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Soviet grain import demand

The past and into the 1990s

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Because of its importance in world grain markets, changes in imports by the former Soviet Union (now the Commonwealth of Independent States, CIS) are likely to affect the prices of grain received by Australian growers. In an essentially qualitative analysis, the factors likely to influence CIS grain import decisions in the short to medium term are placed within the context of the institutional changes occurring in the region, in order to analyse the impact of current developments on grain exporting countries, such as Australia.

The progress of market oriented reforms in the region, the nature of intraregional trade, hard currency availability and the inflow of foreign aid are identified as factors likely to be important influences on CIS grain imports and world market conditions.

The short to medium term impact of economic and political changes in the former Soviet Union appears to be adverse for world grain markets and, therefore, on returns to Australian growers. As the effects of reductions in hard currency availability resulting from increased debt service payments, reduced oil output and a possible fragmentation of trade links between the former republics mount, imports of both wheat and coarse grains are likely to continue to decline. At the same time, significant reductions in the size of animal herds will reduce the demand for feed grain and wheat in the region. However, in the short term, the severity of any reduction in grain imports and the impact of such reductions on world grain prices resulting from changes taking place in the CIS are likely to be mitigated by the provision of international food aid to the region and the introduction of a moratorium on debt repayment.

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Introduction

In 1991 the process of change to economic and political institutions in the Soviet Union gathered pace. Following the failed coup in August 1991 most of the fifteen republics in the region declared their independence from the Union and the control exercised by central authorities over economic resources deteriorated. In January 1992 the Soviet Union formally ceased to exist. Eleven of the fifteen republics have formed the Commonwealth of Independent States (CIS).

With the rapid deterioration in central control, the disruption to economic activity in the region that had already started to emerge became more apparent and severe. In recent years, output generally has declined substantially. There have also been food shortages in important population centres and the capacity of the region to generate sufficient hard currency (that is, currency that is readily convertible and is widely accepted in international transactions) to meet import requirements, while continuing to service a large foreign debt, has been seriously impaired. As the old economic institutions associated with central control continue to decline, the nature of future arrangements governing trade relations between the former republics in the region and their trade with other countries remains unclear.

These developments have raised concerns about the future capacity and willingness of the nations that made up the former Soviet Union to maintain imports of wheat and coarse grains at the high levels that applied during the 1980s. These concerns are of particular significance to grain exporting countries because of the position of the region as the world's largest importer of grain and its role, in recent years, in absorbing subsidised exports of wheat and coarse grains from Western Europe and North America. Changes to Soviet grain imports resulting from economic and political developments in the region will affect the total volume of trade in those commodities and, therefore, the world prices received by Australian growers.

The main objective in this paper is to describe some of the important factors arising from the institutional changes in the region that are likely to affect net wheat imports during the remainder of the 1990s. The analysis is a qualitative one and no attempt is made to obtain quantitative forecasts of the impact of future developments in the region on grain import levels. Indeed, in 1975, Schoonover noted that because of the paucity of available data and uncertainty about future developments in the region, any attempt to forecast future Soviet trade in grain 'would require extreme foolhardiness'. This conclusion, drawn in a period of

relative institutional stability in the former Soviet Union, now applies with greater force. In this paper, the main concern is to emphasise the role that changing institutional factors might have on net grain imports by the region and point to the importance of taking such factors into account in any future quantitative modelling of CIS grain markets.

The paper is organised in the following way. In the next section an overview of the recent institutional changes in the former Soviet Union is provided. This is followed by a discussion of the historical determinants of grain imports and the nature of the institutional changes likely to affect grain imports. In the final section the possible impact of changes in the region's grain imports on exporting countries such as Australia are discussed in greater detail.

Background to institutional change in the region

The recent dramatic changes to economic conditions and institutions in the region were set in train during the latter half of the 1980s. Over this period, it became increasingly apparent that the established system of rigid central control over economic resources, their allocation and use would prove inadequate for the task of generating sustained economic growth into the future. Concern about such conditions gave rise to policies aimed at restructuring and improving elements of the command system. These policies allowed enterprises somewhat greater autonomy over production decisions and, in the case of agriculture, the development of private farms was encouraged (Balassa 1990).

While policy makers sought to rectify some of the more apparent flaws of central planning, they failed to address the main deficiencies of the system, the lack of appropriate incentives to improve efficiency in individual enterprises and the lack of well-functioning mechanisms, such as factor markets, for allocating resources to their most productive uses. Changes were introduced in a piecemeal fashion, with the result that reforms in one area of the economy were hampered by continued rigidities in other areas (Aslund 1991). For example, the extent of possible expansion in manufacturing or construction industries continued to be limited by the absence of well-functioning capital markets for raising and allocating investment funds. In agriculture, the development of private farms was constrained by rigidities in input availability and the lack of well-trained farm managers (Sizov 1991).

The greater political freedoms which accompanied the moves to restructure central planning allowed individual governments in different republics to gain increased political autonomy and exercise greater control over resources within their borders. This assertion

of regional power, combined with the greater autonomy afforded to enterprises, led to a deterioration or fragmentation of central administrative control (Hanson 1991).

With the weakening of central control and in the absence of alternative mechanisms for allocating resources, such as new capital, economic activity declined greatly. For example, the gross domestic product of the Soviet Union fell by an estimated 12 per cent in 1991, oil production has fallen greatly and further reductions in the output of most sectors are likely in the short to medium term. At the same time, inflation accelerated rapidly as the central government continued to inject money into the economy in order to finance its growing budget deficit (Aslund 1991).

