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Using Energy Resources to Diversify the Economy: Agricultural Price Distortions in Kazakhstan

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ABSTRACT Kazakhstan's government has had ambitious plans to use booming oil revenues to promote economic diversification. Prominent among these were measures to reverse the declining agricultural output of the 1990s, including a billion dollar Agriculture and Food Program for 2003-5. This paper provides estimates of producer support equivalents for the main agricultural products in order to establish whether announced policies actually resulted in improved incentives for farmers. Although the estimates are approximate, they present a pattern of price distortions working against farmers in the 1990s and moving strongly in their favor since 2001. In sum, quantification of price distortions supports the government's claim that it has used the country's energy resources to promote the agricultural sector.

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After becoming independent at the end of 1991 Kazakhstan went through a severe recession, which was prolonged by the 1998 Russian Crisis and only turned around in 1999. In sharp contrast, in the first decade of the twenty-first century, the country has experienced rapid GDP growth driven by booming oil exports (Pomfret, 2006). Rapid growth since the late 1990s raised the question of how to ensure that the oilboom will bring enduring prosperity, and among the policy responses have been establishment of an oil fund, direction of resources into human capital formation, and promotion of economic diversification. This paper focuses on one aspect of the diversification strategy, the promotion of agriculture. Specifically, it reports estimates of producer support in order to assess whether announced policies resulted in improved incentives for farmers during the period 2000-4.

The agricultural sector is a major part of Kazakhstan's economy, with between a quarter and a half of the population depending upon it.¹ Following the Virgin Lands program of the late 1950s and 1960s, Kazakhstan became a major grain producer, on top of the traditional pastoral economy and a cotton sector concentrated in the south. After independence the agricultural sector experienced a severe decline; the annual growth rate of agricultural value-added 1990-2001 was -3.22%. The decline was reversed around the turn of the century, and from 1999 to 2004 agricultural output grew at over 5% a year, mostly due to increased crop production while livestock growth was more modest.² One reason for the decline was a policy vacuum, which saw the rapid switch in the early 1990s from support for farmers to a market situation where prices of inputs rose much faster than output prices. The policy situation was reversed in the early 2000s as the government responded to the oilboom by promoting economic diversification, which included generous support for agriculture.

The first two sections of this paper examine the historical background and the evolution of policies since independence. The third section presents estimates of the budgetary support to and price distortions facing farmers, with emphasis on three principal and different sectors of the farm economy: the grains which dominate agricultural exports, the livestock sector, and the regionally concentrated cotton sector. The ultimate goal of the quantitative exercise is to determine whether policy statements about promoting agriculture are captured in measures of producer support or whether they were empty announcements. The fourth section draws conclusions.

1. Historical Background

The traditionally pastoral and nomadic economy in the territory of Kazakhstan became increasingly sedentary during the Tsarist and Soviet eras. From the mid-1800s, as Russia exercised greater control over the territory, public policy encouraged

¹ The number of people involved in agriculture is difficult to define, because many people who lost their jobs during the transition from central planning reverted to growing their own food. The farm sector accounts for less than ten percent of GDP, but employs over a third of the workforce. According to the World Bank's 2006 Agricultural Policy Assessment, about 43% of the population rely on agriculture for their livelihood.

² The growth rate is from the World Bank's 2006 Agricultural Policy Assessment. It is largely driven by the increased wheat harvest - from 4.7 million tons in 1998 to 9.9 million tons in 2004 - which may reflect year-on-year fluctuations rather than an increase in the average harvest (Table 1).

sedentarisation, and a growing proportion of nomads, as well as Russian settlers, were planting winter grain by the end of the century. The most dramatic change after the 1917 revolution was the enforced collectivization of 1928-9, which resulted in huge loss of livestock and a great famine. In the 1950s the Virgin Lands program brought about 25 million hectares into cultivation (ie. over three-fifths of today's arable land). Northern Kazakhstan became a major producer of wheat and barley, although a substantial portion of the land could not sustain long-term agriculture and due to the variable climate harvests were highly volatile (Pomfret, 1995, 82). Agricultural production was carried out on large state or collective farms, whose size averaged 35-40,000 hectares in Kazakhstan, and on over 3 million small private plots which produced over a third of total output (Green and Vokes, 1997).

In 1991 just over a quarter of the workforce was employed in agriculture, but agricultural output accounted for less than 15% of GDP. Grazing and rangeland occupied 140 million hectares, and the livestock sector comprised mainly cattle and sheep. Of 39 million hectares of cultivated land, 65% was devoted to cereals and 33% to fodder crops. In the 1980s Kazakhstan exported up to 10 million tons of wheat, and around 300,000 tons of meat, 250,000 tons of milk and 150 million eggs a year to other Soviet republics (de Broeck and Kostial, 1998). Other crops, while minor in terms of acreage, were regionally significant. In the south, rice and cotton were important, and in 1991 cotton was Kazakhstan's third-largest export to non-USSR markets, after fertilizers and coal. Oil crops (sunflower, soy, rape, etc), mainly grown in East Kazakhstan and Pavlodar oblasts, satisfied two-fifths of domestic demand.

In the Soviet economy agriculture received net support as key inputs such as fuel and fertilizers were provided at below world prices, and some inputs would not have been used had they been fully costed (eg. fodder transported over large distances by rail or cotton-harvesting machines). Under the state order system there was considerable variation in the profitability of differing agricultural activities. In 1991, the purchase price of wheat was more than triple production costs; the corresponding ratios were 156% for sunflower, 98% for raw cotton and 75% for potatoes, but less than 20% for sugar beets, poultry or pigs. Comparative advantage is reflected in lower production costs, but these numbers also suggest that there were positive incentives for Kazakhstan's major crops while import-competing items like sugar beet and poultry were less favored. This incentive structure based on artificial prices would, of course, change during the transition to a market-based economy.

During the 1990s output of all major agricultural products declined substantially (Table 1). Recovery started around 1999, although the pattern is complicated by huge annual variations in the wheat harvest. In southern Kazakhstan, the turnaround started slightly earlier. Cotton output almost tripled between 1998 and 2003, as the area sown with cotton, which had been more or less constant in the first half of the 1990s at 107-111 thousand hectares, increased from 115 thousand hectares in 1998 to 182 thousand hectares in 2003.³

³ In part, this reflected an earlier reform of farms in southern Kazakhstan and the decision of farmers, especially in the Kyzylorda region to shift from rice to cotton production. Cotton output figures need to be treated with caution due to extensive smuggling from Uzbekistan and to a lesser extent Turkmenistan as farmgate prices in those countries were increasingly repressed by state marketing agencies. Sadler (2006, 104) reports estimates that smuggled cotton from Uzbekistan accounted for 25-50% of Kazakhstan's reported output in the early 2000s, but it is hard to evaluate such ballpark figures. The volatility of the cotton sector, as reported in the official data (Table 1), is reflected in the 42% decline in the value of the crop in 2004 and in the 25% drop in output in 2005.

The level of agricultural trade as well as the relative importance of food exports declined substantially after independence. In 1988 agriculture accounted for 17% of exports and the food industry for 7%, but by 2000 these shares had fallen to 6% and 1% (Freinkman et al., 2004, Table 1.4). In this period the share of oil and gas rose from 10% of exports to 50% and that of metals from 19% to 32%. Oil accounted for an ever-increasing share after 2000, as both output and the world price increased.

The post-transition pattern of agricultural trade was of primary products being exported and processed food products of higher perceived quality being imported. Kazakhstan continued to be a substantial food exporter, selling grains, and fruit and vegetables primarily to Russia and other CIS markets, and a minor cotton exporter (Table 2). Exports of livestock products declined substantially; dairy exports were negligible by the late 1990s and meat exports continued to fall, from \$16 million in 1998 to \$5 million in 2001. In the early 2000s, meat, milk and eggs – all important exports in the Soviet era – had almost become non-traded items. Kazakhstan was a net importer of sugar (from outside the CIS) and of chicken and dairy products (from Russia). Between 1998 and 2001 imports of dairy products rose substantially (from \$12.3 to \$27.0 million for milk and cream, and from \$6.6 to \$8.4 million for butter), while meat imports fell (from \$32.1 to \$18.2 million), suggesting some import substitution in the latter but not in the former.

In 2003, the latest year available from the UN-COM trade database, the twenty-seven 2-digit agricultural and agri-processing sectors sold \$998 million worth of exports (7.7% of total exports), while imports of these goods amounted to \$694 million. This was a record year for wheat exports and a good year for cotton exports, so the total may be unrepresentative, but panel (a) indicates the high level of concentration of farm exports. Wheat and wheat flour (58%), cotton (14%), and hides and leather (5%) account for over three-quarters of agricultural exports. Imports are more diverse, with only raw sugar accounting for over 10% of agricultural imports. Other substantial import categories tend to be semi-processed items, such as tea and coffee, alcoholic beverages, dairy products and ice cream, edible oils, tobacco products, and chocolate and confectionary and bakery products (Table 3).

2. Evolution of Policies since 1991

During the 1990s the general policy stance towards agriculture was one of neglect. Relative prices shifted against farmers as agriculture went from being a favored economic activity in the late Soviet era to one suffering from net discrimination (or at best neutrality) by the late 1990s. The large currency depreciation in 1999 helped the traded goods sector, including producers of the main farm exports (wheat and cotton). As government revenues were boosted from the oilboom, budgetary assistance to the agricultural sector increased, especially in the billion-dollar Agriculture and Food Program for 2003-5 (AFP), which had a variety of objectives including consolidation of farms and improving infrastructure and provision of public goods.

