng, Longmire, and Moldashev 2000). Baydildina, Alishinbay, and Bayetova (2000) and de Broeck and Kostial (1998) report official statistics suggesting that the only profitable crops in 1995 were potatoes and sunflowers; grains, vegetables, and eggs made small losses, while sugar beet losses were 19 percent, and the average loss for all animal products was 40 percent.[10]

The second half of the 1990s was characterized by an increasing debt crisis. Directives by local authorities caused farms to concentrate on activities that they knew to be loss making, while the continued extension of (nonsubsidized) loans to loss-making farmers sank them ever deeper into debt. The imposition of heavy penalties for tax arrears distorted the incentives of farmers to repay their creditors.[11] The problem was exacerbated by drought conditions in much of the country during the 1996–98 seasons. Grain production in 1998 was 6.5 million tons compared with 30 million tons in 1992, and the number of cattle fell from 9 million to less than 4 million over the same period (table 6.4).[12] At the macroeconomic level, 1998 became the nadir of Kazakhstan's transitional recession when an incipient recovery in 1996–97 was obliterated by fallout from the 1998 Russian crisis. In 1998, inflation was brought down to single digits, and, in 1999, growth resumed, accelerating in the early 21st century (Pomfret 2006).

In agriculture, the reversal of the price squeeze began in 1999, when the government introduced a price support system for wheat and then extended it to other goods. This was followed by a dramatic increase in the numbers employed in agriculture, from 1.3 million in 1999 to 2.4 million in 2001, although some of

Table 6.4. Inventory of Livestock, by Farm Type, Kazakhstan, 1990 to 2002

(head, millions)

	Cattle			Sheep and goats			Pigs			Horses			Poultry		
Year	AE	IF	HP	AE	IF	HP	AE	IF	HP	AE	IF	HP	AE	IF	HP
1990	6.7	<	3.0	29.2	0.1	6.4	2.6	<	0.7	1.1	<	0.5	40	<	20.0
1991	6.4	<	3.2	27.2	0.4	7.0	2.3	<	0.7	1.1	<	0.6	40	<	19.7
1992	6.1	0.1	3.5	25.9	0.8	7.8	1.9	<	0.7	1.0	<	0.6	33	0.4	19.1
1993	5.5	0.1	3.8	24.9	0.8	8.5	1.6	<	0.8	1.0	<	0.7	31	0.3	18.2
1994	4.4	0.1	3.6	17.2	0.7	7.3	1.2	<	0.8	0.9	<	0.7	23	0.1	10.0
1995	3.2	0.2	3.5	11.4	1.1	7.0	0.8	<	0.8	0.7	0.1	0.8	13	0.1	7.4
1996	1.9	0.2	3.3	5.8	0.9	6.9	0.3	<	0.7	0.4	0.1	0.8	9	0.2	6.7
1997	0.9	0.2	3.1	2.7	0.9	6.8	0.2	<	0.7	0.2	0.1	0.8	9	0.2	6.7
1998	0.5	0.2	3.2	1.5	0.9	7.2	0.1	<	0.7	0.1	0.1	0.8	10	0.2	7.2
1999	0.4	0.2	3.4	1.1	0.9	7.7	0.1	<	0.8	0.1	0.1	0.8	9	0.2	9.1
2000	0.3	0.2	3.6	0.9	0.8	8.2	0.1	<	0.9	0.1	0.1	0.8	10	0.2	9.9
2001	0.3	0.2	3.7	0.9	0.9	8.6	0.1	<	1.0	0.1	0.1	0.8	10	0.2	11.0
2002	0.3	0.3	3.9	0.9	1.2	9.1	0.2	<	1.0	0.1	0.1	0.9	12	0.3	11.6

Source: National Statistics Agency.

Note: AE = agricultural enterprises. IF = individual farms. HP = household plots. < = under 50,000 head.

this was due to statistical reclassification of the shadow economy (IMF 2003a). The Food Contract Corporation currently purchases about 10–17 percent of national production with the goal of maintaining grain reserves and alleviating short-term price fluctuations, but, as a large net exporter, the corporation cannot deviate far from world prices without risking large losses.

Public expenditure on agriculture, forestry, fisheries, and environmental protection increased by an average 40 percent per year between 2000 and 2005, as the budget of the Ministry of Agriculture increased from T 11,345 million (less than US$80 million) to T 80,090 million (US$600 million), and its share of the total central budget went from 2.5 to 6.5 percent. Much of this allocation occurred under the billion-dollar Agriculture and Food Program of 2003–05, which provided general services support to agriculture that was aimed at improving infrastructure and product quality (table 6.5).[13]

The stated objectives of the Agriculture and Food Program were to ensure food security, establish an efficient agroindustrial system, increase the sales of farm products and processed farm products in domestic and foreign markets, and optimize the state support for agriculture. The specifics focused on efficiency and competitiveness and recognized that technical support is an important public service for agriculture. On the other hand, the program might have been used to

Table 6.5. Budget Transfers to Agriculture, Kazakhstan, 2000 to 2005

(tenge, millions)

Transfer	2000	2001	2002	2003	2004	2005
Grain subsidies for inputs	100	450	645	837	911	921
Grain subsidies for services	0	0	0	400	0	300
Crop subsidies for inputs	16	334	363	1,265	1,553	1,784
Crop subsidies for services	0	70	147	173	2,381	2,237
Crop subsidies (miscellaneous)	0	0	0	1,000	4,806	7,950
Livestock subsidies for inputs	100	468	697	819	1,289	1,489
Livestock subsidies (miscellaneous)	0	0	0	279	2,500	1,500
Total: direct subsidies	216	1,322	1,853	4,773	13,440	16,182
Credit programs and grain reserve purchases	3,597	11,353	11,552	17,208	15,504	14,208
Research and development	103	143	279	1,667	3,048	3,031
Inspection services	2,375	4,396	4,596	6,435	6,852	8,320
Infrastructure	1,582	3,690	4,858	3,685	2,347	1,997
Marketing and promotion	393	901	854	730	148	1,325
Miscellaneous	3,079	4,987	9,368	18,799	26,955	35,027
Total: general services for agriculture	7,532	14,117	19,956	31,316	39,349	49,699
Total budget transfers	11,345	26,793	33,360	53,297	68,293	80,090

Sources: World Bank 2004a, 2004b.

Note: The table indicates the budget funds allocated to agriculture through all programs of the Ministry of Agriculture in 2000–04 and planned for 2005.

justify interventionist policies. For example, mention was made of reasonable protectionism to reduce import dependency. Many incentives were provided through subsidies to reduce the cost of inputs (for example, fertilizers, fuel, and seeds) and through price support schemes that might have acted against the aim of increasing efficiency and competitiveness.[14]

Privatization and Organizational Structure

In principle, farms were privatized in 1994, when shares were distributed to employees, but most farms were simply reorganized into cooperatives under the same management that had previously been responsible. When land share certificates were issued, most were turned over to the managers of the collective farms, who could use them to purchase equipment.[15] By 1995, there had been zero decollectivization in the sense of breaking up Soviet farms (a unique extreme, according to Mathijs and Swinnen 1998), but use rights on private plots (of less than

1 hectare) were more secure in Kazakhstan than in neighboring Turkmenistan or Uzbekistan.

The 1995 farm reform established the principle of the state ownership of land, with private use rights under long-term (99-year) leases. The government adopted a fresh approach to restructuring in 1998; the approach was based on acceptance of the need for bankruptcies that would lead to changes in ownership and management. In 2003, the government announced several new agriculture initiatives, most of which reflected statist attempts to modernize infrastructure, relocate farmers, and publicize output targets (Nurskenova 2004). Despite these announced reforms, the overall impression is that the government has still not resolved the issue of how the farm sector should be organized in the market-based economy.

The continued large farm size may reflect scale economies in grain farming on the Virgin Lands area. The small amount of farmland that has been purchased and is cultivated independently (146,642 hectares by 2005) is almost exclusively in the south, where most of the farming is done on individual farms that concentrate on cotton production. Livestock farming, apart from chickens, had almost disappeared from large farms by the end of the 1990s; the numbers of cattle, sheep and goats, pigs, and horses in agricultural enterprises had, by 2002, all fallen to 5 percent or less of the number in 1990, while the number of animals on individual peasant farms has increased by huge percentages, but remained small in absolute terms (table 6.4). By contrast, livestock inventories on household plots were fairly stable during the transitional recession and have substantially increased since 1997; the overwhelming share of animals is now found on over 2 million household plots (average size: 0.2 hectares), and these backyard farms were producing 87 percent of the meat, 91 percent of the milk, 49 percent of the wool, and 49 percent of the eggs in 2003.

Land tenure arrangements posed particular problems in the pastoral sector, where seasonal migration patterns that had already been eroded over decades of deliberate sedentarization were additionally disrupted by changes in access rights (Swinnen and Heinegg 2002). Restoring the traditional (pre-Soviet) transhumance grazing system might ameliorate the current situation of overgrazing on open-access lands close to settlements and the underutilization of the country's abundant rangelands, but no legal framework exists to define routes along which animals may be moved at low cost to summer pastures and back.

One problem facing the farm sector has been the lack of investment to improve infrastructure and permit quality upgrading. The capital-output ratio, labor productivity, and total factor productivity all continued to decline in the second half of the 1990s and early 2000s, when productivity growth was positive in other sectors.[16] Much farm produce was spoiled or had become overpriced before reaching

the primary market. Fruits and vegetables and processed food products often became uncompetitive with imported goods because of poor storage, processing, or packaging. In microcosm and with its own specific problems, the agricultural sector typifies the failure of Kazakhstan's non-oil economy to adapt to and flourish in a market-based environment. The government's three-year program (the 2003–05 Agriculture and Food Program) for the restoration and development of the agriculture sector began to address some of these problems.

The cotton ginning subsector is an exception to this negative picture. By 1998, the existing gins had been fully privatized, and several new gins have been constructed since then. This is partly explained by the participation of Russian investors wishing to access cotton for export directly to textile mills in Russia and also by the increased demand for ginning services in southern Kazakhstan because of the large-scale smuggling of seed cotton from Uzbekistan (Sadler 2006; also see chapter 8).

Trade Policies

Kazakhstan's trade policies are difficult to track in the early postindependence years because the borders were extremely porous.[17] Different practices were applied to trade with CIS countries and to external trade, although the two may not have been easy to distinguish at the Kyrgyz or Russian border. Since 1995, Kazakhstan has pursued a trade policy based on moderate most-favored-nation tariffs, although there has been some variability in implementation. Kazakhstan is a member of several regional organizations, although the only one to have a significant influence is the Eurasian Economic Community.[18] The external environment is also affected by the exchange rate regime, which changed in the wake of the 1998 Russian crisis.

Following the Russian price reform of January 1992, an immediate concern in Kazakhstan was the fear of losing goods in return for rapidly depreciating Soviet rubles, and export restrictions were imposed. The export controls were also aimed at supporting the interstate delivery system, although, as mentioned elsewhere above, this disintegrated rapidly in 1992–94 because exporters found more favorable prices outside the system. Export duties were simplified in 1995 and abolished in 1996. The government itself showed some predilection for non-CIS markets as the value added tax was initially refunded only on exports to non-CIS markets. This disincentive to supply CIS markets was removed in the 1997 budget, and all exports are now zero-rated for the value added tax.[19]

The initially ad hoc tariff schedule was simplified during 1995 and 1996 to form 12 bands, ranging from 1 to 100 percent. In January 1997, a new tariff schedule reverted to 13 bands, but with a maximum of 50 percent and a lower weighted average tariff (12 percent).[20] Table 6.6 provides tariff rates on selected agricultural

Table 6.6. Import Tariffs on Agricultural Products, Kazakhstan, 1996 to 1997

(percent)

Commodity	Taxable imports, 1995	Tariff rate, 1/1/96	Tariff rate, 1/1/97	Trains, 1996
1. Livestock	0.4	5	5	3.7
2. Meat	5.2	15	20	14.6
3. Fish	2.4	10	10	n.a.
4. Milk & honey	10.2	10	16	13.2
5. Agricultural products	0.1	10	10	8.8
7. Vegetables	2.6	15	15	14.9
8. Fruit	7.8	10	10	6.1
9. Coffee & tea	23.3	5	5	1.2
10. Cereals	2.0	1	5	0.8
11. Milling (flour and so on)	0.6	10	10	10.0
12. Oilseeds	5.4	5	5	4.8
13. Resins and juices	0.5	5	5	1.3
14. Vegetable products	6.4	15	15	13.6
15. Fats & oils	14.2	15	20	1.2
16. Meat & fish products	8.4	15	15	22.7
17. Sugar	58.4	25	25	6.4
18. Cocoa	9.0	0	5	0.3
19. Grain products	28.3	15	15	14.1
20. Vegetable products	12.3	20	20	17.6
21. Miscellaneous food products	8.3	15	15	11.9
22. Alcohol	32.5	40	30	15.0
23. Spices	0.4	5	5	1.0
24. Tobacco	37.7	15	19	20.6
41. Leather	0.6	5	10	5.0
42. Leather goods	1.8	25	20	n.a.
43. Fur	0.2	30	5	7.8
46. Hay products	0.0	25	25	n.a.
50. Silk	0.6	5	5	n.a.
51. Wool	1.1	20	20	20
52. Cotton	5.3	20	20	13.9
Average tariff				
Simple average	n.a.	15.2	17.3	9.5
Import weighted	n.a.	13.9	12.0	n.a.

Sources: IMF 1997; UNCTAD Trains Database 2007.

Note: The commodity group numbers and descriptions are those provided through the Ministry of Economics. There are some discrepancies with the Trains and Harmonized Commodity Description and Coding System categories; for example, 22 in the Trains Database includes nonalcoholic beverages. n.a. = not available.

products in 1996–97. Tariffs were reduced again in July 1998 so that there were fewer tariffs over 20 percent and a weighted average tariff of slightly less than 9 percent. After the Russian crisis and the appreciation of the tenge, several temporary tariffs of up to 200 percent and bans on some imports, mainly food products from the Kyrgyz Republic, Russia, and Uzbekistan, were introduced in the first half of 1999, although these were rescinded fairly quickly. Apart from these temporary spikes, the only major peak at the six-digit level is the 100 percent duty on ethyl alcohol (220700); no other category in tables 6.3 (panel c) and 6.6 had an individual tariff line peak at over 30 percent.

The final column of table 6.3, panel c matches tariff rates with 22 major disaggregated import categories (those with over 1 percent of all agricultural imports). Some of the largest import categories enjoyed duty-free status, notably raw sugar. Products enjoying the highest tariff protection included manufactured products (cigarettes, at 30 percent) or processed products (frozen chicken pieces, 23.75 percent; sausages, 20 percent; confectionary sugar, 19 percent; bread, pastries, ice cream, 15 percent). Dairy products (butter, 20 percent; milk, 12 percent) and sunflower seeds (15 percent) are the only primary farm products that Kazakhstan imports in significant amounts at tariffs of over 5 percent.

In January 1996, Kazakhstan lodged its application for membership in the World Trade Organization (WTO). The process lagged in the late 1990s; the lag was associated with slowing reform and economic crisis, but the process resumed in the early 2000s (table 6.7).[21] Key issues in working party meetings in 2003–04 concerned high tariffs on some industrial and agricultural goods, Kazakhstan's desire to maintain some export subsidies and to have developing-country status,

Table 6.7. The Status of WTO Accession Negotiations, Kazakhstan, 1996 to 2006

Event	Date
Application received	January 29, 1996
Meetings of the working party	March 19–20, 1997 October 9, 1997 October 9, 1998 July 12–13, 2001 December 13, 2002 March 4, 2004 November 3, 2004 November 1, 2006
Draft report of the working party	May 20, 2005 September 29, 2006

Source: WTO Web site, http://www.wto.org/english/thewto_e/acc_e/a1_kazakhstan_e.htm.

the inadequate coverage of areas for liberalization under the General Agreement on Trade in Services, weak legislation on the Agreement on Trade-Related Investment Measures, and inadequate institutions to meet the Agreement on the Application of Sanitary and Phytosanitary Measures, the Agreement on Technical Barriers to Trade, or the requirements of the Agreement on Trade-Related Aspects of Intellectual Property Rights.[22] The first draft report of the working party, which is the basis for the final negotiation phase on WTO accession, was completed in May 2005, and another was issued toward the end of 2006.

Kazakhstan has aimed to keep special ties with other former Soviet republics, variously described as a free trade area, customs union, or unified economic space, although the practical implementation has often been difficult to document. In May 1993, when the CIS was clearly failing to establish itself as an economic organization, 10 CIS members, including Kazakhstan, reached an agreement to form an economic union, and a formal treaty to that effect was signed in September 1993. This treaty had little or no impact, although much bilateral trade among CIS members (including Kazakhstan's trade with the Kyrgyz Republic, Russia, Turkmenistan, and Uzbekistan) was unmonitored and, hence, treated differently than extra-CIS trade.

In January 1995, Kazakhstan signed a customs union agreement with Belarus and Russia. Tariffs on trade between members were eliminated in March, and there were moves toward harmonizing external tariffs in 1995–96, although this seemed to halt with Kazakhstan's January 1997 tariff revision. The union was extended to include the Kyrgyz Republic in 1996 and Tajikistan in 1999. In February 2000, reflecting the lack of progress toward a customs union, a new agreement was signed, which envisaged tariff harmonization within five years, but, by 2005, the common external tariff covered only 6,156 of the 11,086 tariff lines identified in the union's classification system (and these were largely lines on which the preexisting tariffs of the members had been similar). In October 2000, the union was renamed the Eurasian Economic Community, and the institutional structure was strengthened. In October 2005, Uzbekistan acceded to the community.[23]

The main reason a common external tariff in the community is unacceptable to Kazakhstan is that Russia's tariffs are higher than those of Kazakhstan, both on average and in terms of peaks on individual items. Although the Kazakh authorities have indicated that Russia's tariff is used as an informal benchmark for Kazakhstan's offers of bound tariff levels in its WTO negotiations, it is unlikely that Kazakhstan would want to raise tariffs to a level that would hurt the country's consumers to the benefit of Russian producers, when Russia's own tariffs would remain unchanged and provide no new preferential advantage to Kazakh exporters.[24]

Exchange Rate Regimes

The history of Kazakhstan's exchange rate since independence may be divided into four phases. Kazakhstan continued to use the ruble until November 1993. From the introduction of the national currency until early 1999, the Central Bank adopted an almost-fixed crawling peg regime, which was successful in ending hyperinflation and resulted in substantial real exchange rate appreciation during 1994–96. In April 1999, driven by a large appreciation of the tenge relative to the ruble following the 1998 Russian crisis, the tenge was allowed to float. Since May 1999, the Central Bank has pursued a dirty float; despite pressures for appreciation of the tenge, it has maintained an exchange rate anchor.

In 1992 and for most of 1993, the country continued to use the ruble. The institutional features of the ruble area allowed each member country to create ruble credits, which set up a classic free rider situation and led to hyperinflation (Pomfret 1995). During these first two years following the dissolution of the Soviet Union, with prices rising at over 50 percent a month, frequent currency shortages, and the sudden replacement of Soviet rubles by Russian rubles in mid-1993, relative prices did not operate as efficient signaling mechanisms, and it is impossible to measure price distortions in any meaningful way.

In November 1993, Kazakhstan introduced a national currency, the tenge. For the first few months of 1994, the new currency depreciated in real terms. The stabilization program introduced in 1994 used the exchange rate as an anchor: an almost-fixed crawling peg that gave credibility to monetary policy. The shift to a nonaccommodating monetary policy was accompanied by a real appreciation from mid-1994 to 1996, by which time annual inflation had been brought below 50 percent. In July 1996, Kazakhstan accepted International Monetary Fund Article VIII, making the tenge convertible for current account transactions. This exchange rate policy was, with minor adjustments, maintained through the 1997 Asian crisis and the 1998 Russian crisis.

Failure to follow the large ruble devaluation in August 1998 led to loss of competitiveness relative to Russia, the country's largest trading partner. Throughout 1997 and the first half of 1998, the tenge remained at T 75–77 per U.S. dollar, and, although the tenge depreciated in the second half of 1998, it stood at T 88 per dollar at the start of April 1999. Meanwhile, the Russian ruble, which, through 1997 and up to the start of August 1998, had traded at Rub 6 per dollar, had fallen to Rub 13 per dollar by the end of August, and further depreciated to Rub 26 per dollar by April 1999. Thus, the tenge-ruble exchange rate had appreciated from a fairly stable 12 to 13 before August 1998 to less than T 4 to the ruble eight months later. The consequence for Kazakhstan was a severe recession.

In April 1999, Kazakhstan allowed the tenge to float. After the announcement of the float, the tenge fell to T 99 per dollar, on April 4, and to T 130 per dollar by

the end of May 1999. This large depreciation fueled a rapid recovery. The subsequent, sustained boom was driven by the expansion of oil exports as world prices soared from less than US$10 a barrel in 1998 to peaks of US$60–US$70 in 2005–06, new oil fields came into production, and new pipeline routes undermined the monopsony power of the Russian state company, Transneft.

Since May 1999, the Central Bank appears to have reverted to an exchange rate anchor. Although there have been fluctuations, the exchange rate in February 2006 was T 130 to the dollar, the same rate that applied at the end of May 1999, despite strong pressures for currency appreciation.[25] Already by the end of 2003, the economy exhibited signs of overheating because of demand pressure from large foreign direct investments in oil, fiscal and public sector expansion, and a credit-fueled private boom (World Bank 2004b). All these pressures were driven by the oil boom and the expectation of its continuation, and, in 2004 and 2005, these expectations were more than justified because oil prices were still rising.

The current exchange rate regime is unsustainable. Oil income will force appreciation of the tenge, and the key issue is the pace and manner of the appreciation and whether the volatility can be minimized. The Central Bank accumulated foreign exchange reserves in 2004 and 2005 to limit exchange rate appreciation, while issuing domestic debt to reduce the prospect of recession in the non-oil sector, but rapid expansion of domestic credit may be dangerous given the limited experience of local banks in managing credit exposure and, also, the limited experience of the banking supervisors. Temptations to lend for construction and real estate, for example, might produce an asset bubble. Expansionary fiscal policies (putting pressure on the price of nontradables) and tight monetary policies (leading to nominal appreciation) might exacerbate the problem if they lead to real appreciation overshooting (World Bank 2005). The government announced that it would move to inflation targeting in 2006, but fear of floating may discourage the abandonment of exchange rate targeting.

This exchange rate history has implications for the calculation of support to the agricultural sector. In perfectly functioning markets, exchange rate changes will be reflected immediately in domestic prices unless public policies shield a sector from such changes, and any gap between domestic and world prices may be considered a policy distortion. However, in transition economies, such pass-through is far from perfect. The exchange rate volatility in Kazakhstan in 1993–94 and 1998–99 affected the gap between border and farmgate prices even in the absence of any policy distortion. In the current environment, increased fiscal spending on agriculture, if accompanied by tight monetary policy, will have an ambiguous effect on incentives to tradable farm goods as the real appreciation overshoots. The level of the exchange rate may also distort the interpretation of producer support based on the price gap. For example, an overvalued currency

will hurt the tradables sector, and worries about Dutch disease effects are a genuine concern in an oil boom economy. Nevertheless, given the assumptions needed to calculate the real exchange rate in Kazakhstan, there is a serious loss of transparency in using such measures. Care should be taken not to read too much into annual variations in support estimates based on the price gap, especially at times of large shifts in the exchange rate.[26]

Quantifying the Distortions

The expectation from the discussion in the previous section is that policy-induced price distortions should be small both within Kazakhstan's agricultural sector and for agriculture relative to other sectors. Kazakhstan is a net agricultural exporter, and the main export products, grains and cotton, are not characterized by significant subsidies or by taxes. For cotton, this is in contrast to neighboring Turkmenistan and Uzbekistan, where state marketing boards cream off a large part of the rents (inducing farmers to smuggle their crops across the border into Kazakhstan where they may benefit from prices that are closer to the world price; see chapter 8).

The government drastically cut back on subsidies to the farm sector during the 1990s, although there has been some revival of support in the 21st century, especially since 2003 (table 6.5). In general, input prices have been unregulated since the early 1990s, although a key exception is water, which is not so important for the rain-watered grain lands, but is crucial for the irrigated cotton fields of southern Kazakhstan. Agriculture has also benefited from credit subsidies, although, as mentioned above, these appear to have been minor since the early 1990s.

Agricultural activities, apart from exceptional episodes, such as the events in 1999, have not been heavily protected by tariffs either as a group or individually. In broad sectoral terms, the minerals and metals sector receives little tariff protection, while other sectors are treated roughly equally. The average import-weighted tariffs, using the 1996 tariff schedule and 1995 weights, are as follows: agricultural products, 18.3 percent; minerals and metals, 6.3 percent; textiles, clothing, and footwear, 20.8 percent; and other manufactures, 18.4 percent.[27] The tariff structure has not changed significantly since 1995/96, although some rates have been reduced. It should also be noted that the most-favored-nation tariff rates in tables 6.3 (panel c) and 6.6 overstate the applied tariffs; most of the dairy imports, for example, are from CIS countries.

There were no published producer support estimates (PSEs) for Kazakhstan at the time of writing. The Organisation for Economic Co-operation and Development (OECD) has produced estimates for transition economies, but the only CIS countries covered were Russia (Melyukhina 2003) and Ukraine (World Bank and

OECD 2004), which indicate large positive estimates at the aggregate level up to 1991, sharp reversals in 1992, and then increases to positive values.[28] In broad terms, we may expect PSEs in Kazakhstan to have exhibited a similar pattern of pre-1991 positive estimates turning sharply negative in 1992, but policy divergence among the Soviet successor states is likely to have increased as the Soviet legacy recedes.

In a report to the World Bank, Serova (2004) provides PSE-style estimates for 1998–2002. The reference prices—unit values of exports (for grains and sunflowers) or imports (for meat, poultry, and wool)—were compared with farmgate prices that had been adjusted by 30 percent for domestic handling costs. Serova's grain and sunflower estimates are plausible; they show minimal support in 1998 followed by negative estimates for 1999–2002, indicating incomplete pass-through from the large currency depreciation. The estimates indicate a strong shift from negative support for meat and poultry in 1998 and 1999 to increasing positive support in 2000–02. Less convincing are the estimates for cotton, which are increasingly negative, from −116 percent in 1998 to −232 percent in 2001 (no estimate for 2002), which is far out of line with the description of a competitive post-1998 cotton sector.

The remainder of this section reports on a preliminary attempt at assessing the net distortions facing producers of the main agricultural products. The first two subsections deal with Kazakhstan's main farm exports: wheat, which, together with barley and flour, is produced by the farmers in the north and center of the country, and cotton, which is produced in a small area adjacent to the border with Uzbekistan. The third subsection covers livestock farming, and the fourth subsection import-competing crops. A fundamental conclusion is that the gap between farmgate prices and border prices, which is often used as a first-cut measure of price distortions in agricultural incentives and competitiveness, is an imperfect measure in Kazakhstan because all producers in the country face high trade costs. Evidence on these costs and assessments of the extent to which they may be interpreted as distortions against particular branches of farming are discussed in the fifth subsection. The final subsection presents preliminary estimates of rates of assistance to agricultural producers in 2000–04.

Wheat

Table 6.8 presents preliminary estimates for wheat in the early 2000s prepared by Anara Jumabayeva (2006) of the Food and Agriculture Organization of the United Nations for the World Bank's agricultural policy assessment. The fundamental finding is that the farmgate price received by wheat producers in Kazakhstan during 2000–04 was well below the world price, minus the costs of transporting

Table 6.8. Nominal Rates of Assistance for Wheat, Kazakhstan, 2000 to 2004

Indicator	2000	2001	2002	2003	2004
Production (tons 1,000s)	9,074	12,707	12,700	11,537	9,937
Border price (free on board, US$)	91	106	83	100	151
Exchange rate (T per US$, mid-year)	142.13	146.74	153.28	149.58	136.04
Domestic currency price (T)[a]	14,227	17,110	13,994	16,454	22,596
Transport, handling, and so on (T)	3,017	3,158	3,262	2,937	2,538
Reference price at farmgate (T)	11,198	13,887	10,679	13,581	18,967
Producer price at farmgate (T)	9,812	11,322	9,678	12,068	14,565
Price distortion (T)	−1,386	−2,565	−1,001	−1,513	−4,402
Market price support (T millions)	−12,572	−32,595	−12,714	−17,453	−43,741
Subsidies (T millions)	61	442	593	1,630	2,529
PSE (T millions)	−12,511	−32,154	−12,121	−15,823	−41,211
Value at farmgate (T millions)	89,029	143,866	122,911	139,223	144,732
NRA (% of value)	−14	−22	−10	−11	−28

Source: Jumabayeva (2006).

a. The domestic currency price equals the border price, adjusted for quality (a multiple of 1.10) to account for the larger proportion of feedstock in exported wheat; for 2004, the adjustment factor is 1.05 because, with the poor harvest, the average quality was higher, and the quality differentials were smaller.

wheat to the border. Perhaps even more striking is the fact that the net distortion against wheat farmers, which had fallen from 14–22 percent in 2000–01 to 9–10 percent in 2002–03, rose to 28 percent of the producer price in 2004 despite an apparently more supportive policy stance.

Two points emerge from the estimates in table 6.8. First, the estimates are dominated by the price gap, and, second, the price gap is difficult to gauge. Although it increased from T 61 million in 2000 to T 2,529 million in 2004, budget assistance to wheat farmers plays a minor role in determining estimates of producer support. Even in 2004, when the subsidies are at their highest, they only amount to 1.75 percent of the farmgate value of wheat. In sum, the estimated distortion in table 6.8 is dominated by the negative price gap. The estimated magnitudes of the price gap must, however, be treated with caution. In a period when the government was not intervening in the market to any great

extent, it is difficult to explain the volatility of the estimated gap between border and farmgate prices from T 1,386 per ton in 2000, to T 2,565 in 2001, T 1,001 in 2002, T 1,513 in 2003, and T 4,402 in 2004.

Obtaining a reference price that may be compared with the producer price at the farmgate has involved three steps: the export unit value in U.S. dollars was calculated from official trade data; the dollar value was converted into tenge at the current exchange rate; and the domestic currency price was adjusted for transport and handling costs between the farm and the border. The quality-adjusted border price is the weakest link in the wheat calculations.[29] Converting the quality-adjusted dollar border price into a domestic currency reference price involves assumptions about the exchange rate and transport costs, but the overall results are not greatly sensitive to these assumptions, and the last two steps do not appear to be likely sources of misleading errors.[30]

The unit value of wheat exports has fluctuated more than might be expected for the true border price. Commonly used indicators of world wheat prices show, at most, a small increase from 2003 to 2004; for example, the world price of the Food and Agriculture Organization of the United Nations increased from US$150 to US$161 and the OECD world price fell from US$156 to US$152.[31] The unit value of Kazakhstan's wheat exports may have reflected specific marketing features in 2002–04 that make it an inappropriate reference price for distortion calculations. Most of Kazakhstan's wheat exports are to CIS markets, although sales to Central Asian neighbors have been reduced as a result of import-substitution strategies in Turkmenistan and Uzbekistan. Some part of sales to Russia and Ukraine is reexported, but transport costs to more distant markets are high. (For example, in 2003–04, when the price was about US$100 per ton at the elevator in Kazakhstan, it cost US$16 per ton to get the wheat on the train and to the border, US$30 to transport it through Russia to the Ukraine border, and US$13 for transport within Ukraine.) The years 2000 to 2002 saw a large increase in Russian wheat production (from 34 million to 51 million tons), and 2002 saw a surge of Ukraine exports to the European Union (EU). At the wrong end of this chain, Kazakh wheat exporters may have found themselves squeezed by the price offered by Russian traders, although sales might have held up if the price were sufficiently low so that it became profitable to import cheap Kazakh wheat and export Russian or Ukrainian wheat to the EU. In 2004, the quantity exported by Kazakhstan was especially low (2.5 million tons, or about half of the quantity in the previous year), which may have reflected a decision to stockpile wheat for strategic reasons.[32] Under these conditions, because the border price is not the price determined in a competitive world market, it is difficult to conceptualize the appropriate reference price for assessing domestic distortions. From all of the evidence, a 51 percent increase in border price between 2003 and 2004

appears misleading, and a more plausible reference price would not show the dramatic decline in support for wheat between 2003 and 2004 that appears in table 6.8.

In sum, from the OECD's PSEs for Russia and Ukraine, it is likely that Kazakhstan's situation switched from substantial distortions in favor of wheat farmers at the time of independence to negative support in 1992. The estimates in table 6.8 suggest that the negative support persisted into the 21st century, although the increasingly negative support in 2004 may be a false indicator based on an inappropriate reference price. In a sensitivity analysis of the support estimates, the picture of wheat growers in Kazakhstan facing negative net incentives driven by negative market price support appears to contradict the description of farm polices in the previous section, which finds little evidence of policy-induced distortions against wheat farmers by the late 1990s and a positive policy stance toward them in more recent years. The paradox may be resolved in two complementary ways. An interpretation of the negative signs in table 6.8 is presented in terms of the inefficiency of internal trade in Kazakhstan; behind-the-border inefficiencies create a wedge between the world price and the farmgate price. The sensitivity analysis shows that allowing for the potential bias in the 2004 wheat estimate because of the use of an inappropriate border price is sufficient to reverse the finding that the situation for wheat farmers deteriorated in 2004; thus, the support could plausibly have been positive in that year.

Cotton

After the end of government controls in the mid-1990s, cotton farmers in Kazakhstan faced slightly unfavorable relative prices. Relative to both wheat and rice, the producer price of cotton declined in 1996 (table 6.9). For the 1997 harvest season, Goletti and Chabot (2000) estimate the average border parity price for raw cotton in Central Asia at US$404 per ton. The local currency price of raw cotton received by farmers in Kazakhstan was T 25,500, or US$349, which was less than the price received by farmers in the Kyrgyz Republic (US$394) or Tajikistan

Table 6.9. Producer Prices for Wheat and Rice Relative to Cotton Lint, Kazakhstan, 1994 to 2002

Product	1994	1995	1996	1997	1998	1999	2000	2001	2002
Wheat	0.038	0.039	0.055	0.048	0.040	0.034	0.046	0.047	0.041
Rice	0.163	0.163	0.234	0.184	0.176	0.150	0.128	0.125	0.132

Source: Author calculations based on data in the FAOSTAT Database 2007.

Note: The prices are calculated as a fraction of the producer price for cotton lint.

(US$388), but substantially above the prices that farmers received in Turkmenistan (US$240) or Uzbekistan (US$242). The gap in Kazakhstan reflected a mixture of the monopsony power of the cotton gin owners, quality differences, and the transport and other costs of moving the cotton to the border, rather than policy-induced distortions against farmers.

The situation changed significantly around 1997–98 as producer prices for cotton improved relative to the prices for other crops (table 6.9).[33] Between 2000 and 2002, as world cotton prices fell by 20 percent, domestic producer prices were stable. This reduction in the price gap reflected changes in the organization of the domestic market rather than any public policy changes. The key relationship is between cotton farmers and cotton gins, and the market position of farmers improved as the number of cotton gins increased in the early 2000s.

Land reform led to the creation of a large number of independent small-scale cotton producers in southern Kazakhstan. Producers enter into a contract to supply a gin with a fixed amount of cotton, for which they will receive a price linked to a world price index at the time of delivery. They do this to obtain prefinance, 30 percent of which is provided upon signing an agreement to deliver a certain amount of cotton, 40 percent at harvest, and 30 percent upon delivery. Some of the finance is provided in kind because gins organize the supply of seeds, fertilizer, fuel, and water. The formal fee structure is US$150 per ton for ginning and 18 percent per year interest on financing, although one suspects that the inputs obtained through gins are overpriced and that the gins are not scrupulous in assessing and rewarding quality. There is also a market for free seed cotton (that is, for cotton production in excess of original agreements) that can pay a significant premium over contract prices. In 2003, for example, free seed cotton prices were, on average, US$500, or 21 percent above the prices paid for contracted cotton.[34]

The extent of distortions facing cotton farmers in Kazakhstan in the early 2000s is unclear. The price differential for free seed cotton might suggest that supplies under contract are underpriced because the gins exploit the lack of access by farmers to financing. On the other hand, the increase in the number of gins and the variety of owners suggest that the gin sector is competitive and that cotton farmers do not face distorted net output prices. Sadler (2006), in reporting on the results of a survey of cotton producers during the 2003 crop season, states that, although many farmers complained of dubious practices at gins, 97 percent of the respondents said they could change their ginners if they wished to do so, and 92 percent had actually done so. Competition among gins appeared to be intensifying in the early 2000s, as gins increasingly provided collection points outside their own immediate area. Unlike the situation among wheat exporting farmers who face high trade costs, the cotton ginners reduce trade transaction costs for agricultural exporters by managing the efficient transport of the baled cotton to

foreign buyers. Following the strong competition among gins in 2004, however, the gins established an informal cartel in 2005, which has reduced the bargaining power of farmers.

In sum, cotton farmers in Kazakhstan have been operating since the late 1990s under largely undistorted market-driven incentives. Apart from seed and fertilizers, the main input is labor, especially at harvest time. Mechanized cotton harvesting, which was vigorously promoted in the Soviet era, is not economic at Central Asian factor prices (Pomfret 2002), and, in addition, handpicking gives a higher-quality harvest. Labor markets are highly competitive in Kazakhstan's cotton growing regions, which have access to cheap migrant labor from neighboring Uzbekistan. Despite the frequent reports of the harassment of migrants and the lack of basic employment rights, there is an almost unlimited supply of skilled Uzbek cotton-pickers willing to migrate to Kazakhstan during the harvest season because a good picker can clear US$200 in a month, compared with the average wage in Uzbekistan of around US$20.[35] Farmers in Kazakhstan are keen to employ the migrants because illegal workers will pick for T 3 to T 5 per kilogram, while Kazakh cotton-pickers demand at least T 10. In the absence of policy-driven distortions in incentives, year-to-year variations in the situation of cotton farmers reflect changes in industrial organization in the ginning sector and, to a lesser extent, changes in labor market conditions that depend on the openness of the border with Uzbekistan.[36]

Livestock

The livestock sector and the commercial grain and cotton sectors followed different paths. The large agricultural enterprises (successors to the collective and state farms) that dominate the agricultural sector in terms of cultivated area dramatically reduced their livestock numbers, and this explains the poor aggregate performance of the livestock sector during the 1990s (table 6.1). The new individual peasant farms have increased their animal numbers, but the total number of head on these farms remains small (table 6.4). Today, livestock farming is concentrated among the small household plots that survived from the Soviet era, although the aggregate numbers remain well below 1991 levels (table 6.4).

