

Agricultural Sector Impacts of Economic Reform in Greater Europe and the Former Soviet Union

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Abstract

Historic economic reforms are under way in Western Europe, Eastern and Central Europe and in the former Soviet Union. Western European governments are committed to reduce the growth of output from their highly protected agricultural sectors and raise domestic demand, thus reducing the region's net food surplus. Although the pre-reform agricultural sector of the former Soviet Union was also heavily assisted, that assistance was combined with substantial consumption subsidies. The move toward less fiscally burdensome policies in that region, combined with the overall economic slump there, has reduced both food production and consumption. But inexpensive "catch-up" technical change could bring major improvements in agricultural productivity and a growing net surplus in many staple food products. This paper marshalls evidence for this tendency of the reforms in East and West to have off-setting effects on the

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region's net agricultural trade. A disaggregated revision of the Tyers-Anderson model of world food trade is then used to quantify these possible effects, the results suggesting that the overall trend will be toward an increasing net surplus of staple food products across Greater Europe and the former Soviet Union.

I. Introduction

The period since the mid-1980s has seen extraordinary pressure for economic policy reform in Greater Europe¹ and the former Soviet Union (FSU)². The rapid growth of manufacturing in many developing countries during the preceding decade had accelerated the decline in this sector in the industrial countries, including in Western Europe. Increased structural unemployment followed and governments in that region sought reforms which would boost internal efficiency and expand output so as to absorb the surplus labour. Governments in the centrally planned economies of Eastern Europe (EE) and the FSU faced a similar predicament. The growth of those economies had been particularly poor in the 1970s and their governments were under pressure to provide larger and more diverse private consumption on the one hand and on the other to match renewed military growth in the United States (Aslund [1991]; Ch. 1). These pressures, too, required

1 Greater Europe is henceforth taken to include the European Community of 12 (EC): Belgium, Denmark, Germany, France, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain and the United Kingdom. Also included are the countries of the European Free Trade Association (EFTA), Austria, Finland, Iceland, Norway, Sweden, and Switzerland, and what has been called Eastern or Central Europe. The latter group, often to be referred to simply as EE, includes Czechoslovakia, Hungary and Poland (the EE-3) and the Balkan states (Albania, Bulgaria, Rumania and the former Yugoslavia). In most applications, EFTA will refer to the five continental European members of the group.

2 The FSU will be referred to extensively. It includes 15 states: the Baltic states (Estonia, Latvia and Lithuania), the Russian Federation, the other Western republics (Belarus, Moldova and Ukraine), the transcaucasus (Armenia, Azerbaijan and Georgia), and the Central Asian republics (Kazakhstan, Kirgizia, Tadjhakistan, Turkmenistan and Uzbekistan). The acronym FSU is used rather than the Commonwealth of Independent States (CIS) because the latter group excludes the Baltic states and Georgia.

enhanced internal efficiency and increased overall economic growth.

In no sector has these pressures for policy reform been greater than in agriculture. More so than manufacturing, and in this region over a longer period, the share of this sector in GDP and total employment has declined. In Western Europe this decline reduced the cost of collective action by farmers, whose influence over the region's trade policy is facilitated by emotional arguments in political fora about the retention of food self-sufficiency and a seemingly idyllic rural lifestyle, one nevertheless forsaken by the great majority of the population. Since the 1940s, Western Europe's farm sector has been increasingly protected. For EC members this protection has come at least in part from the Common Agricultural Policy (CAP), which retains comparatively high and stable domestic food prices. In this *fertile* policy environment, food production outstripped domestic demand and the CAP became a net drain on the EC's public resources. Pressure for agricultural reform stemmed both from this reversal of the CAP's budgetary impact and from competing food exporters abroad. The latter group had successfully pressed for the inclusion of agricultural policy in the Uruguay Round of international trade negotiations. Its influence over Western Europe is enhanced by the desirability of other elements of the draft product of those negotiations, namely those covering trade in services and intellectual property rights, which have to date been linked to progress on agriculture.

In the region encompassing EE and the FSU the policy environment was far less conducive to agricultural growth. That region had made the opposite transition, from net food exports early this century to net imports in the 1980s (Anderson [1992], Tyers and Anderson [1992]; Ch. 8). This occurred in spite of a slower decline in the relative size of agriculture's contribution to output and employment. As late as 1989, almost a quarter of the USSR's GDP was in agriculture, along with a fifth of its employment (IMF *et al.* [1991]). By comparison, nowhere in Western Europe does agriculture contribute more than six per cent of GDP (World Bank [1992c]). The difference is explained largely by improvements in food productivity in the West which were not transmitted to the East (Brooks *et al.* [1991]). The decline in food self-sufficiency was exacerbated, however, by the FSU government's decision in the late 1960s to boost consumption (and therefore production) of

livestock products and, if necessary, to import feed grains (Cook [1988]).

The search for sources of renewed growth in the West led to commitments to both expand and *deepen* the EC, as well as to reform the CAP. It is the CAP reform which most impacts on agriculture and its effect should be to slow food production growth in Western Europe. In the Soviet Union, the answer was found in market-oriented domestic reforms.³ These would not prove sufficient, however, without a simultaneous scaling down of the military establishment through global arms reduction treaties and withdrawal from EE. The latter move facilitated the political independence of the EE states and similarly market-oriented economic reform programs there. Although these reform programs remain in their infancy, their consequences for agriculture have been substantial. In the interim, the demand for high-value foods has collapsed. More importantly for the long run, however, agricultural technology now moves freely between East and West, foreshadowing a catch-up in food productivity. This paper offers a quantitative assessment of the consequences of these reforms, emphasizing the likely direction of change in the region's net trading position in food agriculture. In particular, it seeks to assess the extent to which the Western European reforms, which will restrain future food production growth, could be offset by reduced apparent consumption in EE and the FSU in the short run and, in the long run, by productivity gains in their food production.

Since the various reforms began, a number of studies have addressed these issues. The primary focus of some has been on EE alone (CEPR [1992]) and emphasis has fallen in most of these studies on tradeable goods sectors other than agriculture (Collins and Rodrik [1991]). cursory examinations of the region's agricultural performance in these studies suggest substantial potential for food productivity increases, possibly leading to net exports of some foods, particularly grains. Hamilton and Winters [1992], who had contributed to the CEPR study, followed it with a more formal assessment, again only for the EE economies. In their treatment of the agri-

3. Public support for the market reforms was deemed by the Gorbachov regime to require associated political liberalisation, contrasting the approach taken to reform in the USSR with that taken in China. It was this that led ultimately to the demise of the union and to much of the region's current disorder.

cultural sector, they apply a version of the Tyers-Anderson model of world food trade in two experiments. In the first, real household income and food productivity are boosted in EE to represent the net gains from the on-going economy-wide reforms. EE net food exports expand and international food prices decline, placing budgetary pressure on the EC by increasing the net cost of food export subsidies. In the second, they simulate the inclusion of EE farmers in the EC's Common Agricultural Policy (CAP) and find that the international market impacts are similar in direction but larger in magnitude.

