

# How Distorted Have Agricultural Incentives Become in Europe's Transition Economies?

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## **Abstract**

Over the past two decades, earnings from farming in the former communist countries of Eastern Europe and Central Asia have been altered hugely by government sectoral and trade policy reforms. This paper summarizes evidence on the changing extent of distortions to markets for farm products since the transition away from planned prices began. In particular, it examines the extent to which, following the initial shocks, there has been a gradual improvement in farmer incentives. This new evidence is not inconsistent with that past pattern of earlier-developing countries, but the speed of assistance increase is relatively rapid and is linked with actual or desired accession to the European Union. The final section focuses on future prospects, and in particular on what might be done to avoid agricultural protection levels becoming excessive.

**Keywords:** Distorted farmer and consumer incentives, agricultural price and trade policy reforms, agricultural development, European transition economies

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## 1. Introduction

In a recent survey of European economic growth since 1950, Crafts and Toniolo (2008) conclude that incentive structures are a crucial explainer of comparative growth rates of the economies of east and west Europe. Pre-empting that, a 2006 report on trade performance and policies in the transition countries of Eastern Europe and Central Asia included as one of its key recommendations the need to reduce the mean and variance of the tariff equivalents of trade barriers, and in particular to reduce unilaterally the policy regimes' anti-export bias, especially in countries exporting primary products (Broadman 2006). To progress such reform in Europe's transition economies efficiently and effectively – and to see how recent policies line up with those of the European Union (EU) – requires better information on the extent of reform during the past two decades and of current policy influences on incentives within and between sectors.

Immediately prior to their transition to market economies, policies in the region greatly distorted producer and consumer incentives, especially for agricultural products. Those distortions have been reduced substantially in several countries, but large variations remain across the region and distortions appear to be growing again in some countries. Now is thus an opportune time to examine how policies affecting agriculture are evolving in this region.

To assist that process, the present paper assesses the changing landscape of agricultural protection or taxation patterns in the transition countries of Europe and Central Asia. It is based on a sample of 17 countries: the ten Central and Eastern European (CEE) countries that recently joined the European Union (Bulgaria and Romania joined on 1 January 2007, following eight that joined in May 2004, namely the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovenia, Slovakia), plus seven Commonwealth of Independent States (CIS) countries (Russia, Kazakhstan, Ukraine, Turkmenistan, Uzbekistan, Kyrgyz Republic and Tajikistan). Together these countries in 2000-04 accounted for 89 percent of the region's agricultural value added, 91 percent of its population and 95 percent of total GDP.<sup>1</sup> Some key characteristics of those economies are shown in table 1.

The great diversity within the group of transition countries – in terms of relative resource endowments and comparative advantages, stages of development and transition, agricultural and trade policy regimes, and memberships of the EU, WTO, OECD and regional trading agreements – make the set of countries chosen a rich sample for comparative study. The central and eastern European countries that are now EU members differ substantially from the rest of the former Soviet Socialist Republics that are now members of the Commonwealth of Independent States (CIS), having a higher per capita income (three-quarters of the global average, compared with one-third for the CIS) and a higher population density (0.7 times the global agricultural land per capita, compared with 2.7 times in the CIS).

Analyses of politically feasible agricultural subsidy and trade policy reforms, or of policy options for coping with structural changes such as the boom in energy raw material prices in the mid-2000s 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 politico-

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<sup>1</sup> The other countries of the region include those that were the parts of former Yugoslavia and the other five former Soviet Republics.

economic forces behind their evolution. The paper also explores prospects for further reducing distortions to agricultural incentives and their implications for agricultural competitiveness and trade of the different transition countries, taking into account political economy factors behind the distortions to agricultural incentives in transition countries.

## **2. An Historical Perspective**

### *a. The Communist era*

Incentives for agricultural producers and food consumers were massively distorted under Communist central planning, which was imposed from the 1920s in the former Soviet Union (FSU) and from the 1950s in Central and Eastern Europe until the fall of the Berlin Wall in 1989 and the dismantling of the Soviet Union in 1991. The distortions resulted from a combination of collective farm property rights, 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 (with the exception of Poland and former Yugoslavia) farming was forcefully organized in collective and state farms. This collectivization process and the associated forced migration (and worse) of many landowners and farmers contributed to massive hunger and death before the Second World War in the Soviet Union. From Lenin to Stalin and through most of Khrushchev's regime, agriculture was heavily taxed, and capital was drained from an impoverished countryside to finance urban industrial growth (Ellman 1988).<sup>2</sup>

This all changed at the end of the Khrushchev regime and especially under Brezhnev.

The leadership of the USSR decided to increase agricultural production, with a strong

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<sup>2</sup> The dramatic implications – including millions of peasants dying of starvation – are documented in sobering detail in Conquest (1986).

emphasis on livestock, and this was a policy also followed by many of the Eastern European countries of the Soviet Bloc (Liefert and Swinnen 2002). From the mid-1950s onwards, and especially in the 1970s and 1980s, large amounts of support and investment were directed to 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, with the gap 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 Poland and Hungary was up by half and one-quarter, respectively, compared with output in the late 1960s. In the USSR 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 many OECD countries, even though per capita incomes in Central and East Europe were much lower than the OECD average. This “achievement” came at a cost: large state subsidies, to 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 were about 10 percent of GDP in the USSR and between 5 and 10 percent of GDP in most CEE countries. The bulk of these subsidies went to the livestock sector.<sup>3</sup>

Calculating the net transfers to farmers and to consumers under the Communist regime is very difficult because of the large number of distortions caused by state regulation of prices, production and consumption, exchange rates, marketing organizations, the indirect nature of some of the subsidies, and so forth. While it is generally true that producers of farm

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<sup>3</sup> For an assessment of the support to farmers in the 1980s, see Cook, Liefert and Koopman (1991).

products were strongly subsidized by price settings towards the end of the Communist regime (in sharp contrast to the 1930s when farmers were highly discriminated against), the complexity of the distortions led sometimes to offsetting effects. For example, while agricultural producers in the latter 1980s were supported through high output prices and low input prices, at the same time overvalued exchange rates effectively taxed agricultural (and other) exporters. Correcting for this overvaluation leads to significantly lower protection indicators. As well, agriculture was not alone in being subsidized, as most (heavy) industry was also subsidized or at least protected from import competition. The available fragments of empirical evidence indicate that, on aggregate and in real terms, there was substantial net subsidization of agriculture relative to all other sectors as a group, although much more so for livestock producers than for grain and oilseed farmers. This might suggest food consumers were taxed substantially, but under the central planning system wholesalers were told to sell their food to retailers below their production costs, for which they received state subsidies. As well, with overvalued exchange rates effectively taxing exports and subsidizing imports, they too lowered domestic consumer prices of tradable products. However, by restricting foreign imports and regulating trade, the Communist regime prevented its consumers from accessing higher-quality food products. Kostova Huffman and Johnson (2004) estimate that these welfare losses were equivalent to 50 percent to 75 percent of the direct subsidy benefits to consumers under the communist regime.

### ***b. The reform era***

After 1989, the Central European countries, such as Hungary and Poland, moved first and most rapidly towards market-based systems. The reforms in the Balkan countries, such as Romania and Bulgaria, were initially half-hearted and involved many inconsistencies during most of the 1990s, with government interventions continuing to heavily distort incentives. In

the large CIS countries (Russia, Kazakhstan and Ukraine), governments continued important controls of the agricultural economy through a variety of interventions such as regional trade controls, input supply controls, and the continuation of soft budget constraints. While the Kyrgyz Republic liberalized relatively quickly, the other Central Asian countries moved slower and some have undertaken far less reform and liberalization. In particular, major controls still remain in place in such countries as Uzbekistan and Turkmenistan.

International trade had been strongly regulated under the centrally planned system. The Communist countries were integrated in the Council of Mutual Economic Assistance (CMEA) system, which was a planned inter-country trading regime, trading mainly with other communist countries. (One could think of the CMEA as the international version of the domestic central planner.) The CEE countries were less integrated than the Soviet republics, but still a large part of their trade volume went through the CMEA system. When the CMEA system collapsed in the early 1990s with the liberalization of the macro-economy and of trade policies, important changes in trade and financial flows resulted. Trade liberalization reinforced the reallocation of production activities caused by the abolishment of central planning. Traditional international production allocations were no longer possible when trade had to be financed by hard currencies and when inputs were accounted for at real costs. It also allowed the importation of high-quality Western produce which had earlier been restricted. At the same time, the liberalization of the exchange rates removed discrimination against the sectors producing tradables.

Trade liberalization led to a major international reorganization of production activities. Initially this had a very negative impact on the region's producers, as the traditional export markets dwindled due to a lack of hard currency and because Western countries remained closed to the region's agricultural exports. At the same time, the reduction of import constraints opened regional markets to imports from the West. In combination, this

caused a worsening of the region's agricultural trade balance in the first half of the 1990s. Later on, however, agri-food trade intensified and growing exports (also to Western markets) contributed to the region's recovery. An important development was the shift from centrally imposed extreme specialization (e.g., dairy production in the Baltics and cotton production in Central Asia) to more-diversified production systems and less dependence on single commodities in those countries.