The elimination of large-scale livestock farming was caused by unfavorable initial conditions, combined with rapid economic restructuring. During the 1950s and 1960s, the fodder base had increased rapidly to sustain growth in the sedentarized livestock sector. Livestock farms relied on fodder that was often transported over a substantial distance via the Soviet transportation system at no cost to the farm. The long-range mobility of livestock that had characterized traditional herding practices was effectively eliminated, and any property rights to reestablish

transhumance were impossible to negotiate during the fairly rapid privatization process. With the end of Soviet central planning and the decline in available fodder, the large-scale livestock farming sector collapsed within a half decade of independence.[37] The large agricultural enterprises traded animals to settle their debts or slaughtered them to obtain working capital and cut costs.

In the early 1990s, as relative prices turned against farmers and a tight monetary policy followed the introduction of the national currency in late 1993, barter became the main trading tool for acquiring essential supplies. Livestock became the most commonly used means for settling farm debts and a crucial buffer against the belated payment of wages, salaries, pensions, and other social security payments. During this period, many families relied on the cow or pig or a few sheep on their household plot as a coping measure against the deprivations of the transitional recession. The animals were a means of subsistence and also a source of insurance in case the family should need to provide for important events such as weddings. Although families used their animals to weather the economic uncertainties of the 1990s, they were careful to husband their stock and maintain their capital. At the trough of the recession in 1997, the number of cows, pigs, sheep, and goats on household plots was almost the same as it had been at the start of the decade; only the chicken population had declined (table 6.4).

Since the late 1990s, barter has given way to monetary transactions, and much of the household plot production of meat, milk, and eggs is sold in local markets to cover the household consumption of non-self-produced items.[38] Over half of all rural households sell livestock products; meat shows the highest sales-to-production ratio (0.36) of any major home-produced good, followed by eggs (0.15) and milk (0.12).[39] Although farmgate prices in tenge are reported to have risen substantially since 1993, they vary significantly by season and location, and it is difficult to isolate a real price index or establish a reference price for most livestock products sold locally by farmers. The export of livestock products, except for wool and skins, is limited to local crossborder trade with China, the Kyrgyz Republic, Russia, and Uzbekistan.

The livestock sector has no major price distortions, but it faces high infrastructure costs shared by all dispersed producers in Kazakhstan, and it receives three sets of subsidies. First, the purchase of stockbreeding materials and livestock is subsidized, although budget allocations are small and disbursements less.[40] Second, larger subsidies (T 3.3 billion in 2003) are provided for the veterinary control of contagious diseases. Third, Mal Onimderi Corporation, established in 2001 as a government-owned joint stock company aimed at stimulating the livestock sector and developing new export markets, received an initial loan of T 2 billion at an interest rate about 10 percent lower than it would have paid for a commercial line of credit. Commercial banks also receive partial reimbursement from the

government of the interest on loans to agricultural processing companies, which allows them to offer discounted credit to such companies.

It is difficult to evaluate the impact of this recent assistance to livestock producers, but it has coincided with a turnaround in the livestock sector. Data on animal stocks from the FAOSTAT Database of the Food and Agriculture Organization of the United Nations, which are not consistent in every respect with the numbers of the National Statistics Agency in tables 6.1 and 6.4, show a substantial recovery in livestock herds since around 2000. Between 2000 and 2005, according to the FAOSTAT data, the number of cattle increased from 4.0 million to 5.2 million, the number of sheep from 8.7 million to 11.3 million, goats from 0.9 million to 2.0 million, pigs from 1.0 million to 1.3 million, and chickens from 17.9 million to 25.5 million.[41]

Other Agricultural Products

Other crops followed the overall pattern of declining output until 1997 and then showed varying degrees of recovery, epitomized by potatoes and sunflower seeds (table 6.1) and by sugar beets. Valued at domestic producer prices, potatoes are a more important crop than cotton, although the trade data show that they are grown overwhelmingly for domestic consumption.

Rice production in southern Kazakhstan has declined because farmers have shifted land from rice to cotton production, especially in Kzylorda Oblast, which agronomists would consider climatically marginal for cotton growing. This may reflect distortions against rice, but it more likely reflects the profitability of cotton in the relatively undistorted post-1998 environment described above. The price of rice relative to cotton lint, stable at 0.16 in the first half of the 1990s, jumped to 0.23 in 1996, but then fell dramatically over the rest of the decade to 0.13 in 2000 (table 6.9).

Trade Costs

The gap between farmgate prices and a border reference price, adjusted for normal transport costs, is not simply a measure of policy distortions. It also includes transaction costs that may be defined as transport costs, but the magnitude of which is heightened by poor soft infrastructure, as well as by inadequate hard infrastructure (such as poor roads and railways). This is not merely an issue in transition economies. The reduction of barriers to trade—such as tariffs and quantitative restrictions—during rounds of multilateral trade negotiations has raised the profile of the remaining behind-the-border and at-the-border trade costs, and trade facilitation has become a major concern of policy makers wishing to increase the gains from trade.[42] Such costs are especially high in transition

economies, and they are amenable to change if policy makers are willing and able to strengthen the rule of law.

The most obvious trade costs are internal and may be addressed by national governments.[43] In Kazakhstan, bureaucratic and other obstacles to trading and exporting became a striking feature of the economy during the 1990s, when regional and district governments created their own policies, and local policemen and other officials relied on arbitrary fees to supplement their meager or unpaid salaries. When each individual with the power to levy a fee along the road from the farm to the market or the border thinks only of maximizing his own returns and ignores the potential externalities of his actions, too little trade takes place, and, in extreme cases, trade may be eliminated altogether. The solution in well-functioning market economies is for the government to exert its influence to prevent a tragedy of the anticommons by protecting producers and traders from arbitrary intrusion into property rights.[44] In Kazakhstan, internal levies are an example of the augmented trade costs that arise because of the central government's failure to establish its authority.

High transaction costs are symptomatic of an incomplete transition to a market economy and reflect policy choices that, rather than choices of commission, are choices of omission with respect to the protection and enforcement of trader property rights.[45] While such obstacles do not apply specifically to farm products, many of the transaction costs are related to distance and vary according to local jurisdiction, features which make them especially onerous in geographically specific but dispersed activities.[46] Thus, they often effectively discriminate against agriculture and against some farmers more than others, depending upon location, the perishability of the output, and so forth.

The problems in output marketing encountered by a fairly typical independent farm are illustrated by a case study reported by Gray (2000) and involving a survey of farms in northern Kazakhstan in 1999. On one farm, 36 workers produced wheat, barley, and mustard seed for export to Russia. The *akim* (in this case, a regional governor) frequently banned the export of grains, even to neighboring provinces, until all farms in the province had paid all arrears on inputs, which was unfair with respect to farms with no arrears. When permission to export was available, the farm had to obtain (1) a permit from the regional department of agriculture, (2) a permit from the regional department of external relations, (3) phytosanitary certification, (4) a quality certificate from the Committee of Standardization, Metrology, and Certification, (5) clearance from the commodity exchange, (6) a license from the chamber of trade, (7) clearance from the Customs Committee, (8) a certificate from the tax inspectorate that there were no outstanding unpaid taxes, and (9) a certificate from the Russian Committee for Standards and Metrology. To obtain the clearances and permits necessary for the last

consignment that had been exported by the farm before the survey interviews occurred had required 22 days of full-time effort. Once the consignment had left the farm, corruption by officials along the overland route was a major problem. The farm reported that there had been stops at numerous checkpoints, each of which required the payment of 15–20 Russian rubles per policeman. Reviewing the broader evidence from the overall survey, Gray (2000, 32) found that "harassment by uniformed officers appears to be universal, with established normal bribes required to pass each of a large number of police checks, even if papers are in order." The situation has improved since 1999, but anecdotal evidence suggests that such obstacles to trade remain substantial, despite presidential decrees calling for simplification.[47]

There are regional variations.[48] The logistics situation for farmers is better in southern Kazakhstan, where agricultural recovery began in 1997–98 rather than 1999 or later as in northern Kazakhstan. For cotton producers, this reflects the active role of the gin owners, and, for other farmers, the most likely reason is better market access: most southern farms are within 200 kilometers of the urban markets in Almaty, Bishkek, Shymkent, Taraz, or Tashkent. In western Kazakhstan, the situation is worse because of the poor hard infrastructure, particularly the larger proportion of unpaved rural roads and the greater distance to markets. The wheat farmers of northern and central Kazakhstan are exposed to these costs because they are responsible for trucking their crops either to the Russian border or to the railway, and this is likely to explain the magnitude of the price gap reported in table 6.8.

New Estimates of Rates of Assistance

Table 6.10 and figure 6.1 present support estimates for 2000–04 for 15 major products that account for about four-fifths of agricultural output (see table 6.1). The method, comparable to that used above for wheat, is to divide market price support (the gap between a reference price based on the border price adjusted for trade and handling costs, P^b, and the farmgate price, P^d), plus budget support per unit of output (B), by the farmgate price:

$$\text{Support} = (P^d - P^b + B) / P^d \tag{6.1}$$

The general picture is of negative support for grains and oilseeds and positive support for potatoes, sugar, and, especially, livestock. The trend toward increased support for livestock products is strong, particularly for meat, while the support for the two main exports (wheat and cotton) is variable. Although budget support increased during this period (table 6.5), the support estimates are dominated by the gap between the farmgate price and the reference price.

Table 6.10. Estimated Nominal Rates of Assistance for Major Agricultural Products, Kazakhstam, 2000 to 2004
(percent of farmgate revenue)

Commodity	2000	2001	2002	2003	2004
Wheat	−14	−22	−9	−10	−25
Barley	−6	−6	23	−3	−57
Other grains	−33	−36	−21	−27	−49
Oilseeds	−39	−40	−53	−66	−29
Sugar	6	8	26	30	25
Potatoes	8	−4	4	3	11
Cotton	31	−13	37	39	−23
Subtotal, crops	−4	−16	0	−1	−17
Milk	−2	−3	1	−4	8
Beef and veal	−60	−2	0	27	41
Sheep meat	−150	−5	17	25	34
Pig meat	39	32	29	46	37
Poultry	46	86	67	79	108
Eggs	20	14	−1	15	46
Subtotal, livestock	−15	8	10	22	31
All products	−10	−5	5	10	8

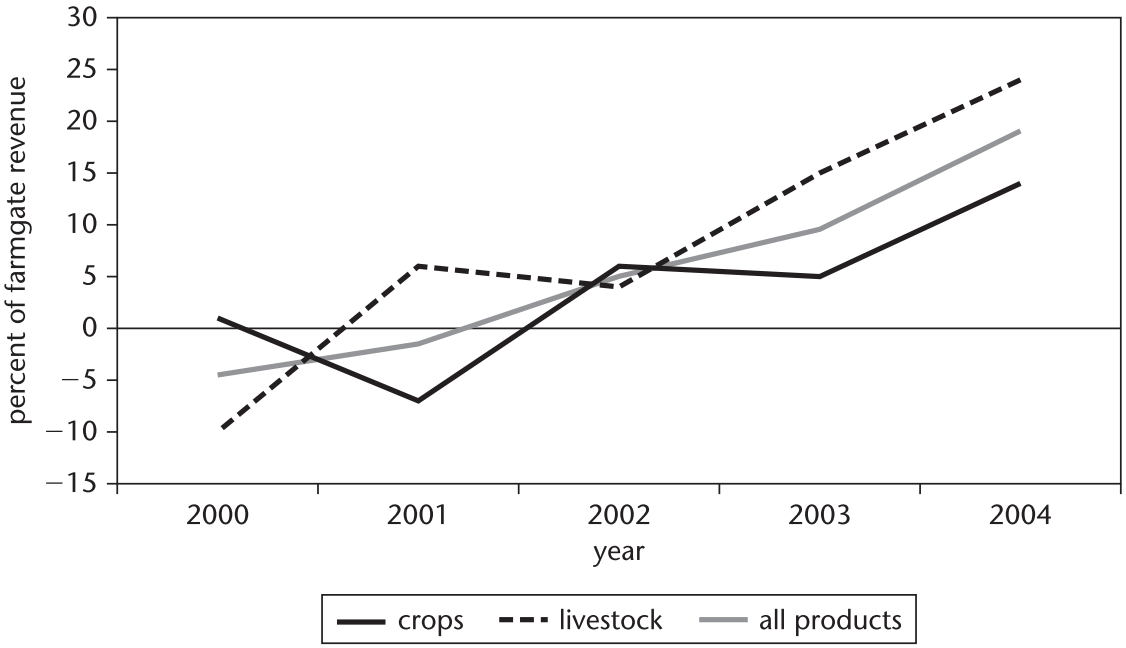
Source: Derived from PSE estimates in Jumabayeva 2006.

Note: The reference prices for exports (grains, cotton, pig meat, and for beef and veal in 2001) are free on board. The reference prices for imports (oilseeds, sugar, potatoes, sheep meat, poultry, eggs, and beef and veal in 2000 and 2002–04) include cost, insurance, and freight. The reference price for milk is the price of New Zealand milk adjusted for delivery costs to Western Europe and for quality.

The numbers reported in table 6.10 are an initial attempt to provide estimates for Kazakhstan of nominal rates of assistance (NRAs) of the sort described in the appendix. The numbers should be treated with caution, especially in light of the high internal trade costs described in the previous subsection. Poor infrastructure is associated with the weak transmission of border prices and permits market segmentation and local monopolies. During a poor harvest, even small increases in excess demand may lead to large domestic price increases because trade costs limit the import response; conversely, a bumper harvest may depress domestic prices well below the border price because trade costs limit the extent to which the surplus may be exported. Perhaps most fundamentally, high trade costs have turned most of the commodities in table 6.10 into essentially nontraded goods for which the unit value of the small quantities exported or imported in any year may be a poor guide to true undistorted opportunity cost prices.[49]

The results are sensitive to assumptions, which may even affect the overall or sector averages if they apply to products with a large weight or lead to large

Figure 6.1. Nominal Rates of Assistance for Key Agricultural Products, Kazakhstan, 2000 to 2004



Source: Author estimates in table 6.11.

outliers. The discussion elsewhere above of the wheat estimate, which concluded that the negative support estimate may be too large for 2004, offers the most important example. Given the weight of wheat (55 percent of the value of the crops covered), this dominates the aggregate 2004 NRA for crops. If the wheat numbers were smaller (as calculated by Serova for the years up to 2002), then the aggregate picture would show more positive support for farmers. The aggregate NRAs for livestock producers indicate increasing support since 2000, which is consistent with the rising farmgate prices, but caveats need to be made about individual meat NRAs (for example, the sheep meat numbers).

As a sensitivity analysis, the aggregate estimates in table 6.10 may be compared to a simple hypothetical alternative to show the importance of removing outliers (or the least plausible NRAs) and of reviewing the NRA for the largest commodity, wheat (table 6.11). The coverage is reduced below normal minima of 70–75 percent, but, in practice, wheat may be a good proxy for barley and other grains, and the pattern of the NRAs of other meats may be similar to that of beef and pork. The crop-livestock balance remains representative of the national proportions. The omission of oilseeds, barley, other grains, and cotton is more or less offsetting in its effect on the subtotal for crops. Because some NRAs were extreme values, omitting sheep meat, poultry, and eggs from the livestock category does have a significant effect in reducing the subsector's negative NRA in 2000 and

Table 6.11. Sensitivity Analysis of Assistance Estimates, Key Agricultural Products, Kazakhstan, 2000 to 2004
(percent of farmgate revenue)

Commodity	2000	2001	2002	2003	2004
Wheat	−1 (22)	−8 (27)	4 (22)	2 (23)	19 (21)
Sugar	−6 (3)	−3 (4)	17 (4)	21 (4)	17 (4)
Potatoes	8 (4)	−4 (2)	4 (3)	3 (5)	11 (2)
Subtotal, crops	1 (41)	−7 (44)	6 (40)	5 (44)	14 (38)
Milk	−2 (16)	−3 (14)	0 (14)	−4 (14)	8 (14)
Beef and veal	−61 (11)	−3 (9)	−1 (10)	26 (11)	40 (11)
Pig meat	39 (9)	32 (8)	28 (5)	45 (5)	37 (5)
Subtotal, livestock	−10 (41)	6 (36)	4 (38)	15 (37)	24 (39)
Average NRA, all commodities	−5	−1	4	15	24
Coverage (% of farm output)	65	64	58	62	57

Source: Author estimates.

Note: The numbers in parentheses are weights (shares of total farm output at reference prices). The NRAs for wheat 2000–03 and for sugar, potatoes, milk, beef, and pork are taken from the revised agricultural policy assessment (September 2006). The 2004 NRA for wheat is a recalculation using a 10 percent (rather than a 50 percent) increase in the border price.

increasing it in 2003–04. By far the biggest source of variation, however, is the treatment of the 2004 wheat NRA.

The alternative estimates imply that the increasing producer support during 2000–04 applied to both crop and livestock farmers, although the rate of increase was larger for the latter. The increase in aggregate support in 2000–03 is more consistent in the alternative estimates, and the level of the final year is higher. The general conclusion is that the pattern of support reported in other sections of this chapter is robust to alternative assumptions about appropriate reference prices, although caution should be exercised in interpreting the support for crops in 2004.

The qualitative picture in tables 6.10 and 6.11 is consistent with the description of agricultural policies in the second section above. After generally operating since 1992 in an environment of policy neglect that was associated with a negative price gap, the farm sector moved from facing negative distortions to facing positive distortions in 2000–04. Most livestock subsectors (cattle farming for meat and milk, sheep and goats, and poultry) have performed well since the end of the 1990s, which partly reflects recovery from a deep trough, but has also been helped by a more positive policy and price environment.[50] The situation facing farmers of grains and other crops is less clear-cut; estimates of negative support for crops around 2000 may reflect high trade costs rather than policy-induced distortions specific to grain

producers, although the negative support for grains and oilseeds might also be evidence of feed subsidies to livestock producers. Following the formulation of the Agriculture and Food Program in 2002, there may have been growing support for grain farmers, although the estimates in tables 6.10 and 6.11 are contradictory on this point.

The Political Economy of Policy Choices

Although the agricultural sector was the largest employer when Kazakhstan became independent, much of the policy toward agriculture has evolved passively rather than as part of a conscious strategy to favor or to penalize the sector. In the early and mid-1990s, price liberalization was harmful to farmers because the administered prices of the previous period had worked in their favor and because, after liberalization, they often faced monopolistic suppliers of inputs or monopsonistic buyers of outputs. Deteriorating infrastructure and other behind-the-border trade costs widened the gap between domestic and world prices, but this was part of the broader economic malaise of the 1990s. Macroeconomic policy was, after 1993, focused on price stabilization, and the attention of policy makers was primarily on privatization and especially on the large actual and potential rents of the oil sector.[51]

Decision making about economic policies in Kazakhstan is centralized in the president's office. There are pressures to accommodate regional interests, but these have had little impact on policies toward agriculture. At independence, the agricultural regions were in opposing situations; the northern grain regions were the richest parts of the country and, uniquely in Central Asia, showed a positive rural-urban income differential, while southern Kazakhstan was the poorest part of the country. The regional distribution was complicated by ethnic factors; the northern regions were (in addition to the then-capital, Almaty) the centers of the German and Russian populations, and, after 1991, many residents of the rich agricultural regions chose to emigrate rather than to try to influence Kazakhstan's policies. The main political reaction to this situation was to move the national capital to a more central location, Astana, but there was no attempt to retain the would-be emigrants by providing support for their economic activities. Between the mid-1990s and the early 2000s the regional distribution of income changed sharply, with the two major cities (Almaty, the financial and economic capital, and Astana, the new political capital) gaining substantially relative to the northern agricultural regions.[52]

Within the farm sector, the major policy initiative during the 1990s was farm privatization, but, because of the nature of the process, existing farm managers retained effective control over unchanged production units. The large farms became increasingly specialized in crop production, as livestock was sold,

slaughtered, or given to individual farmers for their household plots. This situation created a dichotomy between the large commercial farms and the smallholdings, which contributed a disproportionate share of farm output and were oriented toward risk control at the household level. Some of the potentially most beneficial policy changes would have involved the resuscitation of traditional pastoral practices, but these are impractical in a context where the livestock sector is dominated by household plots with an average of one or two cows and one or two sheep.

The picture at the central policy-making level has changed since 1999. As the economy booms, concerns have been voiced over the prospects of the non-oil sector, and public finances have been healthy. During this period, the central government has assisted the farm sector through various public spending programs, notably, the Agriculture and Food Program of 2003–05. Nevertheless, regional and local actors remain influential, and decisions made in the capital do not always filter down to the local government level or are not always implemented if they run against the perceived interests of farm managers.

Future Policy Reform Paths

The influence of the incumbent farm managers and of the debt accumulated in the 1990s may still be contributing to resistance to change and a poor supply response. An additional underlying problem is the fact that, in the Soviet era, little attention was paid to risks or to negative externalities, with the consequence that the area of cultivation of both wheat and cotton expanded too far. The Virgin Lands Program brought substantial areas into production where soils were inadequate to support continuous cropping and the climate made harvests highly volatile. The expansion of the cotton economy led to excessive use of the water from the two rivers of southern Central Asia, and this led to the Aral Sea disaster.[53] In a situation where the socially desirable outcome is a smaller farm sector, managers and workers in that sector may be expected to be conservative and resistant to change.

The travails of the farm sector may not yet be over because Russia's WTO accession will likely work against Kazakhstan's farmers, who will face increased competition from non-CIS suppliers to the Russian market. On the whole, however, any WTO-induced effects on agriculture are likely to be small. The increased trade in farm products after Kazakhstan's own WTO accession, which is likely to follow closely on that of Russia, should yield an overall net benefit through lower prices to consumers, while seriously harming only the domestic producers of sugar (Weber 2003). The ability to increase subsidies for agriculture and the freedom to design such subsidies will be constrained by WTO accession, although accession will also provide an opportunity to

challenge and constrain the tariff and nontariff barriers facing Kazakhstan's exports to neighboring markets (China and Mongolia recently joined the WTO, and accession by Iran, Russia, and Uzbekistan is, to varying degrees, likely in the coming years).[54]

On the positive side, the evidence from the 2003–05 Agriculture and Food Program is of presidential support for agriculture through the oil-boosted public purse. The support is primarily on a technical level and is aimed at upgrading the clear quality deficiencies and improving processing and marketing channels. So far, the support has been too limited to reverse entirely the distortions against agriculture caused by poor hard and soft infrastructure, but it is indicative of an end to the neglect of agriculture that characterized the 1990s. A bigger challenge will be to take steps to lower trade costs by controlling red tape and, more importantly, reducing the widespread and institutionalized corruption.

What may be expected with respect to the size of the agricultural sector and the output mix of the sector? Kazakhstan has substantial agricultural potential, and this will be realized, even though the pace of change will be influenced by the policy environment.[55] Wheat will remain a major export and cotton a minor export, although, for both crops, regional conditions (that is, demand, competition, and input supplies from neighboring Turkmenistan and Uzbekistan) will be important, and there are ecological limits to the expansion of both northern wheat farming and irrigated agriculture in the south. Livestock farming has greater growth potential, and, at a minimum, we may expect improvement of the stock and a revival of pre-1991 patterns of exportation in meat, dairy products, and eggs to Russia, perhaps in combination with the importation of milk from the Kyrgyz Republic to the Almaty region in southeastern Kazakhstan.

Notes

1. The number of people involved in agriculture is difficult to determine because many people who lost their jobs during the transition from central planning reverted to growing their own food, although they may not have been officially recorded as employed in agriculture. According to data in the FAOSTAT Database of the Food and Agriculture Organization of the United Nations, of a population of 15.5 million in Kazakhstan in 2001, 6.9 million people were rural, and 3.0 million were involved in agriculture, but, of the economically active population of 7.6 million, only 1.3 million people were in agriculture. According to a preliminary agricultural policy assessment report for the World Bank (Jumabayeva 2006), agricultural value added as a share of GDP in 2001 was 9.4 percent, but about 43 percent of the population rely on agriculture for their livelihoods.

2. The growth rate is based on preliminary data gathered for the World Bank's agricultural policy assessment (Jumabayeva 2006). The growth is largely driven by the increased wheat harvest, from 4.7 million tons in 1998 to 11.5 million tons in 2003, which may reflect year-on-year fluctuations rather than an increase in the average harvest (see table 6.1).

3. Although agriculture suffered a crisis of declining output during the 1990s, which is clear in every major product listed in table 6.1, the measurement of the aggregate decline for the early 1990s is difficult because of the artificial prices in the Soviet economy and the hyperinflation of 1991–94.

4. According to the World Bank (1992), about 30 percent of the land brought under cultivation during the Virgin Lands Program was unsuitable for cultivation, and this contributed to soil degradation. Transportation problems were also apparent in the Soviet era; Medvedev (1987) pointed to the dependence of the more isolated farms in northern Kazakhstan and lower Siberia on passable roads and cheap fuel, both of which would become problematic in the 1990s as fuel prices increased and road maintenance deteriorated.

5. In part, this reflected an earlier reform of farms in southern Kazakhstan and the decision of farmers, especially in Kzylorda Oblast, to shift from rice to cotton production. Cotton output figures need to be treated with caution because of the extensive smuggling from Uzbekistan and, to a lesser extent, Turkmenistan as farmgate prices in these countries were increasingly repressed by state marketing agencies. Sadler (2006) reports estimates that smuggled cotton from Uzbekistan accounted for 25–50 percent of Kazakhstan's reported output in the early 2000s, but it is difficult to evaluate such ballpark figures. The volatility of the cotton sector, as reported in the official data (table 6.1), is reflected in the 42 percent decline in the value of the crop in 2004 and in the 25 percent drop in output in 2005.

6. There have been some idiosyncratic short-term developments. Food aid in the early 1990s included low-cost chicken parts whose importation exacerbated the problems faced by domestic poultry producers, who were among the most affected by the increased prices for fuel and concentrate feed. As livestock were slaughtered during the transitional recession, the oversupply of low-quality hides and skins provided an opportunity for itinerant traders to arrange for the international export of these less-perishable products during the mid-1990s. For an analysis of Kazakhstan's agricultural trade in 1997, see Weber (2003).

7. The import dominance of Russia reflects an earlier start in that country to investment in agroprocessing after the end of central planning. There are anecdotal reports of dairy farmers in northern Kazakhstan beginning to improve quality after the 1999 devaluation of the tenge so as to reclaim milk markets in Russia that they had lost during the 1990s, but this was still having little impact on export sales in 2003 (see table 6.3). The recent situation in milk markets appears to be characterized by intraindustry trade involving exports from northern Kazakhstan to Russia and imports from the Kyrgyz Republic to southeastern Kazakhstan.

8. De Broeck and Kostial (1998) estimate that, in 1993, the price of inputs used in agriculture increased 18.8 times, while output prices rose 8.8 times. Green and Vokes (1997) report Asian Development Bank estimates that a tractor cost 76 tons of wheat in 1990 and 310 tons in 1995, while the cost of a combine harvester rose from 50 to 580 tons of wheat, and the relative price of fuel tripled over the same period. Livestock farmers were hit by increased prices for fuel, feed ingredients, and animal medicines in 1992–94, while the domestic consumption of livestock products was hurt by declining incomes (between 1990 and 1998, the domestic consumption of livestock products fell by about two-fifths), and meat and dairy exports almost disappeared amid the disruptions following the dissolution of the Soviet Union (particularly important for livestock farmers in eastern and northern Kazakhstan had been supplies of meat, wool, and other animal products to the Soviet Ministry of Defense).

9. Measuring subsidies in the early 1990s is complicated because of payment delays. The delayed payment of budgetary subsidies to farmers is an implicit tax. On the other hand, many loans were not repaid on time, so that calculating the difference between the subsidized interest rate and a commercial interest rate understates the credit subsidy. Arrears and repayment problems were only really brought under control by 1996–97. By the 1998 budget, only US$80 million was directed to agriculture, of which the largest subsidy was a US$33 million credit scheme whereby interest rates were brought down to half the commercial rate.

10. A World Bank report (1997) on Kzylorda Oblast presented a similarly dismal picture in 1995, but with differing patterns: small profits on grains and wool, but losses of over 100 percent on milk, vegetables, potatoes, and beef.

11. The situation was additionally distorted by arrears in the payment of pensions and other social benefits. To a substantial extent in the years up to 1998, cash constraints distorted decision making and, in part, explain the huge decline in livestock numbers on large farms (table 6.4)

because farm managers used livestock to pay for inputs or paid workers with sheep in lieu of money wages.

12. The figures are taken from the United Nations Common Country Assessment (UN 2003). The World Bank (2002) estimates the decline in agricultural production following the dissolution of the Soviet Union at 55 percent from 1991 to 1998. Because of the volatility of grain harvests, such estimates are sensitive to the choice of dates, but 1991 had already seen a massive decline over 1990 (table 6.1). In 1999, agricultural output increased by 28 percent, then fell by 4 percent in 2000, and increased by 17 percent in 2001 (EBRD, various).

13. The initial Agriculture and Food Program proposal envisaged expenditures of US$271 million in 2003, US$330 million in 2004, and US$368 million in 2004. Actual expenditures in the last two years were higher, probably because of the burgeoning public receipts from the oil boom.

14. Price support was provided through increased funds for the Food Contract Corporation, which had been established in 1997 and purchased 1.5 million tons, or 20 percent, of the grain harvest in 2002, and Mal Onimderi Corporation, which had been created in 2001 to provide producer support and market regulation for the livestock sector. The fuel subsidies encouraged corruption because farmers requested more gasoline than they needed and sold the surplus for profit. The fertilizer subsides were paid only to domestic suppliers, acting in a similar trade-distorting way on local-content requirements. The price support and subsidies were justified by reference to farm policies in the European Union (EU) and the United States, but they may have been less sustainable in Kazakhstan given the state's dependence on the volatile oil sector for revenue.

15. Deininger (2002) and Lerman, Csaki, and Feder (2002) ascribe this renunciation of claims to landownership to the lack of asset management experience among the rural population. Behnke (2003) reports field research in 1998–99 that showed how state farm managers retained control of sampled farms in southeastern Kazakhstan.

16. According to International Monetary Fund estimates (IMF 2003a), total factor productivity in agriculture declined by an annual average of 1.8 percent during 1996–2001, when total factor productivity growth averaged 5.8 percent in industry, 9.5 percent in construction, and 4.0 percent in services, and labor productivity fell by 8.2 percent per year in agriculture, while it was increasing by a greater rate than the total factor productivity in other sectors.

17. A large part of the international trade in the 1990s was conducted by individual shuttle traders (*chelnoki*) operating between Central Asia and cities in China, the Gulf, India, or Southeast Asia and often bypassing or bribing customs officials. The Kazakh authorities estimated that over a quarter of total imports in 1995 and a third in 1996 were shuttle imports (IMF 1997), but, by their nature, such estimates are gross approximations. The shuttle trade phenomenon has become relatively less important in the 21st century because the retail sector, especially in the principal cities, has become more well organized.

18. Kazakhstan is a member of the Economic Cooperation Organization and the Shanghai Cooperation Organization, neither of which has had an impact on trade policy (UNDP 2005; Pomfret 2006). In February 2003, the leaders of Belarus, Kazakhstan, Russia, and Ukraine agreed to create a Common Economic Space, but the outcome of the December 2004 Ukraine election undermined Russia-Ukraine cooperation.

19. There is no general value added tax exemption for the agricultural or agroprocessing sectors, but small farmers do not pay the tax. This exemption may not help small farmers if agroprocessors, to offset the inflated value added tax that the processors would have to pay, offer a lower price to farmers who are not maintaining value added tax accounting.

20. See IMF (1997). At the same time, Kazakhstan introduced preferential tariffs of zero for 46 low-income countries and 75 percent of the general tariff for other developing countries.

21. Trade reform commitments included in 1998 programs supported by the Extended Fund Facility of the International Monetary Fund were not implemented. However, Kazakhstan maintained its commitment to current account convertibility, unlike neighboring Turkmenistan and Uzbekistan, which responded to economic difficulties by introducing draconian exchange controls in 1998 and 1996, respectively.

22. The industry policy formulated in 2002–03, which included sector- and even firm-specific assistance to promote diversification and non-oil development, may have also complicated the accession process. See IMF (2003a, 2003b).

23. This was accompanied by dissolution of the Central Asian Cooperation Organization, another regional organization with lofty aspirations, but minimal achievements.

24. Tariff harmonization within the Eurasian Economic Community is even more implausible for the Kyrgyz Republic, which, as a WTO member, already has bound tariffs at levels below what is acceptable to Russia. Tumbarello (2005) estimates the net welfare costs to Kazakhstan from tariff harmonization to Russian levels at US$32 million; the trade diversion and trade destruction would impose large costs on consumers that would be only partially offset by higher tariff revenue.

25. Measurement of the real exchange rate is complicated by the need to change weights. Kazakhstan's economy remained heavily oriented toward Russia, at least with respect to trade, until 1998, but, since the crisis, there appears to be a more concerted effort to diversify international economic relations, so that exchange rates relative to the U.S. dollar, the euro, and the yuan have become more important since around 2000. Kuralbayeva, Kutan, and Wyzan (2001) illustrate a plausible pattern of real exchange rate depreciation in early 1994, followed by sharp appreciation that flattens out in 1996, and then another sharp depreciation in 1999, followed by a plateau, but estimating the magnitude of the changes in the real exchange rate is difficult.

26. Some studies produced through the Organisation for Economic Co-operation and Development (OECD) have used a shadow exchange rate in calculating producer support estimates (PSEs). Melyukhina (2003) argues that the discretion in the choice of the appropriate rate creates nontransparency and that the nominal exchange rate should be used. Shick (2005) argues that this is misleading for Russia, where PSE calculations for 1999 and 2000 are dominated by exchange rate changes following the 1998 crisis, rather than reflecting changes in agricultural support policies. Because Kazakhstan's currency is convertible, the nominal rate is less obviously inappropriate for PSE estimation than it would be in, say, Turkmenistan or Uzbekistan.

27. The group averages are calculated from tariff data in IMF (1997), as cited in table 6.6. Agricultural products are lines 1–24, 41–46, and 51–52; minerals and metals, 25–29 and 68–82; textiles, clothing, and footwear, 50 and 53–67; and other manufactures, 30–40, 47–49, and 83–96. The average for other manufactures may be inflated because of the use of 1995 import weights given that, in 1995, nuclear reactors with a 20 percent tariff accounted for two-fifths of the imports in this group.

28. In Russia, the aggregate PSE rose to 17–30 percent of gross farm receipts in 1995–97 before falling to positive single-digit rates after the 1998 crisis. In Ukraine post-1993, PSEs were lower and, in some years, negative for grains, oilseeds, livestock, and dairy products, but higher for sugar beets; the most recent OECD estimates indicate average Ukraine PSEs of 3 percent in 2004 and 12 percent in 2005.

29. The wheat grown in Kazakhstan includes high-quality hard wheat and lesser-quality wheat that commands a far lower price. The quality composition of wheat exports varies from year to year, largely because of the volatility of wheat harvests in Kazakhstan. There is an association between the harvest size and the average quality of the crop, and there is also a connection between the harvest size and the quantities of various types of wheat sold in the domestic market and exported. In the poor 2004 harvest, for example, the average quality was higher than it had been in previous years, and the gap between the quality of wheat exports and the quality of total wheat output was smaller. The variable output combination makes it difficult to estimate a single border price or to have a constant quality-adjustment factor. In table 6.8, a simple 10 percent adjustment factor is used to account for the generally larger proportion of feedstock in exported wheat, and the factor is reduced to 5 percent in 2004 to allow for the known higher average quality of exports in that year, but these are rough approximations.

30. The method of calculating transport, handling, and other costs has assumed a substantial fixed cost component so that the annual variation of this line in table 6.8 shows less variation than might be expected from the volatility of the crop. In the smallest harvest year, 2000, transport costs account for a surprisingly large share (over 20 percent) of the border price, but, if transport costs are overestimated, then it is even more striking that the bottom line is negative. As described elsewhere above, the

periods of large real exchange rate changes—mid-1994 to early 1996 and mid-1998 to May 1999 (see also Kuralbayeva, Kutan, and Wyzan 2001)—are outside the time period covered by table 6.8.

31. The IMF Primary Commodity Prices Database gives an almost flat world wheat price in 2002–04 (US$149, US$146, and US$157), whereas table 6.8 has border prices of US$83, US$100, and US$151 in these years. The United States Gulf price used in the primary commodity database is not the proper benchmark for Kazakhstan's wheat, which is mainly shipped across the Russian border, but the differences in price patterns are startling.

32. Wheat output was lower in 2004 than in 2003, but only by about 15 percent (table 6.1), while the volume exported fell by half.

33. Between 1996 and 1999, cotton prices increased by over 35 percent relative to the price of both wheat and rice. The cotton and rice price ratio, which is more relevant in southern Kazakhstan, continued to increase during 2000 and 2001.

34. There is an incentive to renege on contracts, but penalties for breach of contract were sufficiently high and credible so that the price differential did not undermine the contract system (Sadler 2006).

35. Dosybiev (2005) cites official figures indicating that there were 4,000 illegal workers from Uzbekistan in South Kazakhstan Oblast in 2004, but adds that the true figure was much higher.

36. Fertilizers and seed, which are subsidized in Turkmenistan and Uzbekistan, are smuggled across the border.

37. The situation in Kazakhstan was exacerbated relative to that in the southern Central Asian countries by the harsher winters, which precluded leaving animals outdoors in winter and required more fodder and heating, both of which became dramatically more expensive after independence (see Suleimenov and Oram 2000; Kerven 2003).

38. Farmers may sell directly to consumers or use local traders. The traders are typically self-financed and without access to storage or refrigeration facilities, so that their sales are overwhelmingly at bazaars within the district (*rayon*) of production. The rise of supermarkets, with their impact on agricultural marketing channels in Central and Eastern Europe (Dries, Reardon, and Swinnen 2004), is not yet a major feature in Kazakhstan. Supermarkets have opened in the large cities, especially since the oil boom began, but they focus on middle- and upper-class customers and account for a small part of the market available to domestic producers of livestock products.

39. These ratios, drawn from Kazakhstan's high-quality (since 2001) household survey data, are cited in the Joint Economic Research Program report (World Bank 2004a). Annex II of the report describes marketing channels in Kazakhstan; annex table 2 reports that the sale of home-produced meat, cheese, butter, and so on accounts for over twice as much farm household income as the sale of live animals.

40. Concerns about breeding arose from the sharp decline in the herds during the 1990s, which included the loss of many purebred animals, and the fragmentation of livestock production units. The budget allocation for bovine artificial insemination was T 947 million in 2001–05. There is also provision for subsidizing the purchase of breeding livestock, set at T 416 million in 2002 and 2003, and increased to T 478 million in 2005, but, in 2002, the actual disbursement was only T 131 million.