The deterioration of central economic control and moves to introduce more market oriented mechanisms for allocating resources and governing trade between the former republics are likely to have a significant impact on net grain imports by the region as a whole. In addition, the fragmentation of control over economic resources is likely to affect the ability of the region to generate the foreign exchange needed to finance import purchases. For example, without the development of binding debt sharing arrangements and property rights over assets and resources between individual republics, the ability of the region as a whole to obtain credits for import purchases will be severely constrained. These and other issues are considered in greater detail later in the paper.

Historical determinants of Soviet grain import demand

To gain some indication of which of the factors accompanying the weakening of central economic control might affect CIS and, therefore, world trade in grain, it is important to obtain an appreciation of some of the specific features of the region's grain distribution and import system as it evolved under central planning and control.

The main features of this system are illustrated in figure 1. Farm enterprises received instructions from planners on input use, quantitative output targets and delivery schedules. Inputs, sufficient to meet target output levels (or more recently state orders), were supplied by the state. Once harvested, grain reached final consumers through a number different channels. For example, consumers in urban areas and elements of the state apparatus, including the army, were supplied largely by state procurements. Typically, such procurements accounted for about 30 per cent of total grain output. The authorities procured grain from farms at prices that differed according to the quality of the grain and from region to region. These procurements entered the All-Union Consumption Funds which in turn

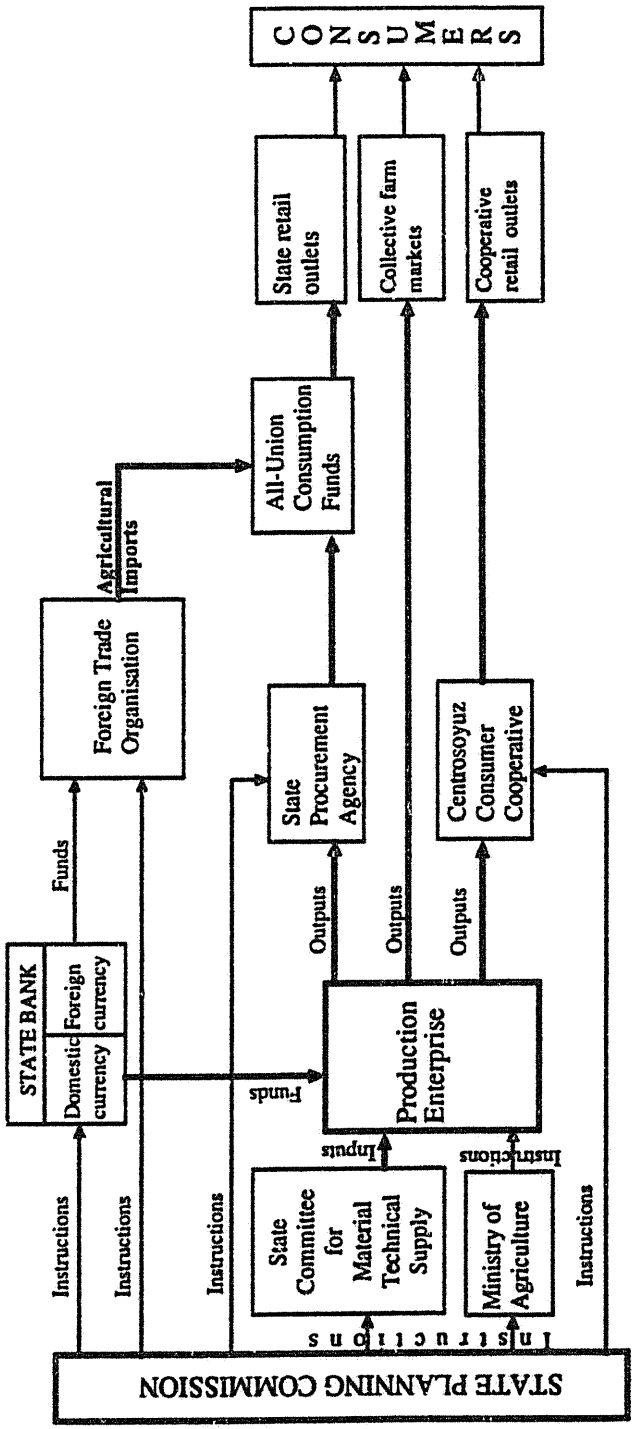


Figure 1: Schematic representation of the Soviet food production and distribution system

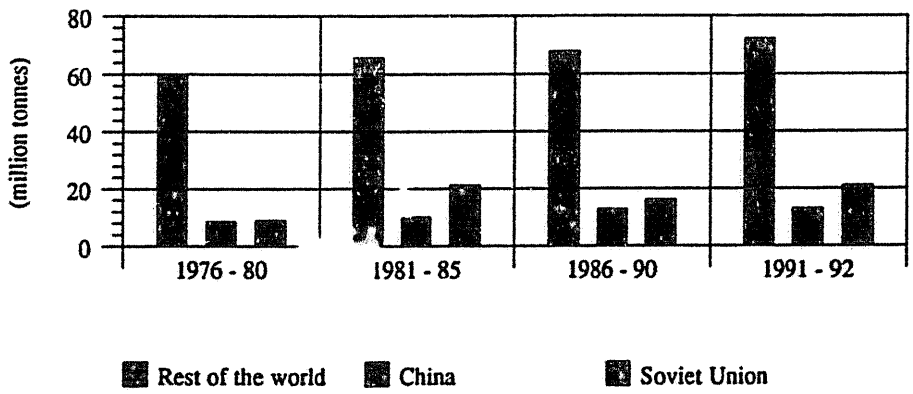
supplied state retail outlets. Large quantities of grain were used on farms for animal feed, human consumption and for inter-enterprise barter to obtain additional inputs from outside official distribution channels.