(a) Prices and subsidies

In Kazakhstan the general price liberalization process was completed at the end of 1994 with the abolition of fixed prices for bread and for oil products.⁴ Foreign exchange surrender requirements were abolished in July 1995, and most export restrictions had been lifted by 1996. Export taxes on grain were abolished in April 1996 and minimum export prices for farm products were ended in December 1996. Some agricultural exports (wheat, rice and cotton) still had to be registered, but this was abolished at the end of 1997.

The farm sector was in deep crisis throughout the 1990s (Gray, 2000). Between 1992 and 1995, as prices were liberalized, input prices rose rapidly but important output prices remained controlled or rose slowly because of monopsonistic markets (eg. many farmers sold their output to the single grain elevator or cotton gin in their district), leading to farm losses and resort to barter.⁵ Subsidies for agriculture were reduced from 10-12% of GDP before 1991 to 2-3% in 1993. The profit squeeze was accentuated in 1994 as directed credits dried up (subsidized credits to agriculture, which amounted to 5% of GDP in 1993, were abolished in February 1995), and as input subsidy programs were terminated (de Broeck and Kostial, 1998, 40). By the 1998 budget, only \$80 million was directed to agriculture, of which the largest subsidy was a \$33 million credit scheme whereby interest rates were half the commercial rate.

The second half of the 1990s was characterized by an increasing debt crisis. Direction by local authorities led to farms concentrating on activities which they knew to be loss-making, while the continued extension of (non-subsidized) loans to loss-making farmers sunk them ever deeper into debt. Imposition of heavy penalties for tax arrears distorted farmers' incentives to repay their creditors.⁶ The problem was exacerbated by drought conditions in much of the country during the 1996-8 seasons. Grain production in 1998 was 6.5 million tons compared to 30 million tons in 1992, and the number of cattle fell from over nine million to less than four million over the same period. At the macroeconomic level, 1998 was the nadir of Kazakhstan's transitional recession, as an incipient recovery in 1996-7 was obliterated by fallout from the 1998 Russian Crisis. In 1998 inflation was brought down to single digits, and in 1999 growth resumed, accelerating in the early twenty-first century (Pomfret, 2006, chapter 3).

⁴ In the early 1990s the government tried to maintain traditional trade ties through bilateral agreements for interstate deliveries and to support these delivery targets by state orders. Compliance was poor, and in 1994 the system was downsized and by 1995 it only applied to grains. After state orders were abolished the government continued to purchase grain for the strategic reserves - 700,000 tons in 1997 (Csaki and Nash 1998, 91) - and this price was often used as a reference price.

⁵ De Broeck and Kostial (1998, 41) estimate that in 1993 the price of inputs used in agriculture increased 18.8 times while output prices rose 8.8 times. Green and Vokes (1997, 266) report ADB estimates that a tractor cost 76 tons of wheat in 1990 and 310 tons in 1995, while the cost of a combine harvester went from 50 to 580 tons of wheat, and the relative price of fuel tripled over the same period. Livestock farmers were hit by increased prices for fuel, feed ingredients and animal medicines in 1992-4, while domestic consumption of livestock products was hurt by declining incomes (between 1990 and 1998 domestic consumption of livestock products fell by about two-fifths) and meat and dairy exports almost disappeared amidst the disruption following the dissolution of the USSR (particularly important for livestock farmers in eastern and northern Kazakhstan had been supplies of meat, wool and other animal products to the Soviet Ministry of Defence).

⁶ The situation was further distorted by arrears in the payment of pensions and other social benefits. To a substantial extent in the years up to 1998 cash constraints distorted decision-making, and in part explain the huge decline in livestock numbers on the large farms (Table 4), as farm managers used livestock to pay for inputs or paid workers with sheep in lieu of money wages.

For agriculture, reversal of the price squeeze began in 1999, when the government introduced a price support system for wheat and then extended it to other goods.⁷ The Food Contract Corporation (FCC) currently purchases about 10-17% of national production with the goal of maintaining grain reserves and alleviating short-term price fluctuations, but as a large net exporter the FCC cannot offer much above world prices without risking large losses. Public expenditure on agriculture, forestry, fisheries and environmental protection increased by an average forty percent per year between 2000 and 2005, as the budget of the Ministry of Agriculture increased from 11,345 million tenge (less than \$80 million) to 80,090 million tenge (\$600 million) and its share of the total central budget went from 2.5% to 6.5%. Much of this allocation was under the billion-dollar Agriculture and Food Program for 2003-5 (AFP), which provided general services support to agriculture aimed at improving infrastructure and product quality (Table 5).⁸

(b) Privatization and organizational structure

In 1994 farms were in principle privatized, as shares were distributed to employees, but most farms were simply reorganized into cooperatives under the same management as previously. When land share certificates were issued, most were turned over to the collective farm's management who could use them to purchase equipment.⁹ By 1995 there had been zero decollectivization in the sense of breaking up Soviet farms, but use rights on private plots (of less than one hectare) were more secure in Kazakhstan than in neighboring Uzbekistan or Turkmenistan.

The 1995 Farm Reform established the principle of state ownership of land, with private use-rights under long-term (99-year) leases. The government adopted a fresh approach to restructuring in 1998, based on acceptance of the need for bankruptcies that would lead to changes in ownership and management. In 2003 the government announced several new agriculture initiatives, most of which reflected statist attempts to modernize infrastructure, relocate farmers and publicize output targets. Despite these announced reforms, the overall impression is that the

⁷ This was followed by a dramatic increase in the numbers employed in agriculture, from 1.3 million in 1999 to 2.4 million in 2001, although some of this is due to statistical reclassification of the shadow economy.

⁸ The initial AFP proposal envisaged expenditures of \$271 million in 2003, \$330 million in 2004, and \$368 million in 2004, but actual expenditures in the last two years were higher, probably due to the burgeoning public receipts from the oilboom. The AFP's stated objectives were to ensure food security, establish an efficient agro-industrial system, increase sales of farm products and processed farm products in domestic and foreign markets, and optimize state support for agriculture. The specifics focused on efficiency and competitiveness, recognizing that technical support is an important public service to agriculture, but the AFP could be used to justify interventionist policies, eg. mention is made of "reasonable protectionism" to reduce import dependency. Many incentives were provided by subsidies to reduce the cost of inputs (eg. fertilizers, fuel and seeds) and through price support schemes, which may work against the aim of increasing efficiency and competitiveness. Price support was provided through increased funds for the Food Contract Corporation, which had been established in 1997 and purchased 1.5 million tons or 20% of the grain harvest in 2002, and Mal Onimderly Corporation which had been created in 2001 to provide producer support and market regulation for the livestock sector. .

⁹ Deininger (2002, 993-4 and 1000) and Lerman et al. (2002, 154) ascribe this renunciation of claims to land ownership to lack of asset management experience among the rural population. Behnke (2003) reports field research from 1998-9 which showed how state farm managers retained control of sampled farms in south-eastern Kazakhstan.

government has still not resolved the issue of how the farm sector should be organized in the market-based economy.

The continued large farm size may reflect scale economies in grain farming on the Virgin Lands. The farmland that has been purchased and is cultivated independently (only 146,642 hectares by 2005) is almost exclusively in the south, where most of the farming is done on individual farms which concentrate on cotton. Livestock farming, apart from chickens, had almost disappeared from large farms by the end of the 1990s; the numbers of cattle, sheep and goats, pigs and horses in agricultural enterprises had by 2002 all fallen to 5% or less of the number in 1990, while the number of animals on individual peasant farms increased by huge percentages but remained small in absolute numbers (Table 4). By contrast, livestock inventories on household plots remained fairly stable during the transitional recession and have substantially increased since 1997; the overwhelming share of animals is now on the over two million household plots (average size 0.2 hectares), and these backyard farms produced 87% of meat, 91% of milk, 49% of wool and 49% of eggs in 2003. Land tenure arrangements posed particular problems for the pastoral sector, where seasonal migration patterns which had already been eroded over decades of deliberate sedentarisation were further disrupted by changes in access rights.

One problem facing the farm sector was lack of investment to improve infrastructure and permit quality upgrading. The capital-output ratio, labor productivity and total factor productivity all continued to decline in the second half of the 1990s and early 2000s, when productivity growth had become positive in other sectors.¹⁰ Much of the farm produce was spoiled or had become overpriced before reaching its primary market. Fruit and vegetables and processed food products often became uncompetitive with imported goods because of poor storage, processing or packaging. The government's 2003-5 AFP for restoration and development of the agriculture sector began to address some of these problems.

(c) Trade policies

Kazakhstan's trade policies are difficult to track in the early post-independence years because borders were extremely porous.¹¹ Since 1995 Kazakhstan has pursued a trade policy based on moderate most-favored nation (MFN) tariffs, although with some variability of implementation. Although most farm products receive tariff protection, this is generally mild and on average no more or less than the protection granted to manufactures.¹² Kazakhstan is a member of several regional organizations, although the only one to have a significant influence is the Eurasian Economic Community.

