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• across the issues • economic insights

Factors affecting Australian agricultural exports

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Apsara Maliyasena



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Factors affecting Australian agricultural exports

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Introduction

Australian agriculture is substantially export oriented with exports in recent years generally comprising some 60 per cent of agricultural production. In the past, agriculture was Australia's largest export earner. During the 1950s, farm exports accounted for more than 70 per cent of Australia's total value of exports. Over the longer term, farm exports have trended upward, but not as rapidly as other exports, particularly minerals and energy, and the proportion of farm exports in the total value of exports has declined substantially. While the longer term trend in Australian farm exports has been upward, there have been times when exports have fallen and then recovered and grown further. Since early in the present decade, significant reductions have occurred in agricultural exports. Such reductions, along with a surge in other exports, largely for minerals and energy, resulted in the contribution of farm exports to total merchandise exports falling sharply from 26 per cent in 2001-02 to 16 per cent in 2007-08.

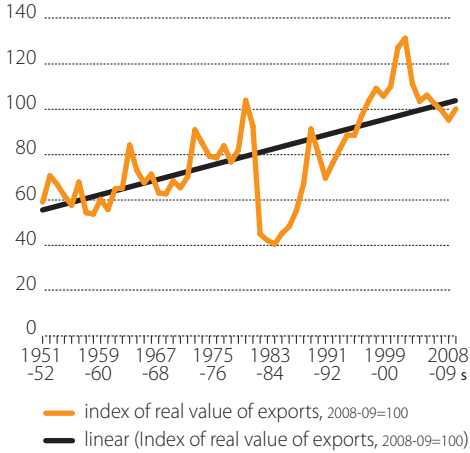
It is not surprising Australian agriculture is heavily export oriented, given that Australia is a large country in area with agricultural industries which have developed a capacity to produce quantities substantially above requirements for the relatively small domestic population. Furthermore, the prospects for growth in domestic consumption are modest given that consumption levels per capita for most agricultural products are already high by world standards. Consequently, the potential for growth and development of Australia's agricultural industries depends largely on continued growth in exports. The reliance on agricultural exports varies among industries with virtually all of Australia's wool and cotton, around three-quarters of Australia's wheat and sugar, two-thirds of beef, almost two-thirds of the wine, half of sheep meat and about half of Australia's milk production (as manufactured dairy products) being exported in the three years ending 2007-08.

A critical issue is whether the recent reduction in agricultural exports is likely to be followed by a recovery and then further growth as in the past; or will agricultural exports stabilise or decline further? In this paper, the forces affecting Australia's agricultural exports are examined with a view to better appreciating the directions which exports may take in the future.

Trends in Australian agricultural exports

Perhaps the best indicator of Australian agricultural exports which can be readily obtained is an index of the real value of exports, calculated through deflating the total value of farm exports by the consumer price index. These data expressed as an index are presented in figure 1.

1 Australia: Index of real value of farm exports, 2008-09=100



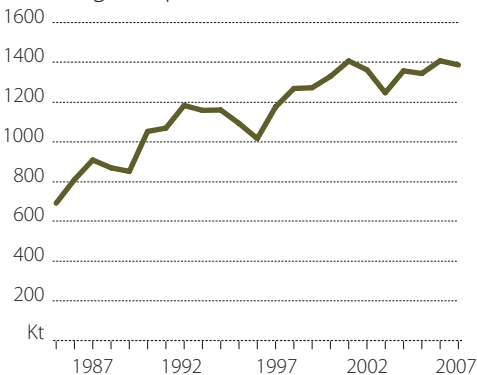
s ABARE estimate.
Source: ABARE 2008: ABSa,b.

Important characteristics of Australian agricultural exports evident from figure 1 include:

- there has been a long-term upward trend in the real value of exports;
- there has been substantial volatility with clearly evident troughs and peaks, especially since about 1980;
- the deepest trough occurred in the early to mid-1980s. It would have been influenced by a poor season for winter grains in 1980-81, a severe drought in 1982-83, and an international debt crisis in the first half of the 1980s which curtailed export demand, especially by developing countries;
- that trough was succeeded by a long period of almost continuous growth culminating in peak levels of exports in 2000-01 and 2001-02, and;
- since 2001-02 there has been a marked decline in the real value of exports, but because the peak was well above the trend, the reduction has brought exports back to slightly below their trend level.

Examination of trends in Australian exports of individual major commodities indicates that for most agricultural products, volumes of exports have declined during the current decade. In fact, the only major agricultural commodity for which exports have not declined is beef,

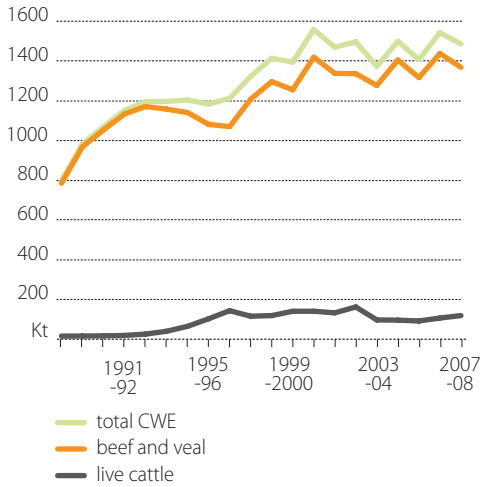
2 Australian exports of beef in carcass weight equivalent



Source: ABARE 2008: ABSa.

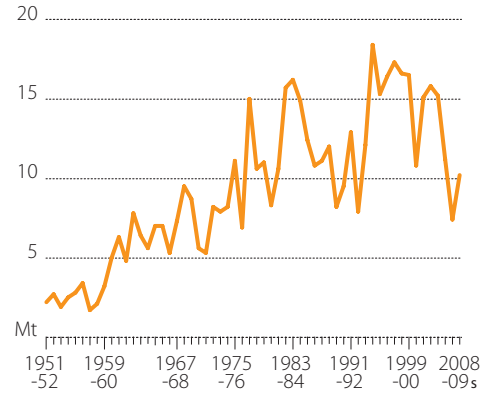
for which exports have been relatively static since 2001 (figure 2). This applied both for beef exported as meat, and also when live cattle are included (figure 3). For some commodities including wheat, dairy products, cotton and rice, the reductions have followed either a period of rapid growth or a period of sustained high exports in the late 1990s (figures 4 to 7). For others including wool and sugar, a downward trend had commenced earlier and has continued (figures 8 and 9). With the decline in wool production and exports, there has been a significant reorientation of the Australian sheep industry toward a combination of wool and meat. In particular, there has been an upsurge in both production and exports of lamb. Even so, overall volumes of exports of sheep meat have not increased since 2001 because of lower exports of mutton and live sheep (figure 10).