Decisions on the allocation of hard currency between alternative requirements including commodity imports and debt service payments were also made by central authorities. Imports of grain were determined by planning authorities, with the Ministry of Agriculture, the Foreign Trade Ministry and agencies concerned with maintaining dietary standards. Such imports entered the All-Union Consumption Fund. Because they entered the Fund, it could be argued that grain imports were used primarily to provide urban consumers with additional grain. Finally, exports of oil, gas, gold and other commodities were planned with a view to generating sufficient hard currency (or goods for barter) to pay for imports from the West (Wolf 1988). An econometric analysis of the historical determinants of wheat and coarse grain import demand is provided in appendix A.

Grain import behaviour and domestic production

During the 1970s and 1980s, under the system of central control described above, the Soviet Union emerged as the world's largest importer of wheat and coarse grains (figure 2). Such purchases were necessary to supplement domestic production which was perceived by planners to be insufficient to meet growing consumption requirements (Medvedev 1987, p. 213). Perceived needs expanded over time not only as a result of population growth but also

Figure 2: Wheat Imports by China, Soviet Union and the rest of the world



because of a move toward raising meat consumption per person by expanding domestic herd sizes and hence grain fed meat production (Cook 1985).

Shortfalls in domestic grain supply have been partly attributed to wastage resulting from inefficient grain harvesting, storage and distribution practices. Such losses averaged about 15 per cent of total grain production during the 1980s (US Department of Agriculture 1990) compared with grain losses of around 5 per cent in the United States (US Department of Agriculture 1989).

Figure 3: Soviet Union: Wheat production and imports

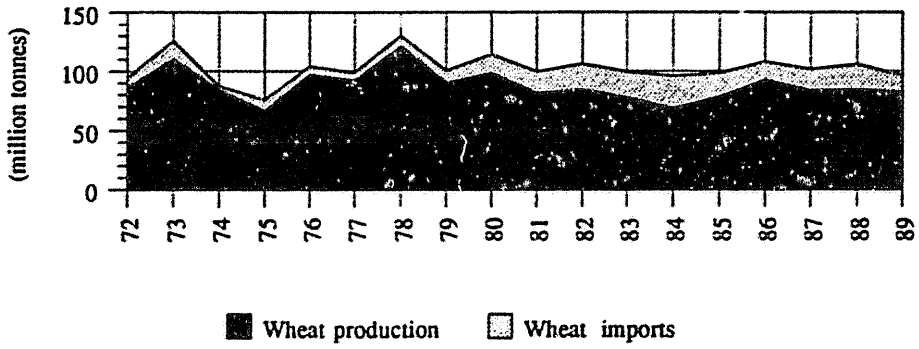
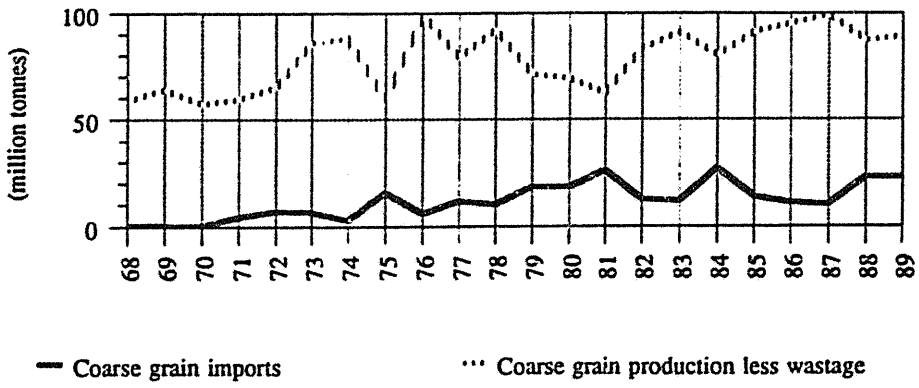


Figure 4: Soviet Union: Coarse grains production and imports



Grain output in the Soviet Union has been particularly variable (Clayton 1985). For example, during the 1980s the size of the total grain crop varied between 158 Mt in 1981-82 and 211 Mt in 1987-88, averaging around 192 Mt over the period. This variability can be attributed to changes in climatic conditions in the region. Frequent droughts and harsh winters are characteristic of the region (Kelso 1983).

The role played by imports in stabilising fluctuations in the availability of grain and making up shortfalls in supply is illustrated in figures 3 and 4. These figures show that in most years,