¹⁰ According to International Monetary Fund estimates (*IMF Country Report No. 03/211*, July 2003, p.23), total factor productivity (TFP) in agriculture declined by an annual average of 1.8% during the period 1996-2001, when TFP growth averaged 5.8% in industry, 9.5% in construction and 4.0% in services, and labor productivity fell by 8.2% per year in agriculture while it was increasing by more than TFP in the other sectors. The cotton ginning sector was an exception to this negative picture; by 1998 the existing gins had been fully privatized, and several new gins have been constructed since then (Sadler, 2006, 105).

¹¹ Following the Russian price reform of January 1992, export restrictions were imposed in 1992 aimed at avoiding loss of goods in a situation of monetary chaos and at supporting the interstate delivery system. This policy unraveled in 1992-4 as exporters found more favorable prices outside the system. Export duties were simplified in 1995 and abolished in 1996.

¹² The average import-weighted tariffs (calculated in *IMF Staff Country Report No.97/67*, August 1997, p.124-5, using the 1996 tariff schedule and 1995 weights) are agricultural products 18.3%, textiles,

The initially *ad hoc* tariff schedule was simplified during 1995 and 1996 with rates ranging from 1-100%. In January 1997, a new tariff schedule had a maximum rate of 50% and a lower weighted average tariff (12%). Tariffs were further reduced in July 1998, with fewer tariffs over 20% and a weighted average tariff of slightly less than 9%. Among farm products some of the largest import categories enjoyed duty-free status, notably raw sugar, while products enjoying the highest tariff protection mainly include manufactured products (cigarettes 30%) or processed products (frozen chicken pieces 23.75%, sausages 20%, sugar confectionary 19%, bread, pastries, ice cream 15%); dairy products (butter 20%, milk 12%) and sunflower seeds (15%) are the only primary farm products which Kazakhstan imports in significant amounts with tariffs over 5%.¹³

On balance, Kazakhstan has remained committed to multilateralism in its trade relations. In January 1995 Kazakhstan signed a customs union agreement with Belarus and Russia. Tariffs on trade between members were eliminated in March, and there were moves towards harmonizing external tariffs in 1995-6, although this seemed to halt with Kazakhstan's January 1997 tariff revision. The Kyrgyz Republic joined the union in 1996 and Tajikistan in 1999. In October 2000 it was renamed the Eurasian Economic Community (EurAsEc), and Uzbekistan joined in October 2005. Progress towards a customs union was slow; by 2005 the common external tariff covered only 6,156 of the 11,086 tariff lines identified in the union's classification system, and these were largely ones where the members' pre-existing tariffs had been similar. Meanwhile, in January 1996 Kazakhstan lodged its application for WTO membership. The process lagged in the late 1990s, associated with slowing reform and economic crisis, but resumed in the early 2000s. The Draft Report of the Working Party, which is the basis for the final negotiations phase of WTO accession, was completed in May 2005 and revised in September 2006.

(d) Exchange rate regimes

The external environment is also affected by the exchange rate regime. Kazakhstan's exchange rate history since independence can be divided into four phases. Kazakhstan continued to use the ruble until November 1993. From the introduction of the national currency until early 1999 the central bank adopted an almost-fixed crawling peg regime, which was successful in ending hyperinflation and resulted in substantial real exchange rate appreciation during 1994-6. In April 1999, driven by a large appreciation of the tenge relative to the ruble following the 1998 Russian crisis, the tenge was allowed to float. Since May 1999, the central bank has pursued a dirty float.

clothing and footwear 20.8%, other manufactures 18.4%, and minerals and metals 6.3%. The tariff structure has not changed greatly since 1995/6, although some rates have been reduced. The average for "other manufactures" may be inflated by the use of 1995 import weights, because in that year nuclear reactors with a 20% tariff accounted for two-fifths of the imports in this group.

¹³ For more detail on the tariffs on agricultural goods, see Pomfret (forthcoming Table 6.6). After the Russian crisis and appreciation of the tenge, several temporary tariffs of up to 200% and bans on some imports, mainly food products from Russia, the Kyrgyz Republic and Uzbekistan, were introduced in the first half of 1999, although these were rescinded fairly quickly. Apart from these temporary spikes, the only major peak at the 6-digit level is the 100% duty on ethyl alcohol; no other agricultural product category has an individual tariff line peak over 30%.

In 1992 and for most of 1993, with prices rising at over fifty percent a month and frequent currency shortages, relative prices did not operate as efficient signaling mechanisms and it is impossible to measure price distortions in any meaningful way. In November 1993 Kazakhstan introduced a national currency, and the stabilization program introduced in 1994 used the exchange rate as an anchor. The shift to a non-accommodating monetary policy was accompanied by a real appreciation from mid-1994 to 1996, by which time annual inflation had been brought below 50%. In July 1996 Kazakhstan accepted IMF Article VIII, making the tenge convertible for current account transactions. This exchange rate policy was, with minor adjustments, maintained through the 1997 Asian Crisis and the 1998 Russian Crisis.

Failure to follow the large ruble devaluation in August 1998 led to loss of competitiveness vis-à-vis Russia, the country's largest trading partner. The consequence for Kazakhstan was a severe recession. In April 1999 Kazakhstan allowed the tenge to float. After the announcement of the float, the tenge fell to 99/\$ on April 4th and to 130/\$ by the end of May 1999. The large depreciation fuelled a rapid recovery.

After May 1999, the central bank reverted to a *de facto* exchange-rate anchor. Although there had been fluctuations, the exchange rate in February 2006 was 130/\$, the same as at the end of May 1999, despite strong pressures for currency appreciation. Already by the end of 2003 the economy exhibited signs of overheating due to demand pressure from large FDI-financed oil investments, fiscal and public sector expansion, and a credit-fuelled private sector boom. The central bank accumulated foreign exchange reserves to limit exchange rate appreciation, while issuing domestic debt to reduce prospects for recession in the non-oil sector; by the end of 2006 reserves, including oil fund assets, stood at \$33 billion, or over twelve months of imports. A real appreciation began in the first half of 2006 with a move away from *de facto* exchange rate targeting, but its magnitude is hard to assess.¹⁴

This exchange rate history has implications for calculation of support to the agricultural sector. With perfectly functioning markets exchange rate changes will be reflected immediately in domestic prices unless public policies shield a sector from such changes, and any gap between domestic and world prices can be considered a policy distortion, but in transition economies such pass-through is far from perfect. The exchange rate volatility in 1993-4 and 1998-9 in Kazakhstan affected the gap between border and farmgate prices even in the absence of any policy distortion. In the current environment, increased fiscal spending on agriculture if accompanied by tight monetary policy will have an ambiguous effect on incentives to tradable farm goods as the real appreciation overshoots. The level of the exchange rate can also distort the interpretation of producer support, eg. an overvalued currency will hurt the tradables sector; "Dutch disease" effects may be a concern for an oilboom economy. Nevertheless, given the assumptions needed to calculate the real exchange rate for Kazakhstan, there is a serious loss of transparency in using such measures. However,

¹⁴ Measurement of the real exchange rate is complicated by the need to change weights. Kazakhstan's economy remained heavily oriented towards Russia, at least with respect to trade, until 1998, but after the crisis there appears to be a concerted effort to diversify international economic relations, so that exchange rates relative to the US dollar, the euro and the yuan have become more important. Measurement issues are discussed in the IMF *Staff Country Report No.07/235* (July 2007, Box 2). Kuralbayeva et al. (2001, Figure 2) illustrate a plausible pattern of real exchange rate depreciation in early 1994, followed by sharp appreciation which flattens out in 1996 and then another sharp depreciation in 1999 followed by a plateau.

annual variations in support estimates based on the gap between border and domestic prices gap should be treated with caution, especially at times of large shifts in the exchange rate.¹⁵

3. Quantifying the distortions

This section reports preliminary estimates of the net distortions facing producers of the main agricultural products in 2000-4. The first two subsections deal with Kazakhstan's main farm exports: wheat and cotton. The third subsection covers livestock farming and the fourth subsection import-competing crops. The gap between farmgate prices and border prices is an imperfect measure of distortions to agricultural incentives and competitiveness in Kazakhstan, because all producers in the country face high trade costs; evidence on these costs and assessment of the extent to which they can be interpreted as distortions against branches of farming are discussed in the fifth subsection. The final subsection provides aggregate measures of support to farmers.

Measuring the extent to which an economic activity is protected from import competition or favored by subsidies has a long history. Since the early 1960s trade economists have used the effective rate of protection, i.e. the impact of tariffs on inputs as well as on the output of an activity, to capture overall protection. In the project evaluation literature, since the influential work of Little and Mirrlees (1969), world prices have been recognized to be the appropriate opportunity cost measures which should generally be used in assessing social costs and benefits. In the contentious area of agricultural trade, the OECD has pioneered the use of producer support estimates (PSEs) - differences between farmgate and border price plus budget transfers - to capture the all-of-government distortions facing farmers:

$$\text{Support} = (P^d - P^b + B) / P^d$$

where percentage support consists of market price support (the gap between a reference price based on the border price adjusted for trade and handling costs, P^b , and the farmgate price, P^d) plus budget support per unit of output (B) divided by the farmgate price, P^d .

There are no published producer support estimates for Kazakhstan.¹⁶ The OECD has produced estimates for Russia (Melyukhina, 2003) and Ukraine (OECD and World Bank, 2004), which indicate at the aggregate level large positive PSEs up to 1991, sharply reversed in 1992 and then increasing to positive values.¹⁷ In broad

¹⁵ Some OECD studies have used a shadow exchange rate in calculating producer support estimates. Melyukhina (2003, 127) argues that discretion in the choice of appropriate rate creates non-transparency, and that the nominal exchange rate should be used.