The more recent study by Overbosch and Tims [1992] focuses on the food trade consequences of the EE and FSU reforms. They apply the Basic Linked System of national models developed at the International Institute for Applied Systems Analysis to three EE and FSU reform scenarios. No model of the EE or FSU economies is incorporated. Rather, these scenarios are built on pre-reform external trade data for that region, modified according to assumptions about the (internal versus external) direction of that trade. Nevertheless, their results also show the potential for substantial increases in the region's excess food supply and for lower relative food prices in the medium term. Finally, Liefert *et al.* [1989 and 1991] and Koopman [1992] report United States Department of Agriculture analysis of incentive distortions in the FSU using the SWOPSIM model. This is the only work which examines these distortions and it highlights the tendency of Soviet policy to discriminate against cereal production and in favour of the livestock industry.

Part II of the paper reviews the evidence favouring slower food production growth in Western Europe and off-setting increases in net food supplies in EE and the FSU. In Part III a newly up-dated version of the original Tyers-Anderson model of world trade in food products is used to estimate the net effects of these reforms on international food trade.

II. Evidence on the Potential Effects of Reform

The argument that the unilateral reforms of the CAP, to which Western Europe is now committed (Commission of the EC [1991]), will yield reduced excess food supplies rests on the presumption that the reforms will

succeed as designed to slow food production growth and increase the consumption of food products. Although this presumption remains controversial, more controversy surrounds the argument that EE and the FSU could become net exporters of food products.

The latter argument rests on one key premise. It is that the policy reforms in EE and the FSU continue to progress in the direction of market orientation and, in association, that the economies continue to be more open to international commerce than they were under central planning. While ever this premise remains true, the performance of the region's infrastructure and market institutions, which has been particularly abysmal during the transition in the FSU, can only improve. Beyond this, the argument has four components. First, during the turbulent transition real incomes have fallen. Until incomes recover, apparent food consumption (direct and by animals, inclusive of waste and losses) will be lower than before the reforms began. Second, for the shift to net exports to be sustained, it requires that the transfer of technology from the West should facilitate substantial improvements in food productivity, so that growth in output will more than compensate any renewed growth in food demand. Third, although incentive distortions in the pre-reform centrally planned economies are difficult to estimate, the general pattern is one of net subsidies to both food production and food consumption. Because the consumption subsidies appear to have been the larger, however, any levelling out of these distortions should retard consumption more than production. And fourth, despite evidence that the FSU is comparatively well endowed with arable land, it is possible that more rapid recovery (a boom) in another tradeable goods sector, such as minerals and energy, could shift the domestic terms of trade so as to retard agricultural growth. It is more likely, however, that the agricultural sector will recover early. This is because that recovery will depend less on foreign direct investment and because the technology needed for food productivity improvements is comparatively inexpensive.

A. Purchasing Power and Apparent Food Consumption in EE and the FSU

The region comprising Greater Europe and the FSU has a sixth of the

world's population and generates fully a third of its recorded output.⁴ The inaccuracy of GDP as a measure of development notwithstanding, it is immediately clear from Table 1 that the region as a whole is heterogeneous in the levels of development achieved.⁵ All of the FSU is in the World Bank's *lower middle income* category, with its Central Asian republics at the bottom end of that range. Of the whole region, EE and the FSU together have more than half the population but little more than a tenth of the income.

Virtually throughout EE and the FSU, new governments have assembled an agenda for enactment which includes programs to stabilize the macro-economy, reform price controls and build market institutions. Differences in the sequence followed and the degree of success at each step depend on country-specific political and cultural factors. The political pressure for decentralization has tended to militate against effective fiscal control and the integration of the new markets. This has slowed progress in Czechoslovakia, the republics of the former Yugoslavia and, of course, the FSU. Moreover, they have suffered under a textbook fallacy of composition. The fact that they have all embarked on reforms simultaneously has changed the external conditions facing each. For example, in 1990-91 they dismantled the Council for Mutual Economic Assistance (CMEA) trading system and the German Democratic Republic disappeared as a trading partner. At the same time trade with Iraq (important to Czechoslovakia and Bulgaria) was disrupted. All of these changes adversely affected the terms of trade facing the EE economies (Rodrik [1992]). For the EE-3, its terms of trade with the Balkans and the FSU declined by between 35 and 50 per cent in 1991 alone. At the same time, the volume of EE-3 exports to those regions declined by between 75 and 90 per cent. According to Rodrik, these largely external shocks reduced GDP in Czechoslovakia and Hungary by at least seven per cent and in Poland by 3.5 per cent.

The contraction of GDP throughout EE and the FSU in 1990 and 1991

4 The numerators in these fractions appear in Table 1, while the denominators are the world totals provided in the World Development Indicators section of World Bank [1992c], Tables 1 and 3.

5 No attempt has been made here to use International Comparison Project methods or to otherwise adjust for purchasing power parity. For further discussion on this point, see Tyers [1992].

Table 1
GDP and Population, ca. 1990^a

	GDP (US\$ billion)	Total (%)	Population (Millions)	Total (%)	GDP per capita (US\$)	EC (%)
EC-12^b	5,420	77	326	42	16,600	100
EFTA-5^b	860	12	34	4	25,300	152
EE-3	141	2	65	9	2,200	13
Czechoslovakia	45	.6	16	2	2,800	17
Hungary	33	.5	11	1	3,000	18
Poland	64	.9	38	5	1,700	10
Balkans	141	2	59	8	2,400	14
Albania	5	..	3	.4	1,500	9
Bulgaria	20	.3	9	1	2,200	13
Rumania	35	.5	23	3	1,500	9
Former Yugoslavia	82	1	24	3	3,400	21
Former USSR	490	7	290	38	1,700	10
Russia	300	4	148	19	2,000	12
Ukraine	79	1	52	7	1,500	9
Baltic states	15	.2	8.0	1	1,900	11
Estonia	2.9	..	1.6	.2	1,840	11
Latvia	5.4	..	2.7	.3	2,000	12
Lithuania	6.9	..	3.7	.5	1,900	11
Western republics	48	.7	31	4	1,600	9
Belarus	21	.3	10	1	2,000	12
Moldova	5.9	..	4.4	.6	1,300	8
Armenia	4.4	..	3.3	.4	1,300	8
Azerbaijan	8.3	.1	7.1	.9	1,200	7
Georgia	7.8	.1	5.5	.7	1,400	9
Kazakhstan	21	.3	17	2	1,300	8
Central Asia	28	.4	33	4	800	5
Kyrgyzstan	3.9	..	4.4	.6	900	5
Tajikistan	3.9	..	5.2	.7	800	5
Turkmenistan	3.9	..	3.6	.5	1,100	7
Uzbekistan	16	.2	20	3	800	5
Total	7051	100	773	100	9,700	58

Notes: a. Values for the centrally planned economies are generally given only to two significant figures of accuracy. The character .. indicates less than 0.1 per cent.

b. EC-12 is the European Community and EFTA-5 the continental members of the European Free Trade Association.