3 Australian exports of beef and veal and live cattle in carcass weight equivalent (cwe)



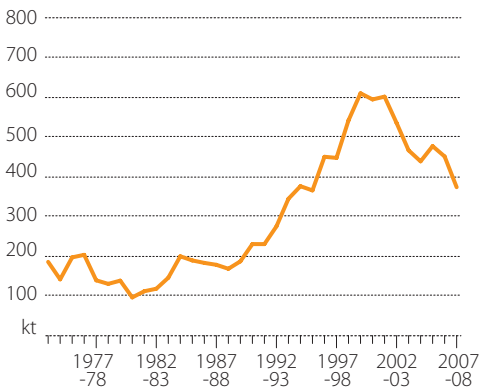
Source: ABARE 2008: ABSa.

4 Australian exports of wheat



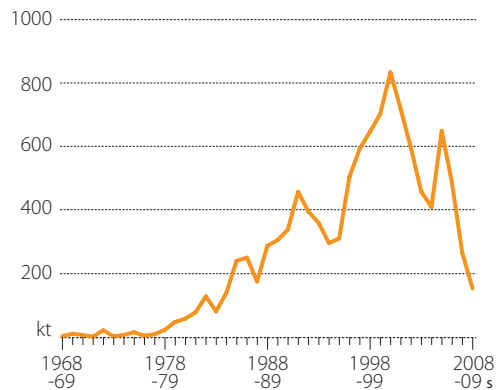
s ABARE estimate.
Source: ABARE 2008: ABSa.

5 Australian exports of major dairy products - milk solids basis a



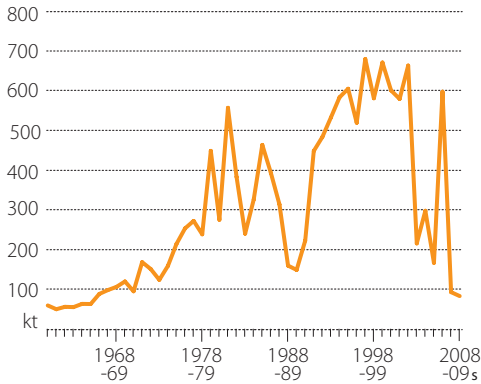
a Butter, cheese, skim milk powder, whole milk powder and casein. Conversion to milk solids basis is through applying milk solids content factors in appendix 3 from Dairy Australia 2008.
Source: ABARE 2008: ABSa.

6 Australian exports of cotton



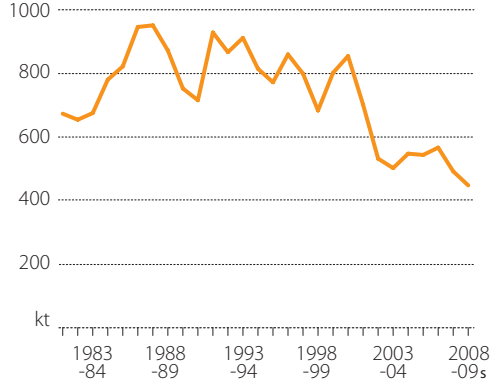
s ABARE estimate.
Source: ABARE 2008: ABSa.

7 Australian exports of rice



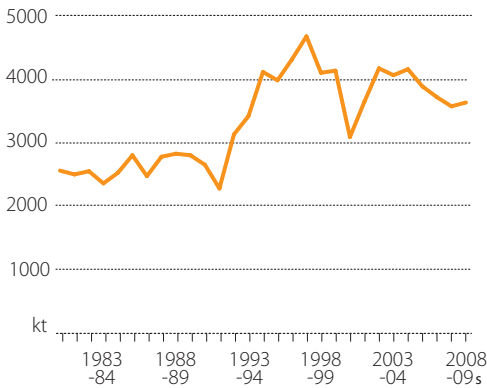
s ABARE estimate.
Source: ABARE 2008: ABSa.

8 Australian exports of wool



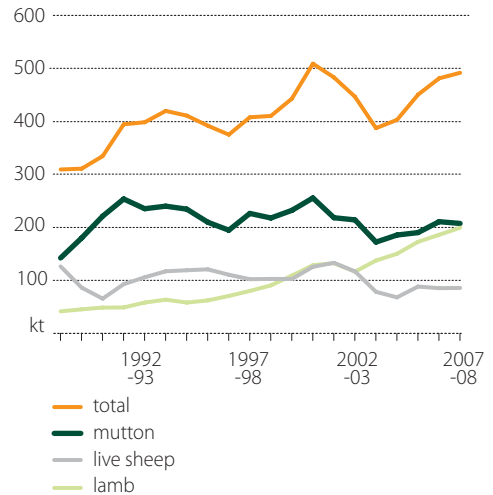
s ABARE estimate.
Source: ABARE 2008: ABSa.

9 Australian exports of sugar



s ABARE estimate.
Source: ABARE 2008: ABSa.

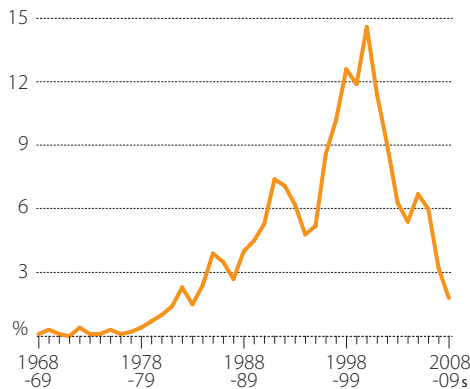
10 Australia's exports of sheep meats in carcass weight equivalent



Source: ABARE 2008: ABSa.

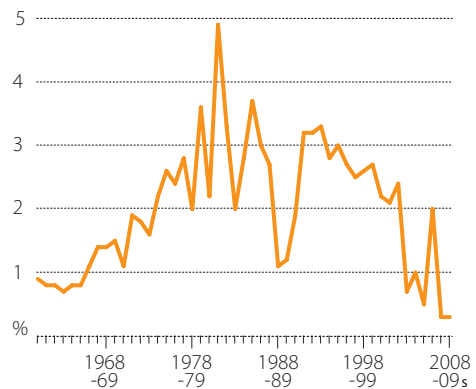
As has occurred with Australia's volumes of agricultural exports, its share of world exports of most agricultural products has declined during the current decade. The declines have been most apparent for cotton, rice and dairy products (figures 11 to 13). Even though Australia's absolute levels of beef exports have not declined, Australia's share of world beef exports has been falling, largely because of increases in Latin American exports (figure 14). While Australian exports of wool have been declining, the reductions in the 1990s were less rapid than for total world exports, and Australia's share of world exports actually increased. However, since

11 Australian cotton exports as a percentage of world cotton exports



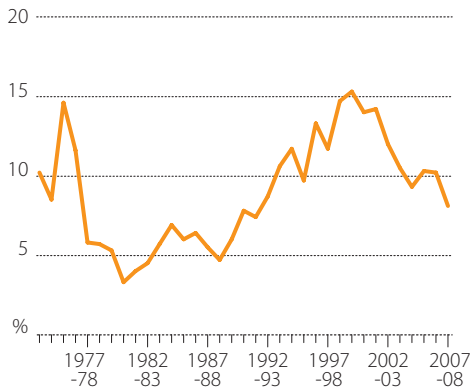
s ABARE estimate.
Source: ABARE 2008; ABSa; USDA.