Figure 5: Soviet Union: Wheat imports and procurements

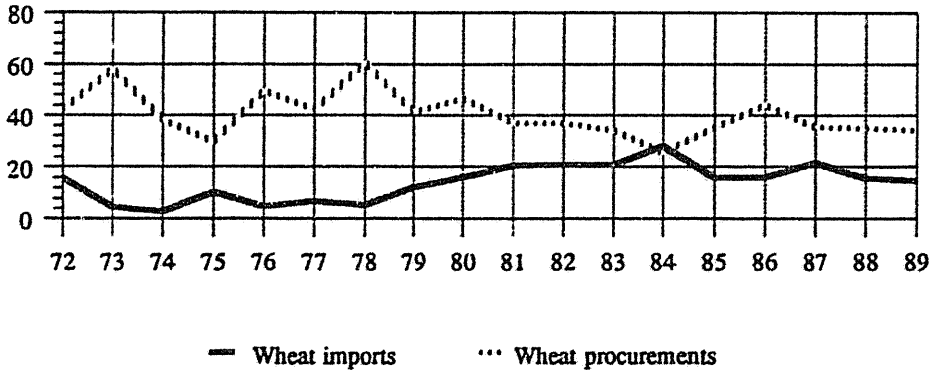
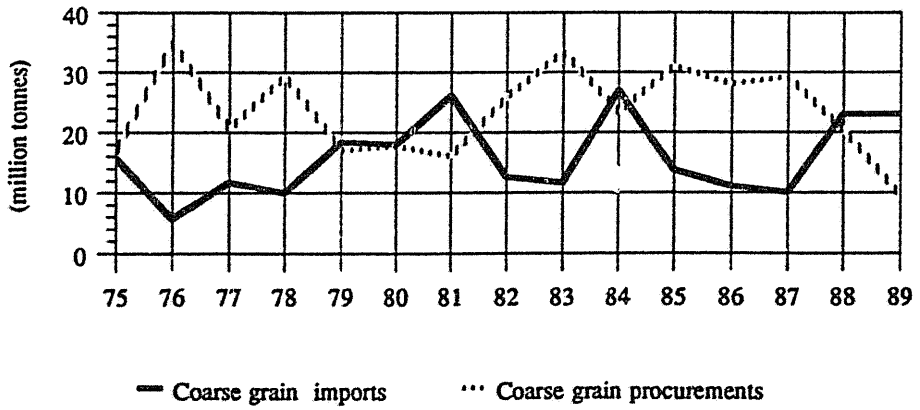


Figure 6: Soviet Union: Coarse grains imports and procurements



increases in domestic production were accompanied by lower imports while higher imports accompanied reductions in domestic output. A similar relationship between imports and grain procurements (central government purchases of domestically produced grain) is evident in figures 5 and 6.

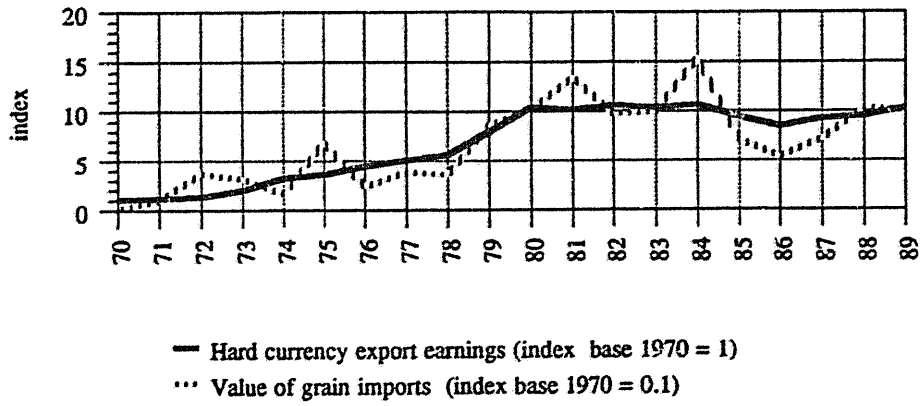
The importance of the hard currency constraint

Foreign exchange, obtained either through direct export sales or international loans, which are essentially claims on future export earnings, appear to be have been correlated with grain import levels. A substantial increase in earnings from energy exports following the first oil price shock in 1973 generated an increase in potential hard currency earnings, which was matched by an expansion in all Soviet commodity imports including grain. The growth in hard currency earnings and the accompanying increase in grain imports during the period between the early 1970s and the mid-1980s is illustrated in figure 7. During this period, revenues from energy exports constituted more than 60 per cent of total hard currency earnings by the region.

While export earnings appear to be positively related to grain imports, it is difficult to gauge the extent to which foreign exchange availability constituted a constraint on grain imports. This is essentially because an expansion in import demand would have led authorities to increase exports and therefore foreign exchange earnings; however, this increase would have had to take place at the cost of reducing the domestic availability of the export item. Consequently, the degree to which authorities could increase export revenues in response to an expansion in import demand would have been limited. Brada and King (1989) suggest that movements in foreign exchange earnings affected imports to the extent that export earnings (or international loans) failed to be sufficient to pay for perceived import requirements. For example, in years when exports fell short of perceived requirements, available foreign exchange would need to be rationed over alternative needs. On the other hand, if export earnings exceeded requirements, the excess foreign exchange would also need to be allocated. The amounts of hard currency allocated to grain imports would have depended not only on the total availability of foreign exchange but on the importance attached to competing uses for that hard currency, such as debt servicing and repayment.

The priority accorded imports of wheat and coarse grains in the rationing of hard currency was probably also influenced by world prices for those commodities and the size of the export subsidies offered by exporters such as the United States and European Community for grain sales to the Soviet Union. Various authors have argued that own-price elasticities

Figure 7: Soviet Union: Hard currency earnings and grain imports



for Soviet grain import demand were likely to be low because of the rigidities associated with decision making. For example, Westhoff, Baur, Stephens and Myers (1989) estimated an own-world-price import demand elasticity for Soviet wheat of about –0.2, while Brada and King (1989) found a positive relationship between grain imports and world grain prices. They argue that this positive relationship emerged both because Soviet import demand for grain was likely to have been highly inelastic with respect to price and because high levels of grain imports by the Soviet Union were likely to increase world demand for grain and, therefore, world grain prices.