Sources: For the EC-12, EFTA-5 and EE-3, all estimates are from the World Development Indicators supplement of World Bank [1992c; Tables 1 and 3]. For the former USSR, GDP is based on shares from IMF [1992b; Table 9], combined with the 1990 GDP estimate of Rubles 622 billion from IMF [1992a], converted to US\$ at the exchange rate 1.27 Rubles per US\$. The latter rate is that used in comparison analysis by the International Economics Department, World Bank [1992d].

averaged 20 per cent (IMF [1992b]; Table 8). While it appears to be bottoming out in the EE-3, that in the Balkan states and the FSU is judged by the IMF to have further to go. Even if price controls are not removed, this decline in purchasing power must reduce food demand; and particularly that for income elastic foods, such as livestock products. Indeed Brooks [1993] cites early evidence that this is occurring.

The corresponding contraction in effective food demand could be proportionally larger if the control of food losses and spoilage is improved. According to a recent survey of the distribution system, the proportion of food lost in the FSU in the period 1986-90 averaged 14 per cent for meat, 28 per cent for grain (compared, for example, to two per cent in the United States), 33 per cent for milk and more than 50 per cent for potatoes (Euroconsult [1991]). Provided the momentum of the reforms is maintained, the privatisation of marketing institutions, combined with new access to Western storage and processing technology, can only improve this performance.

B. Food Productivity Improvements in EE and the FSU

There is little dispute about the extent to which the centrally-planned economies have performed comparatively poorly in the creation and adoption of new technology and, for this reason and others, in the overall efficiency with which the available resources are exploited (Bergson [1991]). What remains unclear is whether the difference in performance can be explained simply by the absence of unfettered private markets and private profit maximising firms. Were the latter true, the obvious information limitations associated with central planning, combined with distorted management incentives (the hiding of production potential, for example, for fear of increased future quotas) should engender both allocative inefficiency across industries and technical inefficiency at the level of the enterprise. Murrell [1991b] reviews a number of recent studies which compare technical and allocative efficiency in the Eastern Europe and the USSR with that in industrial market economies. Although these are conducted with difficulty, given the poor comparability of statistics, the results do not identify any consistent pattern of inferiority in the centrally planned economies. Koopman [1989], for example, finds that average *technical* inefficiency in Soviet agri-

culture in 1960-79 was not greatly different from that in a number of industrial market economies, including the United States. What does differ between the market and centrally planned economies is the *best practice* level of productivity used as the standard in each case. The rate of innovation within enterprises in the centrally planned economies and the rate of inward diffusion of technology have been uncommonly low and their technology has become increasingly backward.

The freeing of trade in both goods and information between EE, the FSU and the rest of the world should facilitate a period of catching up, during which food productivity could increase substantially. A number of recent studies have attempted to gauge the extent of food sector technical backwardness, and thence the potential for productivity improvements, by comparing average yields. Although the comparatively poor performance of the EE and FSU food sectors is evident from such comparisons, they are fraught with dangers of aggregation bias and incomplete information about production conditions. Recent examples include Cook [1988; Figures 1 through 3], OECD [1991; Table 50], the World Bank [1992a; Box 12-1 and 1992b; esp. Tables 2.5 and 2.10], and Koopman [1992; Table 5]. The comparisons are of crop yields, livestock productivity (meat, milk and egg yields per animal) and feeding efficiency (feed weight per unit of meat, milk or eggs produced).

To begin with the grain sector, according to Koopman average yields in EE were only slightly lower than those in Western Europe in the pre-socialist period (1925-33). The average yield of wheat in Poland, for example, was on a par with its counterpart in Western Europe, although that for barley was slightly below it. Since then, however, Polish yields have fallen well behind those in the West. Both are now only two-thirds of the average yield achieved across all of Western Europe. In the FSU, where growing conditions for grains are not as consistently productive as those in Western and Central Europe, wheat and coarse grain yields in the 1920s were just over half those in what are now EC countries. The ratio has fallen to about a third, crudely suggesting a shortfall relative to potential which is also about a third (Koopman [1992]). According to the World Bank [1992a], however, the appropriate comparison is with Canada. In the case of wheat, the average yield is lower than Canada's by about 10 per cent.

Turning to meat production, Koopman's comparison of average beef and veal production as a proportion of beef cattle inventory size between EE and Western Europe suggests the average in EE is inferior by about 30 per cent. For the FSU, a comparison of meat yield per animal in the mid 1980s with that achieved in the United States (Cook [1988], and Koopman [1992]; Table 5) shows a shortfall of 35 per cent for beef and 45 per cent for pigmeat relative to the United States averages. Of course, the latter dichotomy is the result of decisions in the FSU, perhaps rationally motivated by capital scarcity, to increase meat production by raising animal inventories and hence to adopt a more labour-intensive production technology.

In the dairy sector, milk yields per cow are also substantially lower in both EE and the FSU than they are in industrial countries. For EE as a whole the average is lower than that for the EC by about 20 per cent, though the discrepancy is larger with the Northern countries of the EC (Koopman). In the FSU, milk yields per cow are about half what is achieved in Western Europe and less than half what is achieved in the United States (Cook, World Bank [1992a]. Finally, the efficiency of livestock feeding is comparatively poor. The OECD [1991] is clearest on this, finding that average FSU farms spent roughly 75 per cent more grain units for milk, 125 more for beef and 70 per cent more for mutton. The World Bank [1992b] finds the over-spending on pigmeat was 90 per cent and on poultry meat 70 per cent.

This overall picture, which is summarised in Table 2, suggests very substantial scope for food productivity improvements in both the EE and the FSU, but especially in the FSU. Taken at face value, these results indicate that productivity could increase by up to half for grains and beef and by a quarter for milk production in EE. In the FSU, grain productivity could increase by between 10 and 50 per cent, beef by half, pigmeat by 80 per cent and milk production by 100 per cent. Also in the FSU, feed use per unit of product could fall by almost half in both meat and dairy production.