12 Australian rice exports as a percentage of world rice exports



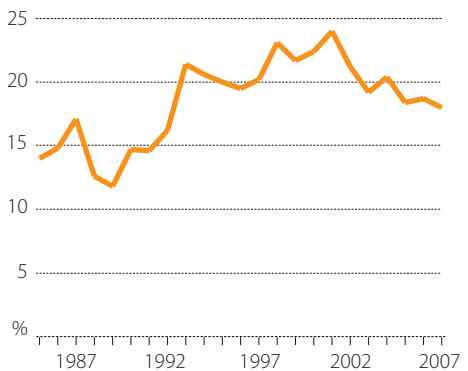
s ABARE estimate.
Source: ABARE 2008; ABSa; USDA.

13 Australian exports of major dairy products as a percentage of world dairy exports - milk solids basis a



a Butter, cheese, skim milk powder, whole milk powder and casein. Conversion to milk solids basis is through applying milk solids content factors in appendix 3 from Dairy Australia (2008).
Sources: ABARE 2008; ABSa; European Union 2008.

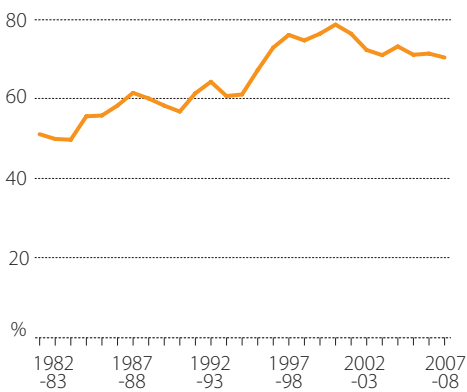
14 Australian beef exports as a percentage of world beef exports



Source: ABARE 2008; ABSa; USDA.

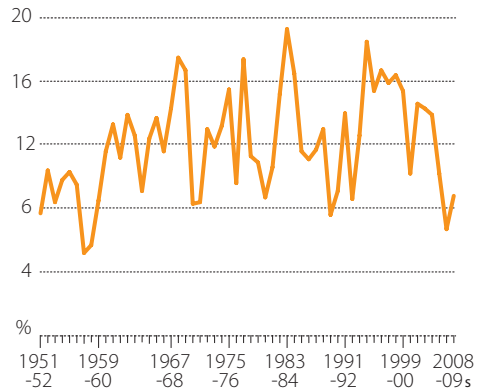
2000-01 Australia's wool exports have fallen more rapidly and its share of world exports has stabilised (figure 15). Australian exports of wheat have varied widely as a proportion of world trade along with seasonal changes in production and availability. They trended upward from the early 1950s until the mid-1980s. They subsequently stabilised as a percentage of world trade, but recently, the proportion has declined markedly (figure 16). Australian exports of sugar expanded markedly as a proportion of world exports for much of the 1990s, but that proportion has declined since about 1998, both because Australian production has been declining and because of greater exports by other countries, especially Brazil (figure 17).

15 Australian wool exports as a percentage of world wool exports



Source: ABARE 2008: ABSa; IWTO.

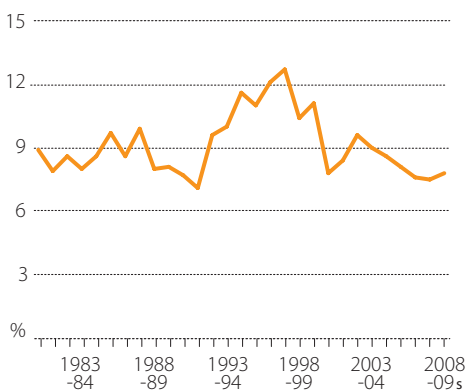
16 Australian wheat exports as a percentage of world wheat exports



s ABARE estimate.

Source: ABARE 2008: ABSa; IGC.

17 Australian sugar exports as a percentage of world sugar exports



s ABARE estimate.

Source: ABARE 2008: ABSa; ISOa,b.

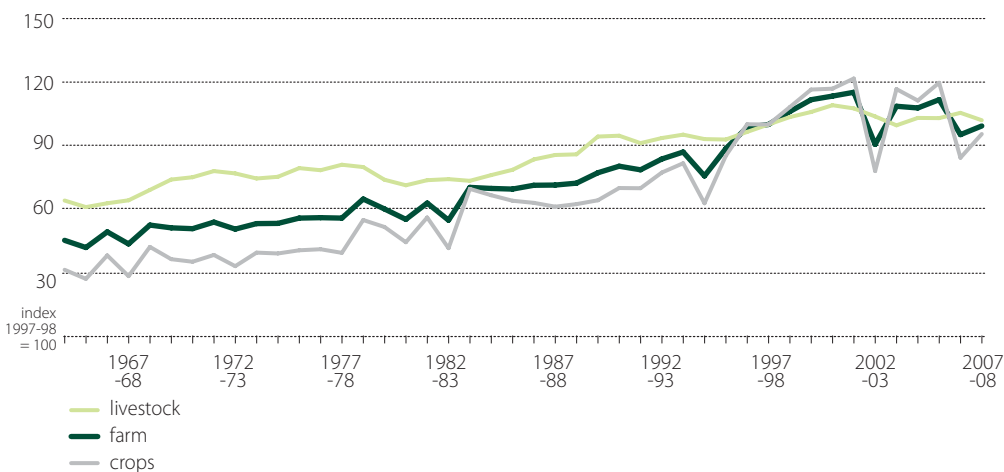
Factors influencing exports

A country's export volumes depend on production and how that production is shared between the domestic and external markets. In turn, production is affected by a range of influences including changes in profitability relative to other activities. This in itself is influenced by market demand and prices for outputs and inputs, changes in the availability and quality of land and water, rates of advance in technology and management that influence the efficiency of transforming inputs into outputs and developments in other industries which compete with agriculture for resources. On the demand side, the amounts consumed domestically depend on income and population growth and taste changes. In Australia, where most agricultural products have prices determined primarily from world market prices, these various supply and demand factors determine both levels of output and the proportions of output consumed domestically and exported.