Using a state-space variable approach[1] to estimate the extent of excess demand in the Soviet foreign exchange market, Brada and King (1989) found that such disequilibriums did not appear to have a significant influence on grain import demand. That is, unplanned changes in foreign exchange availability did not seem to influence grain import levels. This result is underscored by the stability which total grain consumption displayed through the 1980s, despite the relative instability associated with foreign exchange earnings. With future changes in economic conditions and institutions in the region that was the Soviet Union and the recent large reductions in oil production, however, the degree to which such estimated relationships will continue to hold remains unclear.

1 This approach allows for estimation when the dependent variable, in this case the disequilibrium in the foreign exchange market, cannot be observed. See Watson and Engle (1983) for a summary of this approach.

Future economic developments and institutional change

In the past, because of the importance of sustaining food availability, grain imports appear to have been accorded high priority by the Soviet authorities. However, with a continued deterioration in central control, as new institutions evolve and economic conditions deteriorate further in the short term, the grain production, distribution and import system described in the previous section is unlikely to remain immune from developments affecting the economies of the region as a whole.

The relative importance of foreign exchange availability and grain production in determining grain imports will depend on changes in the priority accorded different commodity imports as demand patterns move away from those determined by central planners and toward greater market orientation. The level of grain imports will also be influenced by future developments in economic relations between the former Soviet republics. But the nature of future institutional, economic decision making and trade arrangements remains unclear.

When considering the uncertainty surrounding the development of possible new institutional structures, Hanson (1991) examined a set of possible outcomes for the short to medium term (that is, to the mid-1990s). Of the outcomes suggested by Hanson, the two most likely involved a fragmentation of decision making structures in the region, with slow moves toward the creation of market economies. Specifically, the two outcomes were the *benign* fragmentation of the former Soviet Union into republics with informal cooperation, and the *severe* fragmentation of the region with a substantial breakdown of economic relations within the region. With severe fragmentation, intraregional trade linkages would be seriously impaired and the impetus for market reform would slow because of the strengthening of trade barriers between former republics of the region. Under benign fragmentation, however, trade links between the former republics would be preserved but it is likely that there would be moves toward the creation of different currency areas and more market oriented trade among the former republics of the region that could be based on world market pricing. At present, elements of both a *severe* and *benign* fragmentation appear to be emerging.

In the current environment of rapid political and economic change, four interrelated factors likely to affect the region's grain imports and world market conditions for those commodities in the short to medium term include:

- the extent to which market forces lead to changes in agricultural production and consumption patterns;

- the nature of future trade flows within the region;

- the availability of hard currency to finance import purchases; and

- the level of foreign food aid.

While the analysis of these factors below is essentially a qualitative one, a future modelling approach to their analysis would need to take into account the economywide, or general equilibrium, effects resulting from the introduction of market forces. Future institutional developments also affect the level of aggregation necessary to model the impact of change in the region accurately. In particular, if future trade policies differ among the former republics, and demand and supply patterns in each republic change significantly, the economies of separate republics may need to be modelled separately.

The introduction of market reforms

Production subsidies (which allow loss making enterprises to continue to operate) and consumer subsidies constitute a very large burden on the central government budget and contribute to the growth of inflation in the former Soviet Union (IMF, IBRD, EBRD and OECD 1991). In Poland, where market reforms appear to have been pursued with the greatest pace, the elimination of subsidies to loss making enterprises and consumers was seen as essential reform (Lipton and Sachs 1990). As market prices begin to influence production and consumption decisions in the former Soviet Union to a greater extent than in the past, significant changes in net trade in grain by the region as a whole could result.

For example, moves to reduce distortions in consumption (as part of an overall market oriented reform strategy) by lowering consumption subsidies for feed and food grain would reduce domestic grain demand and the need for grain imports generally. Indeed, this has been the experience in Poland where subsidies for grain use were removed at the end of 1989 (Cochrane and Koopman 1991). Such developments are most likely to affect coarse grain imports for animal feed. At present meat and dairy producing industries in the former Soviet Union remain heavily subsidised. Based on domestic input and output prices, the ratio of revenues to costs in beef, pork and poultry production in the Soviet Union were between 0.20 and 0.25 in the late 1980s, while the ratio of revenues to costs in milk production was

0.58 (Ulyukayev 1991). Such data indicate that with a move to market based structures and a phasing out of subsidies a large number of livestock based enterprises would be forced to shut down, leading to significant reductions in the demand for feed grains. Wheat demand would also be affected by a depletion of livestock numbers, as up to 40 per cent of available wheat is used in animal feed. Similarly, reductions in the large subsidies on bread and flour consumption could lead to reductions in consumption of wheat and coarse grains and, therefore, a fall in imports of grain by the region.

Using the SWOPSIM model of world agricultural trade, Liefert, Koopman and Cook (1990) and Koopman (1990) argue that if producers and consumers in the region face world prices when making their grain use decisions, the consumption of grain could be reduced sufficiently to turn the region into a net grain exporter. The effects of such developments on world grain prices and market conditions for exporting countries would be negative. It should be noted, however, that the SWOPSIM approach did not account for the general equilibrium effects likely to result from the introduction of market forces and the economies of individual republics were not disaggregated.

While, in the short term, market reforms are likely to affect consumption, the extent to which grain output would be affected by the introduction of such reforms, especially in the medium term, is not clear. Ulyukayev (1991) reported that, in recent years, revenues earned by grain producers in the Soviet Union, on average, exceeded costs. However, without a regional breakup of data on the profitability of Soviet grain farms, and some indication of how the introduction of market mechanisms will shift resources between different production sectors in different regions, it is difficult to ascertain the extent to which total grain production in the region will be affected by market reforms. For example, it is possible that grain output in some of the major grain producing areas of the region, such as Kazakhstan which is regularly affected by severe drought, would decline with the introduction of market reforms. On the other hand, grain output in the Ukraine, traditionally considered a 'bread basket' of Europe (Agra Europe 1991), could increase over time as market mechanisms lead to a shift of resources into grain production in that former republic.

