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ECONOMIC OVERVIEW

prospects for world economic growth

Jammie Penm

- **World economic growth is assumed to be 3.9 per cent in 2005, before easing to 3.8 per cent in 2006. This compares with estimated growth of 4.9 per cent in 2004.**
- **Rising world oil prices pose a significant downside risk in the current outlook for world economic growth.**
- **Australia's economic performance is assumed to strengthen, with economic growth increasing from an estimated 2.3 per cent in 2004-05 to 3.0 per cent in 2005-06.**

World economic outlook

Commodity prices supported by world economic growth

Growth in the global economy has proceeded at a relative strong pace over the past few months, with robust economic performance continuing in the United States and China. After exceptional growth in 2004, the world economy is expected to achieve more moderate performance in the short term. While relatively high economic growth is expected in the United States, China and some east and south east Asian countries, an easing is likely in Japan and western Europe.

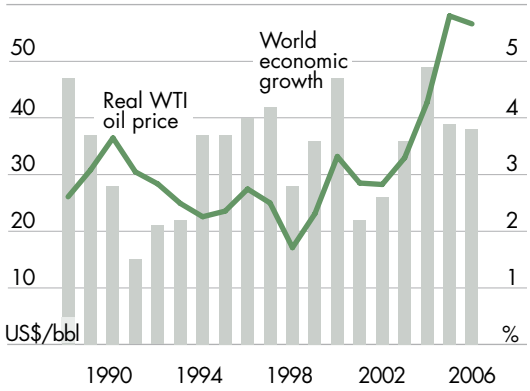
In response to strong world economic performance over the past eighteen months or so, many commodity prices on world markets have increased significantly and are currently at or close to their recent highs. For metals on the London Metal Exchange (LME), for example, prices for copper, aluminium and zinc increased by around 40 per cent, 10 per cent and 30 per cent respectively in the twelve months ended August 2005.

Prospects for commodity prices are crucial to commodity producers and exporters. To maintain favorable commodity prices on world markets, world economic growth needs to be strong. Sustained strong world economic growth will result in increases in commodity demand, which in turn will provide support for higher prices on world markets.

World economic outlook remains positive

In the short term, the prospects for world economic growth are particularly dependent on economic developments in the United States and China. In the United States, the world's largest

World economic growth and real WTI oil prices



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economy, the economic expansion is likely to continue at a pace similar to that achieved in the first half of 2005 (around an annual rate of 3.5 per cent). Despite the disruptions to economic activity caused by Hurricane Katrina in the Gulf of Mexico region, the US Federal Reserve is expected to continue to tighten monetary policy in late 2005 and early 2006 in order to prevent a significant increase in inflationary pressures.

In China, the government appears to be successfully managing the soft landing of the economy. Economic growth remains robust, with year on year growth of 9.5 per cent in the first half of 2005. Industrial production, rising year on year by 16 per cent in July, and fixed asset investment, up year on year by 25 per cent in the first half of the year, have both eased from the highs achieved in 2004. Inflation also moderated from around 5.3 per cent in mid-2004 to a year on year rate of 1.8 per cent in July 2005. China's economic expansion is likely to remain at rates of around 8–9 per cent in the next fifteen months or so.

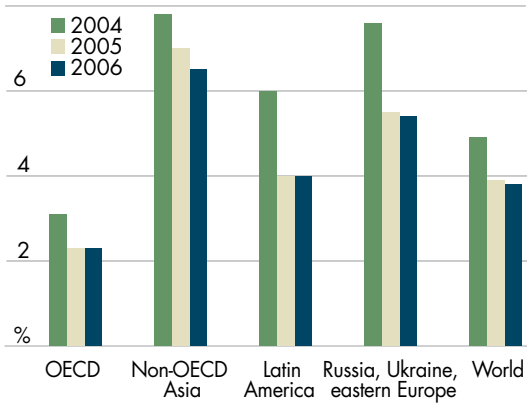
In contrast, economic growth in Japan and western Europe is unlikely to match the performances in 2004 on year average terms. These economies are particularly vulnerable to higher oil prices. With deflation persisting in Japan and structural weakness in western Europe, economic growth is not expected to strengthen significantly in the short term.

In the principal economies of east and south east Asia, robust economic performance in the United States and China is expected to provide support for their exports, and hence economic growth. Higher prices for oil and mineral resources on world markets are supporting economic activity in the Middle East and many Latin American countries.

In other emerging markets, the Russian Federation, the Ukraine and eastern Europe achieved high economic growth rates in 2004 (7.1 per cent, 12.5 per cent and 6.0 per cent respectively). Economic growth in these countries/regions is likely to remain strong over the next few years, albeit at weaker rates than those achieved in 2004.

World economic growth is assumed to average around 3.9 per cent in 2005, before easing to 3.8 per cent in 2006. This compares with estimated growth of 4.9 per cent in 2004.