Production

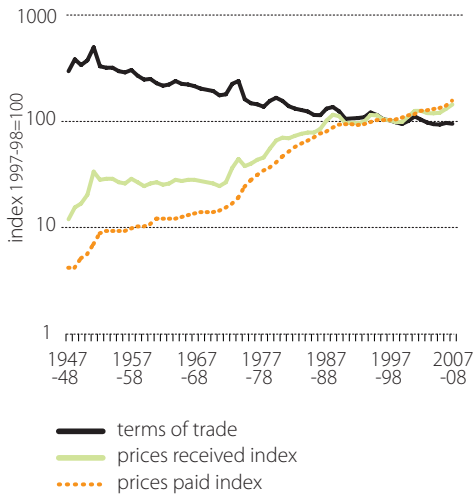
Because exports have constituted such a large proportion of Australian agricultural production, factors which increase or decrease production have also greatly influenced Australian exports. At the same time, export market demand and prices and the ability of Australian farmers to compete have affected both the profitability of farming and volumes of production. Australian agricultural production has trended upward over time, although there have been relatively wide periodic variations around the trend. It is apparent from figure 18 that from 1995-96 to 2001-02, there was a large surge in crop production accompanied by continuing growth in livestock production, resulting in a substantial increase in overall farm production. However, since that time, neither crop production nor livestock production has increased and overall farm production has declined somewhat and been highly variable.

18 Volume of Australian farm production



Source: ABARE 2008.

19 Indexes of prices received for agricultural products and prices paid for inputs, and terms of trade for Australian farmers



a For the purposes of this figure, the index of the terms of trade for farmers is defined as the index of the prices received for farm outputs divided by the prices paid for farm inputs. Source: ABARE 2008.

Changes in prices received for farm products relative to prices paid for inputs

A long-term characteristic of Australian farming has been that prices received for farm products have trended down relative to the prices paid for inputs. The ratio of prices received to prices paid is referred to as the farmers' terms of trade. An index of that ratio, along with indices for prices received and prices paid are shown in figure 19. A logarithmic scale is used in that figure to show trends in the rates of change of these variables. Under conditions of declining farmers' terms of trade, farmers can rely heavily on increasing productivity if they are to maintain or increase profitability and production. In this context, productivity may be defined as output relative to the inputs used in producing that output.

Australian farmers have been able to expand production over the longer term despite the downward trend in the ratio of prices received to prices paid. Nevertheless, the upward trend

in Australian production has been interrupted since the beginning of the present decade. Examination of figure 19 suggests that the rate at which Australian farm product prices have declined relative to farm input prices since 2001-02 has not been greater than trend rates applying over previous years when production was rising. Consequently, it does not appear that the effects of changes in these price relativities would have had any greater negative effect on overall agricultural production and exports since 2001-02 than they did previously when production and exports were increasing.

While the trend in farmers' terms of trade for agriculture overall during the current decade has differed little from the established trend, producers of different commodities have experienced differing pressures as a result of changes in prices received for outputs relative to prices paid for inputs. For example, in the period from 2004-05 to 2007-08, prices received for grains and oilseeds increased markedly at the same time as there were sharp increases in prices paid for fuel and fertiliser. But for some commodities such as wool, the price increases were more subdued.

Marked increases in grain and oilseed prices in 2006-07 and 2007-08 have been influenced by a sharp increase in the demand for biofuels and in the use of grains as feedstocks for biofuels internationally (Mitchell 2008). Greater demand for biofuels than previously experienced is expected to continue because of incentives provided by governments in many countries to produce biofuels and/or to blend them with petroleum products. This is especially the

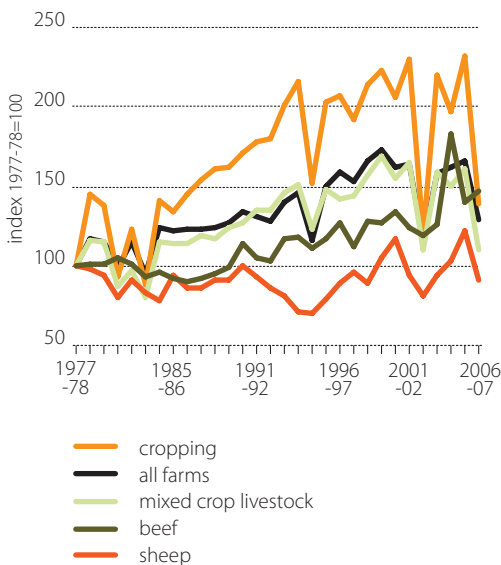
case in the United States and the European Union. Nevertheless, grain and oilseed prices have dropped back from a peak in the first half of 2008 as a result of several factors including substantial oil price reductions since mid-2008 and the 2008 global financial crisis.

For agriculture as a whole, it appears factors other than the ratio of prices received for agricultural products to prices paid for inputs have been primarily responsible for the decline in Australian agricultural production since early in the present decade. In particular, the dropping off in agricultural production appears to have been caused largely by a run of relatively hot, dry seasons over much of Australia's major agricultural producing regions.

Productivity growth

Given the long-term downward trend in farmers' terms of trade, the growth in total factor productivity, defined as total output relative to the inputs used in producing that output, has

20 Indexes of total factor productivity in selected Australian agricultural industries ^a



been essential to Australian farmers' ability to both increase their agricultural production over time, and to maintain or increase their incomes. Indices of productivity for various industries are shown in figure 20.

In Australia, estimated total factor productivity increased substantially in cropping between the late 1970s and the late 1990s. However, since then, there have been virtually no increases at all. For specialised beef producers, productivity has increased gradually since the mid-1980s. However, productivity increases in the beef industry have not been as rapid as those for cropping. It may be noted that productivity estimates for beef in individual years can be markedly influenced by timing of herd building and turn-off of animals. Consequently, in interpreting developments in productivity for the beef industry over time, emphasis should be placed more on broad trends rather than on individual year estimates.

^a The broad definitions used for the various categories of industries in this figure are: **cropping** – farms engaged mainly in growing cereal grains, coarse grains, oilseeds and/or pulses; **mixed crop-livestock** – farms engaged mainly in both growing crops and running sheep or beef cattle; **beef** – farms engaged mainly in running beef cattle (beef specialists) and those running both beef cattle and sheep; and **sheep** – farms engaged mainly in running sheep and those running both beef cattle and sheep.