While the net effect of market reforms on grain output remains unclear, market reforms in grain distribution, which encourage transport enterprises to minimise the size of grain losses, could lead to substantial improvements in grain availability. Such a development, along with any reductions in domestic grain demand resulting from the introduction of market reforms, could reduce grain imports substantially by the region as a whole.

Changes to trade flows within the region

With the decline in central control and the increased fragmentation of control over economic resources in the region, farm enterprises appear to be hoarding increased quantities of output in anticipation of receiving higher prices through unofficial channels. At the same time, the Ukraine, which in recent years was a large surplus producer of grain in the Soviet Union, has placed controls on the quantities of grain that may be exported to deficit regions. Because of such developments, the system of grain procurements which had previously served as an important means of distributing surplus grain over the Soviet Union (see figure 1) has weakened considerably and the extent to which the procurements system can continue to function in the future is not clear. For example, in 1989, despite an increase in grain output and state orders of grain, procurements by the central government actually declined. In recent years, reduced procurements led to substantial shortages of grain in urban areas (Agra Europe 1991).

Historically, the pattern of trade between grain surplus producing regions of the Soviet Union, such as the Ukraine and Kazakhstan, and grain deficit republics such as the Russian Federation, some central Asian republics and the Baltic states was determined largely by central planning. One consequence of the fragmentation of the former Soviet Union and the subsequent decline in the grain distribution system illustrated in figure 1 could be a move to base trade between the republics on world prices. Such a move would alter the terms of trade facing both surplus and deficit regions. For example, consider the case in which, under central planning, grain deficit republics were able to obtain grain from surplus republics for less, in terms of exportable commodities such as oil, than would be possible on world markets. In that case, the use of world prices in trade between those republics would lead to a deterioration in the terms of trade for deficit regions such as the Russian Federation while grain surplus regions such as the Ukraine would gain.

The effect of such changes on world grain trade are ambiguous. A worsening of the terms of trade for grain deficit regions would reduce grain imports by those republics (provided that grain is a normal good). However, the improvement in the terms of trade for grain surplus regions would enable those republics to reduce their grain exports while being able to import the same amount of the commodities, such as oil, which were imported previously from grain deficit regions. As a result, the impact of reduced grain imports by deficit regions on net grain imports by the the region as a whole would be offset, to some extent, by reduced grain exports from surplus regions. Conversely, if the move to using world prices between republics had led to an improvement in the terms of trade for grain deficit republics, the grain

surplus republics would suffer a worsening in their terms of trade. As a result, an increase in grain imports, which have become relatively less expensive, by grain deficit republics would be offset to some extent by an increase in exports by the grain surplus republics.

The extent to which net grain imports are affected by the shift in the terms of trade would depend on the relative magnitudes of the grain import demand elasticity in grain deficit republics, and the grain export supply elasticity in surplus republics of the region. For example, as a special case, it is possible to envisage a structure of consumer preferences in each republic (namely, a homothetic preference structure[2]) under which, other things being equal, a reduction (increase) in grain imports by grain deficit republics caused by a worsening (improvement) in their terms of trade would be offset exactly by a reduction (increase) in exports by grain surplus republics. Under such a preference structure, net imports of grain by the region as a whole, and therefore the level of world trade and grain prices, would not be affected by the move to the use of world prices among republics.

The extent to which changes in trade flows within the region will affect net trade by the region remains somewhat unclear. Changes in net trade resulting from a move to the use of world prices in interrepublic trade depend critically on the nature of consumer preferences for all commodities throughout the region. On the other hand, recent reductions in grain procurements, resulting from the unwillingness of farmers and republics to sell their grain through centrally administered distribution channels, could lead to increases in import requirements in order to maintain the availability of grain in urban centres. However, the extent to which the region may expand its imports of grain will depend on foreign exchange availability.

The availability of foreign exchange

Since the late 1980s the availability of hard currency in the Soviet Union for purchasing imports was substantially constrained. In particular, oil production dropped in line with the general decline in economic activity and this, combined with lower world prices for oil and the persistence of high levels of inefficient domestic energy use, led to a fall in oil export revenues.

2 Given an identical homothetic preference structure for each republic, the reallocation of endowments which follows the move to world prices and the consequent shift in the terms of trade for each republic will not alter the level of aggregate demand for the region as a whole. Therefore, net trade in grain by the region will not be affected.

At the same time, the expansion in foreign debt and debt servicing commitments which accompanied the liberalisation of banking controls in 1989 placed additional demands on available hard currency (IMF et al. 1991). In past years the Soviet Union borrowed funds on international markets in order to meet a part of its debt repayments. The fragmentation of political and economic control in the region has created significant uncertainties about future arrangements for servicing these foreign debts. In the presence of such uncertainties, commercial financial institutions have been reluctant to extend credit to the former republics (Gooding, Blackwell and Durr 1991). Effectively, the ability of the region to use future export earnings to finance current expenditures has been constrained.