Trade effects were only part of the international effects in the agri-food systems. Possibly even more important was the massive inflow of foreign direct investment to food processing industries, which contributed to a major restructuring and to improvements in food quality and productivity enhancements and investments in agriculture (Dries and Swinnen 2004). Most recently, the wave of foreign investments in the retail sector caused further restructurings of the agri-food system, with important implications for both producers and consumers (Dries, Reardon and Swinnen 2004).

The progress in market reforms is not always correlated with the extent of distortions. On the one hand Slovenia, which was a front runner in liberalization and developing a market economy, had a very high level of farm producer support that, prior to EU accession, was well above the average EU15 rate. On the other hand, much-slower reformers such as Bulgaria, Ukraine and Kazakhstan have much lower – even negative – support levels (see below).

### ***c. Growth and structural changes during transition***

Before measuring the effect of the policy changes, and to put the sectoral changes in a broader perspective, it is also helpful to review the economic growth and intersectoral changes that have taken place in Europe's various transition economies over the past two decades. The initial years of transition 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. Real GDP for the region as a whole fell by almost 6 percent per year during 1990-94. The decline for the central and eastern European (CEE) sample was only 0.6 percent, while for the CIS sample it was 11 percent and, for the residual non-studies countries of the CIS, 12 percent. By contrast, annual GDP growth in the 1995-2004 period averaged 2.7 percent: the CIS sample was slowest (2.2 percent), the CEE countries somewhat higher at 3.2 percent, and the residual enjoyed just over 5 percent.

Within those economies, agricultural value added measured at constant prices appears to have declined less rapidly than non-agricultural GDP in the early years of transition, but also to have grown less rapidly in the subsequent decade. The domestic terms of trade (the prices of outputs relative to the prices of purchased inputs) apparently fell even more for farmers than for non-farmers, however, because agriculture's share of GDP measured in current prices declined even in the early transition period. Unlike in the central planning period, this did not allow faster 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.

The halving of agriculture's share of GDP in the transition region between 1992 and 2004 was accompanied by only a one-quarter decline in agriculture's share of employment, according to FAO statistics (which are not always consistent with national data because of definitional differences). In all three sub-groups of countries the latter share by 2004 averaged three times the former, or five times in the case of the eight CEE countries that joined the EU in 2004. This suggests much lower labor productivity on farms than in other employment.

The share of farm and food products in total merchandise exports also has fallen, by as much as half in some transition countries. When expressed as a ratio of that share for the world as a whole (an agricultural revealed comparative advantage index), most countries of

the region are shown to have lost comparative advantage in farm products over the transition period. That index varies greatly across the region though, from a low of less than 0.5 for mineral-rich Russia and densely populated Slovenia to more than 3 for Latvia and the Kyrgyz Republic.

The region as a whole has become more open as a consequence of moving from plan to market, notwithstanding the continuation of numerous barriers to trade. A common indicator is the value of goods and services expressed as a percentage of GDP. For most countries of the region that percentage is now above the average for Western Europe (37 percent in 2004), with several countries approaching 60 percent by 2004.<sup>4</sup>

### **3. Distortions to Agricultural Incentives During Transition**

#### *a. Methodology: Quantifying distortions to incentives*

To quantify government-imposed distortions that create a gap between domestic prices and what they would be under free markets, Anderson et al. (2008) suggest the first step is to compute the Nominal Rate of Assistance (NRA) for each farm product. This is the percentage by which government policies have raised gross returns to farmers above what they would be without the government's intervention (or lowered them, if  $NRA < 0$ ). A weighted average NRA for all covered products can then be derived using the value of production at undistorted prices as weights. This NRA is similar to the producer and consumer support estimates (PSEs and CSEs) computed by OECD (various years), except that the latter are expressed as a percentage of the distorted price.<sup>5</sup> To that NRA for covered products is added

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<sup>4</sup> This is a strong feature of Asia's economies in transition as well. For a comparison of the Asian and European transition experiences, see Swinnen and Rozelle (2006).

<sup>5</sup> It is similar also to the direct distortion estimate generated in the Krueger, Schiff and Valdés (1991) study, whose methodology was used by Valdés (2000) to obtain an early set of estimates for some transition economies. The methodology used here benefitted from but involves considerably more indicators than in the studies of either the OECD or Valdés.

a ‘guesstimate’ of the NRA for non-covered products (on average around 30 percent of the total) and an estimate of the NRA from non-product-specific forms of assistance or taxation. Each farm industry is classified either as import-competing, or a producer of exportables, or as producing a nontradable (with its status sometimes changing over the years), so as to generate for each year the weighted average NRAs for the two different groups of covered tradable farm products. We also generate a production-weighted average NRA for nonagricultural tradables, for comparison with that for agricultural tradables via the calculation of a percentage Relative Rate of Assistance (RRA), defined as:

$$RRA = 100 * [(100 + NRA_{ag}^t) / (100 + NRA_{nonag}^t) - 1]$$

where  $NRA_{ag}^t$  and  $NRA_{nonag}^t$  are the percentage NRAs for the tradables parts of the agricultural (including non-covered) and non-agricultural sectors, respectively.<sup>6</sup> Since the NRA cannot be less than -100 percent if producers are to earn anything, neither can the RRA (since the weighted average  $NRA_{nonag}^t$  is non-negative in all our country case studies). And if both of those sectors are equally assisted, the RRA is zero. This measure is useful in that if it is below (above) zero, it provides an internationally comparable indication of the extent to which a country’s sectoral policy regime has an anti- (pro-)agricultural bias.

This approach is not well suited to analysis of the policies of Europe’s former socialist economies prior to their reform era, because prices then played only an accounting function and currency exchange rates were enormously distorted. During their reform era, however, the price comparison approach provides as valuable a set of indicators for them as for other market economies of distortions to incentives for farm production, consumption and trade, and of the income transfers associated with interventions.

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<sup>6</sup> Farmers are affected not just by prices of their own products but also by the incentives nonagricultural producers face. That is, it is *relative* prices and hence *relative* rates of government assistance that affect producer incentives. More than seventy years ago Lerner (1936) provided his Symmetry Theorem that proved that in a two-sector economy, an import tax has the same effect as an export tax. This carries over to a model that also includes a third sector producing only nontradables.

In addition to the NRA, we also consider the extent to which consumers are taxed or subsidized. To do so, a Consumer Tax Equivalent (CTE) is computed as the percentage by which the price that consumers pay for their food exceeds the international price of each food product at the border. Differences between the NRA and the CTE arise from distortions in the domestic economy that are caused by transfer policies and taxes/subsidies that cause the prices paid by consumers (adjusted to the farmgate level) to differ from those received by producers. In the absence of any other information, the CTE for each tradable farm product is assumed to be the same as the NRA from border distortions, and the CTE for nontradable farm products is assumed to be zero.

To obtain dollar values of farmer assistance and consumer taxation, that multi-country study takes the country authors' NRA estimates and multiplies them by the gross value of production at undistorted prices to obtain an estimate in US dollars of the direct gross subsidy equivalent of assistance to farmers (GSE). These GSE values are calculated in constant (2000) US dollars, and are also expressed on per-farm-worker basis. Likewise a value of the consumer transfer is derived from the CTE, by assuming the consumption value is the gross value of production at undistorted prices divided by the self-sufficiency ratio for each product (production divided by consumption, derived from national volume data or the FAO's commodity balance sheets). These transfer values can be added up across products for a country, and across countries for any or all products, to get regional aggregate transfer estimates for the studied economies.

We also report trade and welfare reduction indexes (TRIs and WRIs, respectively) as an alternative measure of the level of agricultural policy distortion. These indexes have been recently developed by Lloyd, Croser and Anderson (2009), building on the family of indexes first developed by Anderson and Neary (2005). These indexes overcome aggregation problems (across different forms of policy and across industries) by using a theoretically

sound aggregation procedure that answers precise questions regarding the trade and welfare reductions imposed by each country's agricultural and trade policies. The TRI and WRI are computed from sub-indexes of the NRA and CTE across product groups: separate NRAs and CTEs are required whenever there are domestic subsidies or taxes on production or consumption in addition to border measures, as so often is the case for foods and other farm products. Thus the indexes we report capture the aggregate trade- and welfare-reducing effects of all agricultural policies affecting consumer and producer prices of farm products from all price-distorting policy measures in place.

Because of data constraints, some of the indicators could not be calculated for some of the Central Asian republics. Consistent series of empirical estimates are provided below for the ten Central and Eastern European countries that joined the EU in 2004 or 2007 and the three biggest CIS economies (Russia, Ukraine and Kazakhstan). In the case of Kazakhstan, reliable price data are available only for the period 2000-04.