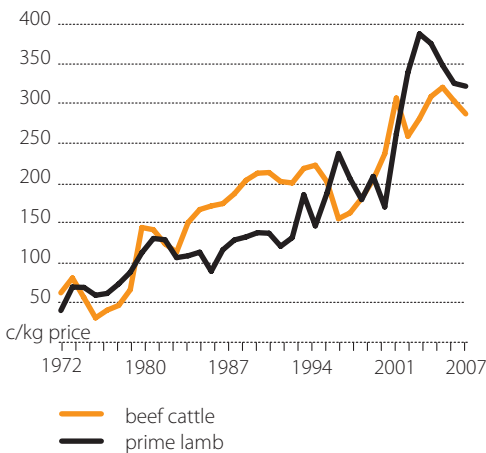
Source: ABARE productivity estimates 2008.

A dichotomy is apparent between productivity growth for beef production in southern and northern Australia. In southern Australia, productivity has been highly variable, reflecting destocking and subsequent rebuilding in response to drought (Nossal, Sheng and Zhao 2008).

Although there have been marked variations over time, little growth in beef productivity has been apparent in southern Australia since the early 1990s. In contrast, productivity of specialist beef producers has trended upward in northern Australia since the early 1990s (Nossal, Zhao, Sheng and Gunasekera 2009). This, along with the proportion of the cattle herd increasing in northern production regions of Australia would have contributed to Australian beef production continuing to increase gradually during the present decade.

Productivity for the sheep industry overall during the current decade has not been much greater than in the late 1970s. Nevertheless, there appear to have been three different periods for productivity growth over this extended period. Productivity levels are estimated to have declined considerably between the late 1970s and the mid-1990s, the reduction having been most apparent between 1989-90 and 1994-95 (figure 20). That was a period of radical

21 Australia - Average annual saleyard prices for prime lambs and beef cattle



Source: ABARE 2008: MLA.

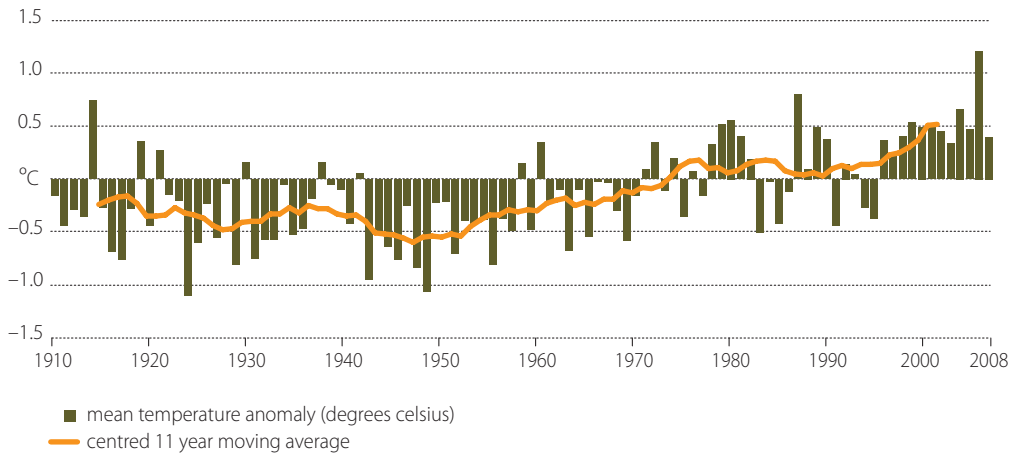
downsizing of the Australian wool industry. Since then there has been a shift in the industry more toward fine wool production and prime lamb production. Accompanying these changes were considerable gains in estimated productivity between 1994-95 and 2000-01. However, since that time, estimated productivity, both for specialist sheep producers and for mixed broadacre farms on which sheep would have been a significant component, has varied around a relatively constant level. These changes in the composition of the sheep industry, in conjunction with ongoing declining terms of trade for wool and the greater productivity gains for cropping and beef, each of which competes with wool for land over substantial areas, would have contributed to the decline in wool production. In contrast, prime lamb production has been rising, reflecting increasing market opportunities internationally and market prices which have at least kept pace with those for beef (figure 21).

Climate, production and productivity

An issue of considerable importance when analysing the significance of productivity gains, production and trade possibilities for agriculture is the influence of climate and weather. As productivity is defined as output relative to the inputs used, and climate and weather affect output, they clearly affect productivity. Nevertheless, there are many other factors which also affect output and productivity. For example, improvements in veterinary treatments, plant varieties and animal breeds and characteristics may result in higher yields and lower costs over a range of production environments including under drought conditions. Such developments could help sustain production levels in the face of intensifying adverse weather conditions or increase production in the face of continuing, but not intensifying, adverse weather conditions.

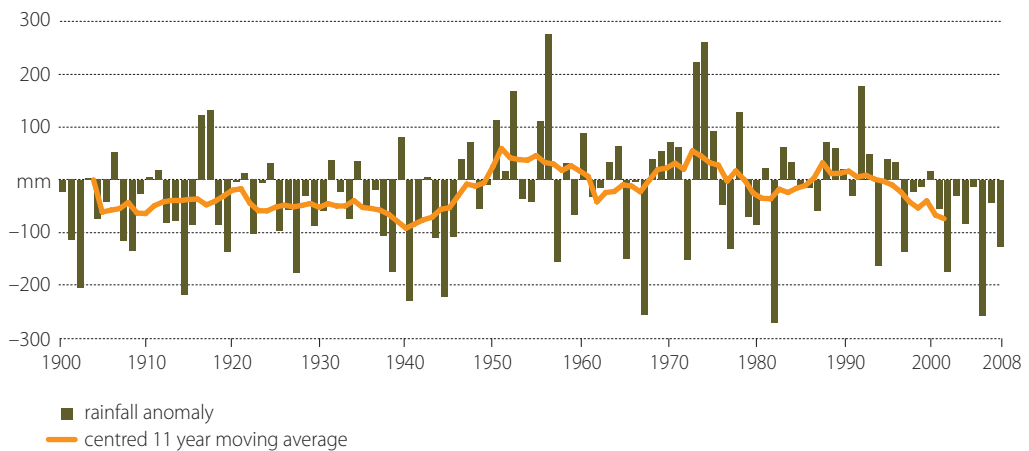
Since 2001-02 much of Australia’s most productive agricultural land, primarily in the south-east of the country, has experienced an extended period of higher than average temperatures and lower than average rainfall. This is apparent from figures 22 and 23 which indicate temperature and rainfall anomalies for south eastern Australia as used by the Australian Bureau of Meteorology. Those anomalies are defined as the difference between actual annual levels and the average level for a base period from 1961 to 1990. The period 1961 to 1990 is the current international standard period for the calculation of climate normals.