¹⁶ In a report to the World Bank, Serova (2004) calculated PSE-style estimates for 1998-2002. The reference prices, unit values of exports (for grains and sunflowers) or imports (for meats, poultry and wool), were compared to farmgate prices adjusted by 30% for domestic handling costs. Serova's grain and sunflower estimates are plausible, with minimal support in 1998, followed by negative estimates for 1999-2002, indicating incomplete pass-through from the large currency depreciation. The estimates indicate a strong shift from negative support for meat and poultry in 1998 and 1999 to increasing positive support in 2000-2. Less convincing are the estimates for cotton, which are increasingly negative from -116% in 1998 to -232% in 2001 (no estimate for 2002), which is far out of line with the description of a competitive post-1998 cotton sector.

¹⁷ In Russia the aggregate PSE rose to 17-30% of gross farm receipts in 1995-7, before falling to positive single-digit rates after the 1998 Crisis. In Ukraine post-1993 PSEs were lower and in some years negative for grains, oilseeds, livestock and dairy products, but higher for sugar beet; the most recent OECD estimates indicate average Ukraine PSEs of 3% in 2004 and 12% in 2005. Although

terms, we may expect PSEs in Kazakhstan to have exhibited a similar pattern of pre-1991 positive PSEs turning sharply negative in 1992, but policy divergence among the Soviet successor states is likely to have increased since the mid-1990s.

My estimates draw heavily on 2000-4 support estimates for fifteen major products, accounting for about four-fifths of agricultural output, prepared by Anara Jumabayeva of the FAO for the World Bank's 2006 Agricultural Policy Assessment. The major change to those estimates is recalculation of the wheat estimates, replacing unit values by an increase in the 2004 border price which is consistent with other indicators (see Pomfret, forthcoming, for more details). Calculations for this major category are described in the next subsection to illustrate the methodology.

(a) Wheat

Table 6, showing the alternative support estimates for wheat in 2004, illustrates two points: first the estimates are dominated by the price gap, and second the price gap is difficult to estimate. Budget assistance to wheat farmers plays a minor role in determining estimates of producer support, despite increasing from 61 million tenge in 2000 to 5,672 million tenge in 2004 (line 10); even in 2004, subsidies only amount to three percent of the farmgate value of wheat.

The estimated magnitudes of the price gap must, however, be treated with caution. Obtaining a reference price which can be compared to the producer price at the farmgate involves three steps. First a border price must be found; in the Agricultural Policy Assessment the export unit value in US dollars was calculated from official trade data. Second, the dollar value is converted into tenge at the current exchange rate. Third, the domestic currency price is adjusted for transport and handling costs between the farm and the border. The overall results are not greatly sensitive to the assumptions about the exchange rate and transport costs, and the last two steps do not appear to be likely sources of misleading errors.¹⁸

The unit value of wheat exports fluctuates more than might be expected for the true border price (see the second line in Table 2).¹⁹ The unit value of Kazakhstan's wheat exports may have reflected specific marketing features in 2002-4, which make unit value an inappropriate reference price for distortion calculations, and this appears to be especially true for 2003-4, when - in contrast to the 50% increase in unit value - commonly used indices of world wheat prices indicate, at most, a small price

Russia and Ukraine are the countries most similar to Kazakhstan in agricultural structure and history, the pattern of disprotection moving to moderate support also characterizes agricultural policy in China and Vietnam since reforms began (Orden et al., 2007).

¹⁸ The method of calculating transport, handling and other costs assumed a substantial fixed-cost component, so that the annual variation shows less annual variation than might be expected from the volatility of the crop. In the smallest harvest year, 2000, transport costs account for a surprisingly large share (over 20%) of the border price, but, if transport costs are overestimated, then it is even more striking that the 2000 wheat PSE is negative. The periods of large real exchange rate changes, mid-1994 to early 1996 and mid-1998 to May 1999, are outside the time period covered by our estimates.

¹⁹ The wheat grown in Kazakhstan includes high quality hard wheat and lesser quality wheat, which commands a lower price. There is an association between harvest size and average quality of the crop, and there is also a connection between the harvest size and the quantities of various types of wheat sold in the domestic market and exported. In the poor 2004 harvest, for example, average quality was higher than in previous years and the gap between the quality of wheat exports and the quality of total wheat output was smaller. The variable output combination makes it difficult to estimate a single border price, or to have a constant quality-adjustment factor.

increase.²⁰ In 2004 the quantity exported by Kazakhstan was especially low, which may have reflected a decision to stockpile wheat for strategic reasons.²¹ Under these conditions, because the border price is not that determined in a competitive “world market”, it is difficult to conceptualize the appropriate reference price for assessing domestic distortions.

The paradox can be resolved by using a border price more in line with world price indices. From all of the evidence, a 51% increase in border price between 2003 and 2004 appears misleading, and the final column of Table 6 assumes a border price increase of 10% between 2003 and 2004, which is larger than the increases in the FAO or OECD indices but produces a more plausible reference price than in the APA column. The change of assumed border price reverses the finding that the situation for wheat farmers deteriorated in 2004. As well as being a more credible assumption, the bottom line of a positive PSE for wheat in 2004 is more consistent with the description of farm policies in the previous section, which found little evidence of policy-induced distortions against wheat farmers by the late 1990s, and a positive policy stance towards them in more recent years.

(b) Cotton

After the end of government controls in the mid-1990s, cotton farmers in Kazakhstan faced slightly unfavorable relative prices. Relative to both wheat and rice, the producer price of cotton declined in 1996 (Table 7). For the 1997 harvest season, Goletti and Chabot (2000, 55) estimated the average border parity price for raw cotton in Central Asia at \$404 per ton. The local currency price of raw cotton received by farmers in Kazakhstan was 25,500 tenge, or \$349, which was less than the price received by farmers in the Kyrgyz Republic (\$394) or Tajikistan (\$388), but substantially above the prices which farmers received in Turkmenistan (\$240) or Uzbekistan (\$242). The gap in Kazakhstan reflected a mixture of monopsony power of the cotton gin owners, quality differences and transport and other costs of getting the cotton to the border, rather than policy-induced distortions against farmers.

The situation changed significantly around 1997-8 as producer prices for cotton improved relative to those for other crops (Table 7). Between 1996 and 1999 cotton prices increased by over 35% relative to the price of both wheat and rice. The cotton/rice price ratio, which is more relevant in southern Kazakhstan, continued to increase during 2000 and 2001. Between 2000 and 2002, as world cotton prices fell

²⁰ The FAO world price increased from 150 to 161 and the OECD world price fell from 156 to 152. The IMF commodity database gives an almost flat world wheat price in 2002-4 (\$149, \$146 and \$157), whereas the APA used \$83, \$100 and \$151 as border prices in these years; the US Gulf price in the *International Financial Statistics* is not the right benchmark for Kazakhstan’s wheat, which is mainly shipped across the Russian border, but the difference in price patterns is startling.

²¹ Wheat output was lower in 2004 than in 2003, but only by about 15% (Table 1), while the volume exported fell by half. Most of Kazakhstan’s wheat exports are to CIS markets, although sales to Central Asian neighbors have been reduced as a result of import-substitution strategies in Turkmenistan and Uzbekistan. Some part of sales to Russia and Ukraine is re-exported, but transport costs to more distant markets are high (eg. in 2003-4 when the price was about \$100 per ton at the elevator in Kazakhstan it cost \$16 per ton to get the wheat on the train and to the border, \$30 to transport it through Russia to the Ukraine border, and \$13 for transport within Ukraine). The years 2000 to 2002 saw a large increase in Russian wheat production (from 34 to 51 million tons) and 2002 saw a surge of Ukraine exports to the EU. At the wrong end of this chain, Kazakh wheat exporters may have found themselves squeezed by the price offered by Russian traders, although sales might hold up if the price were sufficiently low that it became profitable to import cheap Kazakh wheat and export Russian or Ukrainian wheat to the EU.

by 20%, domestic producer prices were stable. The reduction in the price gap reflected changes in the organization of the domestic market rather than any public policy changes. The key relationship is between cotton farmers and cotton gins, and the farmers' market position improved as the number of cotton gins increased in the early 2000s.²²

The extent of distortions facing cotton farmers in Kazakhstan in the early 2000s is unclear. The price differential for free seed cotton might suggest that supplies under contract are under-priced as the gins exploit the farmers' lack of access to financing. On the other hand, the increase in number of gins, with a variety of owners, suggests that the gin sector is competitive and cotton farmers do not face distorted net output prices. Sadler (2006) reporting on a survey of cotton producers during the 2003 crop season states that, although many farmers showed ignorance on their part and complained of dubious practices on the gins' part, 97% of respondents said they could change their ginners if they wished to do so and 92% had actually done so. Competition among gins appeared to be intensifying in the early 2000s, as gins increasingly provided collection points outside their own immediate area. Unlike the situation for wheat-exporting farmers who face high trade costs, the cotton ginners reduce trade costs for exporters by managing efficient transport of the baled cotton to foreign buyers. After strong competition among gins in 2004, however, the gins established an informal cartel in 2005, which reduced farmers' bargaining power.