The worst of the exchange rate distortions in the formerly planned economies were removed in the early 1990s, prior to the start of the period under study here. Since there were no reliable indicators of any remaining secondary market price for foreign currency, we made use of official exchange rates in undertaking price comparisons.<sup>7</sup> Our approach in this respect is consistent with that of, among others, the OECD Secretariat's calculations of agricultural producer support estimates (PSEs) (OECD, various years).<sup>8</sup>

### ***b. Nominal rates of assistance to agriculture***

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<sup>7</sup> For a detailed discussion of how misalignments in the exchange rate may affect the measurement and interpretation of NRAs during transition, see Liefert and Liefert (2008) on Russia.

<sup>8</sup> Nor was it possible to estimate the sectoral assistance equivalent of soft credits provided for some farms (and other enterprises). And throughout there has been no attempt to assess whether some interventions may have been warranted on national economic welfare grounds because of the presence of externalities, or failures in the markets for such things as land and credit, or policy failures such as underinvestment in public infrastructure in rural areas. In addition to the present study's estimation of price wedges, the latter would require a sophisticated economic model of the national economy with some quantification of the difference between private and social marginal costs. Such welfare analysis is thus beyond the scope of the present study.

Beginning in the early 1990s, many trade and price distortions were removed throughout the region. Price, exchange rate 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 to agriculture fell to very low levels in the early 1990s (as it did also for industrial production). Between 1992 and 1995, nominal assistance to agriculture averaged just 12 percent in the CEEC-10 and was below zero in Bulgaria and the three Baltic nations – as it was in Russia and Ukraine (figure 1 and table 2).

The changes in policies and hence in rates of agricultural assistance since 1995 have not been smooth, but rather characterized by stop-go phases and sometimes even reversals of previous reforms, as is apparent from figure 1. Despite that heterogeneity of experiences, one can identify a couple of general phases in the policy changes.

Following its initial collapse, support to agriculture increased during the mid-1990s in some of the region's countries. In the CEE countries this was driven by the explicit introduction of new support policies, while in Russia it reflected primarily exchange rate developments which, in the presence of institutional constraints which constrained the pass-through of border prices to farm-gate prices, pushed assistance rates up to high levels.

The increase in support started first in Central Europe where, after the radical liberalization in the early 1990s, political pressures induced governments to re-introduce a series of measures. The nominal rates of assistance increased from close to zero in 1992 to around 20 to 30+ percent in the second half of the 1990s, but then they stabilized in the lead-up to EU accession in 2004. Between 2000 and 2003, the average rate of assistance to agriculture in the CEEC-10 was just under 25 percent (figure 1), which is slightly less than half the rate of assistance (including from programs somewhat decoupled from production) provided to farmers in the EU-15 at that time (see Josling 2008).

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 some other currencies in the region) in the presence of imperfect pass-through, caused a strong decline in the estimated rates of assistance to agriculture. This macro-economic correction brought estimated assistance rates down to much lower levels. Second, the hike in world energy and mineral prices, and general economic growth in the 2000s, improved many CIS governments' budgetary situations. Income growth induced an increase in 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 is to go to subsidies, as some governments have plans to spend considerably on infrastructure and quality upgrading in agriculture. Also, rural incomes have improved because of better (and timely) payments of farm workers' wages and pensions to farm and rural workers, and because of improved rural services.

The combination of all these developments led to a somewhat lower weighted average NRA for agriculture in the region as a whole for the four-year period since 2000 than in the period immediately before: 13 percent during 2000-03 compared with 20 percent in 1996-99 (table 2). In Russia the average support level fell even more (from 25 to 13 per cent). However, during 2004 and 2005 supports rose again, including in those countries that have since joined the EU (before they dropped again as international food prices rose in 2007). Meanwhile, the NRA moved closer to zero in Ukraine in 2005, but is probably still very negative in the rest of Central Asia. There is thus a very wide dispersion in average NRAs across countries in the region, from very high levels in the highest-income country (Slovenia) to negative levels still in the poorest countries of Bulgaria, Kazakhstan and Ukraine (figure 2).

There are major differences in distortions across commodities too. 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 (table 3). For example, by 2000-03, sugar, poultry and milk were the most highly protected commodities in the CEEC-10, and grains, beef and pork were the least assisted. Meanwhile, in Russia and Ukraine the range is even more extreme, from high positive assistance to livestock and sugar to high negative assistance to the production of the key feed inputs into livestock (coarse grains and oilseeds). It happens that sunflower seed is Russia's dominantly produced and traded oilseed and the only consistently exported commodity through the transition period. The case of Kazakhstan in 2004 was even starker, where import-competing producers were highly assisted while exporting industries had to endure negative assistance such that, even though the average NRA was close to zero, a strong anti-agricultural trade bias prevailed.

Government intervention and controls are especially important in 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. This is, for example, the case for grains and oilseeds in Ukraine, Bulgaria and Russia, both for human consumption and to support (via low feed input prices) the production of livestock products. It has been true also for cotton in Uzbekistan, Tajikistan and Turkmenistan, where heavy taxation is distorting incentives for producers – although open or porous borders make the taxing of cotton exports difficult while tax rates vary across countries in that sub-region.

The total amount of support is an imperfect indicator of distortions to incentives, since different trade, price and subsidy instruments have different market-distorting effects. Most support to agriculture in the region was and, despite the reforms, still is provided via highly distortive and hence inefficient policy instruments. Under the Communist regime, output price distortions were complemented with heavy distortions in input prices, in particular low

fertilizer and energy prices and subsidized irrigation, while in the 1990s the majority of farm support in the CEE countries was provided by output prices being kept above border prices (see near bottom of table 3). However, the share of support from those measures has declined over the past decade, consistent with developments within the EU15. These policy changes are reflected in the composition of the assistance that farms have received. Under the Communist system, price support and output subsidies were the main component in the CEECs, accounting for more than 80 percent of their NRA. 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 of the NRA. The other important components of the NRAs of CEE countries were input subsidies, direct payments and other non-product-specific subsidies, plus some decoupled payments in the most-recent years (table 4).<sup>9</sup> In the CIS countries, those payments include soft loans and debt forgiveness which continue to play an important role. While fiscal constraints for most of the 1990s limited the government's ability to support farms by this means, the budgetary situation changed in the 2000s as earnings from mineral and energy exports grew and this became a more important source of government assistance to farmers.

The gross subsidy equivalent of the assistance to farmers, when expressed in constant (2000) dollar terms, shows Russia, Romania and Poland to be the next biggest aggregate supporters. For the region as a whole, the supports are the equivalent of more than \$15 billion per year, compared with just \$2 billion in the early years of transition (table 5(a)). When expressed on a per farmer basis, the range is huge. In 2000-03, for example, it ranged from negative amounts (-\$300) in Ukraine and Kazakhstan to an average of \$980 in the CEECs, \$430 in Russia, and more than \$2200 in Hungary, Romania and Slovenia (table 7(b)). This

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<sup>9</sup> Water price regulations and subsidies are important policy instruments in the irrigated regions of Central Asia, but it was not possible in this study to estimate their impact on NRAs. Energy policies are still used to assist various sectors, for example in Russia, but since they do not favor agriculture in particular, and are becoming less important, they too have been omitted from our NRA estimates.

compares with \$8400 per farmer in the EU-15 in 2000-04 (Josling 2008). For the EU accedents, per farmer assistance over the next few years is likely to move closer to the EU average.

*c. Effects on consumers*

Since most of the support for farmers came through price-support measures, most notably import restrictions, these have the effect of raising consumer prices by a similar degree when calculated at the farmgate. That means that prior to the mid-1990s, policies in all but Slovenia imposed the equivalent of low or negative taxes on food consumers (CTEs), but thereafter the CTEs have become positive. The region's weighted average CTE in 2000-03 was 15 percent (table 6), compared with nearly twice that in the EU-15. The high CTEs in Romania and Slovenia have been well above that EU average this decade and so presumably will fall during those countries' transition to the EU's Common Agricultural Policy, especially given the EU's policy re-instrumentation towards more direct farm income supports that do not raise consumer prices of food.

*d. Effects on trade and welfare*

Additional insights that can be gained in moving from an average NRA and CTE measure to a TRI and WRI measure. The WRI provides a better indicator of the welfare cost of distortions than the average level of assistance or taxation in the Agricultural Distortions database. Although the latter are a significant contribution in their own right, they can be misleading as a pair of indicators of the extent of the welfare costs of assistance or taxation. This is due to the inclusion in the WRI of the 'power of two'. That is, a weighted arithmetic mean NRA and CTE do not fully reflect the welfare effects of agricultural distortions because the dispersion of that support or taxation across products has been ignored. By contrast, the

WRI captures the higher welfare costs of high and peak levels of assistance or taxation. The WRI series for Eastern European countries is everywhere positive, and lies above the NRA series (figure 3) owing to its capturing of the dispersion of the NRA. That is, the WRI captures the so-called ‘disparity’ issue discussed in Lloyd (1974): the larger the variance in assistance levels within a sector, the greater the potential for resources to be used in activities which do not maximize economic welfare.