41. The FAOSTAT Database also indicates a huge increase in the value, at producer prices, of milk (from T 65 billion in 2000 to T 101 billion in 2004) and eggs (from T 9 billion to T 16 billion), though these values are hard to reconcile with other information on the numbers and distribution of cows and poultry.

42. Anderson and van Wincoop (2004) review the literature on behind-the-border trade costs. The quantitative impact of trade facilitation on trade flows, investment, and government revenue is assessed in Engman (2005), where the results rely on surveys of business people or, for the trade effects, on two papers by Wilson, Mann, and Otsuki (2003, 2004) that incorporate country-specific measures of trade facilitation (port efficiency, customs environment, regulatory environment, and e-business) into a gravity model. Some empirical studies (for example, Djankov, Freund, and Pham 2006) try to capture such costs at the aggregate level by measuring the ways time delays affect international trade, but this work does not specifically address trade facilitation measures.

43. Some trade costs require bilateral attention, for instance, the coordination of opening times at border crossings, and, especially for a landlocked country like Kazakhstan, some require regional or multilateral action; on regional cooperation for trade facilitation in Central Asia, see UNDP (2005) and ADB (2006) and on the problems posed by the fact that Kazakhstan is landlocked, see Raballand (2003) and Cadot, Carrère, and Grigoriou (2006).

44. Tragedy of the anticommons is the term coined by James Buchanan to describe the situation when a desirable activity does not occur with sufficient frequency because an aspect or element (such as trader rents) is viewed as an open-access common property resource. Douglass North has emphasized that the reduction of transaction costs is the key in explaining economic development.

45. CIS governments have been slow to address this kind of behavior in part because the Soviet system promoted a view that economic outcomes, especially in market settings, are zero sum. The idea that there is a winner and a loser in every exchange dies hard, but such a suspicious attitude toward exchange and cooperation is not all-pervasive, and an appreciation of the gains generated by trade is becoming more widespread in government circles as the exposure to market systems increases.

46. The poor quality of the roads in Central Asia is emphasized by Shepherd and Wilson (2006).

47. Kazakhstan scores poorly on international measures of economic freedom or corruption. Measured according to the Heritage Foundation index of economic freedom it is mostly unfree and has high levels of administrative barriers, ranking 113th among the 157 countries graded in 2006 (the 157th country being the most unfree and showing the greatest barriers). Transparency International ranked Kazakhstan the 107th most corrupt country among the 159 countries covered in 2005 (the 159th country being the most corrupt). Both of these scores are slightly better than the corresponding scores in the early 2000s, but they are still poor. The World Bank's quality of governance indicators give low marks to Kazakhstan in areas such as governance efficiency, regulatory quality, and the rule of law.

48. Based on the relative prices of standard goods, Grafe, Raiser, and Sakatsume (2005) conclude that there is more price variation among the regions of Kazakhstan than among the countries in Central Asia.

49. The estimates in table 6.10 treat grains, cotton, and pig meat as exports (that is, export unit values are free on board border prices) and oilseeds, sugar, and sheep meat as imports (that is, import unit values are border prices that include cost, insurance, and freight). Beef and veal are exports for 2000–01 and imports for 2002–04. Only milk is treated as a nontraded good, and the reference point is the quality-adjusted price of New Zealand milk for delivery to Western Europe. The World Bank agricultural policy assessment is being revised, and the main changes in the support estimates will be smaller numbers for poultry and, hence, for the livestock subsector. Although some of the estimated support for livestock producers may reflect the way in which their shift from exporter status to import-competing producer status affects the technical calculations, it does coincide with the greater concern expressed among policy makers.

50. Booming domestic demand as a result of rapid economic growth and the large devaluation against the Russian ruble in 1999, which restricted import competition, stimulated the revival of livestock farming. The inward orientation of growth in the livestock sector is reflected in the production of pig meat (consumed by Russians rather than by Kazakhs or their Islamic southern neighbors), which was given a short-term boost by the devaluation, but has benefited little from domestic growth.

51. The privatization scheme for state enterprises introduced in 1993 may have benefited farmers disproportionately because the distribution of privatization vouchers was biased in favor of rural residents (and, hence, in favor of Kazakhs relative to other ethnic groups that were more heavily based in urban areas). However, the privatization vouchers soon became concentrated in the hands of a few privatization investment funds (Olcott 2002), and the oil rents accrued to the urban elite. On privatization in Kazakhstan, see also Kalyuzhnova (1998, 2003), Verme (2001), and Peck (2003).

52. These patterns are based on analysis of household survey data in Anderson and Pomfret (2003, 2006) and Najman et al. (2007). Increased inequality to the benefit of residents of capital cities is a common feature of the CIS transition economies, and, in Kazakhstan, the pattern has been exacerbated by the massive increase in oil rents.

53. Resolving the Aral Sea disaster will take coordinated efforts from all of the cotton producers in the region. Kazakhstan is a minor contributor to the problem, but, because of the prevailing winds, it is a major sufferer from the negative consequences of climatic and airborne pollution.

54. Competition will, however, be strong, especially in animal products, because China, Mongolia, and Russia are all actively developing their own livestock sectors with the goal of supplying neighboring markets. Moreover, in the short run, any WTO effects may be swamped by the impact of exchange rate policy.

55. Another force for change will be the evolution of the domestic retail sector. Especially in the major cities, modern supermarkets are beginning to expand rapidly, modifying consumer demand patterns.

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7

THE KYRGYZ REPUBLIC

Garry Christensen and
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The Kyrgyz Republic was one of the poorest Soviet republics and, despite attempts by central planners to locate industries in the republic, the economy remained predominantly agricultural outside the capital city and the surrounding areas. When the country became independent in December 1991, agriculture accounted for slightly less than two-fifths of gross domestic product (GDP). During the transitional recession, workers moved from the towns to the countryside, and agriculture's share in GDP reached 50 percent in 1996. The share in GDP declined after 1997 as gold production increased, but agriculture's share remains above a third, while at least half the population is directly or indirectly dependent on the farm sector for their livelihoods.[1]

The country is mountainous and dry.[2] Arable land, accounting for less than 10 percent of the territory, is concentrated in the Chui Valley in the north and the Fergana Valley in the south, and about two-thirds is irrigated (table 7.1). The Tien Shan Mountains divide the heavily populated and climatically warmer south from the more sparsely populated and wealthier north. The three southern *oblasts* (regions) of Batken, Jalalabad, and Osh contain three-fifths of the rural population, but have only a third of the country's arable land; agriculture in these oblasts is similar to that in neighboring areas of Tajikistan and Uzbekistan. Chui Oblast contains a third of the arable land and benefits from the location of the capital and largest city, Bishkek, within its borders and its proximity to Almaty, the largest city in Kazakhstan. The other northern oblasts (Issyk-Kul, Naryn, and Talas) are more mountainous. Although agroecological conditions are diverse, much of the country

Table 7.1. Land Resources and Population, by Oblast, the Kyrgyz Republic, 1995 and 2001

a. January 1, 1995

Oblast	a. Total land (ha, 1,000s)	b. Cultivable land (ha, 1,000s)	c. Irrigated land (ha, 1,000s)	d. Rural population (1,000s)	e. Cultivable land per person (b/d)	f. Irrigated land per person (c/d)
Jalalabad	2,792	159	7	821	0.19	0.01
Osh[a]	4,208	259	129	1,409	0.18	0.09
Issyk-Kul	4,391	188	137	419	0.45	0.33
Naryn	4,412	133	111	262	0.51	0.42
Talas	1,444	120	89	202	0.59	0.44
Chui	2,429	447	273	746	0.60	0.37
Total	19,675	1,306	836	3,857	0.34	0.22

b. 2001

Oblast	% of arable land in oblast total	% of oblast arable land in arable total	% of total rural population	Cultivable land per person (ha)
Batken[a]	4	6	10	0.23
Jalalabad	5	13	21	0.23
Osh[a]	7	15	29	0.20
Issyk-Kul	4	15	9	0.63
Naryn	3	10	7	0.60
Talas	9	9	5	0.64
Chui	21	33	19	0.70
Total	6	100	100	0.39

Sources: Panel a: Bloch and Rasmussen 1998, based on official national data; panel b: World Bank 2003.

a. Osh Oblast was divided into Batken and Osh oblasts in 1999.

faces unfavorable conditions associated with low rainfall and irrigation-dependent farming, soil problems (waterlogging, high salinity, nutrient-deficiency, and erosion), overgrazing of pasture lands, and an inadequate domestic transport network, combined with long distances to world markets (the Indian Ocean is over 2,000 kilometers away, but accessible only by way of circuitous routes over mountains and conflict-ravaged areas; the nearest conveniently accessible sea outlet, Novorossiysk, a Black Sea port in the Russian Federation, is 3,800 kilometers distant).

This chapter analyzes the country's policies in agriculture since independence by attempting to quantify the distortions to agricultural incentives and competitiveness. The Kyrgyz experience is characterized by the most liberal reforms in the Commonwealth of Independent States (CIS) and also by the best performance of any farm sector in the CIS. At the same time, establishment of a well-functioning

market economy has been a slow process, and corruption and lack of truly competitive markets remain major problems.

The first section of the chapter sets out the historical background, describing overall economic strategy and agricultural development in the country. The next section examines the evolution of policies affecting the farm sector. The following section quantifies the distortions in agricultural incentives. The last two sections analyze the political economy of policy choices and future policy reform paths.

Historical Background

The economy of the Kyrgyz Republic suffered perhaps more than the economy of any other former Soviet republic from the breakdown of central planning, the dissolution of the Soviet Union, and the hyperinflation of the early 1990s, with the possible exception of Tajikistan.[3] Much of the country's industry had been established as part of Soviet regional dispersion policies, and many of the factories were part of long supply chains producing military equipment.[4] In addition to the disappearance of the Soviet supply chains, the Kyrgyz Republic suffered from the cessation of net transfers from other Soviet republics; these were substantially reduced in 1991 and had ended completely by May 1993.[5] The initial transition period saw significant economic decline and deindustrialization, accompanied by the reemergence of informal and subsistence activities and by urban-rural migration as town dwellers returned to their family villages. Real output fell by about 50 percent between 1990 and 1995. The collapse of the Soviet economic system and the shift to a more market-oriented economy led to a sharp increase in inequality. Milanovic (1998) calculated Gini coefficients for the Kyrgyz Republic of 0.26 in 1987/88 and 0.55 in 1993/95, representing a shift from one of the world's most equal to one of the world's most unequal distributions within half a decade. Because of low initial income levels, this translated into high rates of unaccustomed and unanticipated poverty; using a per month benchmark of US$120 (in international dollars), Milanovic calculated a poverty rate of 88 percent in 1993, the highest such rate in any transition economy.[6]

Transition Strategy and Macroeconomic Developments

The options available to the newly independent Kyrgyz Republic, the country's official name since 1999, have been limited. The main natural resource is the water flowing down from some of the world's highest mountains, but harnessing this water for hydroelectricity generation requires large investments with long payback periods and grids to take the electricity to reliable markets. In practice, during the 1990s, water only led to quarrels with downstream neighbors, which

needed it for irrigation, but were unaccustomed to paying anything like an economic price for water. The single exploitable resource was the gold in the Kumtor mine, which played a dominant part in the monetized economy after production came on stream in 1997, though the physical life of the mine is limited.[7]

Whether because of the narrow options or other reasons, the Kyrgyz Republic had, by 1993, become the country in Central Asia most closely aligned with the view of transition advocated by the International Monetary Fund and the World Bank. In May 1993, it became the first Central Asian country to leave the ruble area and issue its own national currency, and it was the first to bring hyperinflation under control; annual inflation was reduced to below 50 percent in 1995. The price and trade reforms were the most sweeping in Central Asia, and, in 1998, the Kyrgyz Republic became the first of all the Soviet successor states, including the Baltic countries, to accede to the World Trade Organization (WTO).

Privatization was fairly rapid. Housing and small enterprises were mainly transferred to current occupiers and operators. Large- and medium-sized enterprises were privatized through a voucher scheme. By the end of the 1990s, the private sector was producing three-fifths of GDP.[8] The relative ease of privatization in the Kyrgyz Republic was assisted by the lack of valuable assets to be contested. Even among the small enterprises privatized in the early transition period, most failed to survive for more than two years (Anderson and Pomfret 2001).

Despite success in liberalization, stabilization, and privatization, the results were not as good as expected even though the economy began to register positive growth in 1996 (tables 7.2 and 7.3 and figure 7.1). The economy was hurt by the 1998 Russian crisis and by a concomitant domestic banking crisis, after which reforms were put on hold. The major source of the economic problems was the failure to create an environment in which market forces might produce socially desirable outcomes. Despite formal progress in establishing institutions related to the rule of law and other market-supporting institutions, market-unfriendly institutions such as closed networks of personal contacts and chains of corruption dominated in practice.[9] When he encountered obstacles in the mid-1990s, the initially tolerant president resorted to ruling by decree, and subsequent elections, while not as outrageously manipulated as in Turkmenistan or Uzbekistan, were not fair.

Macroeconomic management was flawed given that price stability was achieved without bringing the budget deficit under control. Assistance from multilateral institutions, by far the most provided in Central Asia, was used to support consumption rather than to generate future growth. High growth rates in 1996 and 1997 proved temporary when the negative shocks of the 1998 Russian crisis and Kazakhstan's subsequent devaluation were exacerbated by domestic bank failures. In 1996–99, the real exchange rate depreciated by 50 percent against the

Table 7.2. Basic Economic and Agricultural Indicators, the Kyrgyz Republic, 1992 to 2004

a. Population, income, and agricultural indicators

Year	Population (millions)		Gross national income per capita (US$)	Agriculture				
	Total	Rural		Employed (1,000s)	Arable land (ha, 1,000s)	Arable land per person (ha)	Arable land per farm-worker (ha)	Crop and pasture land per capita (ha)
1992	4.5	2.9	510	574	1,350	0.30	2.35	2.29
1993	4.5	2.9	450	568	1,370	0.30	2.41	2.23
1994	4.5	2.9	370	563	1,367	0.30	2.43	2.30
1995	4.6	3.0	350	559	1,273	0.28	2.28	2.27
1996	4.7	3.0	380	557	1,372	0.29	2.46	2.28
1997	4.7	3.0	390	556	1,371	0.29	2.47	2.26
1998	4.8	3.1	350	556	1,360	0.28	2.45	2.23
1999	4.9	3.2	300	556	1,368	0.28	2.46	2.20
2000	4.9	3.2	280	555	1,335	0.27	2.41	2.17
2001	5.0	3.3	280	557	1,325	0.27	2.38	2.17
2002	5.0	3.3	290	558	1,308	0.26	2.34	2.15
2003	5.0	3.3	340	559	1,310	0.26	2.34	2.13
2004	5.1	3.4	400	—	—	—	—	—

b. General economic indicators

Year	Agri-culture (% of GDP)	Industry (% of GDP)	Manu-facturing (% of GDP)	Services (% of GDP)	Exchange rate (soms per US$, period average)	Total merch-andise exports (US$, millions)	Total merch-andise imports (US$, millions)
1992	39.0	37.8	33.7	23.2	—	—	—
1993	41.0	32.0	26.3	27.0	—	—	—
1994	40.9	25.5	21.8	33.7	10.84	340	316
1995	43.9	19.5	9.3	36.6	10.82	409	522
1996	49.7	18.3	8.5	32.0	12.81	505	838
1997	44.6	22.8	14.8	32.6	17.36	604	709
1998	39.5	22.8	15.5	37.7	20.84	514	842
1999	37.7	25.0	14.0	37.3	39.01	454	600
2000	36.8	31.0	19.5	32.2	47.70	505	554
2001	37.3	28.9	19.0	33.8	48.38	476	467
2002	37.7	23.3	14.3	39.0	46.94	486	587
2003	37.1	22.3	14.6	40.6	43.65	582	717
2004	36.6	21.1	13.6	42.3	42.65	719	941

Source: World Development Indicators Database 2007.

Note: All U.S. dollars are international dollars. — = no data are available. n.a. = not applicable.

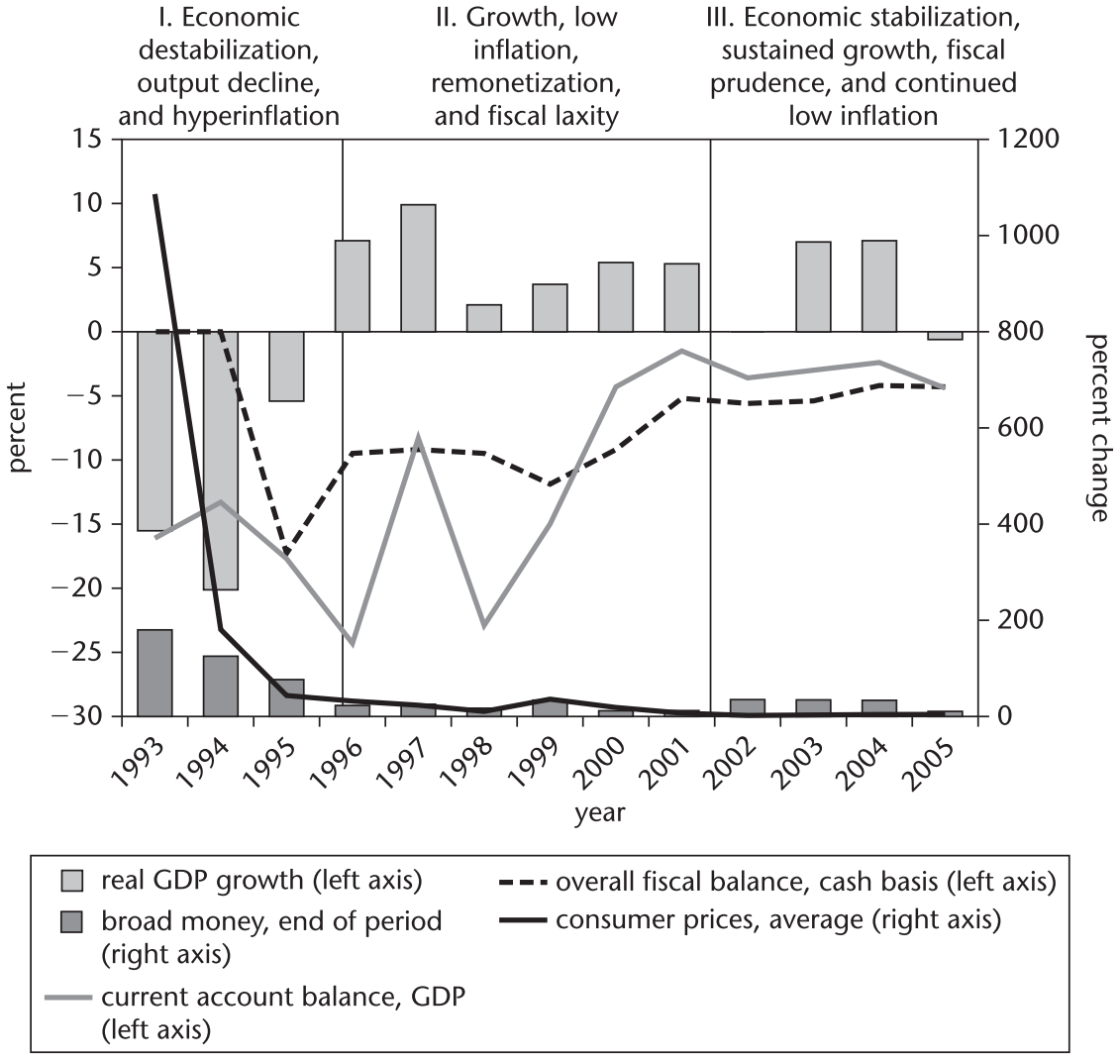
Table 7.3. Output Growth and Inflation, the Kyrgyz Republic, 1991 to 2006

Indicator	1991	1992	1993	1994	1995	1996	1997	1998
Real GDP growth (%)	−5	−19	−16	−20	−5	7	10	2
Inflation (consumer price index)	85	855	772	229	41	31	26	36
Indicator	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Real GDP growth (%)	4	5	5	0	7	7	−1	4
Inflation (consumer price index)	12	19	7	2	3	4	4	6

Source: EBRD 2006.

Note: 2005: preliminary data from official government sources. 2006: projections of the European Bank for Reconstruction and Development.

Figure 7.1. Macroeconomic Performance, the Kyrgyz Republic, 1993 to 2005



Source: Author depiction.

U.S. dollar. This was a slight real appreciation with respect to important CIS trading partners (Kazakhstan and Russia), but it led to improved competitiveness relative to other trading partners (such as China), and most import-substituting activities experienced robust growth between 1998 and 2001. The depreciation exacerbated the external debt problem, however, forcing fiscal adjustment in 2000–01 and a scale-back of external borrowing; the government obtained a debt restructuring agreement from the Paris Club in 2002.

After 2000, on the basis of more sustainable macroeconomic policies, microeconomic reforms were resumed, especially in deregulation and the reduction of bureaucratic red tape. Economic growth was not smooth, but it was higher in 2000–04 than it had been in 1998–99 (table 7.2 and figure 7.1). A second Paris Club restructuring in 2005 established a more manageable external debt position.[10] Economic recovery was helped by robust growth in Kazakhstan and Russia, and, after 2000, labor migration to those two countries and worker remittances became significant.

Nevertheless, popular frustration remained strong. The president's family, especially his daughter and son-in-law, were perceived to be benefiting economically from political connections, and, in the southern part of the country, people complained that the political system favored northern groups closer to the president. When political change came, it occurred remarkably rapidly. The parliamentary elections of February and March 2005 were widely perceived as unfair because leading opposition candidates were barred. Protests began in Jalalabad on March 10, and, within a week, both Jalalabad and Osh, the main cities of the south, were in opposition hands. The north was initially quiet, but, on March 24, crowds converged on the seat of government, and President Akayev fled. He formally resigned on April 4, paving the way for the first peaceful transition of political power in Central Asia. After this Tulip Revolution, new elections were held in June 2005. The government appears to be committed to continuity in economic policies, but the political situation remains fluid. A new constitution in 2006 granted greater powers to Parliament, although how effective this arrangement will be remains uncertain.

Agricultural Development

At the time of independence, the most important agricultural outputs (valued at Soviet relative prices) were livestock products: beef and veal (13 percent of total agricultural output), milk (17 percent), sheep meat (11 percent), and wool (12 percent). The main crops were tobacco (8 percent) and grains (6 percent); fruits and vegetables also accounted for 6 percent (table 7.4). Cotton accounted for less than 2 percent of farm output in 1990, but was important as a readily exportable crop to hard currency markets.

Table 7.4. Gross Value of Agricultural Output, the Kyrgyz Republic, 1990 and 2004

Commodity	1990		2004	
	Value (1983 rub, millions)	% agricultural output	Value (soms, millions)	% of agricultural output
Grains	159	5.9	10,442	19.0
Potatoes	62	2.3	3,810	6.9
Vegetables	110	4.1	4,701	8.6
Cotton	47	1.7	1,870	3.4
Tobacco	220	8.1	245	0.4
Fruit	66	2.4	—	—
Sugar beets	—	—	636	1.2
	—	—	925	1.7
Other crops	257	9.4	—	—
Total crops	922	33.9	—	—
Beef and veal	353	13.0		
Mutton and lamb	298	10.9		
Pork	95	3.5	15,774 (all meat)	28.7 (all meat)
Poultry	104	3.8		
Other meat	41	1.5		
Milk	449	16.5	7,832	!4.3
Eggs	62	2.3	777	1.4
Wool	319	11.7	249	0.5
Other livestock products	80	2.9	—	—
Total livestock products	1801	66.1	—	—
Other products	—	—	7,694	14.0
Total agriculture	2723	100	54,955	100

Sources: World Bank 1992; data of the National Statistical Committee.

Note: — = no data are available.

A large part of the Kyrgyz Republic's preindependence livestock output was based on high levels of support for livestock production on state and collective farms that was funded from outside the republic. To maximize the use of extensive pastoral grazing areas, this budgetary support was aimed at raising the ability to carry stock through the winter by facilitating the importation of manufactured feed, the construction of housing for animals, and the availability of publicly owned trucks to transport livestock to and from pastoral areas during spring and summer. Fine wool sheep breeds were especially supported through this system because they are well adapted to pastoral grazing and produce high-value wool. The highly subsidized structure led, however, to widespread overgrazing on

pastures. The system rapidly collapsed when Russian budget support ceased. Livestock were slaughtered because farmers were unable to feed and house the animals during winter. Fine wool production fell as a result.[11]

In the Soviet economy, the Kyrgyz Republic was a substantial importer of grains and an exporter of tobacco, cotton, and livestock products. The largest industrial enterprise in the country was a refinery that processed sugar imported from Cuba for sale throughout the Soviet Union; after independence, when transport became costed at economic rates and these supply chains collapsed, raw sugar was imported from China and refined sugar exported to Kazakhstan and Uzbekistan. There was also a two-way trade in dairy products, which, after independence, consisted of exports to Uzbekistan and imports of processed items from Russia and the rest of the world. In 1994, the main agricultural exports were wool (US$25 million), tobacco (US$20 million), and cotton (US$19 million), and the dominant agricultural import was wheat (US$54 million); no other agricultural import was valued at over US$5 million (Christensen and Pomfret 2007).

Agricultural production fell considerably from 1990 to 1995, and this was accompanied by demonetization and a retreat into self-supply during the transitional recession. There were large changes in output composition during 1990–97 as wheat output increased by 164 percent, and potatoes and sugar beets also experienced large increases in output.[12] The area under winter wheat increased from 183,000 to 360,000 hectares, and the area under spring wheat rose from 11,000 to 193,000 hectares, replacing barley and fodder crops.[13] The collapse of international and domestic trade in the early 1990s encouraged greater focus on wheat and potatoes, both staple foods that are easy to store. The area sown to vegetables and cotton also increased in this period, but insufficiently to offset falling yields.[14] The area sown to tobacco and barley, both cash crops, fell substantially during the 1990s. Meanwhile, high input prices and the inadequate availability of fodder led to drastic cuts in livestock numbers and falling output, especially in poultry products, sheep and goats, and pigs. The Kyrgyz Republic shifted in status from a net importer of primary agricultural products in 1993 to a net exporter in 1997. At the same time, because of quality problems in the agroprocessing sector, it shifted in status from a net exporter to a net importer of processed agricultural products.[15]

Aggregate farm output began to pick up in 1996 and 1997, reflecting responses to post-1995 land privatization and favorable prices and helped by good weather in 1996 and 1997. Livestock production, which had remained strong on household plots, began to expand after the mid-1990s as incomes recovered and the demand for livestock products increased, although this hastened the decline of fine wool sheep production as the emphasis shifted to meat and dual-purpose sheep breeds produced on a small, but intensive basis. More recently, improved access to livestock feed from Kazakhstan has given impetus to restructuring and growth, particularly in poultry production. Hence, the decline in livestock

production as a share of agricultural sector output and the shift from extensive to intensive production systems represent a rational economic response to a new, less distorted policy environment.

Despite the negative impact on export demand of the 1998 Russian crisis, robust agricultural growth continued in the late 1990s and early 2000s. By the end of 2001, agricultural output had regained pretransition levels. Indeed, during the first decade after independence, agricultural performance in the Kyrgyz Republic, whether in terms of gross output, increased labor productivity, or improved yields, was probably the best among that of all Soviet successor states (Rozelle and Swinnen 2004). The recovery that began in the second half of the 1990s was characterized by a shift to more commercial activities, including products with higher income elasticity of demand, such as livestock products and fruits and vegetables, while wheat output fell from the 1997 peak.

Over the period 1990–2004, a substantial reorientation of Kyrgyz agriculture occurred. Crops are relatively more important now, and livestock products less important than at the time of independence. Among grains, wheat has become clearly dominant. The vegetable subsector is diversified: the 2004 output value in millions of soms consisted of potatoes, 4,272; tomatoes, 892; cabbage, 879; onions, 599; carrots, 547; and cucumbers, 395. Among livestock products, both dairy and eggs have recovered from 1995 troughs. Some agricultural subsectors, which were important in 1990, notably wool and to a lesser extent tobacco, have been practically eliminated.

The Evolution of Policies since 1991

Policies affecting agriculture have followed the general economic strategy described in the previous section. In the initial years following independence, the picture is confused; prices were freed, but well-functioning markets did not exist. Some subsidies were maintained to shelter consumers and producers from the deep recession, but these had been abandoned by 1995. Indirect subsidies through credit markets and underpriced inputs such as water and electricity have remained, but farmers are operating in a market setting. Land reform implementation was likewise slow in 1991–94, but, thereafter, the changes were far-reaching; state and collective farms were replaced by individual farms; and, more recently, land markets have been established. Trade policy has been liberal: tariffs are low and fairly uniform; there are few nontariff barriers to trade; and the currency has been convertible since 1995.

Prices and Subsidies

The Soviet economic system was based on distorted accounting prices and large direct and indirect subsidies. Agricultural input and output prices were all below world prices, but price distortions generally worked in favor of farmers. Output

prices were closer to world prices than were the prices for key inputs (fertilizers, machinery, and transport), although some crops (such as cotton and grains) were favored relative to others. After independence, output and input prices, apart from irrigation water, electricity, and railway tariffs, were quickly deregulated.[16] The price of inputs, which are almost all imported, quickly rose to world price levels, while output prices adjusted more slowly because of local monopolies and poor infrastructure.[17] Relative prices changed substantially.

In 1993–95, the government maintained some direct subsidies and budget transfers to soften the impact of the transitional recession on consumers and enterprises. The main items in 1993 were bread subsidies of som 70.6 million, other food subsidies of som 3.9 million, and enterprise support of som 78.8 million. By 1995, these transfers had been reduced to som 20.0 million, som 3.5 million, and som 4.0 million, respectively, and, after 1995, they were eliminated as support switched to interest rate subsidies.[18]

Budget loans to companies, oblasts (for bread price support), and Agrobank amounted to som 814.1 million in 1995.[19] Credit subsidies were switched to directed credit through banks to agricultural enterprises and to the Ministry of Water (for totals of som 240.9 million in 1996 and som 277.8 million in 1997) and then were phased down in 1998 (som 83.1 million) and out in 1999 (zero). In 2000–03, small amounts of subsidized credit went to agricultural enterprises through the banking system (between som 7 million and som 24 million per year). These credit subsidies were eliminated in 2004.

Budgetary support for agriculture was minor during the 1990s. At the time of the country's accession to the WTO in December 1998, the Ministry of Finance reported that total budgetary support was well below 1 percent of gross agricultural output (Mogilevsky 2004; Mudahar 1998). The total budget expenditure for agriculture and water resources in 1999 was less than US$10 million (table 7.5). Nevertheless, indirect subsidies (low charges for irrigation water or electricity) continued to distort input use and the composition of farm output.[20]

Privatization and Organizational Structure

Agrarian reform was difficult because of population pressure on the land and suspicions about the potential for the creation of a rich peasant (*kulak*) class. Various measures of arable land per person in the late Soviet era all indicate population pressure in rural Central Asia, but an added problem in the Kyrgyz Republic was the regional variation. Irrigated land per person was much less in the southern districts of Jalalabad and Osh than in the mountain areas or the northern districts (table 7.1). An additional complication in the south was the ethnic tensions over land. The worst outbreak of violence in Central

Table 7.5. Budget Expenditure for Agriculture and Water Resources, the Kyrgyz Republic, 1993 to 2004

(soms, millions)

Year	Total budget expenditure	Water use and irrigation	Memorandum item: water user fees	
			Charged	Received
1993	117.8	24.5	236.1	—
1994	86.3	46.6	115.1	1.0
1995	158.5	79.4	96.2	17.4
1996	181.1	91.6	95.4	30.8
1997	238.3	113.6	85.6	55.9
1998	350.4	142.9	178.9	49.0
1999	388.8	195.5	148.8	70.8
2000	476.1	202.9	142.5	76.1
2001	606.9	253.5	165.8	81.1
2002	744.1	293.1	155.5	63.9
2003	783.0	307.6	—	60.4
2004	896.0	408.6	—	63.7

Sources: Budget execution reports; Ministry of Finance and Economy; Ministry of Agriculture and Water Resources; National Statistical Committee.

Note: — = no data are available.

Asia during the Gorbachev era followed a reallocation in 1990 of land tilled by ethnic Uzbeks to ethnic Kyrgyz; several hundred people were killed in the ensuing interethnic riots.

Land reform laws date from February 1991, but implementation was slow until 1994. The initial laws on peasant farms and land reform in February and April 1991 were resisted by local officials and by managers of state and collective farms. The situation was complicated by the November 1991 decree creating the National Land Fund, which favored distribution to ethnic Kyrgyz. Starting in February 1994, the legal situation of individual farmers was clarified, and, in May, detailed nondiscriminatory regulations for the National Land Fund were promulgated. Additional reforms in 1995 created more representative committees for implementing farm enterprise reorganization; this reduced the influence of local officials and of state and collective farm managers.

Between 1995 and 2000, reform accelerated, and the approximately 500 collective and state farms averaging over 2,500 hectares per farm at the time of independence were replaced by over 60,000 farms averaging about 20 hectares per farm (World Bank 2004).[21] By early 2002, about half the arable land was being cultivated by individual farmers; a fifth was owned individually, but managed under a reformed

collective or privatized structure; a quarter was held by the community-based Land Redistribution Fund; and the remaining 5 percent was in the hands of about 20 state research farms, mostly seed and livestock breeding farms (Cord et al. 2004).[22] The successor organizations operated at first with long-term leases. Following a 1998 referendum, private landownership was legalized, but a five-year moratorium was placed on transactions involving land. In September 2001, the moratorium on rural land sales was lifted, although restrictions were imposed (for example, land could only be sold to a member of the same community). By the mid-2000s, land was private property in a meaningful sense, and a land market was functioning.

Land reform in the Kyrgyz Republic has been among the most far-reaching in the former Soviet Union and has certainly gone much further than anywhere else in Central Asia. Many observers ascribe a key role to land reform in the post-1995 revival of Kyrgyz agriculture. Access to some inputs and to rural credit remains imperfect, but farmers have substantial control over their land, and, although there is little hard empirical evidence, the expectation is that they will be responsive to price incentives.

In the agroindustrial complex, a large number of state-owned enterprises were privatized during the 1990s. This reduced the government's obligations to loss-making enterprises, although, in some cases (such as fertilizers and farm machinery), public monopolies became de facto private monopolies (Mudahar 1998).

The cotton sector saw a rapid expansion of the number of cotton gins from 3 at the end of the Soviet era to 23 in 2005, at least 9 of which were built after 1999 (Sadler 2006).[23] The ginners play a key role in providing finance to cotton producers. The financing was initially raised from international sources and, since 2000, has been supplied largely from their own resources. The farmer contracts to deliver seed cotton to the gin in return for local currency advances to pay for inputs and labor.[24] Despite the apparent competition, Sadler (2006) reports the average prices received by farmers for seed cotton in 2003 at US$550 per ton in Kazakhstan and US$450 per ton in the Kyrgyz Republic, and he explains the difference by the monopsony power of Kyrgyz gins. However, the average price also masks regional variations; thus, Sadler reports that the price was US$75 higher in Jalalabad than in Osh (the two cotton-producing oblasts in the southern part of the country), which may be due to market conditions or to quality differences.

Trade Policies

The trade policies of the Kyrgyz Republic are difficult to track in the early postindependence years because the borders were extremely porous.[25] In 1994, the government abolished the state monopoly on international trade, and, since 1995, the Kyrgyz Republic has pursued a trade policy based on moderate most-favored-nation

tariffs at a maximum rate of 15 percent and no specific duties (Christensen and Pomfret 2007). Most tariffs were set at 10 percent. The rate was 5 percent for imports from developing countries and 0 percent on intra-CIS trade. The effective tariff in the second half of the 1990s was around 2 percent. The value added tax rates applied to imported goods were higher than the rates applied to identical domestically produced goods, but this was discontinued after WTO accession in 1998.

In February 1996, the Kyrgyz Republic initiated the WTO accession process. It became a WTO member in December 1998. The country's WTO commitments are remarkably liberal. Bound tariffs are set at low rates, and virtually all sectors are included in the commitments under the General Agreement on Trade in Services (Mogilevsky 2004). The growth of international trade and integration into the global economy since WTO accession have been disappointing partly because the business environment remains unattractive to private investors given the poor institutional arrangements and widespread corruption, but geography and the lack of regional cooperation in facilitating transit are also factors (ADB 2006; Cadot, Carrère, and Grigoriou 2006; Raballand 2003; UNDP 2005).

Neither Russia nor any other Central Asian country was a WTO member as of mid-2007; so, the Kyrgyz Republic operates in a dual-track trade environment whereby much of its trade is conducted outside WTO rules. The country is a member of several regional organizations, of which the most significant is the Eurasian Economic Community, which includes its major CIS trading partners. In 1996, the Kyrgyz Republic signed a customs union agreement with Belarus, Kazakhstan, and Russia, and, in 1999, the union was extended to include Tajikistan.[26] In February 2000, reflecting the lack of progress toward a customs union, a new agreement was signed that envisaged tariff harmonization within five years, but, by 2005, the common external tariff covered only 6,156 of the 11,086 tariff lines identified in the union's classification system (largely ones where the existing tariffs among the members had been similar). The main reason a common external Eurasian Economic Community tariff is unacceptable to Kazakhstan or the Kyrgyz Republic is the fact that Russia's tariffs are higher than those of the two countries both on average and in the peak tariffs on individual items. It is highly unlikely that Russia would agree to cutting its tariffs to the level of the bound rates agreed to by the Kyrgyz Republic in its WTO accession, but, even if the Kyrgyz authorities were tempted to override their WTO obligations, they would not want to raise tariffs that would hurt the country's consumers to the benefit of Russian producers, given that Russia's own tariffs would remain unchanged and provide no new preferential advantage to Kyrgyz exporters (Tumbarello 2005). In sum, despite strong paper commitments, the Eurasian Economic Community is unlikely to evolve into a stronger trading arrangement in the near future.

Despite the existence of a regional agreement, the Kyrgyz Republic's trade relations with its contiguous neighbors suffer from the lack of WTO commitments. Following the 1998 Russian crisis, Kazakhstan introduced a number of draconian import duties, including tariffs of up to 200 percent on dairy fats and margarines, which hurt Kyrgyz dairy exports. The Kyrgyz Republic reacted with restrictions on the wheat trade, although a seasonal (July–November) export tax on wheat in 1999 and 2000 appeared to have minimal impact. More important than trade taxes has been the lack of agreement on issues such as customs valuation or transit; this has augmented the costs of interregional trade in Central Asia. A frequently quoted story in the late 1990s revolved around a truck driver transiting Kazakhstan from the Kyrgyz Republic to Russia who could expect to have to pay US$1,700 in unofficial charges.[27] The situation with respect to Kazakhstan has improved substantially since December 2003.[28] With Uzbekistan, however, there has been no progress in alleviating trade restrictions, which include cumbersome customs clearance procedures and frequent border closures.