C. Incentive Distortions

A useful measure of the totality of agricultural incentive distortions is the Producer Subsidy Equivalent (PSE). This measure consolidates all direct assistance into an equivalent specific subsidy payment, which is readily

Table 2
Measures of Potential Food Productivity Increase in EE and the FSU^a

	Per cent by which productivity measure in other industrial countries exceeds that in	
	Eastern Europe	The former USSR
Cereal yields	50	10 – 50 ^b
Meat output per animal slaughtered		
beef and veal	40	50
pigmeat		80
Milk output per cow per year	25	100
Feed efficiency ^c		
beef and veal		67
pigmeat		80
milk		67

Notes: a. This table summarizes the indicative proportional differences in productivity measures discussed in the text.

b. The comparison of cereal yields in the FSU with those in Canada shows a difference of about 10 per cent. The larger proportion is based on a restoration of the relativity with Western Europe in the 1920s by Koopman [1992].

c. Feed efficiency is usually measured as kilograms of meat or liquid milk per kilogram of cereal feed in oat equivalents.

Source: Cook [1988], Koopman [1992], OECD [1992], and World Bank [1992a], as discussed in the text.

expressed as an *ad valorem* tariff or export subsidy. The PSE and the corresponding measure of consumer price distortions, the Consumer Subsidy Equivalent (CSE), are estimated annually for the industrial countries by the OECD [1992]. For other countries, including those of EE and the FSU, these measures are estimated periodically by the Economic Research Service of the United States Department of Agriculture (Webb *et al.* [1990], Cook *et al.* [1991]).

For use in the analysis to follow, 1989 and 1990 estimates of PSEs and CSEs have been drawn from the above sources, in the form of equivalent *ad valorem* product price distortions, and expressed as nominal protection

coefficients (equivalent domestic to border price ratios). The results are listed in Table 3. Those for the EFTA group are highest, consistent with that group's comparatively high incomes and comparatively small agricultural sectors. From a comparison of the EFTA distortions with those in the EC, it is clear that EC expansion, and hence the extension of the CAP to EFTA farmers, would reduce the overall level of assistance to food production in Western Europe.

Beginning with these measures, the estimation of the trade effects of Western Europe's distortions is a comparatively simple application of partial equilibrium analysis, provided quantity controls are properly accounted for. This is because indirect distortions not usually included in PSEs and CSEs are small (there are no associated exchange controls and other tradeable goods sectors are comparatively lightly protected) and because the partial equilibrium assumption is a fair one for agriculture in Western Europe. This convenience no longer exists in the cases of EE and the FSU. Not only did these economies use multiple controlled exchange rates in the pre-reform period but also it is very likely that the other sectors of their economies were substantially distorted. Most quantity decisions were dictated centrally and official prices were set to satisfy distributional objectives rather than to ration supply.

While it remains possible to estimate PSEs and CSEs for agriculture in these economies, the resulting estimates are particularly sensitive to the method by which product and input prices are calculated and to the representation of indirect distortions. Since quoted prices do not generally direct the choice of production or consumption volumes, true *incentive* prices are first calculated. Next, these are adjusted to incorporate both direct and indirect distortions and compared with corresponding border prices. The latter comparison is complicated, however, by the need to convert border prices to domestic currency at the (equilibrium) exchange rate which would apply in the absence of exchange controls and distortions elsewhere in the economy. The choice of exchange rate, and the estimation of the incentive prices, at which households and firms would have selected the observed quantities, are discussed in detail in Tyers [1992].

The resulting estimates are also listed in Table 3. Incomplete information necessitates that numerous assumptions be made. These relate to distor-

Table 3
Food (GLS) Price Distortions in Greater Europe and the Former USSR^a

		Rice	Wheat	Coarse Grain	Sugar	Dairy Products	Ruminant Meat	Non-ruminant Meat	All GLS
EC	Producer	2.78	1.75	2.22	2.27	4.00	2.33	1.54	2.52
	Consumer	2.33	1.54	1.89	1.92	2.50	1.89	1.33	1.88
EFTA-5	Producer	1.00	8.33	4.00	3.33	6.67	3.70	2.78	4.97
	Consumer	1.00	2.22	2.56	2.38	2.78	2.63	2.33	2.57
EE-3	Producer	1.00	1.20	1.36	0.84	0.93	1.86	1.20	1.23
	Consumer	1.00	0.98	1.36	1.26	0.51	0.89	1.06	0.92
Czechoslovakia	Producer	1.00	0.82	0.76	0.92	0.76	3.23	1.61	
	Consumer	1.00	1.03	0.76	0.92	0.56	1.18	1.54	
Hungary	Producer	1.00	0.88	0.79	0.80	1.33	2.13	1.11	
	Consumer	1.00	0.88	0.79	0.80	1.33	2.13	1.11	
Poland	Producer	1.00	1.72	1.56	0.82	0.93	.91	1.05	
	Consumer	1.00	.99	1.56	1.49	0.34	.59	.79	
Balkans^b	Producer	1.00	0.87	1.00	0.47	1.00	.91	.83	0.91
	Consumer	1.00	0.87	1.00	0.47	1.00	.91	.83	0.91
Former USSR	Producer	2.73	0.65	1.10	1.95	2.33	1.67	1.67	1.63
	Consumer	0.50	0.33	0.52	1.25	.78	.80	1.48	.87
Average for EE and the FSU	Producer	2.59	0.77	1.13	1.56	1.97	1.62	1.39	1.48
	Consumer	0.59	0.53	0.72	1.18	.75	.82	1.26	.83

Notes: a: 1. Incentive distortions are here expressed as equivalent nominal protection coefficients (NPCs, or ratios of domestic to border prices) adjusted to also represent (as equivalent product price effects) those input price distortions accounted for in the calculation of PSEs and CSEs by the OECD and the Economic Research Service.

2. There is a one-to-one relationship between these and PSEs and CSEs. For the PSE (expressed as a proportion of payments to producers), π^p , the equivalent NPC is $\rho^p = 1/(1 - \pi^p)$. For the corresponding CSE, π^c , it is $\rho^c = 1/(1 + \pi^c)$.

3. The consumer distortions for the FSU have been augmented to account for hidden inflation, as explained in the text.

4. Since the estimates in this table are essential to the analysis in the text, it is completed by assumption even where the available information is not. To achieve this, consumer distortions are assumed the same as producer distortions in the Balkan states and the non-existence in many cases of estimates of PSEs or CSEs for rice is taken to indicate a free market.

b: Both PSE and CSE estimates for Hungary and all the Balkan states are not available. The estimates used are PSEs and the Balkans estimates are for Yugoslavia only, in 1988.

Source: Based on estimates of PSEs and CSEs for Western Europe in 1990 by the OECD, as provided on computer diskette to supplement OECD [1992] and for EE and the FSU as provided by Europe Branch of the Economic Research Service of the United States Department of Agriculture. Although the latter are up-dates to 1989 (unless otherwise stated), the method used in estimating them and the policy instruments included and excluded are detailed in Cook *et al.* [1991] and Koopman [1992] for the FSU and in Webb *et al.* [1990] for the other countries.

tions, such as exchange controls, which affect the food sector in its entirety in such a way as to simultaneously raise or lower all the estimates for EE and the FSU, or such as farm debt write-offs, which affect all of food production so as to simultaneously raise or lower all the corresponding producer incentive distortions. The entries in Table 3 for EE and FSU therefore need cautious interpretation. Nevertheless, relativities across individual food markets, which stem from careful examination of observable instruments by the Economic Research Service of the United States Department of Agriculture and from the estimation of incentive prices from parallel private market retail prices, are comparatively robust.