22 Annual mean temperature anomalies (1910–2007) relative to 1961–1990 with an eleven-year moving average south eastern Australia



Source: Bureau of Meteorology 2008.

23 Annual rainfall anomalies (1900–2007) relative to 1961–1990 with an eleven-year moving average south eastern Australia



Source: Bureau of Meteorology 2008.

Some relevant observations for south eastern Australia which may be made from inspecting figures 22 and 23 are that:

- average annual mean temperatures throughout the current decade have been higher than those over the 1961-1990 reference period and also well above those for any period of such duration since 1910;
- temperatures throughout the period from 1910 until the 1961-1990 reference period were predominantly below the average during the reference period;
- there has been a persistent upward trend in temperatures since the 1950s with the increases becoming more pronounced in the present decade;
- average rainfall levels from the mid-1950s until the late 1990s, which includes the 1961-1990 reference period, were higher than for any other extended period since 1900, and;
- the rainfall levels during the current decade, while being below those in the reference period, were similar to rainfall levels during an extended period of drought from 1939 to 1945 and also to levels applying for substantial periods between 1900 and 1938.

From these observations it may be concluded that for several decades prior to the current decade, south eastern Australia had experienced wetter and warmer conditions than previously. The substantial growth in agricultural production which occurred in that period is indicative that the conditions prior to the current decade were relatively favourable for increases in agricultural production, given the degrees of advancement in agricultural technology and the profitability of agricultural production which applied.

However, since about 2001, temperatures in south eastern Australia have risen further, and rainfall has declined to levels comparable with those throughout much of the first half of the 20th century. The Bureau of Meteorology (2007) has noted that 'the combination of heat and drought during the past five to ten years over the Murray-Darling Basin and south eastern Australia is outside the typical range of variability experienced during the previous 100 years'.

The extended period of warmer conditions, along with the reduction in rainfall relative to levels in recent decades, would have contributed to the levelling out in estimated production levels and productivity growth in dryland cropping and pasture based activities.

The weather patterns have also contributed to the variability of agricultural production and exports. In this context, the seasonality of soil moisture levels and rainfall is especially important in southern Australia, with autumn and spring rains being critical for the major winter grain crops and for the adequacy of pastures. This has been especially noticeable for wheat, for which production levels have changed greatly between seasons, and this has been reflected in highly variable exports (figure 4).

It appears from scientific research and appraisals that the trends of increasing temperatures and declining rainfall which have been established are likely to continue. A recent study on drought (Hennessy et. al. 2008) concluded that a now established trend toward a greater frequency of exceptionally hot years over wider affected areas throughout Australia's major agricultural regions is expected to continue. It also concluded that 'projected decreases

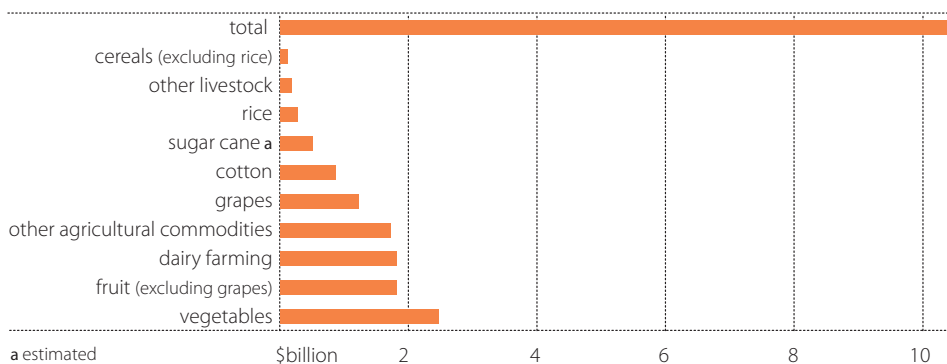
in annual average rainfall are likely to lead to fewer exceptionally wet years and more exceptionally dry years'. Another study, on climate change in Australia (CSIRO and BOM 2007) concluded that the warming of the climate system is unequivocal, that humans are likely to be causing most of the warming since 1950, that it is likely changes in the climate system will continue well into the future and that they will be larger than those changes experienced in the past.

Irrigation

Irrigation has contributed substantially to Australian agricultural production and exports. However, the availability of irrigation water is influenced by a range of factors including the capacity of water storages and the water available in them, accessibility of groundwater, rainfall and evaporation, and competition for water between agriculture and other activities including urban and industrial use, and environmental flows.

Australian Bureau of Statistics' data on the value of irrigated agricultural production for 2005-06, the latest available, indicate that the value of such production was \$10.5 billion, which was around one-quarter of the total value of agricultural production (ABS 2008c). The main products which have been produced using irrigation include fruit and vegetables, grapes, milk, cotton and sugar cane (figure 24).

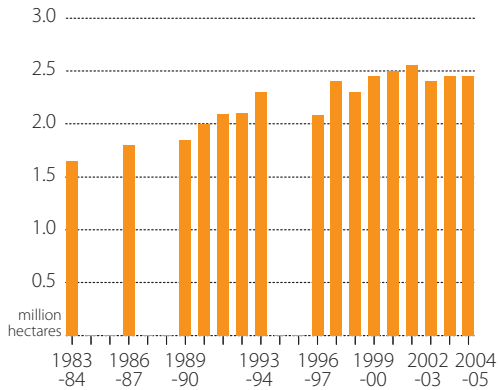
24 Gross value of irrigated agricultural production Australia



Source: ABS 2008c.

Irrigated agriculture is concentrated in the Murray-Darling Basin and the use of land for irrigation in Australia increased gradually over the two decades from the early 1980s until the peak use year, 2001-02. From then until 2004-05, the latest year for which comparable data is available, the total irrigated land area fell somewhat (figure 25). However, since 2005-06, the availability of water has declined significantly because of dry conditions, which has been accompanied by a significant decline in the volume of water allocated to irrigation. This is apparent, for example, for general security allocations in the Murray and Murrumbidgee irrigation areas in New South Wales, where irrigation allocations have fallen to historically low levels in recent years (figures 26 and 27).