Quantifying the Distortions in Incentives

The expectation from the discussion in the previous section is that policy-induced price distortions should be small both within the agricultural sector and for agriculture relative to other sectors. The main export products—cotton, tobacco, and wool—have not been affected by significant subsidies or by taxes. For cotton, this is in contrast to the situation in neighboring Uzbekistan, where state marketing boards attempt to cream off a large part of the rents, inducing farmers to smuggle their crops across the border into the Kyrgyz Republic where they are able to obtain a price that is closer to the world price (see chapter 8). Agricultural activities have not been heavily protected by tariffs either as a group or individually. The government drastically cut back on subsidies to the farm sector during the 1990s. In general, input prices have been unregulated since the early 1990s, although key exceptions are water, for which payment is not always enforced, and electricity. Agriculture has also benefited from credit subsidies, although these appear to have been minor.

There are no published producer support estimates for the Kyrgyz Republic. The Organisation for Economic Co-operation and Development (OECD) has drawn up estimates for transition economies, but the only CIS countries covered before 2007 were Russia (Melyukhina 2003) and Ukraine (World Bank and OECD 2004). Those two studies indicate large positive estimates at the aggregate level up to 1991 that were sharply reversed in 1992 before increasing to positive values again.[29] In broad terms, we might expect producer support estimates for the Kyrgyz Republic to exhibit a similar pattern, whereby pre-1991 positive estimates would have turned negative in 1992 as output prices increased by less than input prices. Thereafter, however, policy divergence among the Soviet successor states is

likely to have increased as the Soviet legacy recedes into the past, so an alternative path is conceivable.

The remainder of this section makes a preliminary attempt at estimating the nominal rates of assistance (NRAs) facing producers of some of the main agricultural products. The approach relies on the methodology outlined in the appendix. The six commodities covered in tables 7.6, 7.7, and 7.8 account for

Table 7.6. NRAs for Wheat, the Kyrgyz Republic, 2000 to 2004
(percent of farmgate revenue)

Item	Indicator	2000	2001	2002	2003	2004
1	Production (tons, 1,000s)	1,039	1,191	1,163	1,014	998
2	Border price[a] (US$)	79	90	73	81	128
3	Exchange rate (som/US$)	47.7	48.5	46.9	43.7	42.7
4	Domestic currency price (som/ton) = 2 × 3	3,768	4,365	3,423	3,540	5,466
5	Transport, handling, and so on (som/ton)	2,263	2,305	2,110	2,167	2,484
6	Reference price (som/ton) = 4 − 5	1,505	2,060	1,313	1,373	2,982
7	Producer price (som/ton)	5,354	5,868	4,730	3,977	5,796
8	Price gap = 7 − 6	3,849	3,808	3,417	2,604	2,814
9	NRA (%) = 100*(8/7)	72	65	72	65	49

Source: Author estimates.

a. The border price is the unit free on board value of wheat imports from Kazakhstan.

Table 7.7. NRAs for Key Agricultural Products, the Kyrgyz Republic, 1993 to 2004
(percent of farmgate revenue)

Commodity	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Wheat	64	46	33	75	68	72	65	72	65	49
Cotton	1	5	−39	9	−70	−28	35	−6	−2	42
Maize	−8	52	65	37	51	59	48	16	42	67
Cow's milk	—	−315	−294	−44	37	22	24	−19	11	—
Poultry meat	—	—	—	—	—	72	81	70	75	82
Wool	1	0	−24	−4	−72	38	67	74	90	94

Source: Author estimates.

Note: Cotton, cow's milk, and wool are export products (although milk may have been nontraded for most of the 1990s; hence, the extreme values for 1996–98). Wheat, maize, and poultry meat are import-competing. — = insufficient data available for the calculation.

Table 7.8. NRAs for Cotton, the Kyrgyz Republic, 2000 to 2004
(percent of farmgate revenue)

Item	Indicator	2000	2001	2002	2003	2004
1	Production (fiber, tons, 1,000s)	28,708	33,662	43,000	42,500	48,000
2	Border price[a] (US$)	1,191	852	1,160	1,456	1,100
3	Exchange rate (som/US$)	47.7	48.5	46.9	43.7	42.7
4	Domestic currency price (som/ton)	56,811	41,322	54,404	63,627	46,970
5	Transport, handling, and so on[b] (som/ton)	11,744	9,798	11,361	12,266	10,004
6	Price of fiber ex-gin (som/ton)	45,067	31,524	43,043	51,361	36,966
7	Ginning costs (som/ton)	7,155	7,275	7,035	6,555	6,405
8	Seed value (som/ton)	8,491	8,633	8,348	7,779	7,601
9	Reference price, fiber[c] (som/ton)	46,402	32,882	44,356	52,585	38,162
10	Reference price, raw cotton[c] (som/ton)	13648	8730	12963	16130	11002
11	Producer price (som/ton)	10,690	13,495	12,231	15,748	18,926
12	Price gap	−2,958	4,765	−732	−382	7,924
13	NRA (%) = 100*(12/11)	−28	35	−6	−2	42

Sources: Author estimates; Cotlook Price Series Database 2007.

a. The border price is the free on board price. It is the Cotlook A index, minus US$70 (for conversion of the cost, insurance, and freight price to the free on board price).
b. Transport, handling and so on consist of US$10 handling at the gin, US$10 for insurance, and US$85 for transport from the gin to the border, plus marketing costs (15 percent of line 6).
c. The reference price of fiber ex-gin (line 6) = ((raw cotton price + ginning cost)/ginning ratio) − ((value of cotton seed left over)*(0.64/0.36)). With a ginning ratio of 36 percent, 1 ton of cotton fiber requires 2.78 (= 1/0.36) tons of raw cotton, and 64 percent of the 2.78 tons will be seed.

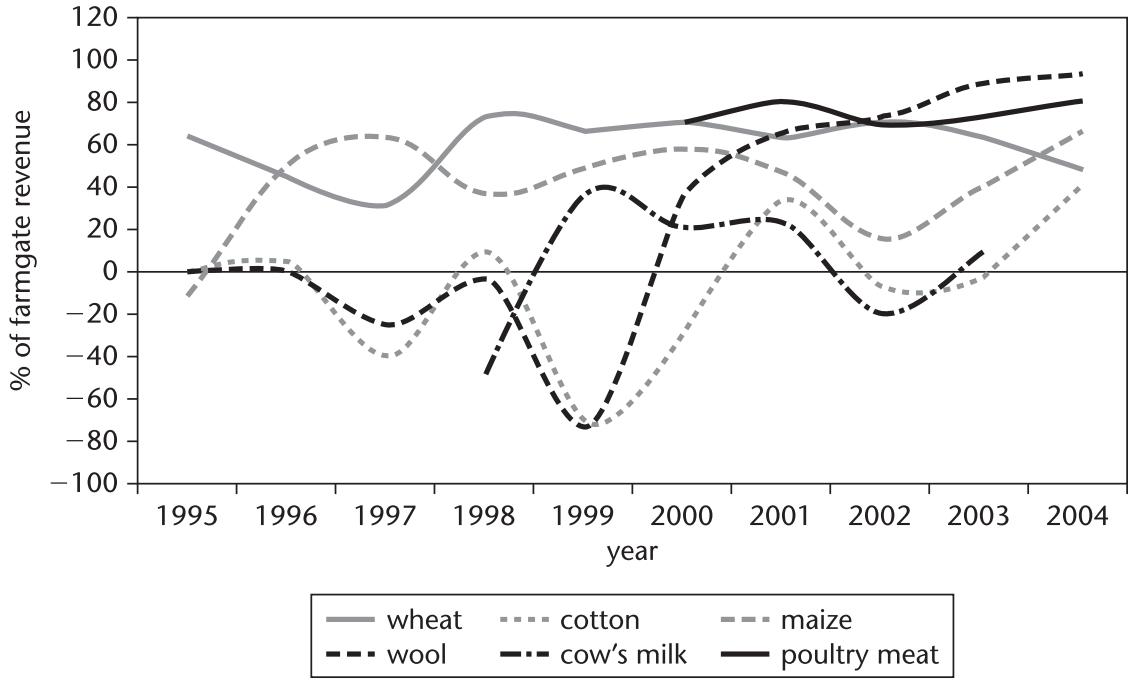
35–40 percent of total agricultural output.[30] Particular attention is paid to wheat, the country's largest single farm output, and cotton, the country's most important farm export item. These estimates must be treated with caution because it is difficult to identify appropriate reference prices, because the producer prices are derived from sales in domestic markets (rather than at the farmgate), and because the transport and handling costs are approximations. Unfortunately, the problems in establishing a plausible reference price are especially acute for two of the major agricultural products, beef and veal (given the heterogeneous nature of the output) and potatoes (because potatoes are largely untraded). For all products, attempts to create reasonable price estimates for the hyperinflationary years before 1995 have been impossible, and, even for 1996–98, the implausible

estimates for milk reflect difficulties in identifying appropriate prices before a national market existed.

Wheat

The bottom line of table 7.6 indicates that the gap between the domestic price for wheat and the border price, adjusted for transport and handling costs, amounted to 65–72 percent of the domestic price in 2000–03. In 2004, the gap was substantially smaller (49 percent), but this may reflect an inappropriately high border price.[31] The pattern of a substantial positive gap between domestic prices and reference prices is also apparent in the data for 1995–99 (see table 7.7 and figure 7.2), although there is more variation in these years. In all years, the price gap may be overestimated if the reference price is too low because of an underestimated border price or an inflated allowance for transport and handling, but comparison with other world price indicators or with border prices used by the OECD to draw up wheat producer support estimates for Russia or Ukraine suggest that the border price used in table 7.6 is not too far out. Similarly, although transport costs clearly vary by location, changing the numbers in line 5 of table 7.6 would not alter the sign of the support estimates. In sum, domestic market prices in the Kyrgyz Republic have consistently been higher than an appropriate reference

Figure 7.2. NRAs for Key Agricultural Products, the Kyrgyz Republic, 1993 to 2004



Source: Author estimates.

price; table 7.6 suggests that the price gap is substantial, even though the numbers should be treated as no more than rough approximations.[32]

In 1990–97, there was a massive increase in the area sown to wheat and in wheat output. This reflected a retreat into staple consumption, problems of storage for more perishable products, and import substitution when trade with Kazakhstan became more difficult and costly than it had been during the Soviet era. The existence of high domestic prices for wheat is not surprising, although the use of domestic market prices rather than farmgate prices makes it difficult to interpret the large price gap or to identify the gap's proximate determinants. Distortions caused by policy may partially explain the price gap during the 1990s and early 2000s; there are reports of local authorities encouraging wheat-growing, although which policy instruments they might have used is unclear, and, in the early 2000s, there was a small seasonal export tax on wheat, but these seem inadequate to explain a large policy-induced distortion in favor of wheat. The price gap is more plausibly explained by a general lack of integration of the domestic and the external market, and the decline in the support estimate for 2004 may be capturing a diminution in the structural problems that disconnect market prices.

Cotton

Of all Kyrgyz farm products, cotton is the most integrated into world markets; so, selecting appropriate border prices is the least problematic for this crop. Nonetheless, calculating support for cotton farmers is complicated by the need for a processing stage between the raw cotton sold by the farmer and the ginned cotton that is exported. Table 7.8 illustrates the calculations based on the Cotlook world price for cotton fiber (Cotlook Price Series Database 2007). In the conversion from the reference price into a price for raw cotton, a constant ginning outturn of 36 percent is assumed.[33] The estimates are sensitive to this and other assumptions, and, at first sight, the pattern appears to be one of implausibly volatile distortions in favor of or against cotton farmers between 1995 and 2004, rather than the small negative values that would be expected for an export crop produced under fairly competitive and undistorted market conditions.

As for most of the Kyrgyz economy, price data are difficult to interpret in the high inflation years of the early 1990s, but the cotton calculations show plausible low support estimates for 1995, 1996, and 1998. The exceptional years in the late 1990s occurred when there was a large nominal depreciation of the Kyrgyz som against the U.S. dollar, from som 12.8 to som 17.4 in 1997 and from som 20.9 to som 39.0 in 1999 (and to som 47.7 in 2000). In these years, the som value of the border price increased sharply, while domestic producer prices were more sluggish, so that the estimated price gap is negative and large. Since 2000, the exchange

rate has been more stable, but, in both 2001 and 2004, when world cotton prices dived, cotton buyers in the Kyrgyz Republic offered prices early in the season that turned out to be too high. Whether the high September prices equated to windfall gains to cotton farmers or whether they were more of a statistical artifact influencing the calculation of domestic prices is difficult to know, but they contributed to the estimates in table 7.8 of large positive assistance in 2001 and 2004. In 2002 and 2003, which were more stable years from the perspective of world cotton prices, the small negative support estimates are consistent with a nondistorted export sector.

Inexperience with market mechanisms applies not merely to the cotton buyers who failed to forecast world price downturns, but even more to the farmers who seem to be surprisingly poorly informed. A continuing feature of the cotton economy is the presence of itinerant buyers who buy cotton at low prices by taking advantage of the limited knowledge farmers have of prices and perhaps their need for cash. The gap between the producer price in table 7.8, which is the price of raw cotton delivered to the gin, and the price the farmers actually receive is probably the largest distortion against cotton farmers, but, unfortunately, we do not have data on this price gap.

Overall Assessment

The estimates of price gaps for six major products from 1995 to 2004 indicate that the domestic prices are generally above an appropriate reference price and often substantially so. This is especially true for wheat and maize, for which the price gap generally exceeded 50 percent of the domestic price.[34] The pattern for cotton is more erratic, although farmers appear to have benefited from the establishment of a competitive ginning sector in the second half of the 1990s and are operating in a fairly nondistorted setting. For the livestock products covered in this analysis, the price gap was negative for milk and wool producers during the second half of the 1990s, but has generally been positive since 1999. In 2000–04, wool and poultry meat producers enjoyed the highest support of any of the commodities studied.

How do these distortion estimates relate to the patterns of farm output and the policies affecting the agricultural sector that are described in the first two sections of this chapter? A major problem is deriving border prices that are a useful reference price in a case where there is little trade. This is exacerbated for dairy products and for beef and veal by the heterogeneity of the products and possible biases because of the quality composition of small trade volumes.[35]

Since the end of central planning and the dissolution of the Soviet Union, the incentives facing farmers have been driven by domestic market conditions. In the early and mid-1990s, domestic demand fell sharply, and long-distance trade was

hurt by market disruptions. The output of staple food crops (wheat and potatoes) increased, while commercial livestock farming collapsed, and the output of grains used as inputs in livestock production or agricultural processing fell. After 1995 (the last year of negative GDP growth), as income levels began to recover, domestic demand increased, especially for meat, dairy products, and eggs. However, much of the output was sold locally, and a national market still scarcely exists. The output of crops like sunflower seeds or fruits and vegetables increased, largely as an import-substitution process even though formal trade barriers remained low.[36] The overall picture for the 1990s and into the early 2000s is of increased self-sufficiency in primary farm products, even though wheat, flour, and oils remain significant imports, and beans have emerged as an export crop. In such a situation, comparing the domestic price to a reference price based on the world price or on the unit value of trade in the product makes limited economic sense.

The collapse of trade in primary products is best illustrated by tobacco, which in the late Soviet era was the main nonfood crop, accounting for one-twelfth of total farm output and still the most important agricultural export in 1994. After 1994, the area under tobacco dropped sharply, and, despite some recovery in 1998–2000, less than a third as much land was devoted to tobacco in 2004 as a decade earlier. Although tobacco continues to be exported, its share of output has dwindled to near insignificance (table 7.4).[37]

The story of the other Kyrgyz industrial crop, cotton, provides a stark contrast. Raw cotton output has increased almost continuously since the early 1990s. By 2005, cotton exports were almost four times greater than tobacco exports, and cotton accounted for about one-third of all agricultural exports. Part of the story is the importance of domestic reform. Land reform was rapid in the cotton growing oblasts of Jalalabad and Osh (and there were no significant scale diseconomies from growing cotton on smaller farms), and the ginning sector was also privatized rapidly. Part of the story also has to do with the nature of cotton as an export commodity. Across Central Asia, cotton was the pillar of the monetized economy after the dissolution of the Soviet Union because Western European cotton agents quickly came to the region, and the exportation of baled cotton to world markets could be organized with less difficulty than the exportation of any other major farm commodity. This underpinned the relative economic success of Uzbekistan, the heart of the Soviet cotton economy, until prices started to fall in 1996. In Tajikistan, Turkmenistan, and Uzbekistan, the cotton sector was repressed by various degrees of state control, and this encouraged the expansion of the (originally much smaller) cotton sectors in Kazakhstan and the Kyrgyz Republic.[38] Some cotton exports from the Kyrgyz Republic are smuggled Uzbek cotton, but there has been a genuine expansion of domestic output, especially in Jalalabad Oblast. The estimates in table 7.7 are a guide to this story, but an imperfect one.

Public policy has reduced distortions in the cotton sector, and this is reflected in the small negative support in 2002 and 2003, but the large positive support estimates for 2001 and 2004 indicate either the immaturity of market mechanisms in the cotton sector or a lack of concern for short-run profit maximization.[39]

The construction of a more efficient market economy is a slow, ongoing process. It is helped by improvements in physical infrastructure and in the soft infrastructure that facilitates trade, but the process became internationalized only after 2003 when the Kazakhstan economy was clearly booming, and the costs of entering or transiting the Kyrgyz Republic were reduced.[40] The apparent paradox between the description of policy interventions in the second section and the estimated price gaps in table 7.7 may be explained with reference to the time taken to replace the coordinating mechanisms of central planning by a well-functioning market economy. This process has been hindered in the Kyrgyz Republic by lack of any pre-Soviet tradition of a modern market economy and by geographical isolation (in turn, exacerbated by the large increase in trade costs with key neighbors).[41] The main responses to the shocks of the early 1990s—cuts in commercial livestock farming and the expansion of staple crops—are easy to explain, but, because they reflected retreats from commercial farming, they are poorly gauged by price-gap measures of distortions. At a conceptual level, open trade policy and low levels of protection have a limited impact on domestic prices when domestic markets are extremely weak, when subsistence-oriented production results in low marketed surplus, and when transaction costs are high, so that there is a distinct risk that the extent of policy-induced distortions, as well as the immediate benefits of a more liberal trade regime, will be overestimated in the Kyrgyz setting.

The Political Economy of the Policy Choices

The role of state farm managers and local authorities in the resistance to farm reform was apparent in the Kyrgyz Republic, as in other Central Asian countries, in the early 1990s. Their long-term influence on the reform process was, however, uniquely limited because serious land reform was undertaken after 1995, and, unlike in Kazakhstan, there was substantial structural change as large farms were replaced by individual farms. The acquiescence of local authorities in farm reform may have partly reflected the sense of separateness of the south, where there was no good technical argument against breaking up large farms, and, unlike in Tajikistan, Turkmenistan, or Uzbekistan, the central government did not impose a policy of squeezing farm rents on local authorities. More generally, President Akayev seems to have accepted arguments made by international financial institutions and personal advisers such as Anders Åslund against trying to retain tight control over producers. Around 2000, this advice may have appeared flawed

because the lack of domestic sources of revenue contributed to the debt crisis, but, in the long run, the Kyrgyz Republic is much better placed for sustained agricultural growth than its neighbors, which have squeezed farmers dry.

The situation since the Tulip Revolution of March 2005 is confused. The new government was not fully constituted until the third quarter of 2005, and internal policy differences within the government, which is an uneasy coalition of the leading southern and northern politicians, remain. At the same time, the government has faced a nearly continuous state of crisis as various interest groups, including criminal elements, scramble for the country's assets. Violence has increased. A decline in agricultural output in 2005 was partly caused by the disruption.

While the major economic reforms appear to be securely in place, the political situation is still fluid, and the longer-term implications for the economy are difficult to predict. The 2006 constitution gives significant power to Parliament, the first such constraint on presidential power in post-Soviet Central Asia. This may be a harbinger of a less personalized political system, with policy continuity and incremental change. On the other hand, how the constitution will be implemented remains unclear given that the president is skeptical of limitations to executive power and as the cohesiveness of Parliament is tested by events such as the resignation of the government in December 2006.

Future Policy Reform Paths

The Kyrgyz Republic inherited a situation in which the main agricultural exports were bulky, unprocessed commodities or the processed outputs of inefficient plants. A major challenge has been the shift to higher-value specialized products and a processing sector based on local raw materials. The dilemma is highlighted by the single, huge sugar refinery, the closure of which would have been economically disastrous for the local economy, but the long-run value of which has been recognized as dubious. Sustainable agricultural development will involve continuous shifts away from such activities (including the extensive fodder- and fuel-intensive livestock farming of the Soviet era) to more intensive farming based on good quality products such as dairy products, fruits and vegetables, and cotton.

The ability to make this quality transition is limited not only by ongoing domestic market distortions caused by substandard institutions and infrastructure, but also by the high costs of transit imposed by neighboring countries. This is especially true for perishable fruits and vegetables and dairy products.[42] The trade facilitation and transit situation is improving with respect to Kazakhstan, which is an important local market for producers in the northern part of the

Kyrgyz Republic, as well as an important transit route to western China and to Russia.[43] Almaty, the biggest urban market in Central Asia and only a two-hour drive from the Kyrgyz border (contiguous with the rich farming oblast of Chui), has the only large modern supermarkets in the region and is the source of growing demand for Kyrgyz inputs into processed farm products.[44] Nevertheless, trade costs are unnecessarily high, and any improvement in regional cooperation in trade and transit (as advocated in UNDP 2005 and ADB 2006) would be hugely beneficial for the Kyrgyz Republic.

Conclusions

The Kyrgyz Republic is an intriguing case among the Soviet successor states. It is one of the poorest of these states, but has also rapidly embraced deep reforms. Transition strategy and economic policies have focused on fairly rapid price liberalization, macroeconomic stabilization, and privatization. The country was the first former Soviet republic to join the WTO. However, the effect of the reforms has been disappointing, largely because the institutional environment for a well-functioning market economy still does not exist. In the early 1990s, the country experienced a severe transitional recession and high incidence of poverty. Incipient recovery in 1996–97 was damaged by the Russian crisis of 1998, then by a domestic banking crisis, and, again, by a debt crisis in 2001.

Nevertheless, farm output recovered substantially after the mid-1990s, and overall agricultural performance in the decade after 1991 was the best in the CIS. In the farm sector, prices were quickly freed, and subsidies were largely eliminated by the mid-1990s. Since the mid-1990s, the Kyrgyz Republic has had a liberal trade policy, with a maximum tariff rate of 15 percent, no specific duties, and no quantitative restrictions on trade. Land privatization, initiated in 1991, was slow until 1994, but, between 1995 and 2000, almost the entire sector was reformed, and the 500 collective and state farms were replaced by over 60,000 individual farms. Since 2001, land has been under private ownership in a meaningful sense, and a functioning land market exists. The comprehensive reforms of the farm sector contributed to the rapid reduction of the country's high rural poverty rates after the mid-1990s.

Estimates of distortions in agricultural producer incentives for six major products (wheat, maize, cotton, milk, poultry meat, and wool) from 1995 to 2004 indicate that many domestic prices are substantially above reference prices based on the border price. This is especially true for wheat and maize, which showed large positive price gaps throughout the period. The pattern for cotton is more erratic, although farmers appear to have benefited from the establishment of a competitive

ginning sector in the second half of the 1990s. For the livestock products covered in this analysis, the price gap was negative for milk and wool producers during the second half of the 1990s, but has generally been positive since 1999. In 2000–04, wool and poultry meat producers enjoyed the largest price gap among the producers of any of the commodities studied.

The estimates of producer support, with the possible exception of cotton since 2000, reflect the slow process of the creation of integrated, well-functioning markets in the Kyrgyz Republic. For most products, high trade costs reduce the usefulness of the world price (or any other border price) as an appropriate reference price from which to measure distortions. Farmers may be price responsive, but they respond to local prices in a poorly integrated national market that is largely disconnected from external markets.

Despite the slow process involved in the construction of a market economy, public policy has been good in terms of establishing ownership rights and competitive market structures. For the Kyrgyz Republic, the impact of changing incentives is captured powerfully and graphically by changes in the level and composition of agricultural production and trade. Not only has sectoral output fully recovered, it has also undergone a dramatic transformation, from dominance by livestock production and the export of processed commodities to crop production and the export of raw commodities. This has occurred in a stable, highly liberalized trade environment with minimal government support, and rural poverty has fallen as a consequence. Assuming that the costs of trade continue to fall and markets become more well integrated, the future for Kyrgyz agriculture should be bright.

Notes

1. Measurement of sectoral shares of GDP is difficult for the 1990s because there was a substantial retreat into subsistence farming; the numbers cited here are data taken from the World Development Indicators Database. Employment in agriculture is even more difficult to measure (the more or less constant levels indicated in official data fail to capture the increase in the number of unpaid farmworkers after 1992), but two-thirds of the population was rural in 2004.

2. The low average rainfall (415 millimeters per year) means that rainfed farming is only possible in limited areas near the mountains, though the country is well endowed with water resources. The available renewable water resources per capita, 10,613 cubic meters, are roughly the same as in the United States, but they have historically been shared with downstream countries (primarily Kazakhstan and Uzbekistan).

3. This section is based on Pomfret (1995, 2006).

4. In 1992–95, the Kyrgyz Republic was still exporting machinery and equipment, but the output of the machine-building sector fell sevenfold (Mogilevsky and Hasanov 2004), reflecting the decline of the country's physical capital stock. During the 1990s, private investment was limited, though there was a spike in 1995–97 associated with the Kumtor gold mine. The restricted level of investment mirrored the low domestic savings rates and the failure to attract foreign direct investment, apart from the Kumtor project.

5. These transfers, which represented 13–14 percent of GDP in 1990, according to World Bank estimates (Pomfret 1995), are difficult to measure because many transactions were within all-union enterprises that would have been unprofitable at opportunity cost prices.

6. Although data on inequality and poverty in this period of great dislocation must be treated with caution, all evidence supports the picture of traumatic economic deprivation during the 1990s (Anderson and Pomfret 2003). The adverse costs of the rapid loss of purchasing power are illustrated by Howell's harrowing picture (1996a, 1996b) of families in the southern regions cutting down fruit trees, slaughtering livestock, and keeping children out of school to maintain subsistence consumption levels.

7. The Kumtor gold mine has estimated deposits of around 700 tons. The aggregate rate of economic growth remains sensitive to this single enterprise. When a landslide shut down the mine in 2002, GDP growth dropped to zero, recovering in 2003 after the mine reopened (table 7.3). In 2005, growth again dropped to around zero because of reduced gold output and political disruption. The mining industry also produces nonferrous metals (antimony, mercury, rare earth), and there are undeveloped deposits of gold, tin, tungsten, and other metals, as well as unexplored coal deposits and possible oilfields.

8. These are the rounded figures quoted in *Transition Reports* (EBRD, various). In the Kyrgyz Republic, the extensive unofficial sector makes it likely that the private share was even larger.

9. In the 1999 Business Environment and Enterprise Performance Survey on the headline measure of the perception of corruption as an obstacle to doing business, the Kyrgyz Republic was rated the worst of the 20 transition economies covered, and this was in the face of the serious competition for the wooden spoon from states such as Bosnia and Herzegovina, Georgia, Moldova, and Romania (see BEEPS Database 2007). In the 2002 survey, which covered 26 transition countries, the Kyrgyz Republic moved up to 16th place on the same measure, but it still ranked below the 3 other Central Asian countries in the survey, Kazakhstan, Tajikistan, and Uzbekistan (Gray, Hellman, and Ryterman 2004).

10. See IMF (2005). Whether the Kyrgyz Republic should accept the conditions of the Heavily Indebted Poor Countries Initiative sponsored by the International Monetary Fund and the World Bank so as to reduce the country's debt burden was a major domestic political issue in 2006–07.

11. The composition of sheep flocks shifted dramatically toward fat-tailed sheep raised for their meat and for the production of low-quality wool. The decline in wool output may be overstated in official data (such as in table 7.4) because much of the low-quality wool is now sold through an informal market of domestic and foreign buyers who pay cash and avoid taxes. According to the World Bank (2005, 51), the informal market may account for "up to 80 percent" of the wool market.

12. The Kyrgyz sugar beet crop was devastated by disease in the 1980s, and some output growth in the 1990s represented a rebounding from this disaster. The extent to which the growth in beet production during the mid-1990s was justified is, however, debatable as it mainly supplied the existing refinery, which had temporarily turned to China for raw sugar and, in any case, was energy inefficient and technologically obsolete.

13. The share of wheat in the total sown area increased from 15 percent in 1990/91 to 46 percent in 1996/97, while the share of fodder crops fell from 50 to 25 percent (Mudahar 1998).

14. Fresh and processed vegetables had been an important export to other Soviet republics, but, in the early 1990s, as transport costs increased and Kyrgyz products had to compete with higher-quality imports from outside the former Soviet Union, these markets collapsed. To some extent, wool exports, which had also been intra–Soviet Union, suffered a similar fate, which was exacerbated by the decline in sheep numbers and the quality of the wool.

15. In 1993, the deficit on trade in primary agricultural products was US$18.9 million, and, in 1997, the surplus was US$10.6 million. Trade in processed food shifted from a US$12.1 million surplus in 1993 to a US$3.7 million deficit in 1997 (Mudahar 1998).

16. Although state orders were abolished in 1994, considerable administrative interference in markets continued at the local level (Mudahar 1998). The state needs system after 1994 involved voluntary supply (mainly for the 1,000 ton national wheat reserve) at negotiated prices. Water charges were introduced in 1992, but the fees paid by farmers only cover a small fraction of the actual expenditures by the Department of Water Resources; in 2003, farmers paid som 119 million, and the actual budget expenditure was som 1.0 billion (World Bank 2004).

17. "In 1996, most farm product prices in the Kyrgyz Republic were two-thirds to three-quarters of the corresponding prices in the United States, yet Kyrgyz farmers paid close to world prices for agricultural inputs" (Mudahar 1998, 50). The evolution of input and output prices for seven major farm products are provided in Mudahar (1998).

18. The data have been taken from the budget execution reports of the government. In 1993, som 153.3 million was equivalent to US$24.3 million (roughly US$5 per capita). In 1995, som 27.5 million was equivalent to US$2.5 million.

19. In 1996, annual inflation was about 35 percent, and market interest rates were 45–120 percent, but farm credit from the public budget or donor-supported programs charged 9–12 percent, which stimulated the demand for subsidized credit and crowded out all other forms of credit to the detriment of the creation of a viable financial sector. Facing massive defaults on agricultural loans made in 1992–96, Agroprombank was replaced by a Debt Resolution Agency in July 1996, and an independent nonbanking public financial institution, Kyrgyz Agricultural Finance Corporation, was subsequently established as part of a World Bank–supported rural finance project. In 1997, the corporation charged annual interest rates of over 30 percent when inflation was about 15 percent. Credit unions were also established as part of a rural credit project supported by the Asian Development Bank. Since 1997, a large number of nonbank financial institutions providing rural credit have emerged; these have been backed by defining legislation in 1999 and 2002 and are considered a success story in the region.

20. Other indirect subsidies are provided through the research institutes that deliver new seed varieties to farms and through the distribution of inputs received by the government as aid (for example, fertilizers from Japan in 1994–97 or tractors and combines from Japan in 1995–2001) or in barter deals (for instance, tractors from Belarus in 2002).

21. Giovarelli (1998) reports large differences in productivity between individually owned and state or collective farms. Although the two groups were each cultivating about half the ploughed land by 1996, the output of individual farms was worth som 12.3 billion, while that of the state and collective farms was worth som 3.1 billion. This may partly reflect the geographical pattern of ownership, whereby individual farms dominant in the fertile Chui Valley in the north, and state and collective farms dominant in the poorer south (Mudahar 1998).

22. Initially, about half the total irrigated arable land, the best land in most cases, was transferred to the National Land Fund. This was subsequently reduced to a quarter, and the National Land Fund was replaced by the Land Redistribution Fund, which has, since 2001, been managed by local governments. Currently, land belonging to this fund may only be leased.

23. Lupton (2002), reporting on a field trip in autumn 2002, identified 22 gins: 3 big Soviet-era plants (privatized in 1992–94), 3 owned by a Russian group, 5 that were Turkish-owned, and 11 other private gins the owners of which included English, German, and Uzbek companies. Most of the new plants use second-hand equipment, which has been moved from other former Soviet republics or are roller gins from Turkey. The five roller gins are slower, but have a greater outturn (38–39 percent) and produce higher-quality fiber.

24. Initially, the gins offered a local currency price, bearing all the exchange rate and world price risk, but, in recent years, prices have been pegged to the Cotlook A world price index (Cotlook Price Series Database 2007). Many inputs are smuggled from Uzbekistan, where they are subsidized.

25. A large part of international trade in the 1990s was conducted by individual shuttle traders (*chelnoki*) operating between Central Asia and cities in China, the Gulf, India, or Southeast Asia and often bypassing or bribing customs officials. The shuttle trade phenomenon has become relatively less important in the 2000s because the retail sector, especially in the principal cities, has become more well organized. The export taxes introduced in 1992 to limit the outflow of goods were soon abolished, although exports outside the CIS were subject to a 20 percent value added tax, and some exports required hygiene certificates.

26. In October 2000, the union was renamed the Eurasian Economic Community, and the institutional structure was strengthened. In October 2005, Uzbekistan acceded to the community, and this was accompanied by dissolution of the Central Asian Cooperation Organization, another regional organization with lofty aspirations, but minimal achievements. The Kyrgyz Republic is also a member

of the Economic Cooperation Organization and the Shanghai Cooperation Organization, neither of which has had an impact on trade policy (UNDP 2005; Pomfret 2006).

27. Stryker and Livinets (2002, 32, 59–61) report that, of the US$4,500 it costs to send a 20-ton truck of apples from Issyk-Kul, in the Kyrgyz Republic, to Russia, US$1,500-US$2,000 goes to "bribes and other unnecessary transaction costs"; the same farm involved in that interview estimated that it paid about som 30,000 in domestic bribes even before a 160-ton shipment of apples had left the farm (that is, about US$0.04 per kilogram). Stryker and Livinets also provide a case study of an exporter of tomato paste from the Kyrgyz Republic to the Baltic countries, Belarus, and Russia who must pay illegal transaction costs at the Kazakhstan border of US$300 per truck and then give two to four jars of tomato paste to officials at each of the police stops on the way through Kazakhstan.

28. In January 2005, the Kazakhstan parliament ratified a 1998 international transport agreement, thereby establishing permit-free transit for Kyrgyz trucks, and, in March 2005, the customs authorities of the two countries signed an agreement establishing that transiting trucks are not subject to deposit payments at the border and no longer have to be accompanied by customs officials. See IMF (2005).

29. In Russia, the aggregate producer support estimate rose to 17–30 percent of gross farm receipts in 1995–97, before falling to positive single-digit rates after the 1998 Russian crisis. In Ukraine, post-1993 producer support estimates were lower and, in some years, negative for grains, oilseeds, livestock, and dairy products, but higher for sugar beets.

30. This share applies to both 1990 and 2004, although the relative weights differ; thus, wool was much more important in 1990. Data were collected for 11 commodities, which accounted for over three-quarters of agricultural output in 2004, and the relatively small share of products covered in table 7.7 reflects difficulties in establishing reference prices.

31. The import prices used for the analysis of wheat are unit values derived from Kyrgyz wheat imports from Kazakhstan. These follow a pattern that is similar to measures of Kazakhstan's wheat export prices and other regional indicators of wheat prices for 2000–04, and, on this basis, the 2004 border price in table 7.6 is treated as a legitimate trend in the regional market for wheat. The 50 percent price increase in 2004 is, however, not reflected in indicators of world wheat prices, such as the index of world wheat prices of the Food and Agriculture Organization of the United Nations, which increased by only 7 percent from 2003 to 2004 (FAO PriceSTAT Database 2007).

32. Using the border price as the denominator would assign a lower numerical value to the distortion. The inclusion of budget support for wheat farmers would increase the measured distortions, although the numbers in table 7.6 indicate that such an adjustment would not be large.

33. The actual outturns in the Kyrgyz Republic have been highly volatile. Sadler (2006), using the FAO ProdSTAT Database on the aggregate output of raw cotton and of cotton fiber, calculates wide swings between 27 percent in 1993 or 29 percent in 1999 and 40 percent in 1997 or 47 percent in 2003. One reason the raw cotton data must be treated with caution is the widespread smuggling from Uzbekistan to the Kyrgyz Republic by farmers seeking to avoid the Uzbek state marketing systems and from Tajikistan to the Kyrgyz Republic by farmers seeking to take advantage of the more competitive ginning sector there (see chapter 8). If the raw cotton numbers are volatile because of uneven patterns of smuggling (for example, after Uzbekistan introduced exchange controls in 1996 or when Uzbekistan tightened the monitoring of its border with Kazakhstan in 2001–02), then the ginning outturn data will also be volatile. Peaks in ginning outturns in the Kyrgyz Republic in 1997 and since 2001 most likely reflect inputs greater than the domestic production of seed cotton.

34. The price gap, while still positive, was probably smaller for barley, but the price data have not always been consistent. Note that, in tables 7.6 and 7.7, producer support is equated with the price gap. Although there is also some budget support, this is difficult to allocate by farm output, and the magnitude of budget support since 1995 has been small.

35. The difficulties in using unit values of recorded trade are exacerbated by corruption in the customs service. The corruption has been associated with the underinvoicing of imports to reduce official duty payments. According to anecdotal evidence, customs officials on both sides turn a blind eye to much of the local crossborder trade in dairy products from the north of the Kyrgyz Republic to the area around Almaty in Kazakhstan.

36. The biggest increases in vegetable production in the 1990s involved tomatoes, carrots, cabbages, and cucumbers, while the production of onions, which had been a significant export, as well as a popular domestic vegetable, grew less strongly.

37. Because of differing stages of production, there may be a classification issue in interpreting tobacco trade data, but the raw crop certainly declined in significance, and the Kyrgyz Republic is a large net importer of the final product, cigarettes (see Christensen and Pomfret 2007).

38. See chapter 8. Cotton funded some of the president's grandiose construction projects in Turkmenistan and was one of the two economic prizes (the other was an aluminum smelter) in the Tajik civil war that ended in 1997.

39. Although gins offer a price linked to the world price (the Cotlook A index; Cotlook Price Series Database 2007), the substantial share of gins owned by Russian and Turkish groups operate as suppliers to textile mills in their home countries; they are more concerned about ensuring the regular supply of the best quality cotton fiber than about responding to short-run price signals. The main distortion in cotton markets may be a gap between the at-gin price for raw cotton (which is the basis for the domestic price in table 7.8) and the farmgate price. This gap arises because many farmers sell to itinerant middlemen who take advantage of the ignorance of the farmers about price information and pay low farmgate prices.