In sum, cotton farmers in Kazakhstan have been operating since the late 1990s under largely undistorted market-driven incentives. Apart from seed and fertilizers the main input is labor, especially at harvest time. Mechanized cotton-harvesting, which was vigorously promoted in the Soviet era, is not economic at Central Asian factor prices (Pomfret, 2002), and in addition hand-picking gives a higher quality harvest. Labor markets are highly competitive in Kazakhstan's cotton-growing regions, which have access to cheap migrant labor from neighboring Uzbekistan. Despite the frequent reports of harassment of migrants and the lack of basic employment rights, there is an almost unlimited supply of skilled Uzbek cotton-pickers willing to migrate to Kazakhstan during the harvest season because a good picker can clear \$200 in a month, compared to average wages in Uzbekistan of around \$20.²³ Farmers in Kazakhstan are keen to employ the migrants because illegal workers will pick for 3-5 tenge per kilogram, while Kazakh cotton-pickers demand at least 10 tenge. In the absence of policy-driven distortions to incentives, year-to-year

²² Land reform led to the creation of a large number of independent small-scale cotton producers in southern Kazakhstan. Producers enter into a contract to supply a gin with a fixed amount of cotton, for which they will receive a price linked to a world price index at the time of delivery. They do so in order to obtain pre-finance, which is provided 30% on signing an agreement to deliver a certain amount of cotton, 40% at harvest and 30% upon delivery. Some of the finance is provided in kind as gins organize supply of seeds, fertilizer, fuel and water. The formal fee structure is \$150 per ton for ginning and 18% per annum interest on financing, although it is suspected that inputs obtained through gins are overpriced and that the gins are not scrupulous in assessing and rewarding quality. There is also a market for free seed cotton, ie. cotton production in excess of original agreements, which can pay a significant premium over contract prices (eg. in 2003 free seed cotton prices were on average \$500 or 21% above prices paid for contracted cotton), which provided an incentive to renege on contracts, but penalties for breach of contract were sufficiently high and credible that the price differential did not undermine the contract system (Sadler, 2006, 107).

²³ Dosybiev (2006) cites official figures of 4,000 illegal workers from Uzbekistan in South Kazakhstan in 2004, but adds that the true figure was much higher. Fertilizers and seed, which are subsidized in Uzbekistan and Turkmenistan, are also smuggled across the border

variations in cotton farmers' situation reflect changes in industrial organization in the ginning sector and, to a lesser extent, changes in labor market conditions depending upon the openness of the border with Uzbekistan. These factors, together with the unreliable and volatile output data (see footnote 3 above), make it difficult to calculate consistent PSEs for cotton.²⁴

(c) Livestock

The livestock sector followed a different path to the commercial grain and cotton sectors. The large agricultural enterprises (successors to the collective and state farms), which dominate the agricultural sector in terms of acreage, dramatically reduced their livestock numbers, and this explains the poor aggregate performance of the livestock sector during the 1990s. The new individual peasant farms increased their animal numbers, but the total head of livestock on these farms remains small. Livestock farming became concentrated on the small household plots which survived from the Soviet era, although the aggregate numbers remain well below 1991 levels (Table 4).

The elimination of large-scale livestock farming was due to unfavorable initial conditions combined with rapid economic restructuring. During the 1950s and 1960s the fodder base had increased rapidly in order to sustain growth in the sedentarized livestock sector. Livestock farms relied on fodder which was often transported over a substantial distance via the Soviet transportation system at no cost to the farm. The long-range mobility of livestock, which had characterized traditional herding practices, was effectively eliminated. With the end of Soviet central planning and the decline in available fodder, the large-scale livestock farming sector collapsed in half a decade after independence.²⁵ The large agricultural enterprises traded animals to settle their debts, or slaughtered them to obtain working capital and cut costs. Any property rights to re-establish transhumance were impossible to negotiate during the fairly rapid privatization process

In the early 1990s, as relative prices turned against farmers and a tight monetary policy followed introduction of the national currency in late 1993, barter became the main trading tool to pay for essential supplies. Livestock became the most commonly used means for settling farm debts, and a crucial buffer against the belated payment of wages and salaries, pensions and other social security payments. During this period many families relied on the cow or pig or a few sheep on their household plot as a coping measure against the deprivation of the transitional recession. The animals were a means of subsistence, and also a source of insurance in case the family should need to provide for culturally important events like weddings. Although families used their animals to weather the economic uncertainties of the 1990s, they were careful to husband their stock and maintain their capital. At the trough of the recession in 1997, the number of cows, pigs, sheep and goats on household plots was

²⁴ The estimates reported in the January 2006 draft of the Agricultural Policy Assessment (31% in 2000, -13% in 2001, 37% in 2002, 39% in 2003 and -23% in 2004) fluctuate greatly, without a consistent pattern or sign.

²⁵ The situation in Kazakhstan was exacerbated, relative to that in the southern Central Asian countries, by the harsher winters which precluded leaving animals outdoors in winter and required more fodder and heating, both of which became dramatically more expensive after independence (Suleimenov and Oram, 2000; Kerven, 2003).

almost the same as it had been at the start of the decade; only the chicken population declined on household plots (Table 4).

Since the late 1990s barter has given way to monetary transactions, and much of the household plot production of meat, milk and eggs is sold in local markets to cover household consumption of non-self-produced items.²⁶ Over half of rural households sell livestock products, with meat showing the highest sales-to-production ratio (0.36) of any major home-produced good, followed by eggs (0.15) and milk (0.12).²⁷ Although farmgate prices are reported to have risen substantially in tenge since 1993, they vary substantially by season and location, and it is difficult to isolate a real price index or to establish a reference price for most farmers' livestock products which are sold locally. Export of livestock products, except for wool and skins, is limited to local cross-border trade with Russia, China, the Kyrgyz Republic and Uzbekistan.

The livestock sector has no major price distortions, but it faces the high infrastructure costs shared by all dispersed producers in Kazakhstan and it receives three sets of subsidies. First, the purchase of stock-breeding materials and livestock is subsidized, although budget allocations are small and disbursements less.²⁸ Second, larger subsidies (3,298 million tenge in 2003) are provided for veterinary control of contagious diseases. Third, Mal Onimderi Korporatsiyasi (MOK), established in 2001 as a government-owned joint stock company aimed at stimulating the livestock sector and developing new export markets, received an initial loan of two billion tenge at an interest rate about ten percent lower than it would have paid for a commercial line of credit. Commercial banks also receive from the government partial reimbursement of interest on loans to agricultural processing companies, which allows them to offer discounted credit to such companies.

It is difficult to evaluate the impact of this recent assistance to livestock producers, but it coincided with a turnaround in the livestock sector. Data on animal stocks in Table 4 show a substantial recovery in livestock numbers since the turn of the century. According to FAO data, between 2000 and 2005 the number of cattle increased from 4.0 to 5.2 million, the number of sheep from 8.7 to 11.3 million, goats

²⁶ Farmers may sell directly to consumers or use local traders, who are typically self-financed and without access to storage or refrigeration facilities, so that their sales are overwhelmingly at not-too-distant bazaars. The rise of supermarkets, with their impact on agricultural marketing channels in Central and Eastern Europe, is not yet a major feature in Kazakhstan. Supermarkets have opened in the large cities, especially since the oilboom began, but they focus on middle and upper class customers and account for a small part of the market available to domestic producers of livestock products.

²⁷ These ratios, drawn from Kazakhstan's high quality (since 2001) household survey data, are cited in the report *Kazakhstan's Livestock Sector – Supporting its Revival* written in June 2004 under the Joint Economic Research Program (JERP) of the Government of Kazakhstan and the World Bank. Annex II of the report describes marketing channels in Kazakhstan; Table 2 of the Annex reports that over twice as much farm households' income comes from selling own-produced meat, cheese, butter, etc. as from sale of live animals.

²⁸ Concerns about breeding arose from the sharp decline in the herds during the 1990s, which included loss of many purebred animals, and the fragmentation of livestock production units. The budget allocation for bovine artificial insemination was 947 million tenge for 2001-5. There is also provision for subsidizing the purchase of breeding livestock, set at 416 million tenge in 2002 and 2003, and increased to 478 million in 2005, but in 2002 actual disbursement was only 131 million tenge.

from 0.9 to 2.0 million, pigs from 1.0 to 1.3 million and chickens from 17.9 to 25.5 million.²⁹

(d) Other Agricultural Products

Other crops followed the overall pattern of declining output until 1997 followed by varying degree of recovery, epitomized by potatoes and by sunflower seed in Table 1 and by sugar beet. Valued at domestic producer prices potatoes are a more important crop than cotton, although the trade data show that they are grown overwhelmingly for domestic consumption.

Rice production in southern Kazakhstan has declined as farmers have shifted land from rice to cotton production, especially in Kyzylorda, which agronomists would consider climatically marginal for cotton-growing. This may reflect distortions against rice, but more likely reflects the profitability of cotton in the relatively undistorted post-1998 environment described in Section 3(b). The relative price of rice to cotton lint, which had been stable at 0.16 in the first half of the 1990s, jumped to 0.23 in 1996 but then fell dramatically in the rest of the decade to 0.13 in 2000 (Table 7).

(e) Trade Costs

The gap between farmgate prices and a border reference price, adjusted for normal transport costs, is not just a measure of policy distortions. It also includes transactions costs which may be defined as “transport costs”, but whose magnitude is heightened by poor soft infrastructure as well as by inadequate hard infrastructure (eg. poor roads and railways). This is not just an issue in transition economies, but trade costs tend to be high in transition economies, and amenable to change by policymakers if they are willing and able to strengthen the rule of law.