25 Australia: Irrigated land area a



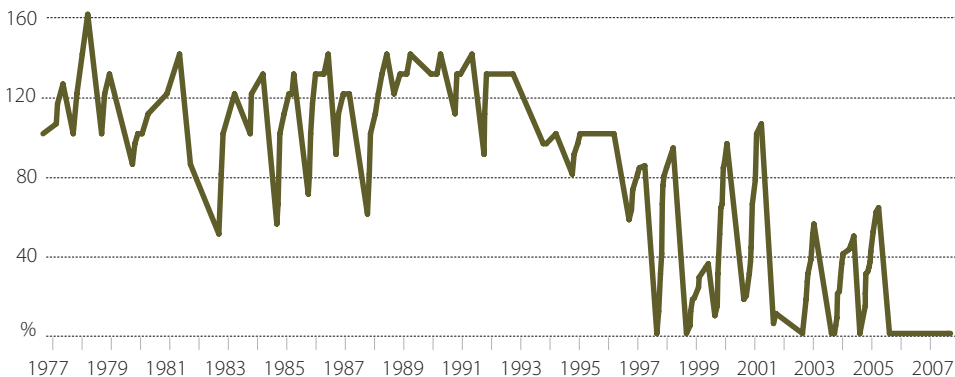
a Data not collected in 1984-85, 1985-86, 1987-88, 1988-89, 1994-95 and 1995-96.
Source: ABS 2008a.

The reductions in irrigated production have been especially severe for cotton and rice, but the effects on the dairy industry, approximately half of which is estimated to use at least some irrigation, have also been substantial.

Broadly, the production performance of Australian agricultural industries during the current decade can be separated into irrigation intensive activities and activities which are primarily dryland. Figures showing how the volume of production has declined for the heavily irrigation-dependent products including cotton, rice and milk are compared with trends for major predominantly dryland activities wheat, beef and wool in figures 28 and 29.

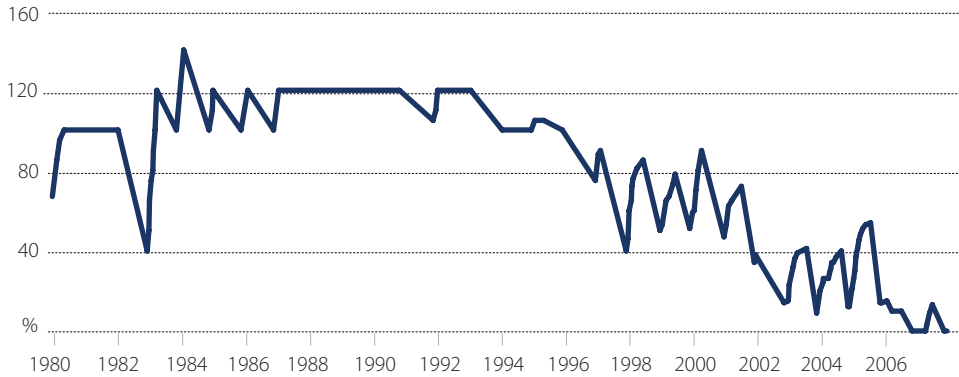
Comparison of figures 28 and 29 reveals that production of crops which have depended most heavily on irrigation, namely cotton and rice, has declined more than the major dryland agricultural pursuits since 2000-01. Also, the production of milk, a substantial proportion of which has been produced through utilising irrigated pastures, has declined considerably. This is despite opportunities to substitute feed for pasture in order to maintain productivity. As well as experiencing water constraints, milk production has been affected by deregulation of the domestic fluid milk market, which resulted in the elimination of price premiums for domestically consumed fluid milk, dating from 2000.

26 Historical water allocations NSW Murray percentage of general security entitlements a



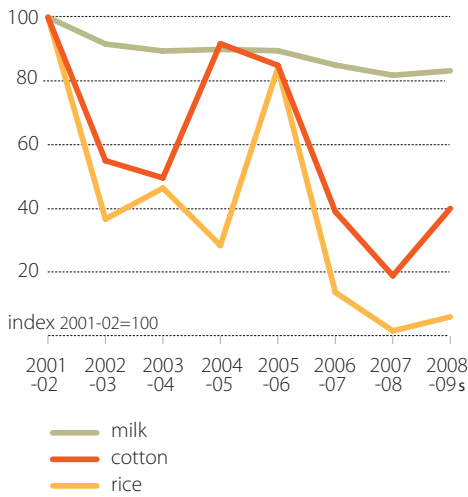
a There are two main classifications of water entitlements in NSW, namely high security and general security. High security supplies are usually a relatively small proportion of total water entitlements and tend to be more reliable than general security water. General security water usually constitutes the bulk of entitlements.
Source: NSW Government 2009.

27 Historical water allocations Murrumbidgee percentage of general security entitlements



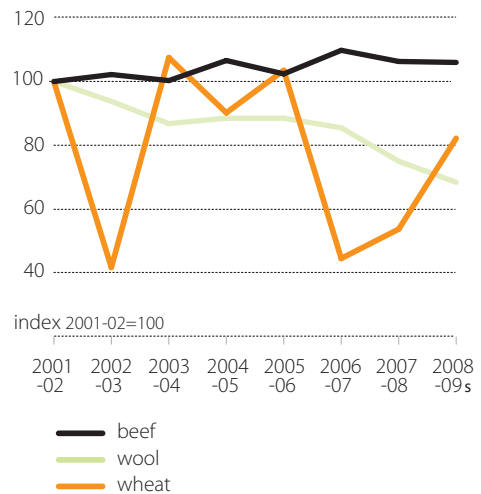
Source: NSW Government 2009

28 Index of production of predominantly or substantially irrigated agricultural products Australia



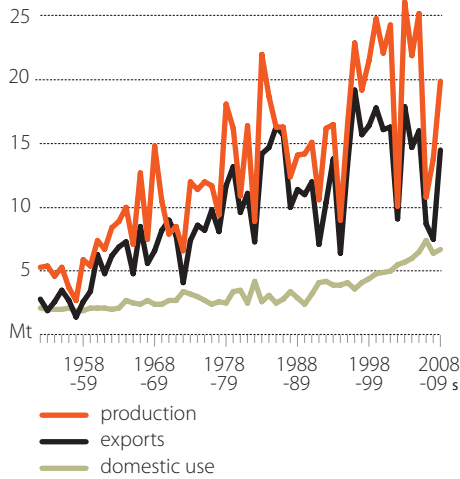
s ABARE estimate.
Source: ABARE 2008: ABSc.

29 Index of production of mainly dry land agricultural products Australia



s ABARE estimate.
Source: ABARE 2008: ABSc.

30 Wheat Australia



s ABARE estimate.
Source: ABARE 2008: ABSa,c.