40. The Soviet transport network ignored republic boundaries. The train from Osh to Bishkek passed through Uzbekistan, Tajikistan, Uzbekistan again, and Kazakhstan, before reentering Kyrgyz territory. The railway no longer operates from Osh, and there is no internal rail network beyond the spur linking Bishkek to the Kazakhstan network. The road between the two major cities was only upgraded after 2000. Before that, the Bishkek-Jalalabad road was of poor quality, crossing through mountain passes that were often closed in winter, while the Jalalabad-Osh road passed through Uzbekistan, and trucks were subject to delays and charges at the border, as well as occasional unannounced border closures.

41. The slow emergence of competitive trade in agricultural products is still striking to outside observers doing fieldwork in the Kyrgyz Republic. Shady middlemen still seem to play a disproportionate role in agricultural marketing. They take advantage of the asymmetry of price information and the limited marketing alternatives available to producers and pay farmers low (farmgate) prices. Significant costs are incurred in delivering farm products to markets, including transport and bribes. Reports of informal checks by local police, who require payment of som 30–200, are common (for example, see World Bank 2005); drivers may take side roads to avoid the checks, but at the cost of longer driving times and increased fuel costs. The high domestic costs observed in local and regional markets reflect this combination of substantial rent seeking and high transaction costs, and both producers and consumers bear these costs. The domestic market prices used in the estimates in table 7.7 may be substantially higher than farmgate prices; a measure of producer support may be decomposed into two distortions (from the domestic market to the border and, also, from the farmgate to the domestic market) that have opposite signs in the Kyrgyz Republic.

42. The elimination of onion exports to Russia in 1998–99 as a result of the high costs of transiting Kazakhstan is highlighted in Pomfret (2006). The World Bank (2005) describes the high costs imposed on dairy goods producers by traffic controls and inspection agencies.

43. Although the Kyrgyz Republic borders China, the mountains are high, and the immediate border towns are small; trade with western China's largest urban center, Urumqi, is more convenient through Kazakhstan. Overland trade with potentially important partners such as Iran or Turkey (and via the closest ocean port, Bandar Abbas) is discouraged by the poor transit regime in Uzbekistan, while transit through Afghanistan and Tajikistan to the booming markets of South Asia is more hazardous.

44. The development of supermarkets in the Kyrgyz Republic has been much slower and is limited to Bishkek, the capital. Most of the so-called supermarkets are the size of convenience stores in Western Europe or North America, although the situation in Bishkek is changing rapidly as stores become more modern and consumer-oriented. In 2006, Ramstore, a Turkish-owned chain that has a giant outlet mall and supermarket in Almaty, opened a supermarket in Bishkek.

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8

TAJIKISTAN, TURKMENISTAN, AND UZBEKISTAN

Richard Pomfret

This chapter compares the distortions to agricultural incentives in Tajikistan, Turkmenistan, and Uzbekistan. Kazakhstan and the Kyrgyz Republic are dealt with in separate chapters (6 and 7, respectively), but will be frequently mentioned here as points of comparison. Although shared history and culture make the five Central Asian countries a natural group for comparison, they differ substantially in size and income levels (table 8.1), as well as in the composition of the agricultural sector and other resource endowments. The significantly higher gross domestic product (GDP) of Kazakhstan and Turkmenistan reflects their abundant oil and gas.[1] In all five countries, the rural economy is important, and, in four of them, the majority of the population is rural. (In Kazakhstan, rural areas accounted for around 44 percent of the population in 2000–04.)

Central Asian agriculture may be divided into two distinct parts. First, in the steppes and mountain regions, traditional pastoral nomadism has long been under pressure, and the Virgin Lands Program begun in the late 1950s brought large areas of nonirrigated land in northern Kazakhstan under grains. Second, in the southern part of Central Asia, the area watered by the two great rivers that flow into the Aral Sea, the Amu Darya and the Syr Darya, contains fertile oases, but farming has historically been constrained by the region's aridity and scarcity of water; under Russian Tsarist and Soviet leadership, the irrigated areas were extended and became dominated by cotton.

This division does not exactly match national boundaries (table 8.2). Nonirrigated farming and pasture are dominant in Kazakhstan and in the northern parts

Table 8.1. Demographic and Economic Indicators, Central Asia, 2003

Country	Population		Openness (% GDP)		GDP per capita (US$)	
	Total (millions)	Rural (%)	Exports	Imports	Current	Purchasing power parity
Kazakhstan	14.9	44.1	50	44	2,000	6,671
Kyrgyz Republic	5.1	66.0	38	42	378	1,751
Tajikistan	6.4	75.2	60	79	246	1,106
Turkmenistan	4.7	54.6	41	42	1,275	5.938
Uzbekistan	25.8	63.3	37	30	389	1,744

Source: UNDP 2005.

Table 8.2. Farmland Resources, Central Asia, 1999
(hectares, 1,000s)

Country	Total cultivated cropland	Irrigated cropland[a]	Pasture
Kazakhstan	30,135	2,313 (7)	18,233
Kyrgyz Republic	1,435	1,077 (75)	9,216
Tajikistan	860	719 (84)	3,600
Turkmenistan	1,744	1,744 (100)	3,070
Uzbekistan	4,850	4,309 (89)	2,280

Source: Bucknall et al. 2003.

a. The numbers in parentheses indicate the percent of the total cultivated cropland that is irrigated. In southern Kazakhstan, 70 percent of the cropland is irrigated (not shown).

of the Kyrgyz Republic. In southwestern Tajikistan, in Turkmenistan, and in Uzbekistan (the most populous Central Asian country), cultivation is overwhelmingly undertaken on irrigated land. South Kazakhstan and the southern half of the Kyrgyz Republic tend to follow this southern pattern rather than the patterns in the steppes and mountainous regions that are more typical, respectively, of these two countries.

Livestock farming is significant in all the Central Asian countries. Following the enforced sedentarization of the Stalin era, traditional transhumant practices disappeared, and animals became concentrated on state farms, often dependent on externally supplied winter fodder. With the breakdown of the Soviet economic system and the associated reduction in subsidized transport and fuel for heating, livestock farming became increasingly centered on smallholdings or farms close to urban areas.

National policies and economic performance have differed greatly since the five countries became independent at the end of 1991 (table 8.3). The Kyrgyz Republic undertook the most rapid and thorough transition from central

Table 8.3. Macroeconomic Performance, Central Asia, 1989 to 2006
(percent)

a. Growth in real GDP, 1989–99

Country	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	1999 (1989 = 100)
Kazakhstan	0	0	−13	−3	−9	−13	−8	1	2	−2	2	63
Kyrgyz Republic	8	3	−5	−19	−16	−20	−5	7	10	2	4	63
Tajikistan	−3	−2	−7	−29	−11	−19	−13	−4	2	5	4	44
Turkmenistan	−7	2	−5	−5	−10	−17	−7	−7	−11	5	16	64
Uzbekistan	4	2	−1	−11	−2	−4	−1	2	3	4	4	94

b. Growth in real GDP, 1998–2006

Country	1998	1999	2000	2001	2002	2003	2004	2005[a]	2006[b]	2005 (1989 = 100)
Kazakhstan	−2	3	10	14	10	9	10	9	9	113
Kyrgyz Republic	2	4	5	5	0	7	7	−1	4	84
Tajikistan	5	4	8	10	9	10	11	7	7	74
Turkmenistan	7	17	19	20	16	17	17	10	9	163
Uzbekistan	4	4	4	4	3	2	7	7	7	123

(*Table continues on the following page.*)

Table 8.3. (Continued)
(percent)

c. Inflation (change in consumer price index), 1991–99

Country	1991	1992	1993	1994	1995	1996	1997	1998	1999
Kazakhstan	79	1,381	1,662	1,892	176	39	17	8	7
Kyrgyz Republic	85	855	772	229	41	31	26	36	12
Tajikistan	112	1,157	2,195	350	609	418	88	28	43
Turkmenistan	103	493	3,102	1,748	1,005	992	84	24	17
Uzbekistan	82	645	534	1,568	305	54	59	29	18

d. Inflation (change in consumer price index), 1998–2006

Country	1998	1999	2000	2001	2002	2003	2004	2005[a]	2006[b]
Kazakhstan	7	8	13	8	6	6	7	8	9
Kyrgyz Republic	11	36	19	7	2	3	4	4	6
Tajikistan	43	28	33	39	12	16	7	7	9
Turkmenistan	17	24	8	12	11	7	6	11	9
Uzbekistan	29	29	25	27	28	10	9	21	19

Sources: Panel a and c: EBRD 2001; panel b and d: EBRD 2006.

a. 2005: preliminary figures from official government sources.
b. 2006: projections of the European Bank for Reconstruction and Development.

planning, becoming, in 1998, the first former Soviet republic to join the World Trade Organization (WTO). Establishing the institutions necessary for a smoothly working market economy has, however, been difficult there, and the economic performance has been disappointing, especially in the more densely populated rural south, where the protests began that led to the March 2005 Tulip Revolution.

Kazakhstan has been fairly reformist, although less consistently so than the Kyrgyz Republic. Its economic performance was disappointing in the 1990s, but, since the end of the decade, the economy, led by soaring oil exports, has been booming.

Uzbekistan adopted a more gradual economic transition strategy and, during the 1990s, enjoyed the best economic performance of all former Soviet republics. However, after the reimposition of foreign exchange controls in 1996, the reforms slowed, and, since around 2000, Uzbekistan has lagged behind other countries in the Commonwealth of Independent States in terms of economic growth rates.

Turkmenistan is the least reformed economy in Central Asia. It is governed by an extremely personalized regime committed to national autonomy and minimal change.[2]

Although their comparative advantage in gas and cotton makes them export economies, both Turkmenistan and Uzbekistan have adopted import-substitution strategies and provide substantial incentives to farmers to grow more wheat and thereby reduce dependence on imports, even though conditions for such cropping patterns are less favorable than in Kazakhstan.

Tajikistan is the only Central Asian country that did not enjoy a peaceful political transition to independence. A civil war, which lasted until 1997, rapidly destroyed central planning mechanisms, but created a legacy of poor governance. Although the government's stated polices are reformist, implementation is often weak. Tajikistan's economic performance during the 1990s was disastrous, and it now ranks among the poorest countries in the world.

The first section of this chapter examines in greater detail the national polices of the five countries as they affect agriculture.[3] The following two sections deal with the two dominant crops, cotton and wheat, emphasizing the divide between the less-interventionist regimes of Kazakhstan and the Kyrgyz Republic and the dirigiste regimes of Turkmenistan and Uzbekistan, which rely on rents from agriculture to bolster public revenues and which favor grains relative to cotton to increase food self-sufficiency. The subsequent section examines the livestock sector. Estimates of the size of the transfers from agriculture in the regulated economies of Turkmenistan and Uzbekistan are examined in the next section. An assessment of the distortions faced by farmers in Tajikistan, Turkmenistan, and Uzbekistan is presented in the penultimate section. The final section provides a summary and conclusions.

Patterns of National Reform

Until the mid-1990s, the Central Asian policy environment was dominated by the events revolving around the end of the Soviet Union, including the demise of central planning, the onset of hyperinflation, and the collapse of living standards.[4] It is difficult to identify and, even more, quantify the microeconomic distortions faced by individual sectors. All five countries continued to use the Russian ruble in 1992–93, and this constrained their freedom with respect to price reform and macroeconomic stabilization. All five followed the Russian price liberalization of January 1992, but they did so with differing degrees of enthusiasm and with varying exceptions in the details. Turkmenistan and Uzbekistan, in particular, retained administered prices on a number of goods and services.

During the early 1990s, even with liberalized prices, the price mechanism played only a limited signaling role because these countries were experiencing hyperinflation, and this masked changes in relative prices (table 8.3, panel c). Following the introduction of national currencies in 1993, the Kyrgyz Republic was the first of these countries to achieve macroeconomic stabilization, followed by Kazakhstan and then Uzbekistan.[5] Turkmenistan relied on price controls to contain open inflation, at the cost of creating high repressed inflation. Although inflation in Tajikistan dropped below 100 percent after the end of the civil war in 1997, the government only really achieved macroeconomic control after 2001 when inflation was reduced below 20 percent.

All prices had essentially been liberalized in Kazakhstan and the Kyrgyz Republic and the state order system had been abolished by the mid-1990s. Export taxes introduced in the initial postindependence period had been eliminated by 1995/96. Tariff schedules had low average tariffs and few peaks. In Tajikistan, administered prices disappeared during the civil war, although competing groups vied for control of the country's two main foreign exchange earners (aluminum and cotton); since around 2000, this control has resided with the central government. By contrast, key prices, including the exchange rate, remained fixed in Turkmenistan and Uzbekistan. Both these countries used a state order system to extract rents from the agricultural sector and to encourage diversification into wheat in the name of self-sufficiency. Farmers in Turkmenistan and Uzbekistan received well below world prices for the main crops, but also prices of inputs such as fertilizers or fuel were much lower in these countries.[6] The price differentials led to the smuggling of inputs and of outputs such as cotton across poorly (or corruptly) monitored borders.

Throughout Central Asia, land reform has been problematic, and actual developments are difficult to assess because of the gap between legislation and reality and because of the paucity of extensive fieldwork by researchers. In practice, Turkmenistan and Uzbekistan remain committed to tight state control over land

and land use.[7] In Turkmenistan, the principle of private ownership is enshrined in article 9 of the 1992 constitution, but land may not be transferred, and the government retains the right to reallocate land if the land is not being used efficiently; private landownership in Turkmenistan means inheritable use rights subject to the will of the government, an almost meaningless use of the term private (Lerman and Brooks 1998). In Uzbekistan, while private farming does not exist, there are degrees of operational autonomy, from the central state ownership of devolved state farms (*kolkhoz*) to joint-stock farms with collective ownership (*shirkat*) and smallholder leased farms (*dekhan*).[8] Tajikistan is sometimes considered to have had land reform that is both de facto, because the civil war destroyed the planned economy, and de jure, because of the distribution of land share certificates. However, many farms remain under the administrative control of former state farm bosses, and farms are subject to state control over planting and harvesting decisions, especially with respect to cotton.

True land reform in southern Central Asia is intimately linked to water. There is general resistance to the market-determined pricing of water, and, in all countries, farmers do not pay the full economic cost of water. Because of the lack of water pricing and the often unclear property rights regimes, the profligate use of irrigation water that was inherited from the Soviet era has continued and is contributing to increased salinization, leading to substantial declines in agricultural yields and rural incomes.[9] All across the southern part of Central Asia, the gap between formal and effective rules regarding irrigation has encouraged opportunistic behavior, which was exacerbated in the 1990s by the shortening of people's time and work horizons and low levels of trust. The collapse of monitoring led, for example, to the piercing of irrigation channels for illegal water withdrawal, especially in upstream areas. A positive farm-level response to the degradation of irrigation systems is difficult, and this is an area where public policy is necessary. The general picture, however, is of policy failure insofar as maintenance of irrigation systems has deteriorated all across southern Central Asia (Bucknall et al. 2003).[10] The authorities in Uzbekistan seem to have been effective in maintaining irrigation and other infrastructure, at least relative to the chaos in Tajikistan and the inefficiency in Turkmenistan.

Even apart from water, it is difficult to quantify subsidies to farmers. During the 1990s and early 2000s, subsidized credit, debt rescheduling, and debt write-offs were important, but often discretionary and nontransparent. Otherwise, actual cash subsidies have been small. There is a general lack of transparency in the administration of the value added tax, which may be less rigorously imposed among (or more widely evaded by) small farmers and which is supposed to be refunded on exports, though this is not always the practice. The provision of inputs in kind or at low prices for fuel, electricity, and so on remains the norm in

Turkmenistan, but it is less prevalent in Tajikistan and has been drastically reduced in Uzbekistan in recent years. The methods of delivery of extension services, veterinary support, and so on have often not changed much since the Soviet era, although there has been a drastic reduction in the availability of such services.

Cotton

Cotton is the most important crop in Central Asia. Indeed, the timing of the incorporation of the area south of the steppes into the Russian Empire in the mid-1800s partly reflected fears of a cotton famine due to the shortages generated by the civil war in the United States. The cotton economy expanded during the Tsarist and Soviet eras and especially rapidly after 1950, when major irrigation projects brought large new areas into cotton production at the cost of desiccating the Aral Sea, which had been the world's fourth-largest lake in 1960. The mechanization of cotton harvesting in the 1960s was aimed at demonstrating to the Third World how the poorest part of the Soviet Union was being modernized. The amount of land sown with cotton in Soviet Central Asia in 1988 was 3,133,000 hectares, of which 2,017 hectares was in the Uzbek Republic, 636 hectares in the Turkmen Republic, 320 hectares in the Tajik Republic, 128 hectares in the Kazakh Republic, and 32 hectares in the Kyrgyz Republic (Lewis 1992).

Since independence, the area sown with cotton, the production of seed cotton, and the output by gins of baled cotton have shown diverging patterns: growth in Kazakhstan and the Kyrgyz Republic, decline in Turkmenistan and Uzbekistan, and Tajikistan somewhere in between (table 8.4). In Turkmenistan, the cotton harvest fell from 1.4 million tons in 1991 to 435,000 tons in 1996. The years 1996–98 were also characterized by relatively poor harvests in other regions (reflected in the low output in Kazakhstan and the Kyrgyz Republic; see elsewhere below), but the extent of the subsequent recovery in Turkmenistan is dubious. In Tajikistan, the civil war years in the 1990s were associated with a large decline in the area sown and in the output of cotton until 1996 and then a recovery back to prewar levels by 2003. In Kazakhstan and the Kyrgyz Republic, by contrast, both the area planted with cotton and cotton output have increased substantially (table 8.4).[11]

In 1990, according to data of the International Cotton Advisory Committee (ICAC World Statistics Database), Uzbekistan was the world's second-largest cotton exporter (397,000 tons), and Tajikistan the fourth largest (200,000 tons). Cotton was also a significant export of Turkmenistan and was regionally important for the southern part of the Kyrgyz Republic and in south Kazakhstan. In the Soviet era, much of the cotton went to cotton mills in the Russian Republic, and the cotton which was sold on world markets went through centralized foreign trade agencies. After 1991, the Central Asian countries controlled their own

Table 8.4. Cotton Area Harvested and Output, Central Asia, 1992 to 2003

	Kazakhstan				Kyrgyz Republic				Tajikistan				Uzbekistan			
Year	*A*	Q_s	Q_b	*G*	*A*	Q_s	Q_b	*G*	*A*	Q_s	Q_b	*G*	*A*	Q_s	Q_b	*G*
1992	111	246	76	31	22	52	14	27	285	513	174	34	1,667	4,129	1,274	31
1993	110	198	60	30	20	49	13	27	275	524	180	34	1,695	4,235	1,321	31
1994	110	208	72	35	27	54	17	31	283	531	167	31	1,539	3,936	1,258	32
1995	107	223	69	31	33	75	18	24	270	411	130	32	1,493	3,934	1,265	32
1996	103	183	79	43	32	73	21	29	228	318	119	37	1,487	3,350	1,081	32
1997	102	198	67	34	25	62	25	40	219	353	110	31	1,513	3,639	1,080	30
1998	115	162	62	38	32	78	21	29	247	384	115	30	1,532	3,206	1,147	36
1999	141	249	67	27	35	87	25	29	248	313	98	31	1,517	3,600	1,021	28
2000	153	287	95	33	34	88	29	33	239	335	93	28	1,444	3,002	1,000	33
2001	184	418	113	27	38	98	34	35	257	453	145	32	1,452	3,275	1,015	31
2002	168	361	90	25	36	109	46	42	269	515	113	22	1,397	3,200	1,008	32
2003	182	480	120	25	38	108	51	47	284	533	117	22	1,393	2,856	914	32

Source: Sadler 2006, citing the FAOSTAT Database.

Note: *A* = area harvested, hectares, 1,000s. Q_s = production of seed cotton, tons, 1,000s. Q_b = production of baled cotton, tons, 1,000s. *G* = ginning outturn, percent (Q_b/Q_s).

exports of cotton, which were readily sold through international brokers, such as Paul Reinhart AG in Winterthur, Switzerland, or Cargill Cotton in Liverpool. Cotton's portability and high ratio of value to weight meant that it could be transported by rail or air, making it an almost uniquely attractive source of foreign exchange during the early transition years, and one that could be easily tapped by governments.

Cotton exports are of great importance to southern Central Asia, accounting for 6.5 percent of GDP in Uzbekistan, 8.2 percent of GDP in Tajikistan, and 3.6 percent of GDP in Turkmenistan (Baffes 2004). However, the postindependence performance has varied greatly. Despite falling harvests, Uzbekistan increased its supplies to the world market, reaching a peak of 900,000 tons exported in 1998 and in 1999. In 2002, Uzbekistan was still the world's second-biggest cotton exporter (with 717,000 tons, after the United States), but Tajikistan had slipped to ninth (147,000 tons). Poor management and diversion to domestic textile mills have dramatically reduced Turkmenistan's cotton exports to the point that they are now lower than Kazakhstan's (table 8.5).

One drawback of cotton dependence is the volatility of world prices (figure 8.1). In January 1992, the world price of cotton was US$1.31 per kilogram. In May 1995, the price peaked at US$2.53, but it had dropped to US$1.66 by October 1996 and continued to fall until it bottomed at US$0.82 in October 2001. Two years later, the world price had doubled, but it then fell by about a quarter in the 2004/05 harvest season. This volatility has a significant effect on government revenues in Turkmenistan and Uzbekistan because the state order system insulates farmers from world price movements.

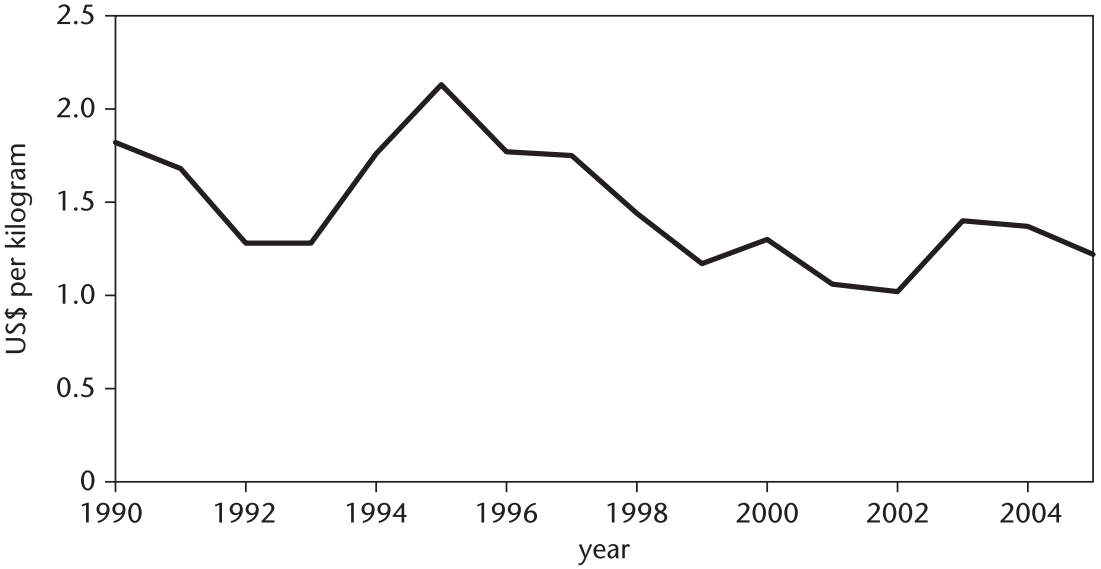
A second drawback of cotton dependence is the prospect that world prices may be in secular decline. The nominal price per kilogram was lower in January 2002 than in January 1952 (US$0.96 versus US$1.05). Given the price volatility, the

Table 8.5. Cotton Output, Central Asia, 2004/05 Season
(tons, 1,000s)

Country	Production	Exports
Kazakhstan	142	114
Kyrgyz Republic	48	44
Tajikistan	174	131
Turkmenistan	207	87
Uzbekistan	1,089	740
World	25,412	7,247

Source: PS&D Database 2007.

Figure 8.1. International Price of Cotton, 1990 to 2005



Source: Cotlook A Index, Cotlook Price Series Database 2007.

nominal price comparison is, of course, sensitive to the choice of dates, but it is indisputable that, in real terms (for example, relative to the price of manufactures), cotton prices have declined substantially over the last half century. Part of the decline arises from tastes and technology, given that artificial fibers are challenging cotton and genetically modified cotton has raised the productivity of cotton producers in Australia, China, and the United States (Anderson, Valenzuela, and Jackson 2008). However, part of the decline reflects policy decisions in high-income countries that provide huge subsidies to cotton producers.[12] Cotton prices have also been depressed by the polices of rich countries toward imports of textiles and clothing.[13]

The analysis of the distortions of incentives within Central Asian countries reveals that the salient difference in the region is between the highly regulated cotton sectors of Turkmenistan and Uzbekistan and the less regulated markets in the other three countries. The governments of Turkmenistan and Uzbekistan have kept control over the cotton sector as a source of rents that contribute substantially to public revenues. In Kazakhstan and the Kyrgyz Republic, the cotton sector is essentially market driven, although the details vary, and the situation is still evolving. Tajikistan has some features of the market-driven cotton sectors, but the government there also extracts substantial rents. The simplest measure of these distortions is the gap between border prices and farmgate prices (estimated below), but the situation is complicated by the differing treatment of inputs, which are far cheaper in the more regulated systems. The relevant literature

Table 8.6. Output Prices for Cotton, Central Asia, 1997 and 2003

Year, currency	Kazakhstan	Kyrgyz Republic	Tajikistan	Turkmenistan	Uzbekistan
1997, local currency	T 25,500	som 7,100	TR 190,000	manat 1,000,000	SUM 14,750
1997, US$	US$349	US$394	US$388	US$240 (US$188)[a]	US$242 (US$105)[a]
2003, US$	US$550	US$450	US$165	—	$200

Sources: 1997: Goletti and Chabot 2000; 2003: Swinnen, Sadler, and Vandeplas 2007.

Note: — = no data are available

a. The price at the parallel exchange rate is shown in parentheses.

(reviewed below) has focused on estimating the net transfers out of agriculture in the regulated systems.

Turkmenistan and Uzbekistan retained state procurement systems for cotton, while the Kyrgyz Republic eliminated state procurement in 1992, and Kazakhstan and Tajikistan did so in the mid-1990s. This was reflected in substantial differences in farmgate prices. For the 1997 harvest season, the prices received by farmers in Kazakhstan (US$349 equivalent per ton), Tajikistan (US$388), or the Kyrgyz Republic (US$394) were not far from the average border parity price in Central Asia, estimated by Goletti and Chabot (2000) at US$404. The U.S. dollar equivalent at the official exchange rate of the price received by farmers in Turkmenistan (US$240) and Uzbekistan (US$242) from the state purchasing agencies was substantially lower (table 8.6).

The gap between the world price of cotton and the prices received by cotton farmers in Turkmenistan and Uzbekistan was widened and made less transparent because of the existence of foreign exchange controls. Uzbekistan introduced strict foreign exchange controls in October 1996, and the black market premium subsequently expanded; at the parallel exchange rate, the local currency price in table 8.6 of SUM 14,750 per ton translates into US$105 per ton, or about a quarter of the border parity price. The burden of the overvalued exchange rate, represented by the gap between domestic and world prices at an equilibrium exchange rate, increased during the remainder of the 1990s.[14] Turkmenistan's black-market premium only became substantial in 1998. Thus, the effect of the foreign exchange controls is less great in table 8.6, but it became a major source of price distortion after 1997. The procurement price in Turkmenistan, calculated at the official exchange rate of manat 5,200 per U.S. dollar, was cut from US$240 in 1997 to US$192 in 1998 and 1999 (Guchgeldiev 1999). By the end of 1998, the black-market rate was manat 15,000 per U.S. dollar; at this exchange rate, the procurement price translated into less than US$70 per ton.[15]

Table 8.7. Cost of Plant Nutrients, Central Asia, Mid-1990s
(US$ per kilogram)

Fertilizer	Kazakhstan	Kyrgyz Republic	Tajikistan	Turkmenistan	Uzbekistan
Nitrogen	0.50	0.50	0.50	0.12	0.25
Phosphorous	1.50	1.50	1.00	1.00	0.50
Potassium	0.16	0.16	0.15	0.04	0.07

Source: Goletti and Chabot 2000.

In the more regulated systems of Turkmenistan and Uzbekistan, farmers receive subsidized inputs and appear to benefit from a more reliable supply of seed and fertilizers. Table 8.7 illustrates the differences in fertilizer prices in the mid-1990s. Seeds are also cheaper in Uzbekistan and perhaps of better quality because of the public maintenance of agricultural research facilities. While this offers incentives to smuggle inputs from Turkmenistan and Uzbekistan to neighboring countries, which may benefit the farmers involved, it is inefficient in terms of regional social welfare.

Although evidence on the maintenance of irrigation systems is difficult to gather, farmers in Uzbekistan and perhaps Turkmenistan may have access to irrigation systems that are more well managed than those in the Kyrgyz Republic or Tajikistan.[16] However, the efficiency of water use does not appear to differ much among the Central Asian countries, apart from war-torn Tajikistan, and the cotton sector in each of the five countries appears to be wasteful of water relative to cotton sectors elsewhere; in 1996–98, the number of kilograms of seed cotton produced per 1,000 cubic meters of water used was 309 in Kazakhstan, 230 in the Kyrgyz Republic, 125 in Tajikistan, 256 in Turkmenistan, and 273 in Uzbekistan, which are all much lower than in other cotton-producing countries; for example, compare with 462 in Syria, 487 in California, 610 in Australia, and 1,027 in Greece (Goletti and Chabot 2000). Farmers in Turkmenistan and Uzbekistan also benefit from interest-free partial advances on output, although it is unclear how promptly these and the final payments are made available and the extent to which farmers are free to use money credited to their bank accounts.[17]

Full assessment of the distortions affecting cotton production is complicated by the lack of information about harvesting techniques. During the Soviet era, cotton mechanization was used as a propaganda tool to illustrate how the Communist system was modernizing agriculture in the Soviet Union's less developed regions. In practice, much of the cotton picking was still done by hand by students and other groups that were mobilized during the harvest season. Given the relative factor scarcities, it seems unlikely that the mechanization of

cotton picking has ever been efficient in labor-abundant Central Asia (Pomfret 2002). Since independence, the share of the cotton harvest picked by machine has declined substantially because farms are unwilling to purchase new machines, and they even appear to let existing machines stay idle given that the benefits do not cover the running costs.[18] In Tajikistan, Turkmenistan, and Uzbekistan, the Soviet-era practice of forced labor is maintained to varying degrees (ICG 2005).[19]

The Market-Based Cotton Sectors and Tajikistan

Market reforms proceeded most extensively and rapidly in the Kyrgyz Republic. One consequence was the rapid expansion of the number of cotton gins from 3 at the end of the Soviet era to 23 in 2005, at least 9 of which were built after 1999 (Sadler 2006).[20] The ginners play a key role in providing finance to cotton producers; the financing was initially raised from international sources, but, since 2000, is largely provided from the resources of the ginners. The farmer contracts to deliver seed cotton to the gin in return for local currency advances to pay for inputs and labor. Initially, the gins offered a local currency price, bearing all the exchange rate and world price risk, but, in recent years, prices have been pegged to the Cotlook A world price index (Cotlook Price Series Database 2007).

Developments were similar in Kazakhstan, although the increase in the number of gins (to 15) has occurred since 2000. The gins are the main source of financing among cotton producers, and the contracts are similar to those described above for the Kyrgyz Republic apart from the fact that some inputs are supplied by the gins. There are complaints of overcharging for inputs supplied by the gins in Kazakhstan, whereas, in the Kyrgyz Republic, many inputs are smuggled from Uzbekistan, where they are subsidized. Nevertheless, the overall position of the cotton farmer seems to be better in Kazakhstan. Sadler (2006) reports average prices received by farmers for seed cotton in 2003 at US$450 per ton in the Kyrgyz Republic and US$550 per ton in Kazakhstan.[21] He explains the difference with reference to the monopsony power of Kyrgyz gins and the more competitive environment in Kazakhstan. This gap probably narrowed in 2005 following the formation of an informal cartel among the gins in Kazakhstan.

Tajikistan occupies an intermediate position between the controlled and the market-based systems. The government is involved at all levels of the production chain and creams off a substantial share of the rents for the public budget. All cotton exports must be registered with the commodities exchange, which regulates the price according to a set formula that leads to underpayment by about US$80 per ton; on exports of 150,000 tons, this transfers US$12 million a year from the cotton sector to the government. A 10 percent tax on exported cotton raises

revenue and gives the government an incentive to maximize exports. Although land has been notionally privatized, the continued existence of national targets for cotton output, which are implemented by regional officials, means that farmers have little choice about growing or not growing cotton; failure to follow the directives of local authorities will lead to the revocation of use rights by the local officials, who have the power to determine whether land is being properly used. This and other measures undermine the incentives of farmers to produce.[22]

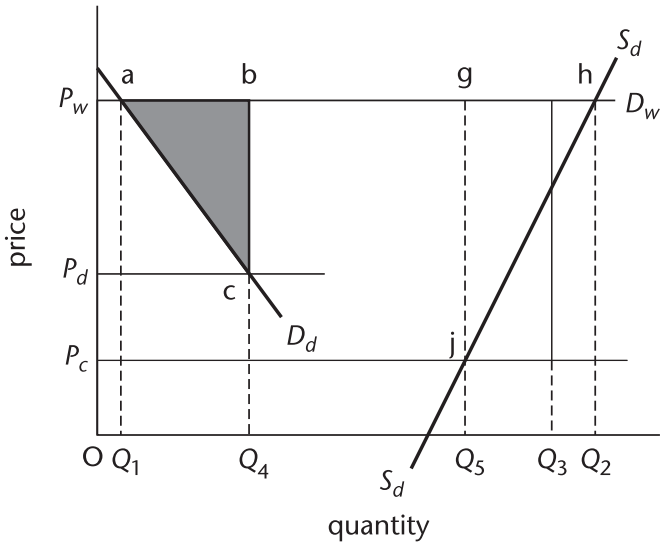
Until 1996, state credits caused severe problems in the government budget, and, in 1997, the Swiss cotton brokerage firm Paul Reinhart AG provided a US$70 million loan that was to be repaid in future cotton deliveries. Starting in 1998, the financing of cotton was controlled by a local banking entity (Agroinvestbank-KreditInvest), acting in conjunction with the Swiss broker (ADB 2002). Although independent middlemen operate in Tajikistan, Sadler (2006) claims that Paul Reinhart controlled over 80 percent of the cotton exports in the early 2000s. The gins were privatized in 1998, but the state still holds shares in 15 of the 20 gins, and each gin operates as a monopsonist in a clearly delineated area, a situation that appears to be enforced by regional officials.[23] Thus, despite the difference in marketing channels compared with Turkmenistan or Uzbekistan, the various levels of government, in collaboration with a leading international broker, act to extract rents from cotton farmers in Tajikistan.

At the microeconomic level, relations between farmers and investors, who are usually gin owners, are similar in Kazakhstan, the Kyrgyz Republic, and Tajikistan, but the bargaining position of farmers is much weaker in Tajikistan. The lack of cash has meant that farmers have been forced to provide liens on their crops in return for inputs, and, facing local monopolies, they are unable to turn to competing suppliers of inputs or services.[24] Physical inputs are supplied as part of the financing package, and there are frequent complaints of inflated prices, low quality, and late delivery. One consequence has been a large drop in seed and crop quality.[25] In the absence of pressure on gins to offer good prices, farmers receive low net prices for their cotton. Swinnen, Sadler, and Vandeplas (2007) report a 2003 price of US$165 per ton in Tajikistan, far below the US$550 in Kazakhstan and US$450 in the Kyrgyz Republic and even below the US$200 received by farmers in Uzbekistan.

The Regulated Cotton Sectors of Turkmenistan and Uzbekistan

The state-controlled markets in Turkmenistan and Uzbekistan are a two-tier system for the transfer of resources from the farm sector to the state budget.[26] Figure 8.2 presents a simple partial equilibrium model of such a system. Assuming a

Figure 8.2. The Market for Cotton in Uzbekistan



Source: Pomfret 2000.

Note: The figure refers to Uzbekistan, but the system in Turkmenistan is similar. See the text for an explanation.

perfectly elastic demand for exports (D_w) at the world price (P_w) and given the domestic supply and demand curves (S_d and D_d), the free-market outcome would involve production of OQ_2, domestic sales of OQ_1, and exports of Q_1Q_2. If there is a controlled price (P_c) on a specified output (OQ_3) and a higher market-related price on additional output, then, as long as farmers receive the world price for their extra output, the outcome will be the same levels of output, domestic sales, and exports as the corresponding levels in the free-market outcome. The only difference between these two outcomes is the fact that the dual-pricing mechanism transfers ($P_w - P_c$). OQ_3 from farmers to the government; the tax rate is determined by the values of P_c and Q_3. If the demand and supply curves capture social and private benefits and costs, then both outcomes are efficient and differ only in the distributional patterns.

The cotton markets in Turkmenistan and Uzbekistan diverge from the basic dual-pricing model because of three distortions: preferential prices for the domestic textile industry, subsidized inputs for cotton producers, and the passage of practically all output through the state marketing system.

Part of the cotton output has been reserved for domestic mills at a price (P_d in figure 8.2) below the world price. Subsidizing domestic mills through lower cotton prices stimulates domestic cotton sales, by Q_1Q_4 relative to the free-market outcome, leading to a corresponding decline in cotton exports. Artificially low cotton prices for domestic mills reduces the government's revenue from the cotton tax by the area (P_wbcP_d), but the benefit to the mills (P_wacP_d) is less than this amount, and there is an uncompensated loss to the nation, which is measured by

the shaded triangle *abc*, from the overexpansion of the textile industry.[27] There is no direct impact on farmers, who receive price P_c on the OQ_4 units whether the cotton ends up in domestic or foreign mills.

Input subsidization shifts the supply curve of cotton growers to the right. Whether the incentive to grow more cotton has a positive or negative effect on national welfare depends primarily on whether output is close to OQ_2 or OQ_5. In the free-market or the pure dual-pricing model, the optimal output (OQ_2) is achieved, and input subsidies will induce an undesirable overexpansion of cotton output. In Turkmenistan and Uzbekistan, where many marginal decisions are based on the controlled price of cotton and output may be suboptimal, input subsidies may be a correcting distortion in the cotton sector, although they may create undesirable distortions in input markets.