The TRI correctly aggregates the restrictiveness of sub-sector policies that are masked in aggregate NRA and CTE measures, because they offset one another. In figure 4, for example, initially the TRI for the Eastern European focus countries is negative. This was the period in which import-competing policies had the overall effect of expanding trade. Over time, however, policies in import-competing sectors increasingly restricted trade flows, with a peak TRI of 35 in 1997 when Eastern Europe’s economies, on average, had policies in place which reduced overall trade in the agricultural sector to the same amount as a tariff of 35 percent on each product. After 1997, both import-competing and exportable sectors had policies that expanded trade. In the most recent years, the overall effect of policies in the import-competing and exportables sub-sector on trade is neutral (table 7). However, as can be seen in figure 5, this overall result masks the trade-reducing nature of policies in import-competing sectors and the trade-expanding nature of policies in exportable product sectors.<sup>10</sup>

*e. Assistance to agriculture relative to other tradable sectors*

The region’s import tariffs on primary agricultural commodities are on average twice as high as average tariffs in industry, but only half as high as tariffs on processed food. This is true both for the CEECs and for CIS countries. It suggests that while the region’s farmers receive

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<sup>10</sup> Such differences in distortions among different types of agricultural industries make it difficult to generalize about the impact of overall policy reforms on income inequality within and between countries of the region. They also suggest that using a single variable to represent trade reform in regression analyses aimed at assessing reform’s impact on inequality, as in Milanovic and Ersado (2008), may be too simplistic.

more tariff protection from competition abroad than do non-agricultural producers, food processors may be effectively protected despite having to pay above world prices for primary farm products.

The import-competing producers are only part of each sector, however. When account also is taken of support for producers of exports in each sector, an overall NRA for all non-agricultural tradable industries can be used, together with the average NRA for agricultural tradable industries, to calculate the relative rate of assistance (RRA). In so far as the NRAs for non-farm industries are positive, the RRA is lower than the NRA for agriculture. But in most cases the nonagricultural NRA is very low. Thus the overall NRA for tradable primary agriculture in the region during 2000-03 is estimated to have averaged more than three times higher than for producers of non-agricultural tradables (15 as compared with 5 percent), so the RRA averaged 10 percent. Only in three of our focus countries – Bulgaria, Kazakhstan and Ukraine – has agricultural production assisted less than nonagricultural tradables ( $RRA < 0$ ) during the present decade. And in virtually all countries for which there is a time series, the RRA is higher at the end of our sample period than in the first few years of transition (figure 5).

#### **4. Implications and Conclusions**

Clearly, reforms have brought major changes in distortions to agricultural incentives and their effects over the past two decades in the transition countries of Europe. While incentives were massively distorted under the Communist system, market liberalizations have reduced distortions to agricultural incentives in the region, and in many of the countries average protection levels are now relatively low.

It is obvious that political and overall economic reforms have played a crucial role in inducing these changes in agricultural distortions. The most obvious example is the fall of the Communist regime and the disintegration of the Soviet Union – and of the central directives coming from Moscow. However, even later there are several examples where more general crises have triggered changes. Most often the policy reforms came only after new elections induced a change in government, reflecting changed electoral preferences. For example, in Romania and Bulgaria, important progress in the removal of distortions and market reforms only occurred in the late 1990s after electoral change brought reform-minded governments to power. Important reform progress was made in Ukraine in the years after the 1999 election in which the large farm lobby fell out with President Kuchma, who consequently introduced a series of important reforms which farmers had successfully opposed previously.<sup>11</sup>

While average protection rates are relatively low, there is still considerable variation among countries within the region. Specifically, for this region as elsewhere, farmer assistance tends to be higher in higher-income countries, and in countries with weaker comparative advantage in agriculture.<sup>12</sup> Hence it is likely that similar political-economic interactions and mechanisms are at work in this region as in other parts of the world.

One important factor affecting the choice of agricultural policies, in particular in the CEECs, was the preparation for joining the EU and its Common Agricultural Policy. The EU accession process encouraged CEE governments to target the levels of support expected 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 in the years before accession the EU

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<sup>11</sup> It should be noted though that democratic political change is not a sufficient condition in itself for better agricultural policies. For example, in both Ukraine and the Kyrgyz Republic, their political changes (the “Orange Revolution” and the “Tulip Revolution”, respectively) have not contributed to better agricultural policy. In fact the Ukraine government seems to have somewhat reversed its reform process, while change in the Kyrgyz Republic mostly resulted in more instability even though relatively few distortions remain in agriculture there.

<sup>12</sup> The positive correlation between a country’s per capita income and agricultural protection is one of the well-known stylized facts of the political economy of agricultural policies – for reasons explained in, for example, Anderson and Hayami (1986), Anderson (1995), Swinnen (1994) and de Gorter and Swinnen (2002).

accession process had more impact on the introduction of new support instruments than on the overall level of support, probably because all the cost of that support had to be borne within the national economy prior to EU accession (Swinnen 2002).

The increases in agricultural support in the CEECs in the second half of the 1990s and more recently in the CIS are the result of interactions between domestic political forces and international events. The increase in farmer assistance in CEE countries in the late 1990s was likely caused by the 'normal' domestic internal pressures that are brought to bear in a contestable political environment which result in rises in agricultural protectionism as per capita income increases and as agricultural comparative advantage declines. In the CEE case it was probably a case of reversing somewhat the overshooting in reform during the first few years of transition.

After accession, the CEE countries that joined have gradually raised agricultural assistance towards EU-15 levels. An important part of the EU farm subsidies are now under the form of direct payments. The CEE countries have been induced also to undertake major regulatory improvements to stimulate their markets, including private investments in the food chain and public rural infrastructure investments. Their trade policies have likewise changed so as to allow free access for all products from other EU-27 member countries and, in most cases, also freer access for non-agricultural products from non-EU countries (the latter because the common external tariff typically was lower than that previously applying in acceding countries). Interestingly, the impact of the EU accession process on consumer food prices in the CEE countries was much lower than expected. The main reason is the increased competition in the CEECs with the full opening of agri-food markets to imports, and with the massive inflow of foreign direct investment in the retail supermarket sector.

Further east, there was a significant increase in CIS farm assistance after 2000. This increase was stimulated by improvements in governments' budgetary situation, which

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

While distortions to agricultural incentives have been reduced substantially in the transition region, there is still substantial room for further reduction of distortions. This could be done through various means: overall reductions in support, shifting support to less-distortive policy instruments, and focusing budgetary expenditures on public good investments (in infrastructure and institutions to reduce trade costs and raise farm productivity) rather than on farm subsidies, shifting from a quantity-based to a quality-based policy paradigm, and so forth.

The accession of the CEE countries to the EU has increased their levels of farm assistance, although they now face more competition within the enlarged EU. While reducing CEE farm assistance in the future will not happen without reductions in EU support levels, some reforms have been introduced in the EU (e.g., the cut in EU sugar price support and the shift from per hectare payments to single farm payments). These reforms have mostly reduced the market-distorting effects of assistance while the level of assistance has remained more or less constant.

Those countries which aspire to join the EU in the medium or long term should focus their policy attention in the near term on efficiency improvements in both their policies and their agricultural economies. This is consistent with the objective of EU accession, since the EU itself has moved in recent years to more-decoupled farm support and is demanding that

member countries move in that direction and improve the efficiency of their farms and food companies.<sup>13</sup>

The same policy framework should be promoted in countries further east, which include countries that have started to spend more funds on agriculture as their fiscal situation improved – although this may be reversed in the current financial crisis. Increased funding should be focused on upgrading infrastructure, on quality and efficiency of the agri-food system, and on the introduction or improvements of a variety of institutions necessary to support rural markets. In several of the poorer and the larger CIS countries, institutional and infrastructure problems, as well as corruption, remain major constraints to trade and thereby distort farm incentives.

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

In terms of further reductions in policy distortions, one of the most distortive situations that still requires attention is the taxation of agriculture, such as through the control and rent extraction in the cotton sectors in some Central Asian countries. In Uzbekistan, Turkmenistan and Tajikistan, cotton traditionally has been a very important source of export tax revenue (as was the case in a number of African countries -- see Anderson and Masters 2009): the government controls the cotton chain so as to extract rents, thereby depressing

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<sup>13</sup> From this perspective, it is important to point to the importance of other reforms, 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.

farmers' prices and production incentives. There is a clear division in Central Asia between the roughly neutral policy towards cotton in Kazakhstan and the Kyrgyz Republic (where cotton exports used to be a relatively modest share of exports) on the one hand, and on the other the extensive taxation and extraction of rents from cotton in Turkmenistan, Uzbekistan, and Tajikistan.<sup>14</sup>

Other cases of export sector extraction include the grain (and oilseed) export sectors of Ukraine, (pre-accession) Bulgaria, and the grain-surplus regions of Russia which are similarly characterized by heavy government regulation and interventions. In these traditional grain-exporting regions, the grain sector has disproportionate political significance – for historic and psychological reasons. For example, in the mid-1990s in Bulgaria, ministers of agriculture had to resign regularly following reports of grain shortfalls or unregulated exports threatening the local grain supply. In Ukraine, ad hoc grain market interventions continued in recent years.