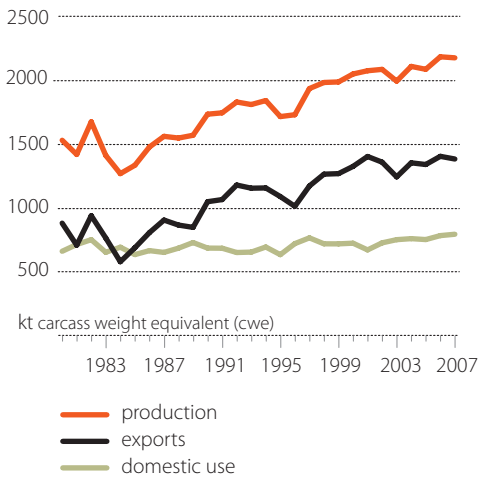
Growth in domestic demand and its effect on agricultural exports

Australia may be considered to be a mature market for agricultural products. Consumption per capita has reached high levels by world standards for most domestically produced agricultural products. Nevertheless, some growth potential exists domestically through population increases, which have averaged around 1.3 per cent a year since 1981. In 2007-08 there was a considerable surge in the rate of population increase to 1.7 per cent, the highest rate since 1988-89. Much of the increase was through extra immigration which contributed 59 per cent of the total population growth (ABS 2008b).

Also, in recent years there have been some increases in domestic demand for particular agricultural products, arising from drought conditions and changing market requirements. This has been especially the case for wheat, greater quantities of which have been demanded for drought feed, grain finishing for beef cattle, in concentrates for milk production and to meet the feed requirements of an expanding poultry industry (figure 30).

For beef, production has been rising gradually since early in the present decade but at a slower rate than previously. Domestic consumption has also been rising, which along with the slower production growth, has resulted in virtually no growth in exports since about 2001 (figure 31). The gradual increase in domestic consumption during the current decade has arisen from population increases, as consumption of beef per capita has barely changed.

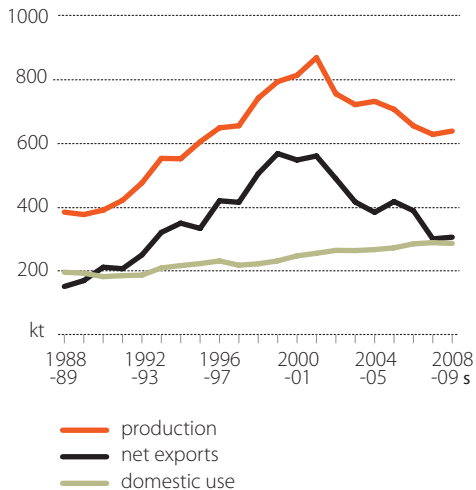
31 Beef and veal Australia



Source: ABARE 2008: ABSa,c.

Australia's consumption of major dairy products overall (total of butter, cheese, skim milk powder, whole milk powder and casein) has been rising gradually. Also, imports, primarily of cheese, have been increasing. During a period of marked production growth from the

32 Major dairy products Australia total milk solids basis ^a



^a Butter, cheese, skim milk powder, whole milk powder and casein. Conversion to milk solids basis is through applying milk solids content factors in appendix 3 from Dairy Australia (2008). ^s ABARE estimate.
Source: ABARE 2008: ABSa,c.

late 1980s until about 2000, the increases in production greatly exceeded those in domestic consumption, and exports rose rapidly. However, since then, the combination of markedly declining production and gradually increasing domestic consumption has resulted in a substantial decline in net exports (figure 32).

The international economic outlook and Australia's agricultural exports

It is notable that Australia's agricultural exports have been declining for most of the current decade, despite there having been relatively buoyant market conditions for many agricultural products, especially grains, oilseeds and dairy products in recent years. This observation provides a basis for concluding that the decline in Australian

agricultural exports has resulted from non-price factors, primarily the long hot-dry spell and the associated effects on both dryland and irrigated agriculture.

If international demand conditions for many major agricultural products had not been as buoyant, especially over the past three years, Australian agricultural production and exports could have fallen even more than has actually occurred.

Currently, the outlook for international market prices for agricultural commodities is more difficult to gauge than at most times in the past because of uncertainties arising from the international financial crisis. However, one thing is clear; prices are likely to remain considerably below their mid-2008 peaks.

The potential for lower income growth globally as a result of the financial crisis and the associated lower petroleum prices are likely to dampen the demand for major food and feed crops which contributed so substantially to the increased prices for grains and oilseeds until mid-2008. As well as lower income growth adversely affecting demand growth directly, lower petroleum prices will reduce profitability and production incentives for biofuels, thereby reducing growth in demand for the grains and oilseeds for that purpose. Nevertheless, significant government incentives are continuing to be provided to produce biofuels and to incorporate into blends. Also, the substantially increased factory capacity to produce biofuels which has been established, particularly in the United States and Europe, will continue to sustain demand for grains and oilseeds. Although world prices for grains and oilseeds are likely to stay below their mid-2008 peak, they could remain higher than they were before the surge in prices that occurred from 2006 to 2008.

Conclusions

Australian agricultural exports have been declining since early in the present decade. Such reductions have occurred before but exports always recovered and increased further. Such recoveries and expansions came about against a background of declining real prices for agricultural commodities and were made possible by a combination of interacting factors. These included increases in productivity related to advances in technology, adjustments to farming enterprises, and relatively favourable seasonal conditions. Such conditions permitted increasing quantities of Australian farm commodities to be produced and sold competitively on world markets.

Reductions in exports for most Australian agricultural products have occurred since 2001-02. Since that time, there has been little change from previous rates of decline in prices received by farmers for their products relative to prices paid for inputs, suggesting that for agriculture overall, the price pressures did not depress production more than in the foregoing period of substantial growth.

The downturn in agricultural production and exports since 2001-02 has resulted mainly from a run of seasons less favourable for agricultural production than in the past. This has been particularly the case in south eastern Australia where seasons have been characterised by above average temperatures and lower than average rainfall. As well as being less favourable than formerly for cropping and pasture growth, the conditions have resulted in a marked decline in irrigated agriculture. Increases in productivity on which farmers relied to increase production in the face of declining real prices for their products appear also to have declined in recent years.

Increases in domestic consumption of major agricultural commodities have also contributed to reduced exports. In particular, domestic consumption of wheat has risen largely because of its greater use as a feed grain, with some of the increase being drought induced. Dairy product exports have fallen because of lower production related to curtailed availability of irrigation water and higher consumption. For beef, some increase in Australian consumption has taken up most of the modest gains that have occurred in production since 2001-02 and export levels have hardly changed.

It appears market conditions are likely to be less of a constraint on future Australian agricultural exports than the need to increase productivity in the face of changing climatic conditions. Research, the ability to put technological and management advances into practice and the ability to adjust farming enterprises to meet the challenges arising from the changing physical and market environments are likely to be key elements in the adaptation process.

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