Regional economic growth



World economic developments

Over the past few months, there have been a number of important world economic developments that have the potential to affect world economic growth and commodity trade. These developments include rising world oil prices and a change to China's foreign exchange regime.

Rising oil prices pose a threat to world economic growth

Despite a gradual easing of world economic growth since late 2004, world oil prices have continued to rise. The price of the commonly quoted 'West Texas Intermediate' crude oil increased to a high of around US$70 a barrel in late August, after fluctuating around US$50 a barrel in early 2005. In the first nine months of 2005, the price for WTI crude oil is estimated to average around US$54 a barrel. This compares with an average of US$41 a barrel in 2004.

Despite the significant increase in crude oil prices, the pace of global economic expansion has not yet been significantly affected. One of the main reasons for continued strong world economic expansion in the presence of rising oil prices is the absence of a significant increase in wage pressures induced by higher oil prices. The impact of higher oil prices on economic

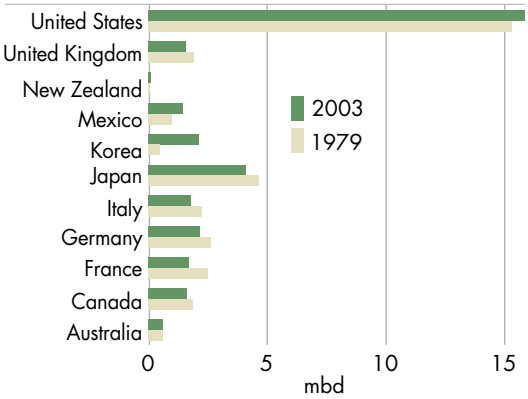
activity is dependent on whether there will be a tightening of monetary policy in response. Since labor markets in major oil importing countries have become more flexible over the past two decades, rising oil prices have not yet led to significant increases in wage pressures.

While the increase in world oil prices over the past two years or so has been significant, it comes from a low base. In real terms, oil prices at current levels are still lower than the highs recorded in the 1970s and the early 1980s. Adjusted by the consumer price movements in the United States, for example, current WTI crude (around US$65 a barrel) are equivalent to around US$30 a barrel in 1980 dollar terms. This compares with actual prices of US$40 a barrel in that year.

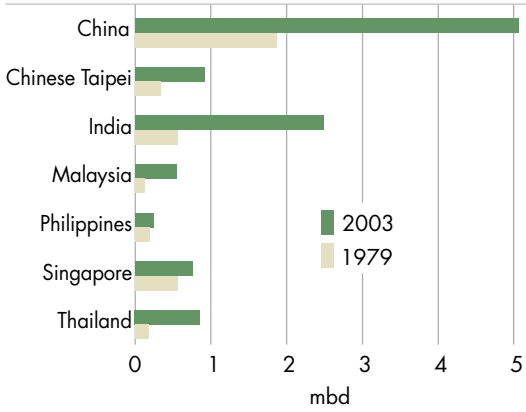
It is also noteworthy that many developed economies have become less oil dependent than they were in the 1970s, despite the remarkable economic expansion over the past two decades. Energy conservation and substitution of other energy sources have resulted in a significant reduction in oil consumption in these economies, especially when measured in terms of a unit of gross domestic product. Oil dependency (defined as oil consumption required in producing a unit of gross domestic product) in major OECD economies, for example, is estimated to have declined by more than 50 per cent since the early 1970s.

Many developing countries, especially those in non-OECD Asia (excluding Japan and the Republic of Korea) have contributed significantly to growth in global oil consumption in recent years. In an attempt to ease inflationary pressures induced by higher world oil prices, several Asian governments introduced subsidies to ease upward pressure on the retail prices for petrol and petroleum products, despite the significant costs to their fiscal positions.

OECD crude oil consumption



Crude oil consumption in Asia



Since early 2005, however, a number of countries, including China, Thailand and Malaysia, have reduced subsidies and allowed retail prices to increase. These price rises are likely to place upward pressures on inflation in these countries.

While the effects of higher oil prices on world economic growth have so far been relatively insignificant, rising world oil prices pose a major downside risk in the current global economic outlook. In this set of commodity forecasts, WTI crude oil is forecast to average around US$58 a barrel in both 2005 and 2006. Given the important links between oil consumption and economic activity, world economic growth will be adversely affected if world oil prices continue to rise.

Rising revenues for oil exporters

In oil exporting countries, higher receipts from oil exports will increase their purchasing power, and hence demand for imports. Increased demand for imports by oil exporters will partially offset the adverse impact of higher oil prices on global economic growth.