Removing those distortions would allow a substantial improvement in incentives to domestic producers. For example, cotton farmers have responded sharply to the differences in price distortions, both in area and output: rapid growth in Kazakhstan and the Kyrgyz Republic contrasts with declines or stagnation in the other countries. Some progress has been made in recent years, but much more can be done.

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<sup>14</sup> In Turkmenistan and Uzbekistan governments use state monopoly powers over marketing to transfer substantial resources out of agriculture. Most of the transfers in Uzbekistan appear to go to general government revenue, whereas in Turkmenistan much is wasted (e.g., in inefficient cotton mills with negative value added) or accrues to secret accounts under the President's personal control. Moreover, recently some potentially important reforms have been introduced in Uzbekistan to reduce some of the distortions to farm incentives, while almost none have taken place in Turkmenistan. In Tajikistan the rent distribution is more opaque, but equally detrimental to farms, as a coalition between the government and a monopolistic private trading company has caused depressed prices and incentives for farmers. Price and trade data are not sufficiently reliable to allow NRA calculations, but Pomfret (2008a,b) and Christensen and Pomfret (2008) provide considerable qualitative information supporting the claims above.

Our final comments are on the role of the World Trade Organization (WTO).<sup>15</sup> The impact of the WTO on (changes in) agricultural distortions has varied strongly between countries. WTO accession has not strongly disciplined transition countries that were founding members in 1995 (Bacchetta and Drabek 2002).<sup>16</sup> For the CEECs, most of whom were original members of the WTO, the most important WTO impact has been indirect: in anticipation of eastward enlargement, the EU was forced to introduce major changes to its Common Agricultural Policy, which in turn has affected post-accession agricultural distortions in the CEECs.

For transition countries that had to negotiate their entry in the latter 1990s, the constraints on introducing or maintaining distortions are more serious. And for those large transition countries still in the process of negotiating their accession, notably Russia and Kazakhstan, the WTO membership has been even tougher in their demands. Whether that latter stance will prove an agricultural trade-liberalizing force 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.

However, there are limits to what the WTO can achieve in terms of further reductions of agricultural distortions in transition countries. First, the slow and intermittent progress of the WTO's Doha trade negotiations reduces the pressure for further reforms. Meanwhile, in the mineral- and energy-rich CIS countries, the rise in export earnings in the mid-2000s reduced budgetary constraints on governments inclined to give assistance to farmers as national incomes grew. Such pressures for increasing farm assistance are more likely to be

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<sup>15</sup> The impact of regional trading arrangements such as the Eurasian Economic Community (EAEC), the Central European Free Trade Area (CEFTA), and the Baltic Free Trade Area (BFTA) on reducing agricultural policy distortions has generally been limited. This is because the agreements include many exceptions for agricultural and food products, and especially for so-called "sensitive products" which make up a substantial share of production. Moreover, Central Asian countries such as Kazakhstan and the Kyrgyz Republic have been reluctant to join the EAEC, because it would impose Russia's trade and customs preferences on them.

<sup>16</sup> The Czech Republic, Slovakia, Hungary, Poland, Romania and Slovenia have been members of the WTO since its creation in 1995. Bulgaria, Estonia, Lithuania, Latvia, Kyrgyz, Armenia, Georgia, Albania and Ukraine joined the WTO later, while in early 2009 Russia and Kazakhstan were still negotiating their WTO accession.

affected by the evolution of global energy and mineral prices than by developments at the WTO. Further, some of the major remaining distortions include CIS regional trade policies which are largely ad hoc and nontransparent. However, eliminating these policy interventions may require fundamental reforms of political systems (for example in Russia), including transformations of attitudes and behaviors involving governance. Accession to the WTO is unlikely to alter that in the medium term.

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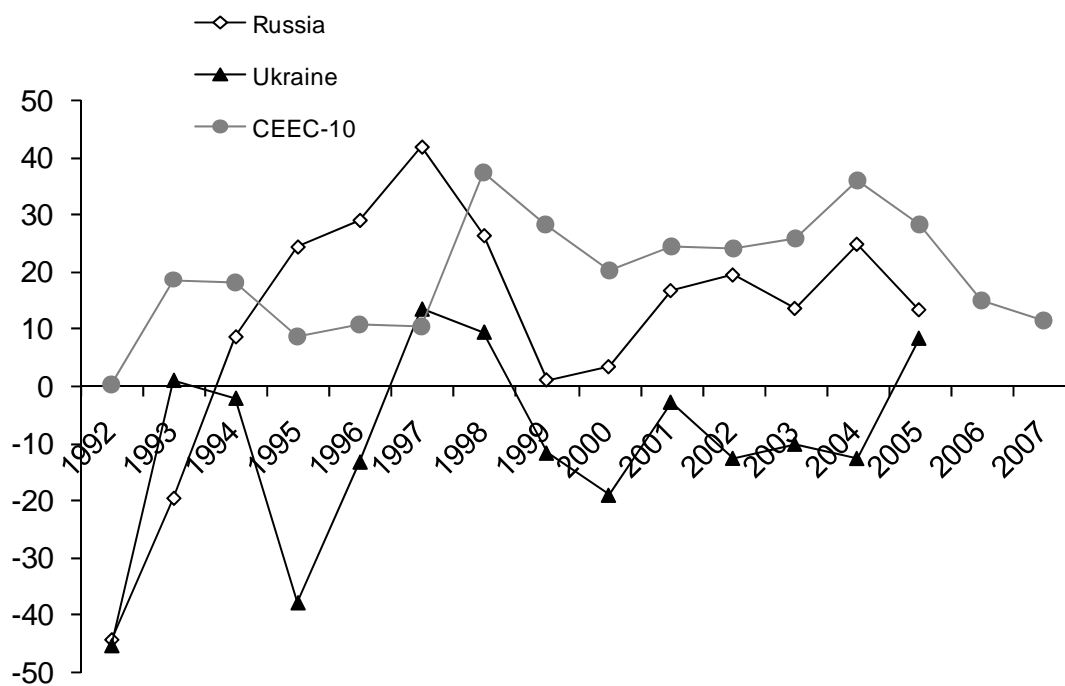
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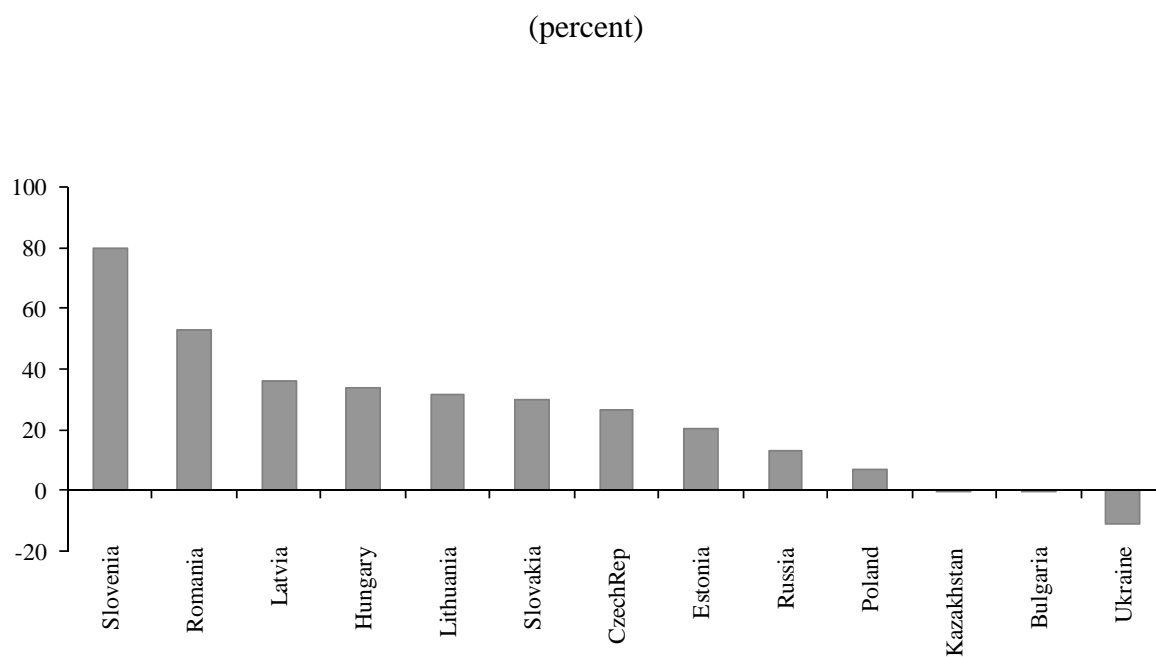
Figure 1: Nominal rates of assistance to agriculture, Eastern European focus countries, 1992 to 2007

(percent)



Source: Anderson and Valenzuela (2008), updated from estimates reported in Anderson and Swinnen (2008).