Finally, practically all the cotton output of farmers has been sold through state orders at the controlled price, with no sales at a price above P_c.[28] Thus, Q_3 is so far to the right as to be irrelevant, and the revenue of farmers is a rectangle with height OP_c, rather than a lazy-L with higher marginal revenue on units Q_2Q_3. This is important not only because of the distributional outcome, but also because output decisions are made at the margin. If all output is sold at a price P_c, then farmers will cut back supply from the free-market or dual-pricing level, OQ_2, to OQ_5; the value of output is cut by (Q_2Q_5). P_w; government revenue is lower; the income of farmers is lower; and there is a deadweight loss represented by the triangle *ghj*, with a national welfare loss, *ghj*, on forgone exports.

How large are the distortions caused by the two-tier pricing system? In figure 8.2, a uniform tax ($P_w - P_c$) on all output will reduce supply, as well as transfer resources from farmers to the state or cotton users. The literature, which has focused on measuring the transfers, is reviewed elsewhere below. The less easily quantifiable consequences of the punitive taxation of an export crop are a long-run loss in sales and the encouragement of illegal economic activities.

There is considerable international evidence that the negative supply response to the state marketing of crops like cotton or cocoa is small in the short run when the rents are a ready source of government revenue, but becomes larger. How big these costs may be in Turkmenistan or Uzbekistan is difficult to estimate because we do not know the exact position of current cotton output along the horizontal axis of figure 8.2. If the supply elasticity of 1.5 used by Connolly and Vatnick (1994) for Uzbekistan is close to the true long-run value, then their 1992 data for P_w and P_c imply that the cotton output associated with a long-run price P_c would be zero. While implausible as the actual outcome, such a calculation is suggestive of how serious the supply response could be.

The rent extraction policies being applied provide incentives for producers to smuggle cotton to neighboring states with freer markets. In the early 2000s, there

were frequent reports that cotton was being smuggled across the porous border between Uzbekistan and Kazakhstan or the Kyrgyz Republic, where agricultural prices are less repressed.[29] Subsidized input prices have also stimulated the smuggling of fertilizers from Turkmenistan to Kazakhstan (Lerman and Brooks 2001) and of cotton seeds and other inputs from Uzbekistan to Kazakhstan and the Kyrgyz Republic (Sadler 2006). The consequences for supply and recorded output are visible in the poor performance of the cotton sectors of Turkmenistan and Uzbekistan since independence, while smuggling incurs evasion (and monitoring) costs and undermines the rule of law.

In Uzbekistan, transfers from the cotton sector to the state budget have been large since independence and played a crucial role in the government's ability to cushion the transitional recession and maintain public expenditures during the 1990s. In Turkmenistan, the farm sector is even more tightly controlled, but it is secondary to natural gas as a source of revenues. In both countries, the ability to transfer rents from farmers to the state has declined because of negative supply responses. Estimates of the magnitudes of these transfers and of the distortions facing farmers in the two countries are presented in the section on transfers elsewhere below.

There were potentially significant reforms in Uzbekistan in 2004/05, although it is difficult to assess their impact.[30] According to Sadler (2006), prices for all inputs other than fuel are now close to world prices, while the provision of services such as agronomic advice continues to follow the Soviet pattern. Uzbekistan has a record of circumventing announced liberalization measures by imposing restrictions during implementation; for example, since the official rescinding of foreign exchange controls in 2003, restrictions on access to foreign exchange accounts or foreign currency have been maintained, and the black market has also been shut down. In cotton, Sadler (2006, 92) concludes that "potentially we might be on the verge of fundamental reform of the sector, although previous experience with nonimplemented reforms have left most commentators cynical about government commitment to real reform in any area of the Uzbek economy."[31]

Grains, Especially Wheat

Kazakhstan is the largest wheat producer in Central Asia; the 2005 harvest there reached over 11 million tons. Kazakhstan is also the only major grain exporter. The volatility of harvests makes it difficult to identify trends, but the pattern is of declining output in the 1990s and a substantial recovery since 1999. This reflects policies, described in the Kazakhstan country study (chapter 6), of large profarm distortions up to 1991, followed by neglect of agriculture (probably with a negative net incentive) during the 1990s, and then by a more positive policy after 1999. Without the high trade costs, Kazakhstan would be able to produce sufficient

grain to feed all of Central Asia, and wheat grown in the cooler climate of northern Kazakhstan is of higher quality than the wheat grown elsewhere in the region.

In the Kyrgyz Republic, there is no policy distortion in favor of wheat, but import substitution was encouraged in the mid-1990s because of the disruption of supplies from (or through) Kazakhstan.[32] The Kyrgyz Republic imported 455,702 tons of wheat in 1993, but this dropped to 84,116 tons in 1995. Wheat output in the Kyrgyz Republic doubled from 0.6 million tons in 1994 and 1995 to over 1.2 million tons in 1997 and 1998, and it has remained over a million tons since then (table 8.8, panel a). Despite the lower profitability of wheat production relative to vegetables in the north and cotton in the south, farmers value the lower risk associated with wheat, which is not perishable, and the domestic price is also relatively stable.

In Turkmenistan and Uzbekistan, public policy has promoted grain production as part of a broader import-substitution strategy and also as a means to increase food self-sufficiency. The limited evidence suggests that this is accomplished by making relative prices (or payment polices) more attractive to wheat growers, although the context is one of net distortions that penalize all farmers. In Uzbekistan, according to Thurman and Lundell (2001), the gap between world market prices and the (actual) farmgate prices for cotton was about 70 percent, for wheat almost 60 percent, and for rice over 50 percent.[33] Thus, although all farmers face negative incentives, producers of wheat and rice are penalized less than cotton growers.[34] In Turkmenistan, Uzbekistan, and, to a lesser extent, Tajikistan, price signals are ultimately less important than administrative decisions about land use taken by the government and enforced at the local level.

The effectiveness of polices to promote wheat production in Turkmenistan and Uzbekistan is apparent in table 8.8, panel a, which shows dramatic increases in wheat production since independence. The directed allocation of irrigated land was crucial in Turkmenistan and also important in Uzbekistan, but there are also factors, apart from the price differential, that make wheat more attractive relative to cotton for farmers in Uzbekistan. Half of the wheat crop is sold at the state purchase price, and an additional share, determined near harvest time, is sold at a negotiated price that is typically about 20 percent above the state purchase price. The selling regime for wheat makes it easier to obtain cash for some sales, while cotton farmers are severely cash-constrained unless they engage in smuggling. Wheat also allows a second crop to be grown, typically vegetables, which are relatively profitable and easily marketable.

In Turkmenistan, for wheat as for cotton, there is doubt about the accuracy of output data. The country's annual domestic demand for wheat is around 2 million tons (1.7 million for flour and 0.3 million for seed). If the official output levels (table 8.8, panel a) are accurate, the country should have been exporting wheat by

Table 8.8. Output of Key Crops and Stocks of Animals, Central Asia, 1992 to 2005

a. Cotton, wheat, and rice production

(tons, 1,000s)

	Kazakhstan			Kyrgyz Republic			Tajikistan			Turkmenistan			Uzbekistan		
Year	C	W	R	C	W	R	C	W	R	C	W	R	C	W	R
1992	246	18,285	467	52	679	3	513	170	3	1,290	377	64	4,129	964	539
1993	198	11,585	403	49	831	2	524	159	2	1,341	509	88	4,235	876	545
1994	208	9,052	283	54	608	4	531	182	4	1,283	675	92	3,936	1,362	498
1995	223	6,490	184	75	625	7	412	174	7	1,293	695	79	3,934	2,347	328
1996	183	7,678	226	73	964	9	318	400	9	436	453	41	3,350	2,742	450
1997	198	8,955	255	62	1,277	12	353	452	12	635	707	27	3,639	3,073	389
1998	162	4,746	236	78	1,204	11	384	388	11	707	1,245	14	3,206	3,556	346
1999	249	11,242	199	87	1,109	15	313	356	15	1,300	1,506	33	3,600	3,602	421
2000	287	9,074	214	88	1,039	19	335	406	19	1,030	1,690	27	3,002	3,532	155
2001	418	12,707	198	98	1,191	17	453	387	17	1,100	1,760	39	3,265	3,690	68
2002	361	12,700	199	106	1,163	21	515	545	21	700	2,326	80	3,122	4,967	175
2003	403	11,537	273	106	1,014	18	537	660	18	714	2,487	110	2,823	5,437	334
2004	467	9,937	276	122	998	18	557	631	18	1,000	2,600	110	3,535	5,378	181
2005	350	11,300	310	122	1,200	20	600	780	20	1,000	2,900	120	3,770	5,840	100

Table 8.8. (Continued)

b. Year-end stocks of cattle and sheep

(head, 1,000s)

	Kazakhstan		Kyrgyz Republic		Tajikistan		Turkmenistan		Uzbekistan	
Year	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep
1992	9,084	33,908	1,190	9,225	1,391	2,484	777	5,380	5,113	8,275
1993	9,576	33,732	1,122	8,480	1,246	2,172	1,004	6,000	5,275	8,407
1994	9,347	33,312	1,062	7,103	1,250	2,078	1,104	6,000	5,431	9,360
1995	8,073	24,273	920	4,924	1,199	1,958	1,181	6,100	5,484	9,053
1996	6,860	18,786	869	4,075	1,147	1,805	1,199	6,150	5,204	8,352
1997	5,425	13,000	848	3,545	1,104	1,650	959	5,400	5,100	7,340
1998	4,307	9,693	885	3,425	1,050	1,554	1,100	6,000	5,200	7,706
1999	3,958	8,691	911	3,309	1,037	1,494	1,250	6,800	5,225	7,840
2000	3,998	8,725	932	3,264	1,037	1,472	1,400	7,500	5,268	8,000
2001	4,107	8,939	947	3,198	1,062	1,478	1,600	8,230	5,344	8,100
2002	4,294	9,208	970	3,104	1,091	1,490	1,750	10,350	5,478	8,311
2003	4,560	9,788	988	3,104	1,136	1,591	1,900	12,570	5,879	8,934
2004	4,871	10,420	1,003	2,884	1,219	1,672	2,000	13,150	6,243	9,514
2005	5,204	11,287	1,035	2,965	1,303	1,782	2,000	13,000	5,400	9,500

Source: FAOSTAT Database (accessed April 12, 2006).

the mid-2000s. President Niyazov was exhorting still higher production, with targets of 4 million tons in 2007 and 5 million tons in 2010. By October 2006, it had become clear that the official figure showing a harvest of 3.1 million tons was false by a large margin, and the president fired two of the country's five regional governors. In a television broadcast, Niyazov stated that, "in 2007, there won't be enough bread for everyone" and that "wheat-sowing amounted to less than 50 percent" of the target in each of the five regions, before claiming that he was having difficulty sleeping ever since he had heard the news (*Eurasia Insight,* December 5, 2006). In November, the new governors were given two days to achieve the winter sowing targets, despite subzero temperatures. Whatever the true harvests, output seems certain to have been below 2 million tons per year in recent years despite the threats and exhortations of the president. Moreover, the reliance on a command economy and the lack of input by agronomists have contributed to poor land use and declining seed stock quality.[35]

The drive for self-sufficiency in food grains has had negative consequences, apart from the poorer quality of wheat available for food.[36] In Uzbekistan, incentives to increase the area under wheat have led to a substantial decline in the area planted with fodder crops, and a lack of rotation has fostered soil degradation. Increasing the area devoted to fodder crops, especially alfalfa, would replenish soils with the badly needed nitrogen that has been taken up by the wheat and cotton, and this would help absorb salts, as well as provide fodder for livestock (Thurman and Lundell 2001). Similar consequences are also evident in Turkmenistan and even in Kazakhstan and the Kyrgyz Republic, where the shift from fodder to wheat has been driven by the market.

Livestock

Livestock production and crop production have evolved differently in Central Asia, although, in both, there is some bifurcation between the more reformist regimes in Kazakhstan and the Kyrgyz Republic and the more dirigiste polices in Turkmenistan and Uzbekistan. Likewise, the grain and livestock sectors in all Central Asian countries have been affected by the reduced share of land devoted to fodder crops, which reduces land fertility and also reduces the carrying capacity of sedentary livestock farming. In Tajikistan, Turkmenistan, and Uzbekistan, the mandated drive to increase cotton exports and wheat self-sufficiency has acted against the production of fodder crops, but, in the more market-driven agricultural sectors of Kazakhstan and the Kyrgyz Republic, fodder production has also declined drastically.

In Kazakhstan, animal stocks on large farms were decimated during the early transition, while the number of animals on household plots remained more or

less constant. In general, the large farms considered livestock a liquid asset that could be used to overcome cash flow problems during the early and mid-1990s. (The situation is analyzed in greater detail in chapter 6.) Households kept one or two cows and a few sheep on their plots as a hedge against the risks of the market economy. Public policy directed specifically toward livestock farming was minimal until the early 2000s, when the government offered subsidies to rebuild the quality of herds.

Similar patterns of vanishing large-scale livestock farming and the concentration of the sector on small farms and household plots have been observed in the Kyrgyz Republic and Tajikistan. Cattle and sheep have become relatively more important, and pigs and chickens less so, reflecting the underlying pasture resource base and the more input-intensive approach to raising chickens and pigs. The composition of the sheep population has shifted from fleecy sheep to fat-tailed sheep reared for meat rather than wool and producing low-quality hides and wool. The concentration of livestock on small farms and household plots has been accompanied by a loss in specialized skills, poor breeding practices, and declining productivity.

In all three countries, land reform has been particularly difficult for seminomadic pastoralists, but even settled livestock farmers have experienced problems. Livestock production was especially important and was affected especially negatively by privatization in Kazakhstan.[37] The seasonal movement of stock across the country's abundant rangelands has been practically eliminated because the new property rights do not accommodate such activities. In consequence, there is overgrazing near human settlements and underutilization of rangelands. In the Kyrgyz Republic, more than two-fifths of the 9 million hectares of pastureland (table 8.2) is summer pasture, and over half of the remainder is spring and autumn pasture. The underutilization of mountain pastures and the overgrazing of winter pastureland has led to large declines in yields. In Tajikistan, traditional grazing patterns based on the summer use of alpine pastures have ceased.[38] These institutional problems and consequences such as the declining quality of herds are amenable to good policies, but they are not generally an outcome of policy distortions against livestock farming.

The Kyrgyz Republic is the only net exporter of livestock products in Central Asia, although most of this trade is unregistered. The trade has been driven by substantial increases in farmgate prices since around 2000. In the Soviet era, exports were based on frozen carcasses and tinned meat and wool, but such exports have been replaced by trade in live animals and, to a lesser extent, dairy products. In 2003, meat prices increased by 23 percent, driven in part by the demand in Kazakhstan for live animals.[39] Before 1991, wool exports were supported by the highly subsidized production of irrigated fodder and feeds, which

was unsustainable after the collapse of central planning; wool exports declined from US$24 million in 1995 (the first reliable post-1992 data) to less than US$2 million in 2001 (Stryker and Livinets 2002). A revival of wool exports since 2003 has occurred in step with trends in world prices, but also the increased activity of Chinese buyers in the Kyrgyz market. The dairy industry has seen the revival of exports to Kazakhstan, which were disrupted by prohibitive temporary tariffs in 1998–99. In recent years, there have been rapid changes in the marketing channels for these products, which have reduced transaction costs and reduced price dispersion across the country, although, in some markets, primary producers may be in a weak bargaining position as evidenced by their willingness to take discounted cash offers when they need money.

In Turkmenistan and Uzbekistan, livestock numbers have increased since independence (table 8.8, panel b). This has been a reflection of the greater resilience of the large-scale production units surviving from the Soviet era. Climate may also have eased the transition in the southern Central Asian countries. Kerven (2003) points out that sheep and camels in the Karakum Desert are able to graze year-round, although the lack of investment has been associated with declining quality in wool and pelts. Even in more routine sedentary livestock farming, the warmer weather in the south meant less dependence on heated barns or on imported fodder, which eased adaptation to the economic shocks of the 1990s.

Transfers from Agriculture in Turkmenistan and Uzbekistan

The government regulation of agriculture in Turkmenistan and Uzbekistan has distorted prices because of the excessive transfer of resources from the agricultural sector to the government. This has been especially true in the cotton sector, where enforcement of a state marketing monopoly has enabled the governments to pay farmers a price that is less than the price received for cotton exports. Several studies have estimated the size of the transfers, using models similar to the model underlying figure 8.2. These estimates are reported in table 8.9.

Using 1992 data, Connolly and Vatnick (1994) estimate that the gross transfer from Uzbekistan's cotton farmers was US$1,034 million, but farmers received US$667 million in input subsidies; so, the net taxation on farmers from the state order system cum subsidies amounted to US$367 million.[40] Of this transfer, US$117 million went to domestic mills (area $P_w bcP_d$ in figure 8.2), of which the deadweight loss (*abc*) was US$31 million. These are large numbers for a country of 21 million people during a period when senior government officials were earning US$25 a month. The World Bank (1993) estimates that the cotton sector provided a sixth of government revenue in 1993. The transfer was even larger in 1994 and the first half of 1995 when world cotton prices were increasing more rapidly

than domestic prices in U.S. dollar terms, although the transfers declined when world prices fell sharply after July 1995 (figure 8.1).

The transfers from Uzbekistan's cotton farmers to the state grew in the second half of 1996, reflecting the sensitivity of the transfers to changes in the exchange rate.[41] In August 1996, a producer price for raw cotton of SUM 12,500 per ton was announced; this was equivalent to about SUM 39,000 per ton of cotton fiber, which was 63 percent of the world market price of US$1,600 per ton.[42] By the end of 1996, depreciation of the sum had reduced the producer price to 44 percent of the world price (IMF 1997). The proportion would be even smaller if the unofficial exchange rate were used, the premium of which had diverged farther from the official rate during the period. (At the end-1996 rate of about SUM 100 per U.S. dollar, farmers received US$400 per ton of fiber.) Given the ongoing increase in the black-market premium on dollars in 1997 and 1998, the farmer share of the world price continued to decline.

Estimates of the transfers out of agriculture in Turkmenistan and Uzbekistan in the late 1990s concern the entire farm sector or, at least, the two major crops (cotton and wheat) because of the difficulty of allocating the large input subsidies. The pattern is one of large transfers in both countries, though they are larger in Turkmenistan (table 8.9).

The most thorough publicly available accounting of the resource transfers in Turkmenistan draws on an autumn 1998 farm survey supported by the World Bank. The sampled farms reported spending manat 42,804 million on purchased

Table 8.9. Estimated Transfers from Agriculture, Turkmenistan and Uzbekistan, 1990s

Literature source	Year	Coverage	Value	Reference
Turkmenistan				
Lerman and Brooks (2001)	1998	cotton and wheat	manat 1,565 billion	11% of GDP
Pastor and van Rooden (2000)	1999	cotton and wheat	manat 2,880 billion	15% of GDP
Lerman and Brooks (2001), adjusted	1999	cotton and wheat	manat 7,330 billion	—
Uzbekistan				
Connolly and Vatnick (1994)	1992	cotton	US$367 million	—
Khan (1996)	1995	agriculture	—	10% of GDP produced in agriculture
Herman (1998)	1996	cotton and wheat	US$1,533 million	8% of GDP

Source: Author compilation.

Note: — = no data provided.

inputs (fertilizers, chemicals, fuel, transport and machinery services, and so on), for which they received a 50 percent subsidy. Given the total area sown by the sampled farms of 86,919 hectares, the subsidy was worth manat 246,250 per hectare. Extrapolating to the total area planted in cotton (548,000 hectares) and wheat (705,000 hectares) yields an estimated subsidy of about manat 300 billion. The 1998 output of cotton (700,000 tons) and wheat (1,200,000 tons) were, respectively, valued at manat 760 billion and manat 588 billion at procurement prices and around manat 3,388 billion at international prices at the official exchange rate, implying an indirect tax of around manat 2,100 billion. Finally, farmers received an irrigation subsidy of manat 235 billion, according to the corresponding budget expenditure category. The net transfer out of agriculture amounted to manat 1,565 billion (that is, 2,100, minus 300, minus 235), or 11 percent of GDP (Lerman and Brooks 2001).

These estimates understate the tax on Turkmenistan's farmers because the calculations are at the official exchange rate. Adjusting the net resource transfer estimates of Lerman and Brooks for the overvaluation of the official exchange rate is sensitive to whether one uses the late-1998 parallel rate of around manat 8,000 or the March 1999 rate of manat 17,000; the former implies a net resource transfer of manat 3,389 billion, equal to almost a quarter of GDP, and the latter implies a net resource transfer of manat 7,330 billion, equal to over half of GDP.[43] Pastor and van Rooden (2000), using an exchange rate of manat 9,000 (a proxy for the value the equilibrium rate might have reached if controls had been removed), estimate the transfers from wheat and cotton farmers in 1999 at manat 2,880 billion or 15 percent of GDP.[44] Perhaps the most that may be said is that the net resource transfers out of agriculture in the 1998 crop season were substantially greater than manat 1,565 billion and probably double that amount because of the foreign exchange regime.

Estimates of the overall impact of transfers in and out of agriculture in Uzbekistan during the second half of the 1990s are also fairly impressionistic (table 8.9) and are highly sensitive to the choice of exchange rate.[45] On the basis of information obtained during a 1995 International Labour Organization mission, Khan (1996) estimated that the transfers out of agriculture amounted to 1/10th of the GDP produced in agriculture. Herman (1998), using 1996 data, calculated the gross transfers from cotton farmers at US$1,402 million and from grain farmers at US$529 million, offset by US$198 million in irrigation water subsidies and US$200 million in other subsidies, to give a net transfer out of agriculture of US$1,533 million or 8 percent of GDP.[46] Rosenberg and de Zeeuw (2001), focusing on the impact of foreign exchange controls, estimate that the implicit tax on cotton increased from 3.4 percent of GDP in 1997 to 6.7 percent of GDP in 1999.

In the 2000s, cotton producers in Turkmenistan and Uzbekistan have continued to be heavily taxed through the operations of state marketing monopolies,

and this has been only partially offset by subsidies. Quantification is difficult for Turkmenistan because of the lack of data, but all anecdotal accounts highlight the deteriorating rural conditions. In Uzbekistan, there have been potentially significant reforms since 2000, when the government began to close the gap between official and black-market rates for foreign exchange; the exchange rates were formally unified in October 2003, although a small black-market premium remains. Steps have also been taken to transform collective farms into individual farms and restructure the cotton ginning and foreign trade sectors, although the actual outcomes remain opaque.[47] The share of cotton covered by state procurement was reduced from 70 percent to 50 percent in 2002, and, more importantly, assessment has been based on actual rather then planned output.[48]

Bravo and Crole-Rees (2005) estimate the distortions to the cotton sector in Uzbekistan in the period 2000–04. The net transfers declined dramatically between 2000 and 2001 because of a fall in other implicit taxes, which is primarily the effect of the dual exchange rate regime. After 2001, this component of implicit taxes practically disappeared, and, at the same time, subsidies also declined sharply, from 7–8 percent of GDP in 2000–01 to 2–3 percent of GDP in 2002–04. As a consequence of these changes, both negative and positive distortions were much lower from 2002 onward. However, the net transfers from cotton producers steadily increased from 2.1 percent of GDP in 2001 to 5.4 percent of GDP in 2004 (table 8.10). The price gap alone (even allowing for black-market premiums) does not capture the increasingly negative net distortion, which, in 2002, was driven by a large decrease in subsidies; after that, it was caused by a mixture of changes in the price gap, explicit taxes, and subsidies.[49]

The dramatic decline in subsidies between 2001 and 2002 reported by Bravo and Crole-Rees (2005) was caused by changes in composition. In 2001 and 2002,

Table 8.10. Cotton Producer Taxes and Subsidies, Uzbekistan, 2000 to 2004

(percent of GDP)

Taxes and subsidies	2000	2001	2002	2003	2004
Explicit taxes	2.9	2.2	1.8	1.5	2.0
Implicit taxes, price gap[a]	5.1	4.7	4.5	4.4	5.1
Other	11.5	3.3	0.0	0.3	0.4
Subsidies	7.2	8.1	2.6	2.1	2.1
Net transfers from producers	12.3	2.1	3.7	4.1	5.4

Source: Bravo and Crole-Rees 2005.

a. The price gap is the gap between the domestic currency price received by producers and the world price at the official exchange rate. Between 23 and 36 percent of the gap would be eliminated if value added tax payments were refunded on cotton exports.

debt write-offs and credit subsidies accounted for over 70 percent of the total, but this share dropped to 18 percent in 2002 and zero in 2003 and 2004.[50] Meanwhile, input subsidies increased both absolutely and as a share of total subsidies; irrigation and electricity subsidies alone accounted for over 80 percent of total subsidies in 2002–04. There were administrative costs in the centralized system, although Bravo and Crole-Rees report estimates that these amounted to less than 1 percent of the value of gross agricultural output. Some implicit taxes and subsidies are omitted from their estimates. For example, farmers pay implicit taxes for the loss in soil fertility resulting from mandatory cropping patterns and for low ginning efficiency or the incompetence of the three foreign trade agencies, which handle virtually all cotton exports and may fail to obtain the best price.[51]

Guadagni et al. (2005) report a similar declining pattern in both taxes and subsidies, but at smaller magnitudes; they estimate that net taxes on cotton farming in Uzbekistan declined from about 8 percent of GDP in 2000–01 to 1.8 percent in 2004. Net transfers from cotton farmers declined from 50 percent of the gross cotton revenue of farmers in 2000 to 20–22 percent in 2003–04. In 2004, total taxes on cotton farmers in Uzbekistan, both direct and indirect via the price gap in state trading organization purchases, amounted to US$644 million and was offset by only US$441 million in subsidies (table 8.11). The subsidy estimates of Guadagni et al. (2005) for 2004 are, however, substantially different from those reported by Bravo and Crole-Rees (2005); interest rate credits (US$81 million) and debt write-offs (US$136 million) accounted for half, and irrigation subsidies (US$161 million) accounted for most of the rest. Thus, the main support in 2004 was the 5 percent interest rate on loans to the farm sector, which was a rate below the market rate. A minor benefit (worth US$28 million) is the fact that producers could buy 50 percent of cotton oil and other by-products at preferential prices. The fuel,

Table 8.11. Value of Cotton Taxes and Subsidies, Uzbekistan, 2004
(US$, millions)

Tax	Amount	Subsidy	Amount
Land tax	19	Fertilizer	11
State trading organization, commission	23	Machinery	12
Ginning tax	35	Fuel	12
Income tax	65	Inexpensive by-products	28
Tax on crushing	120	Interest rate credit	81
Value added tax	170	Debt write-offs	135
Producer price controls	213	Irrigation, including electricity for pumps	161

Source: Guadagni et al. 2005.

machinery, and fertilizer subsidies largely consisted of value added tax waivers. Guadagni et al. (2005) also estimate the implicit taxes arising from low ginning efficiency. If Uzbekistan's gins, run by a state-owned monopoly, were to achieve a 38 percent efficiency rate rather than the official 32.7 percent, then final cotton fiber output for a given harvest would increase by 16 percent, which, at current output levels and prices, amounts to almost US$200 million.[52] An agricultural sector review and planning report prepared for the Asian Development Bank and the Uzbekistan Ministry of Economy (Herman 2005) estimated that indirect taxes through cotton and wheat pricing amounted to about 10 percent of GDP.

Price Distortions

Deriving nominal rates of assistance for cotton using the standard methodology outlined in the appendix is difficult because of the nature of the processing and marketing and because of the variability of the world price. Even in the market-based cotton sectors of Kazakhstan and the Kyrgyz Republic, purchasers of raw cotton may misjudge the appropriate offer price given that the world market price may have moved substantially by the time the cotton has been ginned, baled, and shipped. In the regulated systems of Turkmenistan and Uzbekistan, farmgate prices tend to change slowly from year to year so that calculated nominal rates of assistance are driven by the volatile reference prices; there is little change in the situation of farmers, and the fluctuating price gap indicates the volatility of state revenues rather than the distorted incentives among producers.

For cotton, comparing the price gap between border and domestic prices requires several steps, some of which involve assumptions with a major impact on the estimated distortion. The most frequently cited world price for cotton is the Cotlook A index (figure 8.1). To convert this to a free on board export price, one must include transport and handling costs to a port, which may be Riga (Latvia), or a Black Sea port, or another transport route. The price should also be adjusted for quality differences, which is especially important for Tajikistan, but difficult to document. The conversion of the border price into domestic currency units may be calculated at the market exchange rate for Kazakhstan or the Kyrgyz Republic, but, if foreign exchange controls exist (such as in Turkmenistan or Uzbekistan), the choice of the appropriate exchange rate is more difficult. In Tajikistan, adjustment needs to be made for export taxes.

Internal transport, handling, and commissions include the costs of moving the cotton from the farm to the border, but some costs are difficult to interpret if they are economy-wide rather than sector-specific distortions (such as red tape and unofficial levies en route). Similarly, ginning costs must be deducted from the border price to construct a reasonable reference price for the farmer, but the

allowance for ginning costs may be distorted by the inefficiency of that sector. The ginning outturn ratio determines the conversion of the baled cotton price into the equivalent reference price for raw cotton, which is the relevant point of comparison with farmgate prices, but reported outturns in Central Asia since 1992 have been exceptionally variable (from 22 percent to 47 percent, according to table 8.4), which reflects large differences in efficiency within the sector and is also caused by the problems related to smuggling that are described elsewhere above.

In the country chapters on Kazakhstan and the Kyrgyz Republic (see chapters 6 and 7), the estimated distortions for cotton are among the most volatile. For Kazakhstan, the nominal rate of assistance as a percentage of farmgate revenue for each year from 2000 to 2004 was 31, −13, 37, 39, and −23 percent. This was a period of little observed change in the policy environment. Although the shift to a negative distortion in 2004 may have been caused by the cartelization of the ginning sector, this seems an inadequate explanation for the magnitude of the reversal from positive to negative assistance. In chapter 7, on the Kyrgyz Republic, a longer series is presented for 1995 to 2005, but with similar volatility (1, 5, −39, 9, −70, −28, 35, −6, −2, and 42 percent), and the magnitude is not explicable in terms of policy-driven distortions in farmer incentives.

Estimating distortions for the regulated economies of Turkmenistan and Uzbekistan or for the poorly integrated Tajik economy is more difficult. The calculations are illustrated in table 8.12 for Uzbekistan in 2002 according to the

Table 8.12. Cotton Prices, Uzbekistan, 2002
(per ton)

Item	Indicator	Price
1.	World cotton fiber price (Cotlook A index)	US$1,019
2.	Transport and handling (border to Riga, Latvia)	US$160
3.	Uzbekistan border price	US$859
4.	Border price in domestic currency	SUM 672,597 (917,412)
5.	Internal transport, handling, and commissions	SUM 28,718
6.	Ginning costs	SUM 159,111
7.	Price of delivered seed cotton (4, 5, and 6)	SUM 484,768 (729,583)
8.	Ginning outturn (%)	32
9.	Equivalent reference price of raw cotton (7 × 8)	SUM 155,126 (233,467)
10.	Domestic price at the distribution center	SUM 126,000
11.	Price gap (10/9) (%)	81 (54)

Sources: Christensen 2003; Cotlook Price Series Database 2007.

Note: Sum values are at the official exchange rate of SUM 783 per U.S. dollar. The numbers in parentheses are calculated at the commercial rate of SUM 1,068 per dollar. Cotton marketed at negotiated prices received SUM 151,200 per ton, that is, the price gap on marginal supply was 98 percent (65 percent).

estimated price gap. Depending on whether one considers the official price or the marginal price and the official exchange rate or the commercial rate, the domestic price at the distribution center was between 46 percent and 2 percent below the reference price. The farmgate price was lower, but the table still implies distortions that are less negative than those suggested by other well-informed observers. Baffes (2004) estimates that cotton farmers in Uzbekistan receive about a third of the value of their crop, while ICG (2005) places the share at 10–15 percent. To the best of our knowledge, there are no comparable estimates for Turkmenistan since the late 1990s, although all anecdotal evidence is of large negative price gaps.

As an indicative guide to the degree of distortion in the cotton sectors of the Central Asian economies, table 8.13 compares the pattern of a standard reference price (based on the Cotlook A index) with that of domestic prices as reported in the FAO PriceSTAT Database of the Food and Agriculture Organization of the United Nations.[53] Given the reservations expressed above and also in the section on cotton elsewhere above, this is clearly a rough approximation. Table 8.13 implies that the Kazakhstan and Kyrgyz producer price series have more or less tracked world price movements since the mid-1990s, but the ratio of the prices in Kazakhstan to the reference price improved relative to the situation in the Kyrgyz Republic. The overall picture is consistent with a descriptive analysis of minor distortions in the Kyrgyz Republic since the price liberalization and establishment of monetary stability in 1993–95 and of a somewhat later reduction in distortions in Kazakhstan. This is also consistent with the switch from domestic prices that are higher in the Kyrgyz Republic (US$394) than in Kazakhstan (US$349) in 1997 to domestic prices that are higher in Kazakhstan (US$550) than in the Kyrgyz Republic (US$450) in 2003 (Goletti and Chabot 2000; Sadler 2006).[54]

At first sight, the level of prices in Tajikistan in table 8.13 seem the most credible, but, given the concerns about the data on the other four countries, this may be coincidental. The Tajik data do, however, follow a time path consistent with the analysis in the section on cotton that finds prices slightly below the reference price in the late 1990s and then a substantial widening of the negative price gap in the 2000s.

The FAO PriceSTAT data for Turkmenistan and Uzbekistan are not useful; they are implausibly high for the former and implausibly low for the latter.[55] For both countries, the negative distortion became increasingly large in the late 1990s; the precise magnitudes depended on the exchange rate used. Despite the paucity of reliable data in the final years of President Niyazov, all the evidence indicates that, although GDP was being driven rapidly upward by high prices for natural gas exports, rural living standards were falling, and the negative distortions faced by farmers were increasing. The situation of Uzbekistan's farmers was also poor in the late 1990s; it may have improved somewhat in 2003–05 as the price gap narrowed, although subsidies declined.

Table 8.13. Farmgate Prices for Cotton, Central Asia, 1990 to 2004

a. Local currency prices

(per ton)

Year	Kazakhstan (T)	Kyrgyz Republic (som)	Tajikistan (SM)	Turkmenistan (manat)	Uzbekistan (SUM)
1990	—	—	—	—	—
1991	—	—	—	—	—
1992	—	—	—	—	—
1993	—	5,404	—	—	—
1994	18,230	10,015	—	—	1,000
1995	39,468	11,965	—	—	1,000
1996	48,427	13,587	248	—	—
1997	51,284	13,909	314	9,488,539	—
1998	48,515	13,253	437	7,755,056	—
1999	60,556	18,233	465	7,172,756	—
2000	75,647	23,186	473	7,687,971	—
2001	81,925	24,884	601	5,588,202	—
2002	80,000	25,389	733	7,620,886	—
2003	105,360	26,343	940	8,147,106	—
2004	—	—	765	—	—

b. Cotlook index, reference price, and US$ prices

Year	Cotlook A index (A) (US$/ton)	Reference price (A-200)/3	US$/ton at the official exchange rate				
			Kaz	Kyr	Taj	Tur	Uzb
1990	1,819	—	—	—	—	—	—
1991	1,677	—	—	—	—	—	—
1992	1,278	359	—	—	—	—	—
1993	1,280	360	—	858	—	—	—
1994	1,763	520	299	927	—	—	36
1995	2,128	643	586	1,108	—	—	28
1996	1,773	523	641	1,061	756	—	—
1997	1,748	518	581	799	420	2,099	—
1998	1,445	413	406	634	447	1,491	—
1999	1,171	323	438	468	324	—	—
2000	1,302	366	524	486	215	—	—
2001	1,058	286	543	513	240	—	—
2002	1,019	273	513	541	244	—	—
2003	1,399	400	704	603	324	—	—
2004	1,366	356	—	—	255	—	—
2005	1,217	340	—	—	—	—	—

Sources: Author calculations; FAO PriceSTAT Database (accessed December 15, 2006); Cotlook Price Series Database 2007.

Note: — = no data are available or data are not provided.

We suspect that the nominal rates of assistance for cotton growing have been negative in all five Central Asian countries since 1992. The sector enjoyed positive support in the Soviet era, but, with price liberalization, input prices rose far more than output prices. Since the late 1990s, distortions in incentives in the cotton sector have been small in Kazakhstan and the Kyrgyz Republic, although year-to-year calculations of nominal rates of assistance are volatile because the buyers purchasing cotton from farmers often fail to predict world prices accurately. A similar picture was probably true in Tajikistan from the end of the civil war in 1997 until around 2000, but the situation facing cotton farmers has become increasingly negative since 2000.

Farmers in Turkmenistan and Uzbekistan face far larger negative distortions in incentives, probably somewhere greater than −50 percent. Since the early 2000s, the negative distortions may have been moderated in Uzbekistan, and they are slightly less negative among wheat farmers.

Conclusions

During the transition from central planning in the 1990s, a clear division emerged in Central Asia between the roughly neutral policy toward agriculture in Kazakhstan and the Kyrgyz Republic and the situation in Turkmenistan and Uzbekistan, where the governments relied increasingly on rent extraction from agriculture for a large share of their revenues. Farmers in Tajikistan experienced the chaos and disruption that destroyed the national economy, but appear not to have faced substantial sector-specific distortions.

In contrast to Kazakhstan and the Kyrgyz Republic, the governments in Turkmenistan and Uzbekistan used the state monopoly power over marketing to transfer substantial resources out of agriculture. The distortions and transfers in Turkmenistan became significantly higher than those in Uzbekistan in the late 1990s (table 8.9), and the gap between the two countries has widened since 2000 as exchange rate distortions in Turkmenistan have increased, while those in Uzbekistan have been reduced. Most of the agricultural transfers in Uzbekistan appear to go toward general government revenue, whereas in Turkmenistan much has been wasted (for example, in inefficient cotton mills with negative value added) or accrued to secret accounts under the president's personal control. The government in Uzbekistan is more aware of the costs of taxing the cotton sector, and, although it remains dependent on cotton for revenues, it has introduced reforms aimed at reducing the negative incentives affecting producers and increasing the supply responsiveness of producers.

The situation in Tajikistan is opaque. The government relies on rents from the cotton grown in southwest Tajikistan for a significant part of its revenue, and the

reality, at least among cotton producers (and perhaps among wheat producers), may be closer to the Uzbekistan pattern than is implied in this account (or in table 8.6, which is based on events of the year before the regime had cemented its power).

The dirigisme in Tajikistan, Turkmenistan, and Uzbekistan has been facilitated by the dominance of cotton in the farm sectors of these countries and the relative ease with which rents may be extracted from this crop. Government control has also been strong in the grain sectors, where governments have promoted wheat production in the name of increasing food self-sufficiency. By all accounts, grain farmers in all three countries face negative rates of assistance, but the distortion is less extreme in wheat than in cotton. Other sectors, notably livestock farming, have been relatively less harmed by the transition, but the lack of flexibility in the output mix is in striking contrast to the situation in the Kyrgyz Republic.