For the FSU, the consumer distortions presume a model of demand which has households purchasing at incentive prices (drawn from parallel private market data) and receiving an inframarginal subsidy to the extent that they are able to purchase at subsidised prices from state shops and avoid queuing waste. This behavioural model follows the work of Morduch *et al.* [1993]. The pre-reform incentive price premia assumed are 30, 50 and 100 per cent for sugar, dairy products and meat, respectively. The corresponding inframarginal subsidy amounts to 18 per cent of household disposable income.⁶

The pattern which emerges is summarised in the last two rows of the table. As foreshadowed, both producers and consumers were subsidised in the pre-reform period. But, while cereal consumption was subsidised most heavily, cereal (and particularly wheat) production tended to be discriminated against. A liberalisation should therefore cause more cereal production and less livestock production. Consumption of all foods would decline and that of cereals by most due to reduced animal feed demand. One clear result would be reduced excess cereal demand, or a switch to excess supply. In livestock product markets the pure effects of the subsidies are ambiguous. Liberalisation would bring a proportionally larger loss of subsidy to the producer than to the consumer, particularly when the change in the cereal feed price is accounted for, and hence production would be expected to decline

6. Morduch *et al.* use mid-reform data from Goskomstat consumption and price statistics and unpublished household budget surveys in 1991. In that year the premia and the inframarginal subsidy were larger. See Tyers [1992] for further discussion on this point.

eventually. But the consumer would not only face higher incentive prices. The inframarginal subsidy would also be lost, enhancing the contraction in demand, particularly for these products. The net effect of the incentive distortions alone on the region's excess demand for livestock products is therefore ambiguous.

D. Comparative Advantage and Booming Sector Effects

To gauge the ultimate direction of the transition in EE and the FSU a number of studies have examined the region's physical endowments of non-mobile primary factors such as land, labour, human capital and natural resources, compared them with those of potential trading partners and attempted to predict the region's pattern of specialisation in trade should its economy make a complete transition to markets and private property. For EE, such studies suggest exports of agricultural products and manufactures intensive in human capital (CEPR [1992], Collins and Rodrik [1991], Hamilton and Winters [1991]). For the FSU, Kumi [1992] uses a model in the Heckscher-Ohlin-Vanek tradition, implicit in which is that tastes and technology are identical across trading partners and that what drives trade are differences in primary factor endowments. He concludes that, should the FSU be able to improve its technology to the level of its industrial trading partners, its comparative advantage will be in natural resource based goods, including food agriculture.

Anderson [1992 and 1993] addresses the same issue, taking the dynamic approach of the booming sector literature (Corden [1984]). An important point emerging from this literature is that a growing economy's unfolding pattern of trade specialisation need not always tend toward the pattern which would apply once it has full technological parity. If technology is more quickly transferred to one tradeable goods sector than another, then that sector could boom even if it is not one in which the ultimately developed economy would have a comparative advantage. This is because the sectoral boom draws primary factors from other sectors and its increased productivity causes a real appreciation, thereby raising costs and reducing relative product prices in other tradeable goods sectors and temporarily inhibiting their growth.

In the FSU, were the minerals and energy sectors to be quickly liberalised and foreign investment in development and further exploration encouraged, the republics better endowed with mineral and energy resources would enjoy investment and export booms. For the reasons given above, such booms would retard the growth of food production and accelerate the growth in demand for high-value foods, possibly reversing a prior tendency toward net food exports for the FSU as a whole. But Anderson sees the agricultural sector as having the potential to expand most rapidly. This is largely because substantial productivity increases could be realised without extensive foreign direct investment in farming activities. Even if state and cooperative farms continue to produce at greater than minimum efficient scale output levels, increased market orientation (which must increase management incentives to foster cost reductions on farm) and better access to foreign technology are all that will be required to realise at least some of agriculture's productive potential. Indeed, such improvements in the livestock sector would only require better feed mixtures, a largely recurrent expense, and resort to modern breeding technology, which is now very mobile internationally, and which can change the genetic composition of whole herds in one generation.

This suggests that progress in agriculture is unlikely to be retarded by a boom in another tradeable goods sector. The substantial, and largely private, foreign direct investment which will be required elsewhere will be slow in coming relative to the mostly public infrastructural investments which will aid agriculture.

In the analysis presented in Part III, the effects of reforms on other than food production are not directly addressed. Two scenarios are introduced, one assuming a delayed and ultimately slow recovery in food demand and productivity, representing the case in which the agricultural sector lags, and the other assuming a more prompt general recovery, combined with one-off productivity improvements. Apart from this, food demand and supply are assumed unaffected by shocks due to reforms in other sectors. Moreover, the transient macroeconomic shocks associated with the policy transition are not represented explicitly. Clearly, because governments are reluctant to allow food prices to rise with the general price level, the recovery in agriculture is vulnerable to macroeconomic instability in this period (Brooks

[1993]). The analysis focusses, instead, on the pre-reform economic environment of food production in the region and its likely post-transition counterpart.

III. Analysis of Policy Reforms

The vehicle used is an up-dated and adapted version of the Tyers-Anderson model of international trade in food commodities (Tyers and Anderson [1992]). This model calculates domestic and international food prices and the quantities produced, consumed, traded and stored over the simulation interval 1990-2000. Its attention is restricted to the major traded food staples, namely wheat, coarse grain, rice, meat of ruminants (mainly cattle and sheep), meat of non-ruminants (pigs and poultry), dairy products and sugar. These seven commodity groups account for about half world trade in food, with edible oils and other oilseed products and beverages accounting for most of the rest (Tyers and Anderson [1992]; 17). The model is highly disaggregated across countries, however. In the newly up-dated version there are 35 countries and country-groups, of which Greater Europe and the FSU make up 10 and 18 are developing economies. A complete mathematical description of the up-dated model and its database is provided in Tyers [1992; Appendix 1].