The most obvious trade costs are internal and can be addressed by national governments.³⁰ In Kazakhstan bureaucratic and other obstacles to trading and exporting became a striking feature of the economy during the 1990s, when provincial and district governments created their own policies and local policemen and other officials relied on arbitrary fees to supplement their meager or unpaid salaries. When each individual with the power to levy a fee along the road from the farm to the market or the border thinks only of maximizing their own returns and ignores potential externalities of their actions, too little trade takes place and in extreme cases trade may be eliminated altogether. The solution in well-functioning market economies is for the government to exert its influence to prevent a tragedy of the anti-commons by protecting producers and traders from arbitrary intrusion into property

²⁹ The FAO database also indicates a huge increase in the value, at producer prices, of milk (from 65 billion tenge in 2000 to 101 billion in 2004) and of eggs (from 9 to 16 billion tenge) – values which are hard to reconcile with other information on the numbers and distribution of cows and poultry.

³⁰ Some trade costs require bilateral attention, eg. coordination of opening times of border crossings, and, especially for a landlocked country like Kazakhstan, some require regional or multilateral action. Reports by the United Nations Development Programme (2005) and Asian Development Bank (2006) estimated that the Central Asian countries, including Kazakhstan, were trading below potential and a major reason was high trade costs.

rights.³¹ In Kazakhstan, the internal levies were an example of the augmented trade costs due to the central government's failure to establish its authority.

High transactions costs are symptomatic of incomplete transition to a market economy, and reflect policy choices (of omission to protect and enforce traders' property rights, rather than a choice of commission). While such obstacles do not apply specifically to farm products, many are related to distance and vary according to local jurisdiction, features which make them especially onerous for geographically specific but dispersed activities. Thus, they often effectively discriminate against agriculture, and against some farmers more than others, depending upon location, perishability of output, and so forth.

The problems related to output marketing of a fairly typical independent farm are illustrated by a case study from the survey of farms in northern Kazakhstan in 1999 reported by Gray (2000, 59-60). The farm's 36 workers produced wheat, barley and mustard seed for export to Russia. The *akim* (provincial governor) frequently banned the export of grain, even to neighboring provinces, until all farms in the province had paid all arrears on inputs, which was unfair on farms with no arrears. When permission to export was available, the farm had to obtain (1) a permit from the provincial Department of Agriculture, (2) a permit from the provincial Department of External Relations, (3) phytosanitary certification, (4) a quality certificate from *Gostandard*, (5) clearance from the Commodity Exchange, (6) a licence from the Chamber of Trade, (7) clearance from the Customs Committee, (8) a certificate from the Tax Inspectorate of no outstanding tax, and (9) a certificate from the Russian Committee for Standards and Metrology. The last consignment before the farm was interviewed required twenty-two days of full-time effort to obtain the clearances and permits. Once the consignment left the farm, corruption on the road was a major problem. The farm reported facing many checks, each of which required 15-20 Russian rubles per policeman. Reviewing the broader evidence from the survey of farms in northern Kazakhstan in 1999, Gray (2000, 32) found that "Harassment by uniformed officers appears to be universal, with established normal bribes required to pass each of a large number of police checks, even if papers are in order". The situation has improved since 1999, but anecdotal evidence suggests that such obstacles to trade remain substantial, despite presidential decrees on simplification.

There are regional variations.³² The logistical situation for farmers is better in southern Kazakhstan, where agricultural recovery began in 1997-8 as opposed to 1999 or later in northern Kazakhstan. For cotton producers this reflects the active role of the gin-owners, and for other farmers the most likely reason is better market access: urban markets in Almaty, Bishkek, Chimkent, Taraz or Tashkent are within 200 kilometers of most southern farms. In western Kazakhstan, the situation is worse because of the poor hard infrastructure, in particular the larger proportion of unpaved rural roads, and greater

³¹ The term "tragedy of the anti-commons" was coined by James Buchanan to describe the situation where viewing something as an open-access common property resource (eg. traders' rents) leads to too little of a desirable activity occurring.

³² Based on relative prices of standard goods Grafe, Raiser and Sakatsume (2005) conclude that there is more price variation among regions of Kazakhstan than between countries in Central Asia. Poor infrastructure permits market segmentation and local monopolies, which are associated with weak transmission of border prices, and increases price volatility, because even small increases in excess demand during a poor harvest may lead to large domestic price increases because the import response is limited and a bumper harvest may depress domestic prices well below the border price because trade costs limit the extent to which the surplus is exported.

distance to markets.³³ The wheat farmers of northern and central Kazakhstan are exposed to these costs, because they are responsible for trucking their crop either to the Russian border or to the railroad. Such costs increase the gap between border and farmgate prices. High trade costs have turned some commodities into essentially non-traded goods for which the unit value of the small quantities exported or imported in any year may be a poor guide to true undistorted opportunity cost prices.³⁴

(f) Rate of Assistance Estimates

My estimates draw heavily on 2000-4 support estimates for fifteen major products, accounting for about four-fifths of agricultural output, prepared by Anara Jumabayeva of the FAO for the World Bank's 2006 Agricultural Policy Assessment. The general picture in those estimates is of negative support for grains and oilseeds, and positive support for potatoes, sugar and especially livestock. The trend towards increased support for livestock products is very strong, especially for meat, while support for the two main exports (wheat and cotton) is variable. Although budget support increased during this period, the support estimates are dominated by the gap between the farmgate price and a reference price.

Table 8 and Figure 1 provide estimates of support for producers of six major agricultural products in 2000-4. The major changes to the World Bank estimates are omission of products for which the values seemed implausibly large or volatile (barley and other grains, oil seeds and cotton, and sheep meat, poultry and eggs) and recalculation of the wheat estimates.³⁵ The coverage is reduced below 70%, but in practice wheat may be a good proxy for barley and other grains and the pattern of other meats' PSEs may be similar to that for beef and pork. The crop/livestock balance remains representative of the national proportions.

The results are sensitive to assumptions, which may even affect the overall or sector averages if they apply to products with a large weight or lead to large outliers. The earlier discussion of the wheat estimate, for which the World Bank calculated negative support estimate for 2004, is the most important example. Given the weight of wheat (55% of the value of crops covered), this dominates the aggregate 2004 PSE for crops. Even for the early 2000s, if the wheat numbers were less negative (as calculated by Serova for the years up to 2002), then the aggregate picture would be of more positive support for farmers. The aggregate PSEs for livestock producers indicate increasing support since 2000, especially after the introduction of the AFP in 2003. The estimates in Table 8 indicate increasing producer support during 2000-4 for crop and livestock farmers, although the rate of increase was larger for the latter.

The qualitative picture in Table 8 is consistent with the description of agricultural policies in Section 2. After generally operating since 1992 in an environment of policy neglect which was associated with a negative price gap, in the

³³ Shepherd and Wilson (2006) emphasise the generally poor quality of roads in Central Asia.

³⁴ The APA estimates treat grains, cotton and pig meat as exports (ie. export unit values are fob border prices) and oilseeds, sugar and sheep meat as imports (ie. import unit values are cif border prices), while beef and veal are exports for 2000-1 and imports for 2002-4. Only milk is treated as a non-traded good, with the quality-adjusted price of New Zealand milk for delivery to western Europe as the reference price.

³⁵ Compared to the APA aggregates, omission of oil seeds, barley and other grains, and cotton is more or less off-setting in its effect on the sub-total for crops. Omitting sheep meat, poultry and eggs from the livestock category reduces the sub-sector's negative PSE in 2000 and increases it in 2003-4.

period 2000-4 the farm sector moved from facing negative to positive distortions (Figure 1). Most livestock sub-sectors (cattle farming for meat and milk, sheep and goats, and poultry) have performed well since the end of the 1990s, which is partly recovery from a deep trough but has been helped by a more positive policy and price environment.³⁶ The situation facing farmers of grains and other crops is less clear-cut; estimates of negative support for crops around the turn of the century may reflect high trade costs rather than policy-induced distortions specific to grain producers. Since the formulation of the AFP in 2002 there appears to have been growing support for grain, sugar and potato growers.

4. Conclusions

Measuring the policy-induced distortions facing Kazakhstan's farmers is challenging but also informative. For the main product groups the expected measures are fairly clear. Grains and cotton are export items for which there should be small distortions, perhaps shifting from negative to positive after the turn of the century, while for livestock products the picture is more opaque because they had become largely non-traded goods by the late 1990s before benefiting from favorable policies in the 2000s. In practice it is not easy to capture these patterns in producer support estimates, largely because border prices are hard to define for wheat (due to quality variations, long and varied land borders, and imperfectly competitive markets) and for cotton (due to large-scale smuggling across neighboring borders). For livestock products the absence of trade leads to some extreme values depending on the assumptions made.

Nevertheless, the estimates presented in Table 8 provides insights. The negative estimates for the export goods in 2000 and 2001 suggest substantial behind-the-border trade costs of the kind highlighted by Anderson and van Wincoop (2004). The shift from negative to positive support is captured in Table 8, but the extent to which this result is due to the policy shift embodied in the 2003-5 AFP or reduction in trade costs due to better governance is impossible to say.