As a result, it has become necessary to finance debt servicing commitments directly from hard currency earnings, substantially reducing the availability of hard currency for import purchases (US Department of Agriculture 1991). In 1991, Soviet debt servicing commitments were estimated to be around US$10 billion a year (Fidler 1991), while export earnings in hard currency were estimated to be just under US$28 billion. The difficulties associated with debt repayments have already led to interruptions to debt servicing repayments by authorities in the former Soviet Union and have raised the prospect of a complete moratorium on debt servicing (Waller and Lloyd 1991).

Another factor constraining the availability of hard currency for commodity imports, at present, is the apparent increased use of hard currency as a hedge against high inflation by individual governments in the former republics, and by export oriented enterprises and individuals with access to hard currency. If governments in the region continue to finance their budget deficits by raising the money supply, high inflation is likely to persist. This would encourage the hoarding of foreign exchange for use as a store of value and, as a result, the availability of hard currency to finance import purchases, including grain, would be reduced.

On balance, the significant reductions in the availability of foreign exchange, resulting from factors outside the control of planners, would place some downward pressure on grain imports in the short term as the authorities were forced to ration reduced supplies of hard currency among alternative requirements.

Food aid

With a *severe* fragmentation of trade links between the former republics, not only would the flow of grain to deficit republics be adversely affected, but the ability of those republics,

including the Russian Federation, to export oil and other products in exchange for hard currency would also be reduced. Such a decline in export capacity would take place as transport systems in the region continue to deteriorate in the absence of new investment and as governments of the various republics, autonomous regions and enterprises begin to hoard oil as a hedge against inflation. As a result, the ability of these republics to import grain would be seriously impaired despite the increased need for imported grain in the region as a whole.

The weakening of central control over grain distribution and an increased fragmentation of trade links between the former republics have already contributed to an increased scarcity of food supplies in major urban centres such as Moscow. Mindful of the implications of a severe fragmentation, Russian and other regional authorities have called for food aid on humanitarian grounds from the major Western countries (Lloyd and Parkes 1991). Recent reports have suggested that, in the case of grain, such aid could be in excess of 5 Mt.

Because such grain would be obtained free of charge, or at least at concessional rates, the terms of trade in grain deficit republics following the receipt of food aid would be improved relative to what had prevailed either under central planning or under free market conditions. On balance, such an improvement in the terms of trade, and hence purchasing power, could lead to increased imports of wheat and coarse grains by the region as a whole. This would lessen the possible adverse impact of a marked deterioration in grain imports by the region resulting from the reduced availability of foreign exchange or the introduction of market reforms, on world grain prices.

The possible impact on grain exporters such as Australia

On balance, the short and medium term consequences of political and economic change in the former Soviet Union appear to be adverse for world grain markets and therefore the returns received by Australian growers. As reductions in the availability of hard currency resulting from pressures associated with increased debt servicing payments, reduced oil output and a possible fragmentation of trade links between republics continue to mount, imports of both wheat and coarse grains are likely to continue to decline. Such pressures would be accentuated by hard currency hoarding encouraged by high domestic inflation.

The introduction of market reforms in the region would also appear to have negative consequences for net trade by the region as a whole and therefore world grain prices. While the effect of a move to the use of world prices in trade between different republics on net

trade in grain by the region as a whole is ambiguous, the closure of unprofitable livestock industries resulting from market reforms could lead to a significant decline in grain imports generally. Indeed, it is possible to envisage circumstances under which the reduction in grain consumption following the introduction of market reforms would be sufficient to turn the region into a net grain exporter in the medium to long term placing it in competition with grain exporting countries such as Australia. However, in the short term, the severity of any reduction in grain imports and the impact of such reductions on world grain prices resulting from changes taking place in the region would be lessened by the introduction of international food aid and the implementation of a moratorium on debt repayments which would release additional quantities of hard currency for commodity imports.

Results obtained using the FAPRI world agricultural model show that substantial reductions in grain purchases by the region resulting from the developments taking place there are also likely to lead to substantial reductions in grain prices facing Australian farmers (table 1). In each simulation, CIS wheat imports were reduced after 1991 (by a fixed amount) below the levels that were estimated to prevail without any future institutional change in the region. The adverse impact of such world price reductions would be especially great for exporters in countries such as Australia and Argentina where grain producers do not receive significant government price support. In countries that provide price support, however, lower world prices for grain resulting from developments in the region would increase the burden on government budgets and the size of the taxpayer-cum-consumer transfers to farmers.

Table 1: Change in Australian wheat export prices resulting from reductions in CIS grain imports a

Permanent reduction in grain imports from base	Reduction in Australian wheat export price				
	1992	1993	1994	1995	1996
	%	%	%	%	%
2 Mt	2.02	1.99	2.08	2.11	2.14
4 Mt	4.02	4.15	4.16	4.22	4.28
6 Mt	6.02	5.96	6.25	6.32	6.41

a The simulation was conducted by reducing the constant term associated with the CIS wheat import demand equation in the FAPRI model by the extent of the hypothesised desired reduction in CIS wheat imports.

Conclusions

An analysis of the current situation in the former Soviet Union indicates that the fragmentation of central control in the region will continue and, perhaps, at an accelerated pace. Economic activity is likely to continue to deteriorate, at least in the short term, and the availability of foreign exchange for commodity imports is likely to continue to be limited. Such developments are likely to lower net grain imports by the region below levels that would have prevailed without recent developments. In future years, with the introduction of market reforms in the region, as wastage in grain production declines, some authors contend that the region could become a grain exporter, competing with Australian producers on world markets.

From the perspective of Australian farm industries, the adverse consequences of such developments on world grain prices underscore the need for reductions in subsidised grain production through a process of world trade liberalisation.