The model leaves as exogenous trends in disposable income, exchange rates and food production technology. Most of the changes in the non-agricultural economies of EE and the FSU can be represented in terms of these exogenous variables. Indeed, beyond 1992 they are structured so as to represent three extreme growth and productivity scenarios for the postsocialist economies. Each scenario embodies assumptions about the growth path of real household income, food productivity and the efficiency with which grain feeds are used in livestock production. The first provides a reference against which policy reforms and the other scenarios can be compared. It assumes complete economic stagnation in the postsocialist economies from the base period (1986-90) onwards. There is no growth in per capita real income, no change in food productivity and no improvement in feeding efficiency. The second, *low growth*, scenario incorporates the declines in income and food output from the base period through the early part of 1992,

drawing mainly on IMF [1992] for real income shocks and Sheffield [1992] and Economic Research Service [1992a and 1992b] for production shocks. Thereafter, the EE-3 and the Baltic states are assumed to recover somewhat and then to settle into economic growth at rates similar in magnitude to those achieved in the pre-reform period. The Balkans and the rest of the FSU stagnate for a further year and then resume modest growth. The pattern of food productivity change in the three regions follows that of income. After the shocks of the early 1990s, normal indigenous technical improvements continue, shifting supply curves at the pre-reform or *benchmark* rate, consistent with the assumed pattern of behaviour in all other countries. There is no technology *catch-up* and hence there are no improvements in feeding efficiency take place.

The third, *high growth*, scenario is more optimistic after 1992, both as to the pace of the economy-wide recovery and the performance of the food sector. Real household income growth is arbitrarily (but optimistically) set at rates sufficient to permit the economies to catch up with the extrapolated benchmark trend. An added boost to food productivity is included to represent the adoption of superior farm management and technology from the West, particularly in the livestock sectors (Table 4). This catch-up is modest by comparison with the potential indicated earlier in Table 2.

A. The Reference Simulation

To provide a basis for comparison, one simulation of the seven global food markets extends from 1990 through 2010 on the assumption that policy *regimes* are stable throughout the world and that, while underlying income and productivity growth continues in most economies, those of EE and the FSU remain stagnant throughout. Food production and consumption in the latter region change during this period only in response to any changes in the domestic terms of trade which are transmitted from abroad by their price policy regimes. The simulation does not include unilateral policy reforms to which some Western industrial countries are now committed, nor any reforms which might emerge from the Uruguay Round. In it, the self-sufficiency ratio (the value of domestic output divided by the value of domestic consumption, both measured at base period world prices) for

Table 4
Relative Productivity Gains Embodied in the *High Growth Scenario*

	Rice	Wheat	Coarse Grain	Sugar	Dairy Products	Ruminant Meat	Non-ruminant Meat
Final production:							
<i>High growth over benchmark (%)</i>							
Eastern Europe ^a	10	10	5	5	20	20	20
Former USSR ^b	10	10	5	5	50	20	20
Grain feed use per unit of output: (By weight)							
Eastern Europe							
Low growth					0.6	9.0	5.5
High growth ^a					0.4	6.0	4.5
Former USSR							
(excluding Kazakhstan and Central Asia)							
Low growth					0.8	12.0	7.0
High growth ^b					0.6	9.0	5.0
Kazakhstan and Central Asia							
Low growth					0.8	12.0	7.0
High growth ^b					0.7	10.0	6.0

Notes: a. These gains are to be achieved over the period 1993-96.

b. These gains are achieved over the period 1994-2010.

Source: Postulates based on evidence on comparative and potential performance discussed in the text.

industrial countries as a group rises from 1.07 in the base period to 1.2 by 2000 and those for developing and postsocialist countries fall from 0.97 to 0.90 and from 0.95 to 0.94, respectively.

B. Unilateral Reforms in Western Europe

A second simulation incorporates the unilateral reforms of the CAP (Commission of the European Communities [1991]), combined with the expansion of the EC to include the EFTA countries, and hence the extension of

the CAP to EFTA food markets. Over three years, beginning in 1993, the EC reforms reduce the farm prices of cereals, oilseeds and protein crops by approximately 35 per cent. Cereal farmers are compensated with partially decoupled payments but *commercial farmers* (producers of at least 92 tons of equivalent output) need to set aside 15 per cent of their land. In the livestock sector the major reform is a reduction of the beef price by 15 per cent, compensated in part by per-head subsidies for the culling of the herd. At the time of writing, no reform of the sugar policy, beyond the existing two-tier pricing system, was proposed nor had any substantial reform of the dairy policy been agreed to.

In this analysis of unilateral CAP reform a number of simplifications are made. First, reductions in real EC consumer cereal prices are assumed to be 35 per cent, unmitigated by any resulting rise in international trading prices. Second, the compensation of commercial cereal farmers is in the form of payments which are fixed in terms of area planted and base-period regional average yields. Depending on how this is implemented, it might be profitable for farmers to reduce variable inputs and hence output. In this analysis, grain supply elasticities are left unchanged, while supply curves are shifted so as to reduce output by 10 per cent: 15 per cent land set-aside less five per cent slippage. Beef producer and consumer prices are reduced by 15 per cent, again irrespective of any response in the international market. No changes are introduced to either dairy or sugar policy. The EFTA countries' incentive distortions are concorded with those in the reformed EC over the same three-year period.

The changes in production, consumption and trade volumes, relative to the reference simulation, are provided in Table 5. The changes of policy slow the growth in West European production of cereals and meat (output does not decline) and increase their domestic consumption. The region's excess supply of these commodities declines and world prices rise. The opposite is true for the international prices non-ruminant meats, since farmers in the EC switch their resources out of beef into these products and consumers switch their demand from them to the newly cheaper beef and cereal products. The EC's self-sufficiency remains high at 112 per cent. This is higher than both its base period level (105 per cent) and only slightly smaller than its reference level for the year 2000 (116 per cent).

Table 5
Effects of EC Unilateral Reform and EFTA Membership on
International Prices, Production and Net Trade^a
 (Per cent changes, unless otherwise specified)

	Rice	Wheat	Coarse Grain	Sugar	Dairy Products	Ruminant Meat	Non-ruminant Meat
Change in world price: 2000: reform over reference	5	10	8	2	1	7	-3
Production growth: 2000 over 1990							
Reference	16	29	19	24	20	20	30
Reform	5	11	8	22	20	5	41
Change in production: 2000: reform over reference	-10	-13	-10	-1	0	-12	9
Change in consumption: 2000: reform over reference	10	9	-1	-1	0	11	-1
Change in net exports:^b 2000: reform over reference, Million metric tons							
EC	-5	-18.7	-9.3	1.8	3.9	-2.2	4.0
EFTA	-1	-4.2	-1.0	.2	-4.2	-2	-1.2
Total	-4	-22.9	-10.3	2.0	-3	-2.4	-2.8

Notes: a. All quantities listed are for the combination of EC with the EFTA-5, except where otherwise specified.

b. In 2000 the EC is actually projected to be a net importer of rice and coarse grain. Where positive, a change in *net exports* indicates increased exports or a reduction in net imports, depending on which prevailed in the reference case. Dairy product volume is in liquid milk equivalent.

Source: Results from the analysis discussed in the text.