Notes

1. The reliability of data is an issue throughout the region, but, apart from the war years in Tajikistan, the reliability of statistics is clearly the worst in the case of Turkmenistan. For the data reproduced in tables or the text that have been taken from international institutions, it is important to stress that, while these organizations adjust data for definitional consistency, the raw data generally originate with national sources, and international organizations often have no way of correcting undisclosed bias in collection or reporting.

2. The situation following the sudden death of President Saparmurat Niyazov, also known as *Turkmenbashi* (leader of all Turkmen), in December 2006 remains unclear at the time of writing.

3. More information may be found on Kazakhstan and the Kyrgyz Republic in chapters 6 and 7.

4. For more detailed analysis of the issues presented in this section, see Pomfret (1995, 2006).

5. National currencies were introduced by four of the countries in 1993: the Kyrgyz Republic (som [som]) in May and Kazakhstan (tenge [T]), Turkmenistan (manat [manat]), and Uzbekistan in November, although Uzbekistan initially issued sum coupons, which were converted into sum (SUM) in July 1994. In Tajikistan, the Tajik ruble (TR) was introduced in 1995 and replaced by the somoni (SM) in 2000.

6. Fertilizer use collapsed elsewhere; 10 years after the end of central planning, fertilizer use in Kazakhstan had fallen by 95 percent, whereas, in Uzbekistan, it had fallen by only 40 percent (data of the Food and Agriculture Organization of the United Nations cited in Swinnen and Rozelle 2006).

7. In their comparison of land reform processes in 28 formerly centrally planned economies, Swinnen and Rozelle (2006) rank Turkmenistan and Uzbekistan among the three least reformed (with Belarus).

8. Wall and Lamers (2004), reporting on fieldwork in Khorezm in 2003, describe the degrees of autonomy. More sweeping land reforms were introduced in Uzbekistan in 2003, but the privatization process is far from transparent (Spoor 2006).

9. A summary report on irrigation in Central Asia produced for the World Bank (Bucknall et al. 2003) estimates that close to 50 percent of the irrigated land in Central Asia has been affected by salinization, with national levels ranging from about 12 percent in the Kyrgyz Republic to 96 percent in Turkmenistan.

10. Even in the Soviet era, maintenance was neglected; according to reports summarized in Bucknall et al. (2003), about half the infrastructure in irrigated areas of Kazakhstan, the Kyrgyz Republic, and Uzbekistan was already in need of capital repairs in the early 1990s.

11. The cotton output data need to be treated with caution because of widespread smuggling. There is much anecdotal evidence that cotton was being smuggled from Turkmenistan and Uzbekistan to Kazakhstan and the Kyrgyz Republic to avoid the state marketing systems in the former two countries and from Tajikistan to the Kyrgyz Republic, where the ginning sector is more competitive. An indirect indicator of such flows is the volatility of the ginning outturn data in table 8.4, which suggest that the gins in Kazakhstan were receiving imported cotton between 1996, when Uzbekistan introduced exchange controls, and 2001 or 2002, when Uzbekistan tightened the monitoring of its border with Kazakhstan. Similarly, peaks in ginning outturns in the Kyrgyz Republic in 1997 and since 2001 imply inputs greater than the domestic production of seed cotton. Sadler (2006, 87) notes that, in Uzbekistan, "the statistics are also likely to be inaccurate, as they are more driven to meet with government targets than a true reflection of production. They are also inflated by the inclusion of cotton that is not of merchantable quality." The million ton harvests in Turkmenistan in 2004 and 2005 (see table 8.8) are even less credible than the Uzbekistan data; Tukhbatullin (2005) reports an actual harvest of 723,000 tons in Turkmenistan in 2005.

12. This has been especially true in the United States since 1985, when the policy shifted from stockpiling to price supports, and since the accession of Greece and Spain to the European Union (EU) in the 1980s. The International Cotton Advisory Committee estimates that, in 2001/02, direct assistance to cotton production amounted to US$2.3 billion in the United States and to US$0.8 billion in the EU; U.S. producer prices were 91 percent higher than world prices, and, in Greece and Spain, producer prices were 144 percent and 184 percent above world prices, respectively. Estimates of the effects of removing these production and export subsidies reach as high as a 71 percent increase in cotton prices (with 2001/02 as the base year) and a 6 percent increase in the volume of Uzbekistan's cotton exports (Baffes 2004). Devereux, Lawrence, and Watkins (2006) give even higher estimates of the support for cotton producers in the EU and the United States in 2001/02, but also indicate lower support in 2002/03. A more recent economy-wide study suggests that, if all cotton subsidies and import trade barriers had been removed everywhere as of 2001, international prices for cotton would be 13 percent higher, on average (Anderson and Valenzuela 2007).

13. The Multifiber Arrangement and its successor the Agreement on Textiles and Clothing, a transitional program, took these products outside the rules of the General Agreement on Tariffs and Trade and the World Trade Organization and allowed substantial trade barriers to persist, which not only reduced the demand for textiles and clothing and, hence, the demand for all fibers covered by the textiles and clothing agreement, but also discriminated against cotton relative to other fibers. Will Martin (quoted in Baffes 2004) estimated in 1996 that the Multifiber Arrangement imposed an implicit tax of 20 percent on cotton relative to other fibers and that ending the arrangement would increase the world price of cotton by 4 percent. This regime was phased out as part of the 1994 Uruguay Round, but the process was backloaded and was only completed at the end of 2004, though some exceptions (most notably for China) continued until 2008.

14. According to data of the National Bank of Uzbekistan (reported in Akimov 2007), the black-market premium for cash U.S. dollars, which had been 13 percent at the end of 1995, jumped to 136 percent at the end of 1996, stabilized at 125 percent in 1997, and then rose to 264 percent in 1998 and 471 percent in 1999, before narrowing to 177 percent in 2000, and practically disappearing in 2003. The reduction in the premium was largely achieved through an increase in the official exchange rate from SUM 140 per U.S. dollar in 1999 to SUM 980 in 2003, while the black-market cash rate depreciated from SUM 800 to SUM 1,000 per U.S. dollar.

15. The official rate remained pegged around manat 5,200 per U.S. dollar, but, by 2006, the street rate was around manat 25,000 per dollar. However, this was in a thin market; so, it is impossible to even guess at an equilibrium exchange rate.

16. A World Bank field report on Uzbekistan (Thurman and Lundell 2001) observed that, in the five *rayons* (districts) surveyed, little maintenance had been carried out in the three years before 2000 and that, as a consequence of dysfunctional drainage systems, salinization had become a major problem. The situation appears to be even worse in the Kyrgyz Republic, Tajikistan, and Turkmenistan. In Kazakhstan and the Kyrgyz Republic, institutional reforms have decentralized maintenance to farms

that are unable to afford it. Addressing the drainage problem in Turkmenistan through the construction of a huge artificial lake in the desert has been widely condemned for environmental reasons.

17. One difficulty with quantifying the situation in Turkmenistan and Uzbekistan is the discretionary power of public officials, who may accelerate or hold up payments to individual farmers.

18. One reason people accept the backbreaking work of cotton-picking in Uzbekistan is that they are paid in cash immediately, unlike the payments for crops, which may be delayed for months or be paid into restricted-access bank accounts. People are, however, paid more in southern Kazakhstan, where a skilled picker could earn T 20,000 (US$135) a month during the 2002 harvest season by picking 100 kilograms a day (the wages in Uzbekistan were as low as SUM 25 per kilogram, or US$2 per 100 kilograms, according to ICG 2003). This imbalance has led to substantial illegal temporary immigration from Uzbekistan.

19. According to ICG (2005), the use of forced labor is not an outcome of labor shortages, but the power of vested interests that aim at maximizing the net revenue from cotton sales and force children, students, and others to work for practically nothing. The extent of child labor is difficult to document in the face of official denials, but some children help their parents in the fields. Cannell (2005) cites estimates of the United Nations Children's Fund that 23 percent of all 5- to 14-year-olds, or 1.4 million children, are annually sent to the cotton fields in Uzbekistan. University students complain that not only are they required to provide unpaid labor, but an unreasonable portion of their low student stipends is kept by farm managers to cover the cost of food and accommodation.

20. Most of these new plants rely on second-hand equipment brought from other former Soviet republics. There are also five roller gins from Turkey.

21. The averages mask variations across *oblasts* (regions); for example, Sadler reports that the price was US$75 higher in Jalalabad than in Osh (the two cotton-producing oblasts in the southern part of the Kyrgyz Republic), which may be due to market conditions or to quality differences.

22. In 2005 and 2006, the targets were not fulfilled in any oblast. According to data of the Ministry of Agriculture and Environmental Protection, the national cotton target in 2005 was 610,000 tons, but output was 447,918 tons; in 2006, the target was 547,000 tons, and actual output was 440,245 tons.

23. Monopoly power reduces the incentives of the gins to raise efficiency (reflected in the abysmal ginning outturns in table 8.4). In Kazakhstan and the Kyrgyz Republic, improved ginning efficiency is part of the competitive environment because, for any world price for baled cotton, the higher the outturn, the higher the price that the gin is able to offer farmers for seed cotton.

24. Farm debts accrued since 1997 (estimated by the Asian Development Bank at US$180 million in September 2004 and reported by the government to be around US$280 million in early 2006) add to the problem because no independent financier will lend to indebted farms. The crisis of Tajikistan's cotton sector is often viewed as a debt crisis, but the burgeoning debt is a symptom of structural flaws rather than the heart of the problem (see World Bank and SECO 2006).

25. In the early 1990s, Tajik cotton was considered to be the best in Central Asia, but, since 1997, it has not been in demand from high-quality spinning markets and has traded at a discount relative to, say, Uzbek cotton. This is because of a lack of staple length uniformity (most likely arising from low-quality seed), a high trash content given that pickers have little incentive to take care (and may be trying to increase the weight delivered to gins), poor grading and pricing policies at the gins, which select for color rather than trash content, and poor baling. The reliance on a single international buyer may also have blunted incentives to maintain quality.

26. The analysis below in the text (from Pomfret 2000) is of Uzbekistan's cotton sector, but, qualitatively, the system in Turkmenistan is similar.

27. In Uzbekistan, P_d was less than half of P_w in 1992 (Connolly and Vatnick 1994). In 1998, one-seventh of the cotton output went to domestic mills, and the rest was exported. By 2001, the costs were being acknowledged, and the government indicated a shift to a less dirigiste industrial policy. Bravo and Crole-Rees (2005) report that 10–15 percent of cotton production in 2000–04 was allocated to the local textile industry at a price discounted by 15–30 percent. By 2005, the discounted internal price for cotton had been eliminated, leading to the bankruptcy of several textile companies that had relied on the subsidized input. In Turkmenistan, the promotion of the textile industry was

less extreme in the early 1990s, but the distortion became larger as funds were used in the late 1990s and early 2000s to build up a substantial cotton textile and apparel industry; by the end of 2000, this industry was absorbing a third of the cotton crop and probably had negative value added at world prices (Pomfret 2001).

28. In Uzbekistan's state order system, the percentages of the two main crops that must be sold to the state were gradually reduced during the late 1990s. However, if a farm produced less than its target output for cotton, then the entire crop had to be sold through the state order system. With the long-term decline in cotton productivity, this was a common outcome.

29. Early reports of smuggling between Uzbekistan and southern Kazakhstan are cited by Pomfret (2000), and extensive smuggling from Uzbekistan to the Kyrgyz Republic in 2003–04 is reported in ICG (2005). Sadler (2006) cites Uzbek government estimates of 300,000 tons of seed cotton per year being smuggled to Kazakhstan and the Kyrgyz Republic, although he rejects these estimates as improbably high.

30. In 2004, state procurement prices were increased relative to the prices in 2003, but world market prices fell during 2004–05 (figure 8.1). The gap between farmgate and world prices in 2005 was dominated by the fall in world prices; independent of any policy change, distortions became smaller quantitatively.

31. After the Andijan events of May 2005, the government appears to have turned even more to the control rather than the reform of the economy, including stricter control of the borders with Kazakhstan and the Kyrgyz Republic, in part to curtail cotton smuggling. In October 2006, President Karimov dismissed Saidullo Begailiev, the governor of the Andijan Region, which was falling behind in its target cotton output. The reason for the dismissal is, however, unclear in that Begailiev's dismissal for his role in the Andijan massacre had been rumored for over a year, and this may have distracted him from making proper arrangements for the 2006 cotton harvest, which, in turn, may have given Karimov the pretext for removing the governor without formal admission of any government fault at Andijan. Begailiev's successor, a police chief from Namanjan, arrived too late to affect the cotton harvest, but there was a clampdown on cotton smuggling across the Kyrgyz border.

32. During the 1990s, food aid and a 1997 regulation allowing duty-free imports of one ton of flour or two tons of wheat operated as negative incentives to domestic wheat production. The regulation was suspended in 2002, and, in the same year, the government introduced a seasonal (August–December) 20 percent tariff on imported wheat.

33. Farmers try to bypass state marketing channels (for milk and meat, as well as for grains) and sell directly in local bazaars where prices are higher, but crackdowns on bazaar traders in 2002 and 2004 have curtailed this practice, and farmers have been left with few other options. Wall and Lamers (2004) report that the farmers whom they surveyed in the region of Khorezm (Uzbekistan) in 2003 only received about SUM 150 per kilogram (US$0.15 at the market exchange rate) for their wheat; in Kazakhstan, farmgate prices in 2003 were T 12.1 (US$0.81) per kilogram.

34. Guadagni et al. (2005) point out that, in Uzbekistan, wheat farming is also preferred because, unlike cotton, wheat is paid for on delivery, and wheat only occupies irrigated land for part of the year so that, from July to November, the land is free for other crops such as vegetables.

35. President Niyazov's frequent purges included farm managers and local and provincial officials, and the lost expertise was not replaced by newly trained experts. The tertiary education system was practically destroyed, and foreign degrees and other qualifications were no longer recognized, as the president placed loyalty above competence throughout the country.

36. The point is frequently made that consumers prefer the hard wheat grown in Kazakhstan, but it is difficult to make observations of consumer preferences in the regulated grain markets of Turkmenistan and Uzbekistan. Wall and Lamers (2004, 17) quote the owner of a wheat mill in the region of Khorezm (Uzbekistan) as follows: "We process the wheat but the quality is not as good as [in] Kazakhstan. . . . wheat from Kazakhstan is much better to eat and cheaper." In Turkmenistan, the president has been unwilling to authorize the use of foreign exchange (which is kept in tightly controlled accounts) for imports of wheat or flour, and, because the quality of domestically produced flour has deteriorated, the price of imported flour in Turkmenistan's bazaars—if it is available at all—is exorbitant.

37. Suleimenov and Oram (2000) ascribe this to the more severe winters in Kazakhstan, which means that heated barns are required, and the disruption of power supplies during the transition from central planning. Privatization was less catastrophic in the Kyrgyz Republic, where the farms were smaller, and farm management could therefore be more flexible.

38. In Tajikistan, even more than elsewhere, the traditional transhumant system was largely replaced during the Soviet era by a collectivized livestock sector that was sustained by large imports of grain. With the cessation of these imports, the livestock numbers became unsustainable, and, despite a post-1991 decline (table 8.8, panel b), the numbers are still above the carrying capacity. The result has been undernourished animals and low productivity; symptoms include milk yields as low as half a kilogram a day, calving intervals of 17–18 months, beef cattle 4 years old and lambs 18 months old before slaughter (and still with low carcass weights), and the disappearance of the wool industry.

39. This was caused by policy insofar as it coincided with increased subsidies going to farmers in Kazakhstan for the purchase of new breeding stock.

40. The model used by Connolly and Vatnick (1994) is more complex than figure 8.2. They assume a market-related price on above-quota sales that is below the world price because of a (subsequently repealed) 5 percent export tax on cotton, but the consequences for their estimated effects are small.

41. Christoph Rosenberg, former International Monetary Fund resident representative in Uzbekistan, has emphasized the implicit taxation arising from the multiple exchange rate system (Rosenberg, Ruocco, and Wiegard 1999; Rosenberg and de Zeeuw 2001).

42. Note that, in different sources, cotton prices may be quoted for seed cotton or for the fiber equivalent, which costs approximately three times more per ton. Also, it is not always clear how processing and transport margins, approximately US$220 per ton of fiber equivalent in the competitive U.S. market (Lerman and Brooks 2001), are treated.

43. However, it did not really matter to the farmer whether he was paid in December 1998 or March 1999 because he was unlikely to spend much of his revenue on imports.

44. The comparison with GDP is overstated because the export component of GDP is valued at the official exchange rate; for consistency, exports should be valued at opportunity cost prices rather than administered prices. In any case, the valuation at the official exchange rate at a time when there was a large black-market premium ignores an added burden on farmers in the event imported consumption goods tended to have market-determined prices. It also represented an added gain to the government because the domestic purchasing power of the dollars earned by exports increased, while the government's obligations to farmers, denominated in manat, remained unchanged.

45. All these estimates are subject to data difficulties, but one key assumption is that payments are made promptly and are accessible. The common delays in payments to farmers, the (reported) payments in kind (in cottonseed oil and flour) in some districts, and, most of all, the use of limited-access bank accounts may be the most important source of bias indicating that the reported calculations underestimate the tax on farmers.

46. These seem more plausible than the "approximate accounting of transfers" by the International Monetary Fund (IMF 1997, 65) showing transfers out of agriculture in 1996 of SUM 25.4 billion to SUM 28.4 billion (about 15 percent of the total value of agricultural production); the latter two amounts would have been more than offset by transfers into the agricultural sector of SUM 29.5 billion, of which SUM 23.0 billion was related to subsidized irrigation. The International Monetary Fund's unexplained calculations appear to understate the costs to farmers of the state order system by using the official exchange rate to convert world prices into domestic prices, and they also appear to overstate the value of input subsidies.

47. After the ginning sector was restructured in 2001, it comprised 134 gins, of which 128 were joint stock companies controlled by the state, and 6 were private. Apart from the sales by the one or two private gins that have been granted export licenses, output must be sold to the three foreign trade agencies that handle export sales.

48. Previously, the share of the crop to pass through the state procurement system was based on planned output; there was the crucial condition that, if the plan was not met, as was often the case (from 1994 to 1999, the target production level remained at 4 million tons and then fell gradually to

3.75 million tons in 2003, all far above the actual output levels indicated in table 8, panel a), 100 percent of output had to go through the state marketing system.

49. Bravo and Crole-Rees (2005) and Guadagni et al. (2005) mention the lack of transparency surrounding the principal explicit taxes: the land tax, the value added tax, and remittances to the pension fund. These costs are automatically levied from the bank accounts of cotton producers and allow some bureaucratic discretion in assessing the value added to be taxed or the combination of family and external permanent or seasonal labor for which pension fund deductions are due. In principle, the value added tax should be refunded on exports, but, in practice, it is rarely refunded to cotton producers; see the note to table 8.10.

50. To some extent, the directed lending to cotton producers was a tax on bank depositors, including farmers.

51. Bravo and Crole-Rees (2005) mention a World Bank study that estimates at US$5 million the cost of declining soil fertility caused by cotton growing. They also mention findings of the Food and Agriculture Organization of much higher levels of profitability for vegetables, melons, grapes, and, especially, potatoes on land devoted to cotton or wheat.

52. Guadagni et al. (2005) state that 38 percent is typical of similar cotton-producing countries. Goreux (2003) reports ginning ratios of between 40 and 43 percent in five West African countries in the early 2000s. In Xinjiang, with cotton that is similar in quality to the cotton in Central Asia, the average outturn is 39 percent. A source of inefficiency in Uzbekistan is the underutilization of gins, given that the government keeps all 134 gins operating despite falling harvests and the smuggling of cotton for ginning in Kazakhstan and the Kyrgyz Republic. Bravo and Crole-Rees (2005) provide anecdotal evidence of actual outturns closer to 34 percent than to the official 32.7 percent, with the benefit accruing to the gins. Yuldashev (2005) views the underreporting of ginning ratios as an example of corruption that benefits the elite (at up to US$140 million a year). He also claims that the quality of much of the cotton is reassessed upon delivery. For example, in 2004, most cotton was reportedly first grade, for which farmers were paid US$235 per ton, but, in fact, it was assessed as fourth or fifth grade, with a price of US$60–US$70. The aggregate price difference of around US$200 million was hidden from official records and accrued to the cotton barons.

53. The reference price includes a fixed US$200 allowance for transport, handling, and other costs and assumes a ginning outturn of one-third. In fact, the margin may have a fixed cost component that depends on the harvest size and may also be related to the value per ton. Most of the detailed calculations, such as those of Christensen (2003) in table 8.12, assume a mixture of fixed and variable costs, but the degree of error is unlikely to be large, especially relative to the errors in the domestic price data.

54. Although the two studies used as benchmarks are the most careful cross-country comparisons available, the numbers are not mutually consistent because they incorporate differing approaches to the construction of domestic prices. Thus, the prices quoted in Sadler (2006) for the market-oriented cotton sectors in 2003 are substantially higher than the 1997 estimates of Goletti and Chabot (2000), even though world prices were 20 percent lower in 2003 than in 1997.

55. The FAO PriceSTAT data for the early 1990s, not reported in table 8.13, are also difficult to reconcile with the facts insofar as they indicate large differences in local currency prices even though all five countries were using the same currency in 1990–92 and even though there were virtually no border restrictions.

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APPENDIX

METHODOLOGY FOR MEASURING DISTORTIONS TO AGRICULTURAL INCENTIVES

Kym Anderson, Marianne Kurzweil, Will Martin, Damiano Sandri, and Ernesto Valenzuela

This appendix outlines the methodological issues associated with the task of measuring the impact of government policies on incentives faced by farmers and food consumers. The focus is on those border and domestic measures that arise exclusively from government actions, that, as such, may be altered by a political decision, and that have an immediate effect on consumer choices, producer resource allocations, and net farm incomes. Most commonly, these measures include import or export taxes, subsidies, and quantitative restrictions, supplemented by domestic taxes or subsidies for farm outputs or inputs, and consumer subsidies for food staples. The incentives faced by farmers are affected not only by the direct protection or taxation of primary agricultural industries, but also indirectly via policies assisting nonagricultural industries, given that the latter may have an offsetting effect by drawing resources away from farming. This appendix begins by outlining what theory suggests should be measured directly and indirectly. It then outlines the way the theory is put into practice through this study.

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What, According to Theory, Should Be Measured

The key objective of this study—obtaining a long time series on a wide range of countries that are at different stages of development—requires that the indicators be simple. If the indicators are simple, this also means that it would be easier to update the indicators subsequently for policy monitoring. Throughout, we have followed the concept of Bhagwati (1971) and Corden (1997) whereby a market policy distortion is, by definition, imposed by a government to create a gap between the marginal social return to a seller and the marginal social cost to a buyer in a transaction. The distortion creates an economic cost to society that may be estimated using welfare measurement techniques such as those pioneered by Harberger (1971). As Harberger notes, this focus allows for great simplification in the evaluation of the marginal costs of a set of distortions: changes in economic costs may be evaluated by taking into account the changes in volumes directly affected by the distortions and ignoring all other changes in prices. In the absence of divergences such as externalities, the measure of a distortion is the gap between the price paid and the price received, irrespective of whether the level of these prices is affected by the distortion.

Other developments that change the incentives facing producers and consumers may include flow-on consequences of the distortion, but these should not be confused with the direct price distortion that we aim to estimate. If, for instance, a country is large in world trade for a given commodity, the imposition of an export tax may raise the price in international markets, thereby reducing the adverse impact of the distortion on producers in the taxing country. Another flow-on consequence is the effect of trade distortions on the real exchange rate, which is the price of traded goods relative to nontraded goods. Neither of these flow-on effects are of immediate concern, however, because, if the direct distortions are accurately estimated, they may be incorporated as price wedges into an appropriate country or global economy-wide computable general equilibrium model, which, in turn, will be able to capture the full general equilibrium impacts (inclusive of the real exchange rate effects) of the various direct distortions to producer and consumer prices.

Importantly, the total effect of distortions on the agricultural sector will depend not only on the size of the direct *agricultural* policy measures, but also on the magnitude of distortions generated by direct policy measures that alter the incentives in *nonagricultural* sectors. It is the *relative* prices and, hence, the relative rates of government assistance that affect producer incentives. In a two-sector model, an import tax has the same effect on the export sector as an export tax: this is the Lerner (1936) symmetry theorem. This carries over to a model that has

many sectors and is unaffected if there is imperfect competition domestically or internationally or if some of the sectors produce only nontradables (Vousden 1990). The symmetry theorem is therefore also relevant in the consideration of distortions *within* the agricultural sector. In particular, if import-competing farm industries are protected, such as through import tariffs, then this has similar effects on the incentives to produce exportables as does an explicit tax on agricultural exports; and, if both measures are in place, this represents a double imposition on farm exporters.

In what follows, we begin by focusing on direct distortions to agricultural incentives before turning to those distortions affecting the sector indirectly through nonagricultural policies.

Direct Agricultural Distortions

Consider a small, open, perfectly competitive national economy that encompasses many firms producing a homogeneous farm product with only primary factors. In the absence of externalities, processing, and producer-to-consumer wholesale marketing, plus retail marketing margins, exchange rate distortions, and domestic and international trading costs, such a country would maximize national economic welfare by allowing both the domestic price of the farm product and the consumer price of the farm product to equal E, times P, where E is the domestic currency price of foreign exchange, and P is the foreign currency price of the identical product in the international market. Thus, any government-imposed diversion from this equality, in the absence of any market failures or externalities, would be welfare-reducing in the small economy.

Price-Distorting Trade Measures at the National Border

The most common distortion is an ad valorem tax on competing imports (usually called a tariff), t_m. Such a tariff on imports is the equivalent of a production subsidy and a consumption tax, both at rate t_m. If this tariff on the imported primary agricultural product is the only distortion, its effect on producer incentives may be measured as the *nominal rate of assistance* (NRA) to farm output conferred by the border price support, (NRA_{BS}), which is the unit value of production at the distorted price, less its value at the undistorted free-market price expressed as a fraction of the undistorted price, as follows:[1]

$$NRA_{BS} = \frac{E \times P(1 + t_m) - E \times P}{E \times P} = t_m \tag{A1}$$

The effect of this import tariff on consumer incentives in this simple economy is to generate a *consumer tax equivalent* (CTE) on the agricultural product for final consumers:

$$CTE = t_m \tag{A2}$$

The effects of an import subsidy are identical to those in equations (A1) and (A2) for an import tax, but t_m would have a negative value in that case.

Governments sometimes also intervene through an export subsidy, s_x (or an export tax, in which case s_x would be negative). If this is the only intervention, then:

$$NRA_{BS} = CTE = s_x \tag{A3}$$

If any of these trade taxes or subsidies are specific rather than ad valorem (for example, US$ per kilogram rather than z percent), the ad valorem equivalent may be calculated using slight modifications of equations (A1), (A2), and (A3).

Domestic Producer and Consumer Price-Distorting Measures

Governments sometimes intervene through a direct production subsidy for farmers, s_f (or a production tax, in which case s_f is negative, including through informal taxes in kind by local and provincial governments). In that case, if only this distortion is present, the effect on producer incentives may be measured as the NRA to farm output conferred by the domestic price support (NRA_{DS}), which is as above except that s_f replaces t_m or s_x, but the CTE is zero in this case. Similarly, if the government imposes only a consumption tax, c_c, on this product (or a consumption subsidy, in which case c_c is negative), the *CTE* is as above except that c_c replaces t_m or s_x, but the NRA_{DS} is zero in this case.

The combination of domestic and border price support provides the total rate of assistance to output, NRA_o.

$$NRA_o = NRA_{BS} + NRA_{DS} \tag{A4}$$

What if the Exchange Rate System Is Also Distorting Prices?

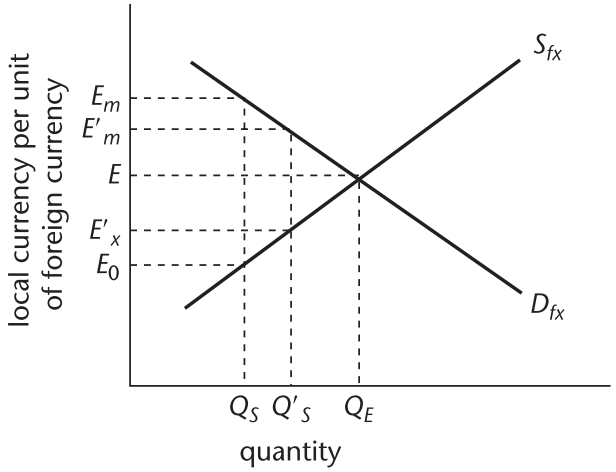
Should a multiple foreign exchange rate regime be in place, then another policy-induced price wedge exists. A simple two-tier exchange rate system creates a gap between the price received by all exporters and the price paid by all importers for foreign currency, thereby changing both the exchange rate received by exporters and the exchange rate paid by importers relative to the equilibrium rate, E, that would prevail without this distortion in the domestic market for foreign currency (Bhagwati 1978).

Exchange rate overvaluation of the type we consider here requires controls by the government on current account transfers. A common requirement is that exporters surrender their foreign currency earnings to the central bank for exchange to local currency at a low official rate. This is equivalent to a tax on exports to the extent that the official rate is below the level of the exchange rate in a market without government intervention. This implicit tax reduces the incentive of exporters to export and, hence, the supply of foreign currency flowing into the country. With less foreign currency, demanders are willing to bid up the purchase price. This provides a potential rent for the government that may be realized by auctioning off the limited supply of foreign currency extracted from exporters or creating a legal secondary market. Either mechanism will create a gap between the official and parallel rates.

Such a dual exchange rate system is depicted in figure A1, in which it is assumed that the overall domestic price level is fixed, perhaps by holding the money supply constant (Derviş, de Melo, and Robinson 1981). The supply of foreign exchange is given by the upward sloping schedule, S_{fx}, and demand by D_{fx}, where the official exchange rate facing exporters is E_0 and the secondary market rate facing importers is E_m. At the low rate, E_0, only Q_S units of foreign currency are available domestically, instead of the equilibrium volume Q_E that would result if exporters were able to exchange, at the equilibrium rate, E units of local currency per unit of foreign currency.[2] The gap between the official and the secondary market exchange rates is an indication of the magnitude of the tax imposed on trade by the two-tier exchange rate: relative to the equilibrium rate, E, the price of importables is raised by $e_m \times$ E, which is equal to $(E_m - E)$, while the price of exportables is reduced by $e_x \times E$, which is equal to $(E - E_0)$, where e_m and e_x are the fractions by which the two-tier exchange rate system raises the domestic price of an importable and lowers the domestic price of an exportable, respectively. The estimated division of the total foreign exchange distortion between an implicit export tax, e_x, and an implicit import tax, e_m, will depend on the estimated elasticities of supply of exports and of demand for imports.[3] If the demand and supply curves in figure A1 had the same slope, then $e_m = e_x$ and $(e_m + e_x)$ is the secondary market premium or proportional rent extracted by the government or its agents.[4]

If the government chooses to allocate the limited foreign currency to different groups of importers at different rates, this is called a multiple exchange rate system. Some lucky importers may even be able to purchase foreign currency at the low official rate. The more that is allocated and sold to demanders whose marginal valuation is below E_m, the greater the unsatisfied excess demand at E_m, and, hence, the stronger the incentive for an illegal or black market to form and for less-unscrupulous exporters to lobby the government to legalize the secondary market

Figure A1. A Distorted Domestic Market for Foreign Currency



Sources: Martin 1993. See also Derviş, de Melo, and Robinson 1981; Kiguel and O'Connell 1995; Kiguel, Lizondo, and O'Connell 1997; Shatz and Tarr 2000.

for foreign exchange and to allow exporters to retain some fraction of their exchange rate earnings for sale in the secondary market. Providing a right to exporters to retain and sell a portion of foreign exchange receipts increases their incentives to export and thereby reduces the shortage of foreign exchange and, thus, the secondary market exchange rate (Tarr 1990). In terms of figure A1, the available supply increases from Q_S to Q'_S, bringing down the secondary rate from E_m to E'_m, such that the weighted average of the official rate and E'_m received by exporters is E'_x; the weights are the retention rate, r, and $(1 - r)$. Again, if the demand and supply curves in figure A1 had the same slope, then the implicit export tax and import tax resulting from this regime would each be equal to half the secondary market premium.

In the absence of a secondary market and in the presence of multiple rates for importers below E_m and for exporters below E_0, a black market often emerges. The rate for buyers in this market will rise above E, the more the government sells its foreign currency to demanders whose marginal valuation is below E_m, and the more active the government is in catching and punishing exporters selling in the illegal market. If the black market were allowed to operate frictionlessly, there would be no foreign currency sales to the government at the official rate, and the black market rate would fall to the equilibrium rate, E. So, even though, in the latter case, the observed premium would be positive (equal to the proportion by which E is above the nominal official rate E_0), there would be no distortion. For our present purposes, because the black market is not likely to be completely frictionless, it may be considered similar to the system involving a retention scheme. In terms of figure A1, E'_m would be the black-market rate for a proportion of sales, and the weighted average of this and E_0 would be the return going to exporters.

Calculating E'_x in this situation (and thereby being able to estimate the implicit export and import taxes associated with this regime) by using the same approach as in the case with no illegal market thus requires not only knowledge about E_0 and the black-market premium, but also a guess about the proportion, r, of sales in the black market.

In short, if a country exhibits distortions in its domestic market for foreign currency, the exchange rate relevant for calculating the NRA_o or the *CTE* for a particular tradable product depends, in the case of a dual exchange rate system, on whether the product is an importable or an exportable, while, in the case of multiple exchange rates, it depends on the specific rate that applies to the product each year.

What About Real Exchange Rate Changes?

A change in the real exchange rate alters equally the prices of exportables and importables relative to the prices of nontradable goods and services. Such a change may arise for many different reasons, including changes in the availability of capital inflows, macroeconomic policy adjustments, or changes in the international terms of trade. If the economy receives a windfall, such as a greater inflow of foreign exchange from remittances, foreign aid, or a commodity boom, the community moves to a higher indifference curve (Collier and Gunning 1998). While net imports of tradables may change in response to this inflow of foreign exchange, the domestic supply of and demand for nontradables must balance. The equilibrating mechanism is the price of nontradables. The price of nontradables rises to bring forth the needed increase in the supply of nontradables and to reduce the demand for these products so as to bring the demand into line with supply (Salter 1959).

While this type of alteration in the real exchange rate affects the incentive to produce tradables, it is quite different in two respects from the distortions in the market for foreign currency analyzed above. First, this real exchange rate appreciation reduces the incentives to produce importables and exportables to the same degree. In contrast with the case of the multiple-tier exchange rate, the appreciation does not generate any change in the prices of exportables relative to importables. Second, most such changes do not involve direct economic distortions of the type measurable using tools such as producer surplus or consumer surplus. If the government or the private sector chooses to borrow more from abroad to increase domestic spending, this may raise the real exchange rate, but such an outcome is not obviously a distortion. Moreover, the symmetric treatment of any such overvaluation during periods of high foreign borrowing would require that one take into account exchange rate undervaluation during periods of low foreign borrowing or the repayment of foreign debt. For these reasons, we do not follow Krueger,

Schiff, and Valdés (1988) or Orden et al. (2007) in including deviations of real exchange rates from benchmark values unless these deviations arise from direct exchange rate distortions such as multiple-tier exchange rates.[5]

What if Trade Costs Are Too High for a Product to Be Traded Internationally?

Suppose the transport costs of trading are sufficient to make it unprofitable for a product to be traded internationally, such that the domestic price fluctuates over time within the band created by the cost, insurance, and freight import price and the free on board export price. Then, any trade policy measure (t_m or s_x) or the product-specific exchange rate distortion (for example, e_m or e_x) is redundant. In this case, in the absence of other distortions, $NRA_o = 0$, and the $CTE = 0$. However, in the presence of any domestic producer or consumer tax or subsidy (s_f or t_c), the domestic prices faced by both producers *and* consumers will be affected. The extent of the impact depends on the price elasticities of domestic demand and supply for the nontradable (the standard closed-economy tax incidence issue).

Thus, for example, suppose only a production tax is imposed on farmers producing a particular nontradable, so that $s_f < 0$ and $t_c = 0$. In this case:

$$NRA_{DS} = \frac{s_f}{1 + \frac{\varepsilon}{\eta}} \tag{A5}$$

and

$$CTE = \frac{-s_f}{1 + \frac{\eta}{\varepsilon}} \tag{A6}$$

where ε is the price elasticity of supply, and η is the (negative of the) price elasticity of demand.[6]

What if Farm Production also Involves Primary Factors, but Intermediate Inputs?

Where intermediate inputs are used in farm production, any taxes or subsidies on the production, consumption, or trade of these inputs would alter farm value added and thereby also affect farmer incentives. Sometimes, a government will have directly offsetting measures in place, such as a domestic subsidy for fertilizer use by farmers, but also a tariff on fertilizer imports. In other situations, there will be farm input subsidies, but an export tax on the final product.[7] In principle, all these items might be brought together to calculate an effective rate of direct assistance to farm value added (the effective rate of assistance). The nominal rate of direct assistance to farm output, NRA_o, is a component of this, as is the sum of the

nominal rates of direct assistance to all farm inputs, call it NRA_i. In principle, all three rates may be positive or negative.

The participants in this project have not been required to estimate effective rates of assistance because to do so requires a knowledge of each product's value added share of output. Such data are not available for most developing countries for every year in the time series nor even for every few years. And, in most developing countries, distortions to farm inputs are small compared with distortions to farm output prices, and these purchased inputs are a small fraction of the value of output. However, where there are significant distortions to input costs, the ad valorem equivalent is accounted for by summing each input's NRA, multiplying this by the input-output coefficient to obtain the combined NRA_i, and adding this to the farm industry's nominal rate of direct assistance to farm output, NRA_o, to obtain the total NRA in farm production, call it simply NRA.[8]

$$NRA = NRA_o + NRA_i. \tag{A7}$$

What About Postfarmgate Costs?

If a state trading corporation is charging excessively for its marketing services, thereby lowering the farmgate price of a product (for example, as a way of raising government revenue in place of an explicit tax), the extent of the excess should be treated as if it were a tax.

Some farm products, including some that are not internationally traded, are inputs into a processing industry that may also be subject to government interventions. In this case, the effect of these interventions on the price received by farmers for the primary product also needs to be taken into account. Before we explain how, it may be helpful first to review the possible role the marketing and distribution margins of the value chain may play in the calculation of distortions in primary agricultural activities so as to ensure that nondistortionary price wedges are not inadvertently included in any distortion calculations.