This paper does not attempt to link the changing incentives to performance, but there are signs of a positive outcome. For the main crops, the short-term output fluctuations make it difficult to separate out policy-driven diversification from Kazakhstan's underlying comparative advantage in some farm products and the natural volatility of grain farming in the conditions of northern Kazakhstan. Wheat harvests fell in 2002-4, but the value of output increased (Table 1). More recently, the start of real exchange rate appreciation in 2006-7, with its threat of Dutch disease consequences, has been more than offset by bumper harvests and increasing world wheat prices.³⁷ Wheat exports of 8 million tons in 2006 and 8.5 million in 2007 were

³⁶ Booming domestic demand as a result of rapid economic growth and the large devaluation against the Russian ruble in 1999, which restricted import competition, stimulated the revival of livestock farming. The inward orientation of growth in the livestock sector is reflected in the production of pig-meat - consumed by Russians rather than by Kazakhs or their Islamic southern neighbors - which was given a short-term boost by the devaluation but has benefited little from domestic growth.

³⁷ The US Department of Agriculture estimates Kazakhstan wheat harvests of 13.5 million tons in 2006 and 16.6 million tons in 2007 (downloaded from <http://www.fas.usda.gov/psdonline/psdReport.aspx> on 28 February 2008), the best since the early 1990s. World wheat prices in 2007 were driven up by a poor Canadian harvest and drought in Australia. The 2007-8 market year was even more dramatic as bad weather and poor harvests in Australia, Canada, Argentina, China, India and the EU pushed wheat prices to record highs. Increased prices for dairy and other livestock products as well as for domestic consumers led the government in 2008 to impose first an export tax and then quantitative controls on

double what they had been in the first half of the decade, and in both 2006 and 2007 over a million tons of flour were exported, over four times the level at the start of the decade. The livestock sector has experienced more sustained growth, with output of meat, milk and eggs all growing substantially since the early 2000s.

Overall, and in stark contrast to the repressed agricultural sectors of neighboring Turkmenistan and Uzbekistan, the robustness of Kazakhstan's farm sector in 2007-8 represented a major turnaround from its dire situation a decade earlier. Whether through farm support or through other policies (e.g. better governance or improved infrastructure which reduced trade costs), Kazakhstan has enjoyed some success in diversifying the economy away from total reliance on the energy sector. In contrast to the 1990s when huge negative shocks were compounded by poor governance, Kazakhstan in the 2000s has had windfall gains in terms of new oil discoveries, good harvests and record world prices for oil and wheat, which appear to have been accompanied by better policy implementation.

grain exports. These measures hurt grain exporters relative to an undistorted market outcome, but they were problems of affluence for farmers who nevertheless enjoyed good harvests and high farmgate prices.

Table 1: Production of Main Agricultural Products

(a) Volume in thousand metric tons.

	1980	1985	1989	1990	1991	1992	1993
Wheat	17,548	14,191	10,784	16,197	6,889	18,285	11,585
Barley	6,405	6,357	5,727	9,303	3,412	9,482	7,909
Potatoes	2,238	2,197	1,783	2,324	2,143	2,570	2,296
Seed cotton	358	305	315	324	291	252	200
Sugar beet	2,223	1,901	1,188	1,134	726	1,276	925
Vegetables	1,134	1,085	1,254	1,136	955	985	808
Meat	1,069	1,133	1,573	1,560	1,524	1,258	1,312
Milk	4,597	4,763	5,563	5,642	5,555	5,265	5,577
Wool	103	97	110	108	104	97	95

Source: De Broeck and Kostial, 1998, 42.

	1993	1994	1995	1996	1997	1998	1999
Wheat	11,586	9,052	6,490	7,678	8,955	4,746	11,242
Barley	7,149	5,497	2,208	2,696	2,583	1,093	2,265
Rice	403	283	184	226	255	236	199
Soybean	6	6	4	3	3	4	4
Potatoes	2,296	2,040	1,720	1,657	1,472	1,263	1,695
Sunflower seed	86	97	99	64	54	83	104
Tobacco	4	3	2	2	2	9	8
Seed cotton	198	208	223	183	198	162	249
Vegetables	808	781	780	778	880	1,079	1,287
Meat	2,231	2,102	1,774	1,541	1,346	1,213	1,182
Milk	5,577	5,296	4,619	3,627	3,220	3,394	3,535
Wool	96	75	58	42	32	25	22

Source: National Statistical Agency data and FAO database.

	2000	2001	2002	2003	2004	2005
Wheat	9,073	12,707	12,700	11,537	9,937	11,300
Barley	1,664	2,244	2,209	2,154	1,388	1,600
Rice	214	199	199	273	276	310
Soybean	4	7	25	38	47	45
Potatoes	1,692	2,185	2,269	2,308	2,261	2,300
Sunflower seed	105	149	190	293	266	240
Tobacco	16	15	16	16	14	14
Seed cotton	287	418	361	480	467	350
Vegetables	1,544	1,782	1,867	1,938	2,058	1,939
Meat	1,140	1,155	1,191	1,243	inc	inc
Milk	3,730	3,923	4,110	4,317	4,557	4,713
Wool	23	24	25	27	28	29

Source: FAO database.

(b) Value at farmgate prices (animals – live weight), in billion tenge.

Value of main crops	2000	2001	2002	2003	2004
Wheat	89.0	143.9	122.9	139.2	144.7
Rye	0.4	0.4	1.0	0.4	0.2
Barley	10.7	17.7	15.7	14.7	11.9
Oats	0.9	1.2	1.2	1.0	0.9
Maize	2.3	3.4	4.7	4.5	5.7
Sugar	11.2	18.6	22.2	25.1	26.1
Potatoes	31.2	36.0	35.6	48.2	47.4
Sunflower seed	1.8	2.8	4.9	7.0	6.7
Seed cotton	14.7	12.6	16.5	29.7	16.3
Value of livestock production					
Beef and veal	42.3	49.4	57.5	65.6	76.8
Sheep and goat meat	10.2	12.4	28.1	32.6	38.2
Pig meat	34.9	42.1	26.4	27.5	31.8
Poultry meat	4.4	5.1	6.3	7.1	7.9
Cow milk	64.8	72.0	79.6	84.5	101.0
Eggs	9.0	10.7	11.6	13.6	16.5
(15 items as % of total ag.output)	82%	80%	78%	81%	76%

Source: quantities and producer prices from national statistical authorities (also as reported on the FAO database).

Table 2: Export of Main Agricultural Products, 1995- 2004

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Grain										
volume (000 tons)	3,484	2,809	3,578	2,905	3,816	5,612	3,336	4,311	5,835	2,929
price (US \$ per ton)	89	153	143	102	82	88	103	80	97	150
value (\$ millions)	308	429	512	295	314	496	344	346	565	440
Cotton fiber										
volume (000 tons)	26	70	64	48	62	90	96	138	126	143
price (US \$ per ton)	1,425	1,388	1,214	1,077	797	946	864	763	1,110	1,190
value (\$ millions)	36	97	78	52	50	85	83	105	139	170
Wool										
volume (000 tons)	52	31	42	12	16	11	8	8	10	7
price (US \$ per ton)	999	1,372	1,368	1,440	426	450	618	618	465	737
value (\$ millions)	52	43	57	17	7	5	5	5	5	5
Total exports (\$ millions)	5,440	6,291	6,899	5,871	5,989	9,288	8,928	10,027	13,233	20,603

Source: International Monetary Fund: Republic of Kazakhstan: Selected Issues and Statistical Appendix, *IMF Staff Country Report No.00/29* (March 2000- revised version of *Staff Country Report No.99/95*), 124; International Monetary Fund: Republic of Kazakhstan: Selected Issues and Statistical Appendix, *IMF Staff Country Report No.03/211* (July 2003), 98.

Table 3: Principal Agricultural Exports and Imports by Value, 2003 (UN-COM trade database)

(a) Exports over \$10 million (thousand US dollars).

HS code	Description	Exports	Share (%)
030420 + 030379	Frozen fish fillets and frozen fish, nes	15,969	1.60
100100	Wheat and meslin	522,568	52.36
100300	Barley	37,107	3.72
110100	Wheat or meslin flour	57,678	5.78
170199	Cane or beet sugar, in solid form,	37,540	3.76
240110 + 240220	Tobacco, & cigarettes containing tobacco	19,951	2.00
410121	Whole hides and skins of bovine animals	11,423	1.15
410422	Bovine leather	47,327	4.34
520100	Cotton, not carded or combed	140,298	14.06
		889,861	88.8

Note: Export shares are of the agricultural total, categories 01-24, 41 and 52-3 (\$998 million).

(b) Imports over \$7 million (thousand US dollars).

HS code	Description	Imports	Share (%)	Tariff (%)
020741	Frozen cuts and offal of chicken	22,284	3.21	23.75
0402	Milk and cream	34,764	5.01	12
040500	Butter and other fats and oils derived from animals	8,813	1.28	20
0902	Tea	31,228	4.50	5
110710	Malt not roasted	7,974	1.15	10
120600	Sunflower seeds	18,375	2.65	0
130219	Other vegetable saps and extracts,	7,639	1.10	0
151190	Palm oil (excl. crude)	9,243	1.33	0
151219	Sunflower-seed and safflower oil	21,254	3.06	15
151620	Vegetable fats and oils	9,135	1.32	0
160100	Sausages and similar products	9,040	1.30	20
170111	Raw cane sugar, in solid form	120,273	17.34	0
170199	Cane or beet sugar, in solid form	11,888	1.71	12.5*
170490	Sugar confectionery	18,814	2.71	19
1806	Chocolate	43,336	6.25	0.6
1905	Bread, pastry, cakes, etc.	34,477	4.97	15
2101	Extracts and preparations of coffee	7,306	1.05	13.75
210500	Ice cream and other edible ice	9,601	1.38	15
210690	Other food preparations, nes	10,001	1.44	2.14*
2203-08	Alcoholic beverages	31,306	4.51	
	2203 Beer made from malt - 15,458			0.6
	2204 Wine of fresh grapes - 6,605			0.5
	2205/6 Vermouth & other fermented beverages - 556			0.2/0.7
	2208 Spirituous beverages - 8,687			2
2401	Unmanufactured tobacco; tobacco ref	27,688	3.99	5
2402-03	Cigars, cigarillos, cigarettes, & other manuf. tobacco	13,638	1.97	30
		508,077	73.23	

Notes: (1) Import shares are of the agricultural total, categories 01-24, 41 and 52-3 (\$694 million). (2)

* indicates a residual category with various tariff rates (in the UNCTAD TRAINS database), which could not be matched to the precise import categories.