C. Closer Economic Ties Between the EE-3 and the EC

Although the possibility that Poland, Czechoslovakia and Hungary might join the EC has been mooted (Hamilton and Winters [1992b]), the comparative size and present poverty of their collective economy are factors which weigh against this happening in the short term. Nevertheless, there have been developments in the direction of bringing the agricultural sectors of these countries under the CAP. These take the form of Association Agreements (Tangermann [1992]), which became effective in early 1992. In the early period following reforms in the EE-3, barriers to all trade were virtually eliminated. More recently, however, farm subsidies and export restitutions have been implemented in unilateral moves by the EE-3 to bring their agricultural policies into greater harmony with those in the EC (Swinnen [1992]). Since these agreements commit the EC to gradual reductions in the quotas and tariffs imposed against these countries' exports, including their agricultural exports, they will increasingly reduce the domestic cost of EE-3 agricultural support.

The agreements restrain the growth in agricultural exports through phased quantitative restrictions and safeguards clauses, and hence the trade growth which might be expected to stem from them in their present form is modest (Tangermann). Nevertheless, central to the agreements are reductions in tariffs and levies are as high as 60 per cent over three years. They therefore represent a *foot in the door* for EE-3 farmers.

To assess this increasing harmony between incentive distortions in the EE-3 and in the EC, the next simulation adds to the unilateral reforms in the EC and EFTA membership the complete extension of the CAP to EE-3 farmers, phased over the 20 year interval 1990-2010. In this simulation it is assumed that the policy transition in the EE-3 is from pre-reform domestic prices to post-reform EC prices and that this transition takes place linearly. A third simulation, incorporating these changes along with those in Western Europe, is then made and compared with the second, so that the difference reflects only the incremental effects of the policy changes in the EE-3. This simulation is in two versions, one which assumes low growth in the EE-3 economies and no productivity catch-up and another which is the corresponding high-growth scenario. The effects on international food prices, pro-

duction, consumption and net trade for the year 2000 are given in Table 6.

The most significant aspect of the policy transition thus assumed concerns the dairy sector. Although the EE-3 average hides some heterogeneity of pre-reform dairy policy (Table 3), on the whole dairy farms were not protected in the pre-reform sector and dairy consumption was subsidised. The change to EC prices therefore brings about a massive shift in incentives facing EE-3 dairy producers and consumers which greatly increases the region's excess supply of these products. Unleashed on a heavily insulated international market, this change is sufficient to depress the price by between a fifth and a quarter over 20 years. Net changes in the other traded food prices are small, however. The activity in those international markets continues to be driven mainly by the unilateral policy reforms in the EC. Given that the expanded EC remains a subsidising net exporter of dairy products, it is clear that such a change would adversely affect the cost of the CAP. By the year 2000, the fiscal burden of the CAP on the EC (expanded to include both EFTA and the EE-3), is lower by about US\$23 billion per year due to its unilateral reform (mainly from savings in the EFTA countries). Even though less than half the transition in the EE-3 will have taken place, its cost would offset these gains from unilateral reform by about half.

D. Economic Policy Reform in the Balkans and the Former USSR

The paths the economic recovery will take in the Balkans and the FSU are even more uncertain than for the EE-3. Here, the two economic growth and agricultural productivity scenarios are combined with a phased liberalisation of all incentive distortions over five years, beginning in 1991.⁷ Each corresponding simulation is compared with one which embodies all the reforms discussed previously.

The spread of international price effects is as predicted in Part II. There is an overall shift to excess food supply in the FSU, and therefore lower international food prices, which is greatest for cereals and particularly wheat. In the short run the loss of assistance to the dairy sector reduces

7. An alternative scenario in which the Balkans and the FSU move toward Western European style protection is also examined in Tyers [1992].

Table 6
Effects of Partial Extension of the CAP to EE-3 Farmers, Year 2000^a

	Rice	Wheat	Coarse Grain	Sugar	Dairy Products	Ruminant Meat	Non-ruminant Meat
Effect on world prices (%)							
Low growth ^b	.3	.3	1.1	-.9	12.4	-1.2	-1.2
High growth ^b	-1.5	-2.7	-2.5	-1.8	-16.9	-3.5	-2.9
Change in production (%)							
Low growth	26	21	26	19	82	23	44
High growth	38	34	50	28	120	67	78
Change in consumption (%)							
Low growth	-9	22	61	-0	-11	-5	3
High growth	-6	21	55	3	-8	-1	6
Change in net exports:^c (Million metric tons)							
Low growth	.0	-.1	-10.7	.6	23.9	.4	1.9
High growth	.0	3.1	2.6	.7	32.8	.9	3.4

Notes: a. These results examine the incremental effect of EE-3 farmers coming under the CAP.

The reference simulation in this case includes unilateral EC reform and expansion of the EC to include the EFTA countries. Compared with this is one in which these reforms are included, along with the phased extension of the CAP to all EE-3 farmers over the period 1992 through 2010. By 2000, therefore, EE-3 farmers have roughly half the protection of those in the EC.

b. The low and high growth scenarios here refer only to the EE-3. In these simulations, the economies of the Balkans and the former USSR remain stagnant.

c. In 2000 the EE-3 is actually projected to be a net importer of cereals and sugar and a net exporter of livestock products. Where positive, a change in *net exports* indicates increased exports or a reduction in net imports, depending on which prevailed in the reference case. Dairy product volume is in liquid milk equivalent.

Source: Results from the analysis discussed in the text.

production by a larger proportion than the loss of consumer subsidies reduce consumption. Excess demand for dairy products therefore increases. This increase in excess demand is largely eliminated by the end of the decade, as the sector recovers from the transition (most rapidly in the high growth case). For meat production the contraction in demand exceeds that in supply and excess demand in the FSU declines. In the Balkan states, the average pre-reform distortions were not large, with the single exception of the sugar policy, which taxed production and subsidised consumption. The changes in excess demand in the Balkans, then, are mainly in response to shifts in the terms of trade due to the corresponding changes in the FSU, most notably substitution in grain production from wheat to coarse grain and higher meat production.

In all the former Soviet republics, this phased liberalisation from a common set of pre-reform distortions yields a consistent pattern of changes in production, consumption and net trade. Most prominently, the removal of the substantial wheat consumption subsidies causes consumers (mainly the livestock sector) to substitute coarse grain for wheat. The higher domestic wheat prices also encourage production increases of between a quarter and a third. In the livestock sector, dairy and ruminant meat consumption fall while there is some substitution favouring non-ruminant meats (the consumption of which was apparently less subsidised before the reforms). The many forms of assistance to livestock production are correspondingly removed and production falls (most substantially in the dairy sector). In all the republics, therefore, net dairy imports rise or net exports decline.