Figure 2: Nominal rates of assistance to agriculture, individual Eastern European focus countries, 2000-03

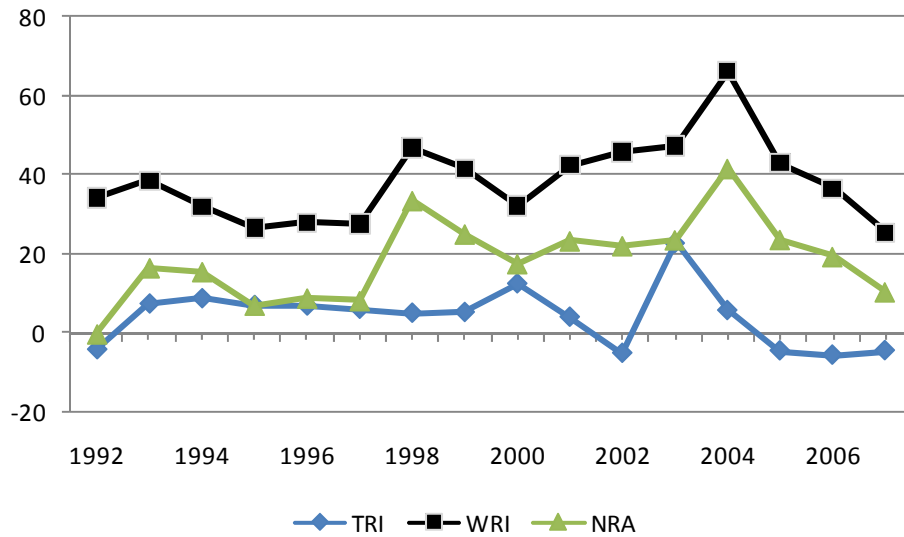


Source: Anderson and Valenzuela (2008), updated from estimates reported in Anderson and Swinnen (2008).

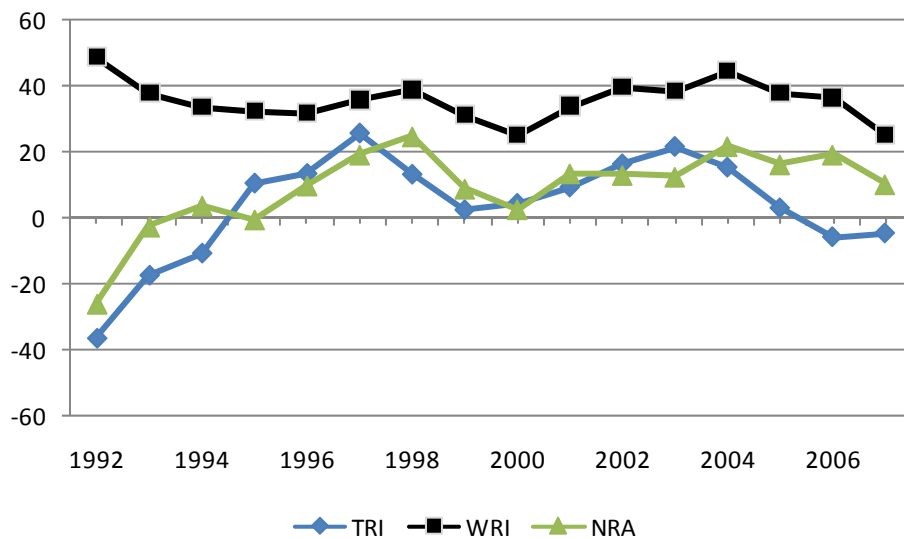
Figure 3: Trade and welfare reduction indexes, with nominal rate of assistance, all covered tradable farm products, Eastern European focus countries, 1992 to 2007

(percent)

(a) CEEC-10



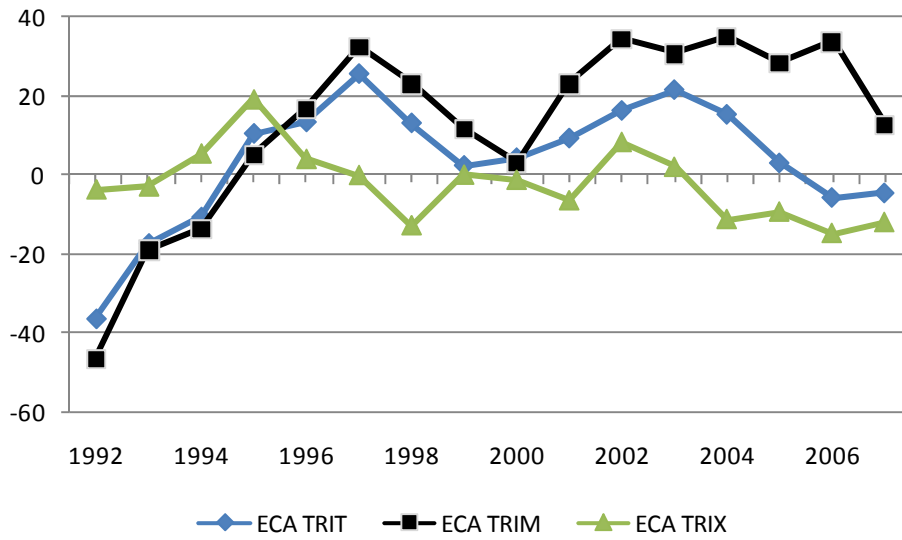
(b) All Eastern European focus countries



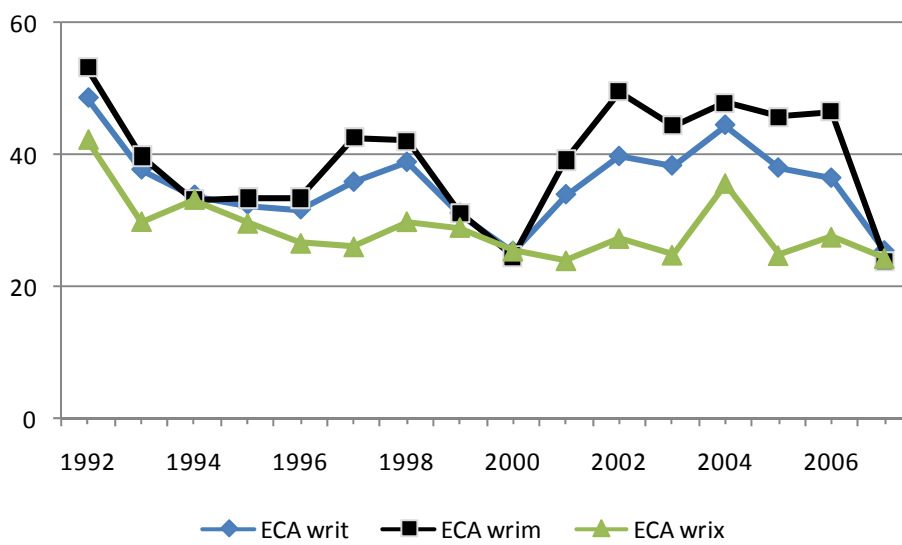
Source: Derived from estimates in Anderson and Croser (2009).