Table 4: Inventory of Livestock by Farm Type, 1990-2002 (million head)

Year	Cattle			Sheep & goats			Pigs			Horses			Poultry		
	AE	IF	HP	AE	IF	HP	AE	IF	HP	AE	IF	HP	AE	IF	HP
1990	6.7	--	3.0	29.2	0.1	6.4	2.6	--	0.7	1.1	--	0.5	40	--	20.0
1991	6.4	--	3.2	27.2	0.4	7.0	2.3	--	0.7	1.1	--	0.6	40	--	19.7
1992	6.1	0.1	3.5	25.9	0.8	7.8	1.9	--	0.7	1.0	--	0.6	33	0.4	19.1
1993	5.5	0.1	3.8	24.9	0.8	8.5	1.6	--	0.8	1.0	--	0.7	31	0.3	18.2
1994	4.4	0.1	3.6	17.2	0.7	7.3	1.2	--	0.8	0.9	--	0.7	23	0.1	10.0
1995	3.2	0.2	3.5	11.4	1.1	7.0	0.8	--	0.8	0.7	0.1	0.8	13	0.1	7.4
1996	1.9	0.2	3.3	5.8	0.9	6.9	0.3	--	0.7	0.4	0.1	0.8	9	0.2	6.7
1997	0.9	0.2	3.1	2.7	0.9	6.8	0.2	--	0.7	0.2	0.1	0.8	9	0.2	6.7
1998	0.5	0.2	3.2	1.5	0.9	7.2	0.1	--	0.7	0.1	0.1	0.8	10	0.2	7.2
1999	0.4	0.2	3.4	1.1	0.9	7.7	0.1	--	0.8	0.1	0.1	0.8	9	0.2	9.1
2000	0.3	0.2	3.6	0.9	0.8	8.2	0.1	--	0.9	0.1	0.1	0.8	10	0.2	9.9
2001	0.3	0.2	3.7	0.9	0.9	8.6	0.1	--	1.0	0.1	0.1	0.8	10	0.2	11.0
2002	0.3	0.3	3.9	0.9	1.2	9.1	0.2	--	1.0	0.1	0.1	0.9	12	0.3	11.6

Source: Agency on Statistics, Republic of Kazakhstan

Notes: AE = agricultural enterprises; IF = individual farms; HP = household plots; -- < 50,000 head.

Table 5: Budget Transfers to Agriculture, 2000-5 (million tenge)

	2000	2001	2002	2003	2004	2005
Grain subsidies on inputs	100	450	645	837	911	921
Grain subsidies on services	0	0	0	400	0	300
Crop subsidies on inputs	16	334	363	1,265	1,553	1,784
Crop subsidies on services	0	70	147	173	2,381	2,237
Crop subsidies (miscellaneous)	0	0	0	1,000	4,806	7,950
Livestock subsidies on inputs	100	468	697	819	1,289	1,489
Livestock subsidies (misc.)	0	0	0	279	2,500	1,500
Total: direct subsidies	216	1,322	1,853	4,773	13,440	16,182
Credit programs & grain reserve purchase	3,597	11,353	11,552	17,208	15,504	14,208
Research and development	103	143	279	1,667	3,048	3,031
Inspection services	2,375	4,396	4,596	6,435	6,852	8,320
Infrastructure	1,582	3,690	4,858	3,685	2,347	1,997
Marketing and promotion	393	901	854	730	148	1,325
Miscellaneous	3,079	4,987	9,368	18,799	26,955	35,027
Total: general services to agriculture	7,532	14,117	19,956	31,316	39,349	49,699
Total Budget Transfers	11,345	26,793	33,360	53,297	68,293	80,090

Source: state budgets as reported in the Agricultural Policy Assessment being conducted under the Joint Economic Research Program (JERP) of the World Bank and the Government of Kazakhstan.

Note: Budget funds allocated to agriculture (all programs of Ministry of Agriculture and Committees) 2000-4, and planned for 2005.

Table 6: Support Estimates for Wheat, 2004

		Source	APA	revised
1	Production (thousand tons)	Table 1	9,937	9,937
2	Border price (fob, US dollars)	see text	151	110
3	Exchange rate (KZT/USD, mid-year)	IMF	136.04	136.04
4	Domestic currency price (KZT)	line 2x3	20,542	14,964
5	Transport, handling, etc. (KZT)	APA	2,565	2,565
6	Reference price, at farmgate (KZT)	line 5-4	17,977	12,399
7	Producer price at farmgate (KZT)	FAO	14,565	14,565
8	Price distortion(KZT)	line 7-6	-3,412	2,166
9	Market price support (KZT million)	line 1x8	-33,905	21,520
10	Subsidies(KZT million)	APA	5,672	5,672
11	PSE (KZT million)	line 9+10	-28,233	27,192
12	Value at farmgate (KZT million)	line 1x7	144,732	144,732
14	PSE (% of value)	line 11/12	-19.5%	18.8%

Notes: APA = revised Agricultural Policy Assessment (September 2006) conducted under the Joint Economic Research Program (JERP) of the World Bank and the Government of Kazakhstan. See Pomfret (forthcoming) for more details.

Table 7: Relative Producer Prices for Wheat, Rice and Cotton Lint, 1994-2002

	1994	1995	1996	1997	1998	1999	2000	2001	2002
Wheat	.0375	.0388	.0552	.0480	.0396	.0339	.0461	.0470	.0411
Rice	.1628	.1628	.2343	.1836	.1761	.1502	.1275	.1249	.1319

Source: Calculated from FAO data base (at <http://faostat.fao.org>)

Note: calculated as a fraction of the producer price for cotton lint.

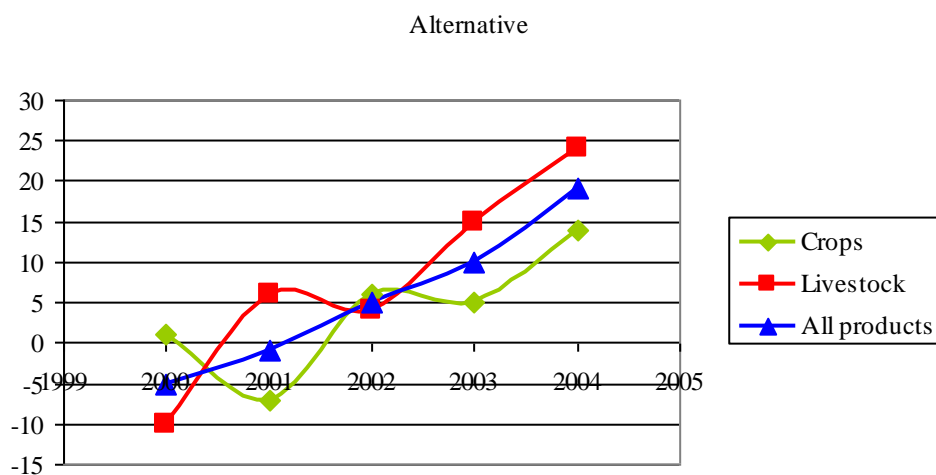
Table 8: Support for Major Agricultural Products, 2000-4
(as a percentage of farmgate revenue)

Commodity	2000	2001	2002	2003	2004
Wheat	-1 (22)	-8 (27)	4 (22)	2 (23)	19 (21)
Sugar	-6 (3)	-3 (4)	17 (4)	21 (4)	17 (4)
Potatoes	8 (4)	-4 (2)	4 (3)	3 (5)	11 (2)
<i>Sub-total crops</i>	1 (41)	-7 (44)	6 (40)	5 (44)	14 (38)
Milk	-2 (16)	-3 (14)	0 (14)	-4 (14)	8 (14)
Beef and veal	-61 (11)	-3 (9)	-1 (10)	26 (11)	40 (11)
Pig meat	39 (9)	32 (8)	28 (5)	45 (5)	37 (5)
<i>Sub-total livestock</i>	-10 (41)	6 (36)	4 (38)	15 (37)	24 (39)
Average PSE – all commodities	-5	-1	4	15	24
Coverage (% of farm output)	65	64	58	62	57

Source: The estimates for wheat 2000-3 and for sugar, potatoes, milk, beef and pork are from the revised Agricultural Policy Assessment (September 2006). The 2004 wheat estimate is recalculated with a 10% (rather than a 51%) increase in border price, see Table 6 and text.

Notes: the numbers in parentheses are weights (shares of total farm output).

Figure 1: Producer Support for Agriculture, 2000-4



Source: Table 8

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