The consequences of reform for overall food self-sufficiency and net food export earnings are summarised in Table 7. The Balkan states respond to their own reform with increased food production and net exports while at the same time they substitute newly cheap wheat for coarse grain in consumption and export coarse grain. Their net food export earnings increase as does their overall level of self-sufficiency, both in the low growth and the high growth scenarios. For the former Soviet republics, the direction of effects on these two measures depends on exogenous income and productivity growth. In both the low and high growth simulations self-sufficiency improves in all republics, principally because of substantial declines in cereal consumption. Correspondingly, net food export earnings increase (or net

Table 7
Food Price Reform in the Balkans and Former USSR: Effects on Self Sufficiency and Net Food Export Earnings, Year 2000^a

	GLS self sufficiency (per cent)				Net GLS export earnings (1990 US\$ billion)			
	Low growth ^b		High Growth ^b		Low Growth ^b		High Growth ^b	
	No reform ^c	Reform	No reform ^c	Reform	No reform ^c	Reform	No reform ^c	Reform
Balkans	103	116	103	125	.5	2.6	.5	3.9
Russia	87	99	87	106	-7.2	-1.0	-7.2	2.2
Ukraine	114	135	114	143	2.9	1.8	2.8	6.4
Baltics	145	160	144	179	1.5	1.5	1.4	2.1
Western republics	74	87	74	93	-3.0	-1.2	-2.9	-6
Kazakhstan	131	154	130	174	1.9	2.5	1.8	3.4
Central Asia	36	40	36	44	-6.2	-4.6	-6.0	-4.1
Total EE and FSU	99	111	104	123				

Notes: a. These results examine the incremental effect of food market liberalisation in the Balkans and the FSU. The reference simulation in this case still maintains economic stagnation in the FSU but includes unilateral EC reform and expansion of the EC to include the EFTA countries, as well as the phased extension of the CAP to cover EE-3 farmers.

b. The low and high growth scenarios here refer both to the EE-3 (in the reference simulation used) and the Balkans and former USSR.

c. The *no reform* values are for 2000 and are drawn from the revised reference simulation, as explained in note a.

Source: Results from the analysis discussed in the text.

food import costs decrease) most prominently for the Ukraine, the Western Republics and Kazakhstan.

E. International Price Effects of All the Greater European and FSU Reforms

In the preceding discussion, each new policy reform was compared with the collectivity of those which preceded it. Here, two simulations which

incorporate the complete set of reforms thus far considered are compared with the original reference simulation (which assumed economic stagnation in the post-socialist countries). The extent to which reforms in Western Europe and the EE-3 might offset the effects of reform in the FSU can then be clarified. Consider first the low growth reform case. Recall the high grain prices which followed unilateral reforms in the EC and its expansion to include EFTA. Although the adoption of a CAP-like policy in the EE-3 has little effect on world wheat trade, reform in the Balkans and the FSU does cause offsetting downward pressure on the international wheat price. Similarly, although the Western European reforms considered would have little effect on the international dairy product price, protection in the EE-3 would reduce it substantially while reform in the Balkans and FSU would increase it, at least temporarily.

It is just possible that these various reforms, carried out simultaneously, might almost exactly offset each other and leave little net effect on international food trade outside Greater Europe. In the crude characterisations simulated here, however, this is not quite the case. As shown in Figure 1, the price-depressing effects of the reforms in EE and the FSU dominate, most strongly in the markets for wheat and dairy products. In the high growth counterpart of the reform scenario (Figure 2), the spread of price effects is initially similar. But as productivity improvements take hold in the later 90s, and despite the demand increases which stem from higher real household income, all international food prices decline.

IV. Conclusion

On the presumption that the trend of reform in the post-socialist economies continues to be market-oriented and that these economies continue to be more open to international commerce than before their reforms, the available evidence suggests a trend toward a net food surplus in this region. Moreover, this net surplus could more than offset any reduction in the largely subsidised exports of Western Europe which might be achieved through unilateral reforms of the CAP and of the national agricultural policies of the EFTA countries. This new food surplus could come to the post-socialist world, initially, through reductions in domestic purchasing power

Figure 1
World Prices, Low Growth Reform

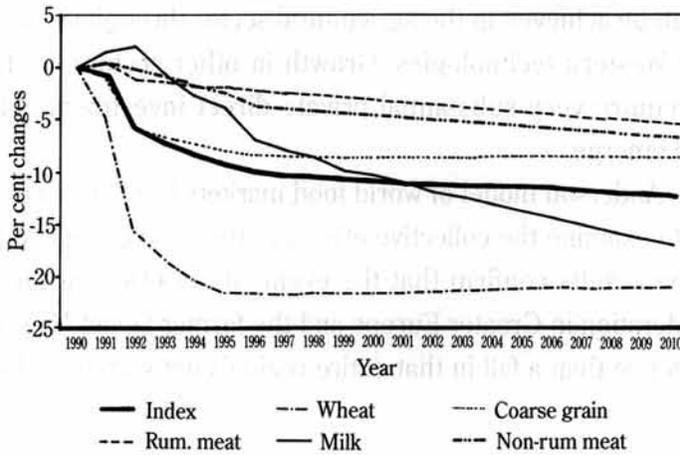
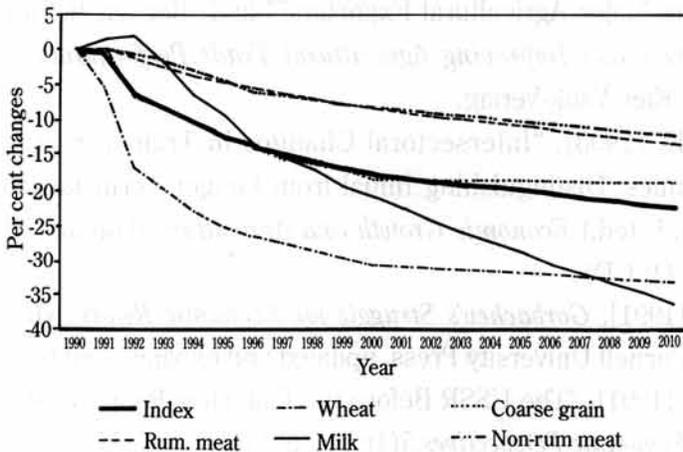


Figure 2
World Prices, High Growth Reform



and hence in both direct and derived demand. In the medium term, however, it is likely to be sustained by improvements in food productivity. New access to considerably more advanced Western technology at comparatively low cost could increase food productivity in the former Soviet Union by as much as half. And reductions in price distortions, while they will bring the livestock sector under pressure in the short run, will reduce domestic cereal demand while at the same time enhancing its supply. Finally, although

renewed growth in agricultural production, particularly in the former Soviet Union, could be temporarily inhibited by a take-off elsewhere in the economy, much can be achieved in the agricultural sector through the adoption of inexpensive Western technologies. Growth in other sectors, on the other hand, will require very substantial private direct investment, which has been slow to emerge.

The Tyers-Anderson model of world food markets is used as a framework with which to examine the collective effects of these on-going and potential changes. The results confirm that the eventual net effect of the reforms under consideration in Greater Europe and the former Soviet Union is more likely to be a rise than a fall in that entire region's net surplus of food products.

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