Appendix A

An empirical model of historical Soviet grain import behaviour

The discussion in section 3 was focused on the importance of differences between the supply of domestically produced grain and of hard currency and the demand for those items in determining grain imports by the region that was formerly the Soviet Union. The discussion suggests that the disequilibrium approach to modelling Soviet foreign trade, which captures the extent of excess supply and demand for foreign exchange and grain, suggested by Burkett, Portes and Winter (1981) and Brada and King (1989) would be appropriate at least for the period in which imports were determined by planning authorities under the institutional framework which existed prior to the current fragmentation of economic control.

The econometric time series model developed here incorporates key determinants of the excess demand for grain and the excess supply of or demand for hard currency. These include the levels of domestic grain production, income, foreign exchange earnings and foreign debt. Also, the linkages between between livestock herd sizes, grain imports and world grain prices are accounted for explicitly. It should be noted that the import decision processes modelled below do not necessarily reflect the actual differences between consumer demand and supply for grain and hard currency in the region but rather the historical perceptions of planning authorities about the level of disequilibrium for those items.

The model has the following basic structure:

$$HD = H[HD(-1), GT(-2)] \quad (1)$$

$$WM = W[IN, HC, DT, WPN, WPR] \quad (2)$$

$$CM = C[IN, HC, DT, CPR, CPN, HD] \quad (3)$$

Where *HD* is livestock herd numbers based on cow equivalents; *GT* is the total availability of grain including domestic production and imports; *WM* is wheat imports by the Soviet Union; *IN* is gross domestic product (1968 = 100); *HC* is total earnings of hard currency from exports to Western countries; *DT* is total foreign debt denominated in hard currencies;

WPN is total domestic wheat production less dockage and wastage; *WPR* is the world price of wheat (US hard red winter wheat, fob Gulf); *CM* is coarse grain imports by the Soviet Union; *CPN* is total domestic coarse grains production less dockage and wastage; and *CPR* is the world price of corn (US no. 2 yellow corn, fob Gulf).

The size of the herd measured at the beginning of the year (*HD*) is likely to depend positively on the herd size at the beginning of the previous period and the total grain availability (*GT*) in the crop year (September–August) two periods lagged; for example, increases in grain availability in 1980-81 would have increased the availability of grain for piglets and calves during 1981 and this increase in numbers would have been reported in 1982. The import demand equations are each based on the same principles. Consider the wheat import demand equation as an illustrative example. As the supply of domestically produced wheat (*WPN*) increases, the excess demand for that grain would fall, thereby reducing wheat imports. Hard currency earnings (*HC*), the level of debt (*DT*) and the wheat price (*WPR*) capture the impact of deficiencies or surpluses in the availability of hard currency on import levels. Greater hard currency earnings and lower debt would be expected to increase the availability of hard currency and, as a result, it could be expected that wheat imports are positively related to hard currency earnings while wheat imports are negatively related to debt levels. The world price for wheat would determine the extent to which imports of wheat are affected by the need to ration deficient hard currency or excess quantities of hard currency over alternative requirements. While the own-price could be expected to be negatively related to imports, as Brada and King (1989) point out, if greater imports by the region led to increased grain prices on world markets, a positive relationship between grain imports and prices could be observed. Income plays a dual role in the import demand equations. While a rise in income could increase the excess demand for food in general, and grains in particular, it could also lead to increased import requirements in other sectors of the economy. This would raise the level of excess demand for foreign exchange and place downward pressure on wheat imports. An additional term representing the prices of other imported commodities would have been appropriate; however, the authors have been unable to find a reliable index.

The model is estimated using time series data for annual observations for each of the variables for the years 1973 to 1989. The estimation method for the system is two stage least squares. The results obtained are as follows (t statistics for H0: $\beta = 0$ are in parentheses):

(1) $$HD = 18.8 + 0.82HD(-1) + 0.05GT(-2)$$
$$(1.74)\ (8.72) \qquad (1.08)$$

adjusted $R^2 = 0.907$, Durbin-Watson statistic = 1.95

(2) $$WM = 20.6 - 0.002IN + 1.02HC - 1.9DT - 0.05WPR - 0.2WPN$$
(1.49) (–0.02) (4.52) (–1.11) (–1.35) (–2.92)

adjusted $R^2 = 0.86$, Durbin-Watson statistic = 2.85

(3) $$CM = 101 + 0.51IN + 0.01HC - 0.29DT + 0.04CPR - 0.52CPN - 0.92HD$$
(–1.08) (2.13) (0.04) (–0.84) (0.65) (–4.83) (–1.43)

adjusted $R^2 = 0.77$, Durbin-Watson statistic = 2.78

For wheat, variables affecting the excess demand for foreign exchange are statistically significant explanators of import behaviour while income is not significant. This could indicate that wheat imports have been accorded low priority compared with the import of goods which increase with economic growth, such as investment and consumer items. On the other hand, coarse grains imports do not appear to be significantly influenced by factors affecting the excess demand for hard currency, including the own-price, total hard currency earnings and debt levels, while income appears to be an important determinant of import demand. A possible explanation for this result relates to the importance which was placed on increasing domestic herd sizes over the period using coarse grains imports. As income rose, the perceived excess demand for meat also increased and this led to an increase in coarse grains imports and, consequently, herd sizes. At the same time, because of the importance accorded increased meat production, rationing in foreign exchange markets was not likely to have affected coarse grains imports significantly.

The estimation technique does not provide efficient estimates for the parameters in the equations and their standard errors. An efficient, but highly complex, approach to the estimation of disequilibrium models is provided in Brada and King (1989).

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