Figure 4: Trade and welfare reduction indexes, covered import-competing products, covered exportables and all covered tradable farm products, all Eastern European focus countries, 1992 to 2007

(a) Trade reduction indexes

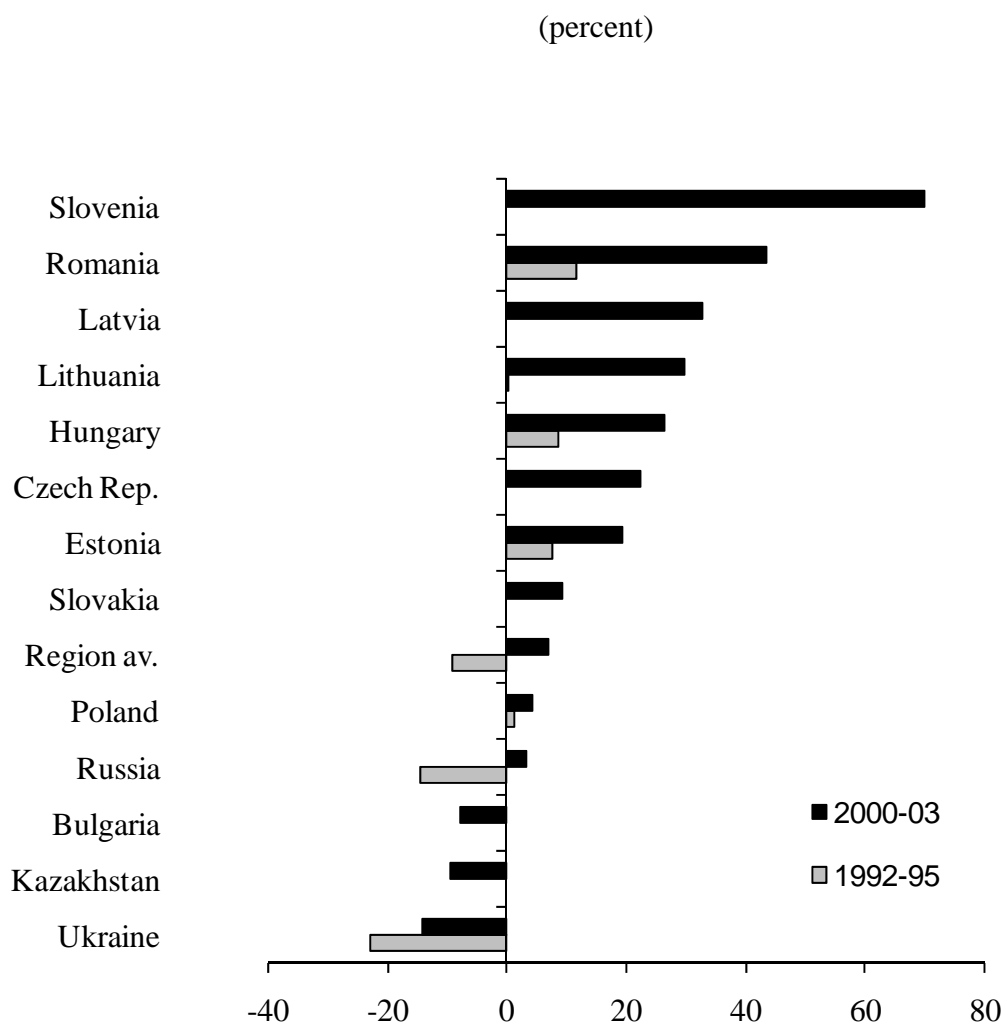


(b) Welfare reduction indexes



Source: Derived from estimates in Anderson and Croser (2009).

Figure 5: Relative rates of assistance to agriculture,<sup>a</sup> individual Eastern European focus countries, 1992-95 and 2000-03



Source: Anderson and Valenzuela (2008), updated from estimates reported in Anderson and Swinnen (2008).

a. The RRA is defined as  $100 * [(100 + \text{NRA}_{\text{ag}}^t) / (100 + \text{NRA}_{\text{nonag}}^t) - 1]$ , where  $\text{NRA}_{\text{ag}}^t$  and  $\text{NRA}_{\text{nonag}}^t$  are the percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively. No estimates are available for including after Kazakhstan, Russia and Ukraine after 2005.

Table 1: Key economic and trade indicators, Eastern European and CIS focus countries,<sup>e</sup> 2000-04

	Share (%) of world:			National rel. to world (=100)			TSI <sup>b</sup>	Poverty <sup>c</sup>	Gini <sup>d</sup>
	Pop'n	Total GDP	Agric GDP	GDP per capita	Agric land per capita	RCA ag & food <sup>a</sup>			
Slovenia	0.03	0.07	0.04	216	32	52	-0.68	0	na
Czech Rep.	0.16	0.22	0.19	135	52	61	-0.44	0	26
Hungary	0.16	0.20	0.14	122	72	90	0.40	0	27
Estonia	0.02	0.02	0.03	102	78	199	-0.38	1	36
Poland	0.62	0.57	0.47	93	57	105	-0.39	0	34
Slovak Rep.	0.09	0.07	0.09	92	57	57	-0.50	0	na
Lithuania	0.06	0.04	0.08	80	125	176	-0.21	1	36
Latvia	0.04	0.03	0.03	76	132	364	-0.51	0	38
Romania	0.35	0.15	0.49	41	84	74	-0.06	1	31
Bulgaria	0.13	0.05	0.15	39	86	143	0.37	0	29
<b>CEE sample<sup>f</sup></b>	<b>2.75</b>	<b>2.05</b>	<b>3.67</b>	<b>74</b>	<b>70</b>	<b>98</b>	<b>-0.09</b>	<b>1</b>	<b>37</b>
Russia	2.34	1.10	1.58	47	186	53	-0.46	0	40
Kazakhstan	0.24	0.08	0.18	33	1737	76	na	1	34
Ukraine	0.78	0.13	0.46	17	107	112	na	0	28
Turkmenistan	0.07	0.01	0.06	18	881	92	na	5	41
Uzbekistan	0.41	0.03	0.27	8	134	na	na	0	37
Kyrgyz Rep.	0.08	0.00	0.05	6	268	390	na	0	30
Tajikistan	0.10	0.00	0.03	4	85	192	na	7	33
<b>CIS sample</b>	<b>4.02</b>	<b>1.37</b>	<b>2.62</b>	<b>34</b>	<b>270</b>	<b>na</b>	<b>0.02</b>	<b>0</b>	<b>37</b>
Other CEE/CA	0.64	0.19	0.61	29	82	166	0.41	1	na
<b>All CEE/CA<sup>f</sup></b>	<b>7.43</b>	<b>3.60</b>	<b>6.90</b>	<b>48</b>	<b>179</b>	<b>na</b>	<b>-0.06</b>	<b>0</b>	<b>37</b>

Source: Sandri, Valenzuela and Anderson (2008), compiled from World Bank (2007).

a. Revealed Comparative Advantage = share of agriculture and processed food in national exports as a ratio of that sector's share of global exports

b. Primary Agric Trade Specialization Index =  $(X-M)/(X+M)$ , 2000-02 (world av =0).

c. Percentage of population living on <US\$1/day, from Chen and Ravallion (2007).

d. Gini Indices for the most recent year during 2000-04, from Chen and Ravallion (2007).

e. CEE=Central and Eastern Europe, CIS=Comm'th of Independent States, CA=Central Asia

f. Includes Turkey.

Table 2: Nominal rates of assistance to agriculture,<sup>a</sup> individual Eastern European and CIS focus countries, 1992 to 2007

	(percent)			
	1992-95	1996-99	2000-03	2004-07 <sup>d</sup>
Bulgaria	-19	-11	0	7
Czech Rep	20	19	27	24
Estonia	-14	20	20	23
Hungary	19	18	34	20
Latvia	-15	30	36	28
Lithuania	-19	29	32	29
Poland	10	24	7	32
Romania	22	29	53	50
Slovakia	28	26	30	21
Slovenia	64	79	80	31
<b>CEEC-10</b>	<b>12</b>	<b>22</b>	<b>24</b>	<b>31</b>
Russia	-8	25	13	19
Ukraine	-21	-1	-11	-2
Kazakhstan	na	na	0	-5
<b>All focus countries:</b>				
Unweighted average <sup>b</sup>	6	24	25	22
Wted average <sup>a</sup>	-2	20	13	22
Dispersion <sup>c</sup>	27	22	27	14

Source: Anderson and Valenzuela (2008) updated from estimates reported in Anderson and Swinnen (2008).

a. Weighted average for each country, including product-specific output and input distortions and non-product-specific assistance as well as authors' guesstimates for non-covered farm products, with weights based on gross value of agricultural production at undistorted prices.

b. The unweighted average is the simple average across the 13 countries of their national NRA (production-weighted) average NRAs.

c. Dispersion is a simple 4-year average of the annual standard deviation around a weighted mean of the national agricultural sector NRAs.

d. Final column refers just to 2004-05 for Russia and Ukraine and 2004 for Kazakhstan; and the CEEC values assume the NRA for each product is the same as for the EU-25 in 2004-06 and for EU-27 in 2007, such that the differences across CEE countries is due to differing national product weights.

Table 3: Nominal rates of assistance, key covered farm products,<sup>a</sup> all Eastern European and CIS focus countries, 1992 to 2005

(percent)

	<b>1992-95</b>	<b>1996-99</b>	<b>2000-03</b>	<b>2004-07</b>
Wheat	-14	0	-5	-3
Barley	-8	-5	-12	-3
Rye	0	13	-10	-2
Maize	14	-2	14	14
Rapeseed	-8	-18	1	0
Sunflower	-21	-23	-17	-3
Soybean	45	0	9	-4
Sugar	20	58	60	87
Potato	7	17	12	10
Beef	-25	4	21	36
Sheepmeat	-19	-26	-15	-8
Pigmeat	-7	15	12	31
Poultry	19	39	54	88
Egg	11	45	-2	14
Milk	-2	35	21	23
<b>All covered products</b>	<b>-6</b>	<b>16</b>	<b>10</b>	<b>17</b>
Domestic market support	1	1	1	1
Border market support	-8	14	9	16
Dispersion of product NRAs	20	26	23	31
Product coverage <sup>b</sup>	<b>65</b>	<b>66</b>	<b>63</b>	<b>65</b>

Source: Anderson and Valenzuela (2008) updated from estimates reported in Anderson and Swinnen (2008).

a. Region's weighted average for each product and for All covered products, with weights based on gross value of agricultural production at undistorted prices.

b. Dispersion is the standard deviation shown is the simple 4-year average of the annual standard deviation around the weighted mean.