Nondistortionary Price Wedges

So far, it has been assumed that there are no divergences among farmer, processor-wholesaler, consumer, and border prices other than those arising because of subsidies or taxes on production, consumption, trade, or foreign currency. In practice, this is not so, and these costly value chain activities need to be explicitly recognized and netted out in using comparisons of domestic and border prices to derive estimates of government policy-induced distortions.[9] Such recognition also offers the opportunity to compare the size of the NRA with wedges associated with, for instance, trade and processing costs (used in trade facilitation and value chain analyses, respectively). It may also expose short-term situations where the

profits of importers or exporters are amplified by less-than-complete adjustment by agents in the domestic value chain.

Domestic Trading Costs

Trading costs may be nontrivial both intra- and internationally, especially in developing countries with poorly developed infrastructure.[10] For example, domestic trading costs are involved in delivering farm products to port or to domestic wholesalers (assuming the latter are at the international border; otherwise, another set of domestic transport costs needs to be added to obtain a relevant price comparison). Suppose, for instance, that domestic transport costs are equal to the fraction T_f of the price received by the farmer.

Processor-Wholesaler Costs

Domestic processing costs and wholesale and retail distribution margins may represent a large share of the final retail price. Indeed, Reardon and Timmer (2007) argue that these costs and margins are an increasingly important part of the value chain in developing countries because consumers desire more post-farm processing and services added to their farm products, aided by the contribution of the supermarket revolution to globalization.[11] We denote the increases in the consumer price caused by these processing and wholesaling activities, over and above the farmgate price plus domestic trade costs, as m_p and m_u, respectively (or simply m_u above the price of the imported processed product if the processing must be done before the product is internationally tradable), in the absence of market imperfections or government distortions along the value chain.

International Trading Costs

International trading costs are not an issue in the distortions calculations if the international price used is the cost, insurance, and freight import unit value for an importable or the free on board export unit value for an exportable. But these costs are relevant if there is no trade (because of, say, a prohibitive trade tax on the product) or if the border prices are unrepresentative (because of low trade volumes, for example). In these instances, it is recommended that one select an international indicator price series (such as those of the World Bank or the International Monetary Fund) and account for international trading costs (ocean or air freight, insurance, and so on).[12] We denote T_m as the proportion by which the domestic price of the import-competing product is raised above what it would otherwise be at the country's border, or, equivalently, we denote T_x as the fraction of the free on board price by which the price abroad of the exported product is greater.

Product Quality and Variety Differences

The quality of a product traded internationally is usually considered to differ from the quality of the domestically sold substitute, and consumers typically have a home-country bias.[13] Whenever appropriate, the domestic price should be deflated (inflated) by the extent to which the good imported is deemed by domestic consumers to be inferior (superior) in quality to the domestic product.[14] We denote q_m as the deflating fraction for the adjustment for product quality and variety differences in the case of importables.

The situation is similar for exported goods. Especially if an international indicator price has to be used in lieu of the free on board export unit value (for example, if exports are close to zero and unrepresentative), the international price needs to be deflated (inflated) by the extent to which the good is deemed by foreign consumers to be inferior (superior) in quality relative to the indicator good. We denote q_x as the deflating fraction to adjust for product quality and variety differences in the case of exportables.

Net Effect of Nondistortionary Influences

If one takes into consideration all these influences and so long as the product is still traded internationally, the relationships between the price received by domestic farmers and the international price, in the absence of government-imposed price and trade policies, are described by the following for an importable:

$$E \times P = \frac{P_f(1 + T_f)(1 + m_p)(1 - q_m)}{1 + T_m} \tag{A8}$$

and for an exportable it is the following:

$$E \times P = \frac{P_f(1 + T_f)(1 + m_p)(1 + T_x)}{1 - q_x} \tag{A9}$$

while the urban consumer price is above the producer price to the following extent:

$$P_c = P_f(1 + T_f)(1 + m_p)(1 + m_u) \tag{A10}$$

where P_f is the farmgate price.

The Impact of Distortions in Food Processing on Agricultural NRAs

Some farm products that are not internationally traded in their primary form (for example, raw milk and cane sugar) are tradable once they have been lightly processed, and the downstream processing industry may also be subject to government interventions. In this case, the effect of the latter interventions on the

price received by farmers for the primary product also needs to be taken into account, and the primary product should be classified as tradable.

Some analysts have assumed that any protection to processors, if it is passed back fully to primary agriculture (as may be the case with a farmer-owned cooperative processing plant, for example), effectively raises the farmer price by the amount of the rise in the processor price, divided by the proportional contribution of the primary product to the value of the processed product. Another equally extreme, but opposite assumption is that there is zero pass-through by the processor back down the value chain to the farmer. This is likely to be the case if the raw material may be sourced internationally, but seems unlikely if the primary product is nontradable and there is a positive price elasticity of farm supply (since an assisted processor would want to expand). A more neutral assumption is that there is a proportional pass-through by the processor down the value chain to farmers and their transporters, or up the value chain to consumers. This would be equivalent to an equal sharing of the benefits along the value chain, which is more likely to be the case, the more equally market power is spread among the players in the chain.

This trio of examples illustrates the importance both of separating primary and processed activities for the purpose of calculating agricultural assistance rates and of being explicit about the extent of pass-through that is occurring in practice and, hence, the consequences for the NRAs in primary agricultural and processing activities.[15]

The above examples involving processors may also be generalized to any participants in the value chain. In particular, state trading enterprises and parastatal marketing boards may intervene significantly, especially if they have been granted monopoly status by the government. Such interventions by domestic institutions may explain the low econometrically estimated degree of transmission of price changes at a border to farmgate domestic prices even following a significant reform of more-explicit price and trade policies (see Baffes and Gardner 2003 and the references cited therein). Where reform has also involved the freeing up of previously controlled parts of the marketing chain, the lowered marketing margin may provide a benchmark against which to compare the prereform margin (as in Uganda beginning in the mid-1990s; see Matthews and Opolot 2007).

The Mean and Standard Deviation of Agricultural NRAs

We need to generate a weighted average NRA for covered products in each country because only then will we be able to add the NRA for noncovered products to obtain the NRA for all agriculture. If one wishes to average across countries, each polity is

an observation of interest; so, a simple average is meaningful for the purpose of political economy analysis. But, if one wants a sense of the distortions in agriculture in a whole region, a weighted average is needed. The weighted average NRA for covered primary agriculture may be generated by multiplying the value share of each primary industry in production (valued at farmgate equivalent undistorted prices) by the corresponding NRA and then adding across industries.[16] The overall sectoral rate, which we denote as *NRAag*, may be obtained by also adding the actual or assumed information for the commodities not covered and, where it exists, the aggregate value of non-product-specific assistance to agriculture.

A weighted average may be similarly generated for the tradables part of agriculture—including those industries producing products such as milk and sugar that require only light processing before they are traded—by assuming that the share of the non-product-specific assistance in this subsector equals the subsector's weight in the total. Call this $NRAag^t$.

In addition to the mean, it is important also to provide a measure of the dispersion or variability of the NRA estimates across the covered products. The cost of government policy distortions in incentives in terms of resource misallocation tends to be greater, the greater the degree of substitution in production (Lloyd 1974). In the case of agriculture involving the use of farmland that is sector specific, but transferable among farm activities, the greater the variation of NRAs across industries within the sector, the higher the welfare cost of these market interventions. A simple indicator of dispersion is the standard deviation of industry NRAs within agriculture.[17]

Trade Bias in Agricultural Assistance

A trade bias index also is needed to indicate the extent to which a country's policy regime has an antitrade bias within the agricultural sector. This is important because, as the Lerner (1936) symmetry theorem demonstrates, a tariff that assists import-competing farm industries has an effect on farmer incentives that is the same as the effect of a tax on agricultural exports (see elsewhere above), and, if both measures are in place, this is a double imposition on farm exports. The higher the NRA for import-competing agricultural production ($NRAag_m$) relative to the NRA for exportable farm activities ($NRAag_x$), the more incentive producers in the subsector will have to bid for mobile resources that would otherwise have been employed in export agriculture, all else being equal.

Once each farm industry has been classified as import-competing, as a producer of exportables, or as a producer of a nontradable (the status may sometimes change over the years; see below), it is possible to generate, for each year, the weighted average NRAs for the two different groups of tradable farm industries.

These may then be used to generate an agricultural trade bias index, *TBI*, which is defined as follows:

$$TBI = \left[\frac{1 + NRAag_x}{1 + NRAag_m} - 1\right] \tag{A11}$$

where $NRAag_m$ and $NRAag_x$ are the average NRAs, respectively, for the import-competing and exportable parts of the agricultural sector (their weighted average is $NRAag^t$). This index has a value of zero whenever the import-competing and export subsectors are equally assisted, and its lower bound approaches -1 in the most extreme case of an antitrade policy bias.

Indirect Agricultural Assistance and Taxation through Nonagricultural Distortions

In addition to direct assistance to or taxation of farmers, the Lerner (1936) symmetry theorem also demonstrates that farmer incentives are affected indirectly by government assistance to nonagricultural production in the national economy. The higher the NRA for nonagricultural production (*NRAnonag*), the more incentive producers in other sectors will have to bid up the value of mobile resources that would otherwise have been employed in agriculture, all else being equal. If *NRAag* is below *NRAnonag*, one might expect there to be fewer resources in agriculture than there would be under free-market conditions in the country, notwithstanding any positive direct assistance to farmers, and, conversely, if $NRAag > NRAnonag$. A weighted average may be generated for the tradables part of nonagriculture, too; call it $NRAnonag^t$.

One of the most important negative effects on farmers arises from protection for industrialists from import competition. Tariffs are part of this, but so, too (especially in past decades), are nontariff barriers to imports. Other primary sectors (fishing, forestry, and minerals, including the extraction of energy raw materials) tend, on average, to be subject to fewer direct distortions than either agriculture or manufacturing, but there are important exceptions. One example is a ban on logging; however, if such a ban is instituted for genuine reasons of natural resource conservation, it should be ignored. Another example is a resource rent tax on minerals. Unlike an export tax or quantitative restriction on the exports of such raw materials (which are clearly distortive and would need to be included in the NRA for mining), a resource rent tax, like a land tax, may be fairly benign in terms of resource reallocation and, so, may be ignored (see Garnaut and Clunies Ross 1983).

The largest part of most economies is the services sector. This sector produces mostly nontradables, many of which are provided through the public sector. Distortions in service markets have been extraordinarily difficult to measure, and no

systematic estimates across countries are available over time or even for a recent period. The only feasible way to generate time series estimates of *NRAnonag* in this project has therefore involved the assumption that all services are nontradable, and that they, along with other nonagricultural nontradables, face no distortions. All the other nonagricultural products may be separated into exportables and import-competing products for purposes of estimating correctly their weighted average NRAs, ideally using production valued at border prices as weights (although, in practice, most of our authors have had to use shares of gross domestic product).

Foreign exchange rate misalignment relative to the value of a country's currency—as suggested by the fundamentals—will be ignored (see elsewhere above). This is because a real appreciation of the general foreign exchange rate uniformly lowers the price of all tradables relative to the price of nontradables; the converse is true for a real devaluation. If a change in the exchange rate has been caused by aid or foreign investment inflows, then the excess of tradables consumption over tradables production leads to a new equilibrium. Certainly, such a new inflow of funds would reduce the incentives among farmers producing tradable products, but this is not a welfare-reducing policy distortion. Thus, it is only the exchange rate distortions caused by a dual or multiple exchange rate system that need to be included in the calculation of the NRAs for the exportable and import-competing parts of the nonagricultural sector and, hence, of $NRAnonag^t$, and this should be accomplished in the same way discussed above for the inclusion of these distortions in the calculation of $NRAag^t$.

Assistance to Agricultural Production Relative to Nonagricultural Production

Given the calculation of $NRAag^t$ and $NRAnonag^t$ as above, it is possible to calculate a relative rate of assistance (RRA), defined as follows:

$$RRA = \left[\frac{1 + NRAag^t}{1 + NRAnonag^t} - 1\right] \tag{A12}$$

Because an NRA cannot be less than -1 if producers are to earn anything, then neither can the RRA. The RRA is a useful indicator in undertaking international comparisons over time of the extent to which a country's policy regime has an anti- or proagricultural bias.

The Ways the Theory Is Put into Practice in This Study

Making the theory described above operational in the real world, where data are often scarce, especially over a long time period, is as much an art as a science.[18] Thankfully, for many countries, we have not had to start from scratch. NRAs are

available from as early as 1955 in some cases and at least from the mid-1960s to the early or mid-1980s for the 18 countries included in Krueger, Schiff, and Valdés (1988, 1991a) and Anderson and Hayami (1986). Much has been done to provide detailed estimates since 1986 of direct distortions in farmer incentives (though not in food processing) in the high-income countries that are now members of the Organisation for Economic Co-operation and Development (OECD) and, since the early to mid-1990s, in selected European transition economies and Brazil, China, and South Africa (OECD 2007a, 2007b). At least for direct distortions, the Krueger, Schiff, and Valdés measures (1988, 1991a) have been updated to the mid-1990s for some Latin American countries (Valdés 1996) and have also been provided for some countries in Eastern Europe (Valdés 2000), and a new set of estimates of simplified producer support estimates for a few key farm products in China, India, Indonesia, and Vietnam since 1985 is now available from the International Food Policy Research Institute (Orden et al. 2007). The methodology described above is, in some sense, a variation on each of these studies, and the basic price data, at least, as well as the narratives attached to the estimates in these studies, are invaluable springboards for our study.[19]

Time Period Coverage of the Study

For Europe's transition economies, it is difficult to find meaningful data on the situation prior to 1992. For the same reason, estimates are not particularly useful before the 1980s for China and Vietnam. For all other countries, the target start date has been 1955, especially if this date includes years before independence so that one might examine the effects of independence, although, for numerous developing countries, the data simply are not available. The target end date has been 2004, but, where available, 2005 data have also been included. In most cases, the most recent few years offer the highest-quality data.

Farm Product Coverage of the Study

The agricultural commodity coverage includes all the major food items (rice, wheat, maize or other grains, soybeans or other temperate oilseeds, palm oil or other tropical oils, sugar, beef, sheep and goat meat, pork, chickens and eggs, and milk), plus other key country-specific farm products (for example, other staples, tea, coffee or other tree crop products, tobacco, cotton, wine, and wool). Globally, as of 2001, one-third of the value added in all agriculture and food industries has been highly processed food, beverages, and tobacco (GTAP Database; Dimaranan 2006). We have also addressed these products briefly, in the same cursory way we have addressed nonagricultural products. Fruits and vegetables are another one-sixth; so, the rest constitute the other half. Of that other half, meats are one-third;

grains and oilseeds are almost another one-third; dairy products are one-sixth; and sugar, cotton, and other crops account for slightly more than one-fifth. If the high-income countries are excluded, these shares change quite sharply. Then, highly processed food, beverages, and tobacco are only half as important; fruits and vegetables are somewhat more important, and, if these two groups (which together account for 41 percent of the total) are excluded, the residual is equally divided among three groups: meats, grains and oilseeds, and other crops and dairy products. By focusing on all major grain, oilseed, and livestock products, plus any key horticultural and other crop products, the coverage of our project reaches the target of 70 percent of the gross value of production of primary agriculture and lightly processed food products. Priority has been assigned to the most distorted industries because the residual will then have not only a low weight, but also a low degree of distortion.

If highly processed food, beverages, and tobacco are excluded, then fruits and vegetables account for almost one-quarter of household food expenditure in developing countries. If fruits and vegetables are also excluded, three groups each then account for almost 30 percent of expenditure: pig and poultry products, red meat and dairy products, and grains and oilseed products. All other crops account for the remaining one-eighth. So, from the consumer tax viewpoint, the desired product coverage is the same as the coverage outlined above from a production viewpoint.

Each product is explicitly identified as import-competing, exporting, or nontradable. For many products, this categorization changes over time. In some cases, products move monotonically through these three categories, and, in others, they fluctuate in and out of nontradability. Hence, an indication of a product's net trade status is given for each year rather than for only one categorization for the whole time series. In large-area countries with high internal and coastal shipping costs, some regions may be exporting abroad, even while other regions are net importers from other countries. In such cases, it is necessary to estimate separate NRAs for each region and then generate a national weighted average.

Farm Input Coverage

The range of input subsidies considered in any particular country study in our project has depended on the degree of distortions in that country's input markets. In addition to fertilizer, the large inputs and distortions are likely to involve electrical or diesel power, pesticides, and credit (including, occasionally, large-scale debt forgiveness, as in Brazil and Russia, although how this is spread out beyond the year of forgiveness is an issue).[20] There are also distortions revolving around water, but the task of measuring water subsidies is especially controversial and complex; so, these distortions have not been included in the NRA calculations. (The OECD has also

ignored them in its producer support estimates.) Similarly, distortions in land and labor markets have been excluded, apart from qualitative discussions in the analytical narratives in some of the country case studies.

Trade Costs

For the calculation of distortions in international trading costs, T_m and T_x, the free on board–cost, insurance, and freight gap in key bilateral trade in products during years when the products have been traded in significant quantities is used. Both international and domestic trading costs are a function of the quality of hard infrastructure (roads, railways, ports) and soft infrastructure (business regulations and customs clearance procedures at state and national borders), each of which may be affected by government actions. However, because it is difficult to allocate these costs between items that are avoidable and those that are unavoidable, measuring the aggregate size of the distortions involved in a comparable way for a range of countries is beyond the scope of this study.[21]

Classifying Farm Products as Import-Competing, Exportable, or Nontradable

The criteria used in classifying farm industries as import-competing (M), exporting (X), or nontrading (H) are not straightforward. Apart from the complications raised above about whether a product is not traded simply because of trade taxes or nontariff barriers, there will be cases where trade is minimal, or the trade status has been reversed because of policy distortions, or the industry is characterized by significant imports *and* exports. A judgment has to be made for each sector each year as to whether it should be classified as M, X, or H. In the case of the two tradable classifications (that is, leaving out nontradables), this judgment will determine which exchange rate distortion to use. If trade is minimal for reasons of trade cost rather than reasons of trade policy, then a product is classified as nontradable if the share of production exported *and* the share of consumption imported are each less than 2.5 percent, except in situations (for example, rice in China) in which the product is clearly an exportable year after year even though the self-sufficiency rate is rarely above 101 percent. Otherwise, if the share of production exported is substantially above (below) the share of consumption imported, the product is classified as exportable (importable).

In cases in which the trade status has been reversed because of a policy distortion (for instance, an export subsidy, in combination with a prohibitive import tariff, is large enough to encourage sufficient production to generate an export surplus), the product should be given the classification of the trade status that would prevail without the intervention (that is, import-competing). The

same applies if tariff preferences reverse a country's trade status with respect to a product. The exports of many countries enjoy preferential access into the protected markets of other countries. In some cases, these arrangements are based on bilateral or plurilateral free trade agreements or customs unions. In other cases, the preferences are unilaterally offered by higher-income countries to developing countries through schemes such as the generalized system of preferences, the Cotonou Agreement (between the Africa, Caribbean, and Pacific group and the European Union [EU]), and the EU's Everything But Arms Initiative. In the few extreme cases where these preferences are such that they (in combination with a prohibitive import tariff) cause the developing country to become an exporter of a product that would otherwise be import-competing (such as sugar in the Philippines), the product should nonetheless be classified as import-competing because the developing country's import-restrictive policy is allowing the domestic price of the product to equal the price reached in exporting to the preference-providing country.

If there are significant exports *and* imports in a given year, closer scrutiny is required. If, for example, there are high credit or storage costs domestically, a product may be exported immediately following harvest, but imported later in the year to satisfy consumers out of season. The product would be considered an exportable for purposes of calculating the NRA because, even if there are policies restricting out-of-season imports (which would affect the CTE calculation), they would not represent an encouragement for the production earlier in the year in the presence of high credit or storage costs.

If trade or exchange rate distortions are sufficiently large to choke off international trade in a product, then they contribute to the NRA and CTE only to the extent required to drive that trade to zero: any trade taxes that exceed this requirement have an element of redundancy. If there are trade policy distortions, but no trade passes over them (that is, they are prohibitive), there may still be policy effects that need to be measured, but they will differ from those involved in the other cases above. An example would be a prohibitive tariff that is high enough to take the price of imported goods above the autarchy price and thus results in no imports. The NRA would therefore be less than the prohibitive tariff rate. Another common example is an import tariff in a context in which the world price is sufficiently high so that the country is freely exporting the product at issue. In this case, the domestic price would be determined by the world price, less the export trade costs; the import tariff would be irrelevant, and there would be no distortion despite the presence of the import tariff.

Similar conditions apply to exportable goods in a context in which a prohibitive export tax creates a distortion at a level lower than the tax rate. Then, the distortion wedge would be equal to the difference between the autarchy price and the world

price, less the export trade costs; if the country were freely importing the good, the export tax would be irrelevant, and there would be no distortion despite the presence of the export tax. The choice of the international price to be compared with domestic prices is therefore not based only on the actual trading status of a country (Byerlee and Morris 1993). Moreover, different prices may be needed for different regions of a large country that simultaneously exports and imports because internal trading costs (including coastal shipping) are so high relative to international trading costs (Koester 1986). In this case, the value of production is split according to the regional production shares in the country. If the only intervention in this sector is a tariff on imports, the tariff rate is the NRA estimate for the import-competing part, and the NRA is zero for the other part of the sector; these different NRAs are then included in the weighted average calculations of the NRAs for the import-competing and exportable subsectors of agriculture.

The Transmission of Assistance and Taxation along the Agricultural Value Chain

A crucial aspect of the NRA calculation for agricultural products is the way any policy measure beyond the farmgate is transmitted back to farmers and forward to consumers. Only a few parameters and exogenous variables are needed to obtain meaningful estimates of an individual agricultural product's NRA and CTE. Specifically, to take account of the pass-through of distortions along the value chain, parameters have been identified as follows (although the default is an equi-proportionate pass-through):

- θ_f, the extent to which any distortion to a primary farm product at the wholesale level is passed back to farmers
- θ, the extent to which any distortion to the downstream processed product is passed back to wholesalers of a primary farm product that is nontradable

The CTEs of Farm Products

Many farm products are processed and are used as ingredients in the additional processing of food products before the food products are purchased by final consumers. (For example, wheat is ground to flour and then mixed with other ingredients before baking, slicing, and packaging for sale as bread.) Other farm products are used as inputs in various farm activities, often after the farm products have undergone some processing. (Thus, soybeans are crushed, and the meal is mixed with maize or other feed grains for use as animal feed, while the oil is sold for cooking.) Because of these many and varied value chain paths and because, in practice, it is difficult anyway to determine the extent to which a change in the primary farm product would be passed along any of these value chains, the OECD

expresses its consumer support estimate simply at the level at which a product is first traded (for example, as wheat, or soybeans, or beef). This practice has been adopted here, too, to generate a consistent set of CTEs across countries to use in the analysis in chapter 1 (even though our authors of individual country studies may report CTEs that they have estimated in a more sophisticated way farther along the value chain). In the absence of any domestic production or consumption taxes or subsidies directly affecting a product, the CTE at the point at which the product is first traded will be the same as the NRA_o. (Also recall that the NRA_o in this case also equals the NRA if NRA_i is zero.)

Key Required Information

A template spreadsheet has been designed to aid in the management of individual country information and ensure a consistent comparison across regions and periods. The precise ways in which parameters and exogenous variables have entered each country spreadsheet to generate the NRAs and CTEs endogenously are detailed in Anderson et al. (2008). Most are straightforward; the main exception is the treatment of exchange rate distortions that is described below.

The key exogenous variables needed are the agricultural quantities produced and consumed (or imported and exported if the proxy for consumption is production plus net imports); the wholesale and border prices of primary and lightly processed agricultural goods (along with, where relevant, a quality adjustment to match border prices); agricultural domestic input and output subsidies and taxes (the default is zero); if there are distorted farm input markets, the share of the input in the value of farm output at border prices (and, if there are only farmgate prices rather than wholesale prices for a primary good, the proportion of the farmgate value in the value at the wholesale level measured at the border price); the final domestic food consumer subsidies or taxes (the default is zero); and the official exchange rate (and, where prevalent, the parallel exchange rate and the share of currency going through the secondary or illegal market, plus the product-specific exchange rate if a multiple exchange rate system is in place).

Exchange Rate Distortions

The treatment of exchange rate distortions is worth spelling out since it differs from the method used by Krueger, Schiff, and Valdés (1988, 1991a).

If there are no exchange rate distortions, the official exchange rate is used. However, in the presence of a parallel market rate (which might be the black-market rate if no legal secondary market exists), this is reported, along with an estimate of the proportion of foreign currency that is actually sold by exporters at the parallel market rate. This proportion is the formal retention rate if a formal

dual exchange regime is in place; otherwise, it is based on a guesstimate of the proportion traded on the black market. (The black-market premiums are provided in Cowitt, various years; Cowitt, Edwards, and Boyce, various years; and the Global Development Network Growth Database.) The spreadsheet is then used to compute an estimate for the equilibrium exchange rate for the economy; this is the rate at which international prices are converted into local currency for the computation of each NRA.

Relevant exchange rates for importers and exporters are also then computed endogenously. If they are distorted away from the official exchange rate, the relevant exchange rate for importers and exporters are, respectively, the discounted parallel market rate and the weighted average of the official exchange rate and the discounted parallel rate according to the proportion of the exporter's currency that is sold on the parallel market. However, if a multiple exchange rate system is in place and this system provides for a specific rate for a product that differs from the general rates automatically calculated as above, then the automatically computed relevant exchange rate is replaced by this industry-specific rate.

Guesstimates of NRAs for Agricultural Products not Covered

In the calculation of the weighted average rates of assistance for a subsector or sector, NRAs must be guesstimated for the agricultural products that are not covered (30 percent or so) and for which price comparisons are not calculated. The OECD, in its work on producer support estimates, assumes that the part not measured enjoys the same market price support as the average of the measured part. Another default is the assumption that the rates are zero. Orden et al. (2007) show that these two alternatives produce significantly different results for India. It is therefore preferable to make informed judgments about the import-competing, exportable, and nontradable parts of the residual group of farm products. An average applied import tariff is often the best guess for only the import-competing products among this set if there is no evidence of the existence of explicit production, consumption, or export taxes or subsidies. Even though this approach will miss the nontariff trade barriers affecting these residual products, the bias will be small if the weight is small.

Non-Product-Specific Assistance to Agriculture

If, in addition to the product-specific subsidies or taxes, there are non-product-specific forms of agricultural subsidies or taxes that one is unable to allocate among importables, exportables, and nontradables, these are included in the

NRAag using the same method (as a percentage of the total value of production) used for these types of interventions in the OECD's calculations of its total support estimate (see OECD 2007a, 2007b).

No attempt is made to estimate the discouraging effects of underinvestment in rural infrastructure or underdevelopment among pertinent institutions. The structure of the related expenditure within the rural sector is also important. This may well be a nontrivial part of the distortions in agricultural incentives, but, unfortunately, it is not captured in the measures of distortions outlined above.

In some higher-income countries, governments also assist farm households through payments that are purported to be decoupled from production incentives. An example is the single farm payment in the EU. We count such payments as part of *NRAag* because typically they still do alter producer incentives somewhat. However, we show in charts the ad valorem equivalent of these payments to farmers as a social group so as to be able to compare the order of magnitude of this equivalent with the support provided through conventional price measures that alter production incentives.

Assistance to Nonagricultural Sectors

If nonagricultural sectors are assisted only through import tariffs on manufactures or export taxes on minerals, it is a relatively easy task to estimate a weighted average *NRAnonag* once the shares of import-competing, exporting, and nontradable production have been determined. In practice, however, nontariff trade measures must also be considered among the measures affecting tradables (Dee and Ferrantino 2005; OECD 2005), and most economies have myriad regulations affecting the many service industries. These regulations may be complex (see Findlay and Warren 2000). Because most of the outputs of service industries (including the public sector) are nontradable, the default in this study is to assume that the average rate of government assistance, along with that of nontradable nonagricultural goods, is zero. Then, the task of estimating the *NRAnonag* is reduced to obtaining only the NRAs for the producers of import-competing products and of export-oriented nonagricultural goods, plus the shares of these products and goods in the undistorted value of the production of nonagricultural tradables, so as to derive the weighted average $NRAnonag^t$ to be entered into the RRA calculations.

The Use of Percentages in the Chapters

To simplify the presentation in the chapters, the NRA_o, NRA_i, *NRA*, *CTE*, and *RRA* are expressed there as percentages rather than proportions.

Notes

1. The NRA therefore differs from the producer support estimate calculated by the Organisation for Economic Co-operation and Development (OECD) in that the producer support estimate is expressed as a fraction of the distorted value (see the OECD PSE-CSE Database). It is thus $t_m/(1 + t_m)$, and, so, for a positive, t_m, it is smaller than the NRA and is necessarily less than 100 percent.

2. By equilibrium is here meant the situation that would prevail without the distortion in the domestic market for foreign currency. In figure A1 and in the discussion that follows, the equilibrium exchange rate, E, exactly balances the supply and demand for foreign currency. Taken literally, this implies a zero balance on the current account. The approach here may readily be generalized to accommodate exogenous capital flows and transfers, which would shift the location of Q_E. With constant-elasticity supply and demand curves, all of the results would carry through, and any exogenous change in the capital flows or transfers would imply a shift in the D_{fx} or S_{fx} curves.

3. From the viewpoint of using the NRA_o and CTE estimates later as parameters in a computable general equilibrium model, it does not matter which assumptions are made here about these elasticities because the model's results for real variables will not be affected. What matters for real impacts is the magnitude of the total distortion, not its allocation between an export tax and an import tax; this is the traditional incidence result from tax theory that also applies to trade taxes (Lerner 1936). For an excellent general equilibrium treatment using an early version of the World Bank's 1–2–3 model, see de Melo and Robinson (1989). There, the distinction is drawn between traded and nontraded goods (using the Armington 1969 assumption of differentiation between products sold on the domestic market and products sold on the international market), in contrast to the distinction between tradable and nontradable products made below in the text.

4. Note that this same type of adjustment might be made if the government forces exporters to surrender all foreign currency earnings to the domestic commercial banking system and importers to buy all foreign currency needs from that banking system and if that system is allowed by regulation to charge excessive fees. This apparently occurs in, for example, Brazil, where the spread is reputedly 12 percent. If actual costs in a nondistorted competitive system are only 2 percent (as they are in the less distorted Chilean economy), the difference of 10 points might be treated as the equivalent of a 5 percent export tax and a 5 percent import tax applying to all tradables (although, as with nontariff barriers, there would be no government tariff revenue, but rather rent, which, in this case, would accrue to commercial banks instead of to the central bank). This is an illustration of the point made by Rajan and Zingales (2004) about the power of financial market reform to expand opportunities.

5. The results of a multicountry research project that has had macropolicy as its focus are reported in Little et al. (1993).

6. As in the case of the two-tier exchange rate, the elasticities are used merely to identify the incidence of these measures; as long as both the NRA_o and the CTE are included in any economic model used to assess the impact of the production tax, the real impacts will depend only on the magnitude of the total distortion, s_f, not on the estimated NRA and CTE.

7. On this general phenomenon of offsetting distortions for outputs and inputs (and even direct payments or taxes), see Rausser (1982).

8. Bear in mind that a fertilizer plant or livestock feed mix plant might be enjoying import tariff protection that raises the domestic price of fertilizer or feed mix to farmers by more than any consumption subsidy (as was the situation with respect to fertilizer in Korea; see Anderson 1983). In such a case, the net contribution of this set of input distortions to the total NRA for agriculture would be negative.

9. This is not to say that there is no interest in comparisons across countries or over time in, for example, the farmgate price as a proportion of the free on board export price, which summarizes the extent to which the producer price is depressed by the sum of internal transport, processing, and marketing costs, plus items such as explicit or implicit production or export taxes. Prominent users of this proportion—which may be less than half in low-income countries even if there is little or no processing—include Bates (1981) and Binswanger and Scandizzo (1983). Users need to be aware,

though, that this ratio understates the extent of farmer assistance (that is, it understates the rate of protection or overstates the rate of dis-protection to farmers), possibly by a large margin.

10. On the basic economics of trading costs as affected by, for example, infrastructure within the country, at the border (ports, airports), and, in the case of landlocked countries, in transit countries, as well as international freight costs and so on, and their impact on both the aggregate volume and product structure of international trade, see Limão and Venables (2001), Venables and Limão (2002), and Venables (2004). See also the survey by Anderson and van Wincoop (2004), where it is reported that the tax equivalent of trading costs are estimated at more than 170 percent in high-income countries and higher in developing and transition economies, especially those that are small, poor, and remote. By lowering these trading costs (for example, by streamlining customs clearance procedures), trade facilitation may be the result not only of technological changes, but also of government policy choices such as restrictions on the ships that may be used in bilateral trade. For example, Fink, Mattoo, and Neagu (2004) estimate that the policy contribution to the cost of shipping goods from developing countries to the United States is greater than the border import barriers. More generally, on imperfect competition in services markets, including cartelized international shipping, see Francois and Wooten (2001, 2006).

11. The costs of processing and of wholesale and retail distribution, as well as domestic trading costs, change over time not only because of technological advances, but also following policy changes. For example, government investment in rural infrastructure may lower trading costs. Reardon and Timmer (2007) argue that the global supermarket revolution is, in part, driven by the opening of domestic markets following the relaxation of government restrictions on foreign direct investment since the 1980s. These types of government policies are not included in our project's measurement of distortions.

12. Trading costs may be unrelated to the product price (that is, specific rather than ad valorem), in which case the formulas should be adjusted accordingly (for example, if T_f is in dollars per ton). If this were the case with international trading costs, the domestic price of importables (exportables) would change less (more) than proportionately with P. The ad valorem assumption is preferable to the specific one in situations where international price and exchange rate changes are less than those that are fully passed though the domestic value chain to the farmer and consumer because of incomplete market integration caused, for example, by poor infrastructure or weak institutions. Ideally, in such cases, one would estimate econometrically the extent to which the price transmission elasticity is below unity and use this to calculate the margin each year.

Trading costs include the storage costs that would be incurred to hold domestic products until the time in the season when international trade takes place. Any subsidies or taxes on these or any other trading costs should be included in the distortion calculus. On the importance of these domestic trading costs in low-income countries, see Khandker, Balkht, and Koolwal (2006) on Bangladesh; Moser, Barrett, and Minten (2005) on Madagascar; and Diop, Brenton, and Asarkaya (2005) on Rwanda.

13. On the how and the why of the variation by country of origin in the quality and variety of traded goods, see Hummels and Klenow (2005).

14. We assume that the quality difference arises because one good provides more effective units of service than another, so that the relative price is a constant proportion of the value of the first good. If products are simply differentiated, without such a quality dimension (as in Armington 1969), there will be no fixed relationship between the two prices.

15. In using the NRA and the CTE estimates later as parameters in a computable general equilibrium model, as in the case of the incidence of the exchange rate distortion discussed elsewhere above, the assumptions made here about the extent of pass-though along the value chain may not greatly affect the model's results for real variables such as prices, output, and value added.

16. Corden (1971) proposed that free trade volumes be used as weights, but, because these are not observable (and an economy-wide model is needed to estimate them), the common practice is to compromise by using actual distorted volumes, but undistorted unit values or, equivalently, distorted values, divided by $(1 + NRA)$. If estimates of own- and cross-price elasticities of demand and supply are available, a partial equilibrium estimate of the quantity at undistorted values might then be generated,

but, if these estimated elasticities are unreliable, this may introduce additional error over and above the error one seeks to correct.

17. The mean and standard deviations might be captured by a single measure, namely, the trade restrictiveness index developed by Anderson and Neary (2005). Calculating this index even in its simplest partial equilibrium mode requires that one know the own- and cross-price elasticities of demand and supply (or, at least, the elasticity of import demand, but this shortcut is only usable if the NRA and CTE are identical).

18. In addition to the methodologies of Krueger, Schiff, and Valdés (1988, 1991a) and the OECD (2007a, 2007b) for estimating agricultural distortion and producer support indicators, see the recent review by Josling and Valdés (2004) of methodologies in earlier studies.

19. Other trade policy studies have also been of great help, particularly studies on trade and exchange rate distortions. These include various multicountry studies such as the one summarized in Bhagwati (1978) and Krueger (1978) and more recent ones summarized in Bevan, Collier, and Gunning (1989); Michaely, Papageorgiou, and Choksi (1991); Bates and Krueger (1993); and Rodrik (2003).

20. For an analysis of input subsidies in Indian agriculture, see Gulati and Narayanan (2003).

21. That these costs vary hugely across countries and often dwarf trade taxes has now been clearly established. See, for example, World Bank (2006a, 2006b), the Doing Business Database, and the governance and anticorruption indicators in the WGI Database. Also now available is a database on information and communications cost indicators for 144 countries; see the ICT at a Glance Database. In some settings, price bands induced by trading costs arising because of missing or imperfect markets in rural areas lead poor farmers to forgo cash crops to ensure sufficient food production for survival (de Janvry, Fafchamps, and Sadoulet 1991; Fafchamps 1992). This contributes to the low supply responsiveness among poor producers to international price changes for the cash crops.

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The vast majority of the world's poorest households depend on farming for their livelihoods. During the 1960s and 1970s, most developing countries imposed pro-urban and anti-agricultural policies, while many high-income countries restricted agricultural imports and subsidized their farmers. Both sets of policies inhibited economic growth and poverty alleviation in developing countries. Although progress has been made over the past two decades to reduce those policy biases, many trade- and welfare-reducing price distortions remain between agriculture and other sectors and within the agricultural sector of both rich and poor countries.

Comprehensive empirical studies of the disarray in world agricultural markets first appeared approximately 20 years ago. Since then the OECD has provided estimates each year of market distortions in high-income countries, but there have been no comparable estimates for the world's developing countries. This volume is the first in a series (other volumes cover Africa, Asia, and Latin America) that not only fill that void for recent years but extend the estimates in a consistent and comparable way back in time—and provide analytical narratives for scores of countries that shed light on the evolving nature and extent of policy interventions over the past half-century.

Distortions to Agricultural Incentives in Europe's Transition Economies provides an overview of the evolution of distortions to agricultural incentives caused by price and trade policies in the economies of Eastern Europe and Central Asia that are transitioning away from central planning. The book includes country and subregional studies of the ten transition economies of Central and Eastern Europe that joined the European Union in 2004 or 2007, of seven other large member countries of the Commonwealth of Independent States, and of Turkey. Together these countries comprise over 90 percent of the Europe and Central Asia region's population and GDP. Sectoral, trade, and exchange rate policies in the region have changed greatly since the dissolution of the Soviet Union in 1991, but price distortions remain. The new empirical indicators in these country studies provide a strong evidence-based foundation for evaluating policy options in the years ahead.

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