Table 4: Components to nominal rates of assistance to agriculture, Eastern Europe, Russia and Ukraine, 1992 to 2007

(percent)

(a) CEE-10

	1992-94	1995-99	2000-04	2005-07
Covered products	10.4	16.4	25.5	17.7
Non-covered products	10.6	17.3	26.9	24.7
All agriculture (excl NPS)	10.5	16.7	26.1	21.3
All importables	19.1	32.1	45.2	31.7
All exportables	2.4	7.0	10.9	12.0
Non-product-specific (NPS)	1.9	2.5	2.5	4.4
All agriculture (incl NPS)	12.4	19.2	28.6	25.7
Decoupled payments	0.6	0.8	2.9	12.1
All agriculture (incl NPS & decoup.)	13.0	20.1	31.5	37.8
All agric tradables (incl NPS)	12.9	19.5	26.4	15.9
All non-agricultural tradables	5.7	4.9	4.4	4.6
RRA	6.7	14.1	21.1	10.7

(b) Russia and Ukraine

	1992-94	1995-99	2000-04	2005
Covered products	-23.7	8.6	4.2	11.0
Non-covered products	-23.9	11.3	6.2	14.1
All agriculture (excl NPS)	-23.7	9.4	4.9	12.0
All importables	-25.4	20.3	24.7	22.9
All exportables	-21.5	-13.4	-15.3	-2.0
Non-product-specific (NPS)	6.3	4.8	2.7	0.0
All agriculture (incl NPS)	-17.4	14.2	7.5	12.0
Decoupled payments	2.6	0.6	0.0	0.0
All agriculture (incl NPS & decoup.)	-14.8	14.8	7.6	12.0
All agric tradables (incl NPS)	-17.4	14.2	5.9	6.3
All non-agricultural tradables	4.9	9.0	8.1	7.3
RRA	-21.5	4.8	-2.0	-0.9

Source: Anderson and Valenzuela (2008) updated from estimates reported in Anderson and Swinnen (2008).

Table 5: Gross subsidy equivalents of assistance to farmers, total and per farm worker, Eastern European and CIS focus countries,<sup>a</sup> 1992 to 2007

(a) Total (constant 2000 US\$ million per year)

	1992-95	1996-99	2000-03	2004-07 <sup>b</sup>
Bulgaria	-671	-381	-17	197
Czech Rep	784	632	711	689
Estonia	-73	82	74	90
Hungary	856	768	1205	920
Latvia	-208	167	195	179
Lithuania	-332	414	395	361
Poland	1378	3106	857	4314
Romania	1921	2064	3332	4073
Slovakia	421	338	309	301
Slovenia	431	483	381	143
<b>CEEC-10</b>	<b>4509</b>	<b>7674</b>	<b>7441</b>	<b>11265</b>
Russia	-1486	7394	3394	3100
Ukraine	-4461	-70	-1157	-182
Kazakhstan	na	na	-34	69
<b>All focus countries</b>	<b>-1438</b>	<b>14998</b>	<b>9645</b>	<b>14253</b>

(b) Per person engaged in agriculture (constant 2000 US\$ per year)

	1992-95	1996-99	2000-03	2004-07
Bulgaria	-1429	-1075	-65	1010
Czech Rep	1423	1255	1581	1762
Estonia	-678	898	931	1267
Hungary	1335	1372	2494	2253
Latvia	-1038	993	1333	1393
Lithuania	-1113	1693	1932	2123
Poland	283	683	204	1118
Romania	879	1135	2202	3311
Slovakia	1393	1199	1197	1281
Slovenia	na	na	na	na
<b>CEEC-10</b>	<b>466</b>	<b>893</b>	<b>977</b>	<b>1682</b>
Russia	-152	842	431	439
Ukraine	-956	-17	-333	-60
Kazakhstan	na	na	-27	59
<b>All focus countries</b>	<b>-60</b>	<b>700</b>	<b>477</b>	<b>794</b>

Source: Anderson and Valenzuela (2008), based on NRA estimates updated from Anderson and Swinnen (2008) and data on the number of farmers from FAOSTAT.

a. Gross subsidy equivalents including assistance to nontradables and non-product-specific assistance. The number of farmers in these countries is difficult to get on a consistent basis. The FAOSTAT numbers may be subject to error. For example, Slovenia's appear to be understated in FAOSTAT, so its GSE per farmer is not estimated.

b. Final period refers just to 2004-05 for Russia and Ukraine and 2004 for Kazakhstan.

Table 6: Percentage consumer tax equivalent of policies assisting producers of covered farm products,<sup>a</sup> Eastern European and CIS focus countries, 1992 to 2007 (percent, at primary product level)

	1992-95	1996-99	2000-03	2004-07 <sup>e</sup>
Bulgaria	-20	-10	3	7
Czech Rep	23	19	22	20
Estonia	-15	12	9	20
Hungary	18	15	22	16
Latvia	2	28	32	32
Lithuania	-20	21	20	29
Poland	4	2	18	25
Romania	-6	16	39	29
Slovakia	13	15	16	17
Slovenia	48	58	45	24
<b>CEEC-10</b>	<b>2</b>	<b>11</b>	<b>24</b>	<b>23</b>
Russia	-37	13	16	24
Ukraine	-25	0	-3	3
Kazakhstan	na	na	4	16
<b>All focus countries:</b>				
Unweighted average	-1	16	19	20
<b>Weighted average<sup>b</sup></b>	<b>-19</b>	<b>10</b>	<b>15</b>	<b>20</b>
Dispersion of national CTEs <sup>c</sup>	30	18	14	8
Dispersion of region's product CTEs <sup>d</sup>	33	36	47	51

Source: Anderson and Valenzuela (2008) updated from estimates reported in Anderson and Swinnen (2008).

a. Assumes the CTE is the same as the NRA derived from trade measures (that is, not including any input taxes/subsidies or domestic producer price subsidies/taxes).

b. Weights are consumption valued at undistorted prices, where consumption (from FAO) is production plus imports net of exports plus change in stocks of the covered products.

c. Simple 4-year average of the annual standard deviation around a weighted mean of the regional average CTE across the covered products.

d. Simple 4-year average of the annual standard deviation around a weighted mean of the national average CTE for covered products.

e. Final column refers just to 2004-05 for Russia and Ukraine and 2004 for Kazakhstan; and CEEC values assume the CTE for each product is the same as for the EU-25 in 2004-06 and for EU-27 in 2007, such that the differences across CEE countries is due to differing national consumption weights.

Table 7: Trade and welfare reduction indexes, Eastern European and CIS focus countries, 1992 to 2007

(percent)

	1992-95	1996-99	2000-03	2004-07 <sup>b</sup>
Trade reduction indexes				
Bulgaria	11	10	6	10
CzechRep	-15	1	16	0
Estonia	5	17	9	-2
Hungary	-5	-14	-18	-15
Latvia	28	24	7	26
Lithuania	31	13	6	-13
Poland	15	6	2	-24
Romania	8	23	45	29
Slovakia	0	7	7	-2
Slovenia	-5	-22	-22	-14
<b>CEEC-10<sup>a</sup></b>	5	6	9	-2
Russia	-22	18	21	22
Ukraine	21	7	13	9
Kazakhstan	0	0	2	20
<b>All focus countries<sup>a</sup></b>	-13	14	13	2
Welfare reduction indexes				
Bulgaria	28	26	19	31
CzechRep	34	31	32	39
Estonia	25	28	21	37
Hungary	34	34	50	33
Latvia	49	51	56	48
Lithuania	50	55	61	47
Poland	25	30	29	41
Romania	34	47	65	55
Slovakia	29	32	32	35
Slovenia	62	76	70	47
<b>CEEC-10<sup>a</sup></b>	33	36	42	43
Russia	44	33	32	37
Ukraine	39	32	26	25
Kazakhstan	0	0	20	28
<b>All focus countries<sup>a</sup></b>	38	34	34	36

Source: Derived from estimates in Anderson and Croser (2009).

a. Regional aggregates are weighted using the country-level absolute value of trade for trade reduction indexes, and the country-level average of the value of production and consumption for welfare reduction indexes.

b. Final period refers just to 2004-05 for Russia and Ukraine and 2004 for Kazakhstan.