Reflecting higher oil revenues, the current account surplus has been on the rise in many oil exporting countries. For the Middle East as a whole, for example, the current account surplus is estimated to have tripled between 2003 and 2005. Associated with higher oil revenues, foreign investment from the Organisation of the Petroleum Exporting Countries has also increased. For example, OPEC's holdings of US Treasury securities rose from around US$46.8 billion in December 2001 to US$62.6 in May 2005.

If oil prices remain high over an extended period, the importance of oil exporting countries as lenders in world capital markets could be expected to increase.

Revaluation of China's currency

After pegging the value of its currency to the US dollar for the past eleven years, China's government announced, on 21 July 2005, a change of its foreign exchange regime to the so-called 'managed' float. Under the new regime, the value of China's currency, the renminbi, is linked to a basket of international currencies, the parities of which is set at the end of each day.

After the announcement, China's currency appreciated by around 2.1 per cent against the US dollar (from 8.28 to 8.11 yuan). In late August, China's currency was trading around 8.10 yuan against the US dollar.

Given the small extent of the appreciation, the effects of this change on China's export and import performance are unlikely to be significant. Many market commentators, nevertheless, interpret this revaluation as the first step of a process to reform China's foreign exchange system. Under this scenario, the impacts on China's economy would be dependent on the speed of the reform and the extent to which China's currency appreciates.

A significant appreciation of China's currency, if it occurred, could potentially reduce China's export competitiveness on world markets. A higher value of China's currency, however, would also reduce the costs of imports, many of which are used as intermediate inputs in the manufacturing of exports. These effects would be likely to offset each other to some extent.

The process of transforming China's foreign exchange system into a market based regime, if it occurred, would likely be slow. From China's perspective, a sizable revaluation of its currency would lead to a significant loss of the value of its foreign exchange reserves (measured at around US$771 billion at the end of June 2005). For example, a 10 per cent revaluation of China's currency against the US dollar means that China's foreign exchange reserves would lose about US$77 billion in value. There are also concerns that a market based currency could lead to instability in China's banking system and an increase in unemployment at the current stage of economic development in China.

Despite concerns about the possible short term impacts, a market based exchange rate in China would result in improved stability of its economy over the longer term. Improved economic stability and hence sustained income growth in China would directly or indirectly provide support for world commodity demand and prices.

Economic prospects in major world economies

United States

Following strong performance in 2004, economic growth in the United States eased in the first half of 2005. The US economy is estimated to have grown by an annualised rate of 3.3 per cent in the June quarter 2005, following growth of 3.8 per cent in the March quarter.

Main factors contributing to the growth in the June quarter were higher personal consumption expenditures (an annualised rise of 3.3 per cent) and net exports (a rise of 12.6 per cent in exports and a decline of 2.0 per cent in imports). The effects were partly offset by a decline in private domestic investment spending (–4.9 per cent) and lower private inventories (detracting from economic growth by 2.3 percentage points).

Looking forward, the pace of economic growth is likely to remain robust. While near term disruptions to economic activity are expected in the areas affected by Hurricane Katrina, the

Depreciation of the US dollar against international currencies [a]

	Early Feb 2002	Late Aug 2005	% *change*
OECD			
Japan	133	111	*–16.3*
Euro area	1.16	0.82	*–29.4*
Australia	1.82	1.31	*–28.0*
East Asia			
China	8.28	8.10	*–2.2*
Korea, Rep. of	1 313	1 038	*–20.9*
Chinese Taipei	35.0	32.7	*–6.6*
South east Asia			
Indonesia	10 344	10 601	*2.5*
Malaysia	3.81	3.77	*–1.0*
Philippines	51.4	56.3	*9.6*
Singapore	1.83	1.69	*–7.7*
Thailand	43.5	40.5	*–6.9*

a Units of currency per US dollar.

follow-on reconstruction is likely to provide support for economic growth, especially in late 2005 and early 2006.

The Federal Reserve has been tightening monetary policy since mid-2004 in order to avoid a significant increase in inflationary pressures. The federal funds rate was raised by 0.25 percentage points for the tenth consecutive time to 3.5 per cent in early August. Given the robust economic performance, the Federal Reserve is expected to raise interest rates further in the short term, reducing the stimulus effects on the economy.

Reflecting higher world oil prices, fuel prices have increased markedly in the United States. In early September, the national retail price for gasoline averaged around US$3.07 a gallon, an increase of around US$1.22 from a year earlier. For diesel, the retail price averaged around US$2.90 a gallon, up by 55 per cent from a year earlier.

Despite higher fuel prices, inflationary pressures remain modest in the economy. The consumer price index rose by 0.5 per cent in July, after remaining unchanged in June and a decline of 0.1 per cent in May. Excluding energy and food items, the core consumer price index increased by only 0.1 per cent in July.

In preparing this set of commodity forecasts, economic growth in the United States is assumed to average around 3.5 per cent in both 2005 and 2006.

One major risk in the economic outlook for the United States is associated with the current state of the trade and current account imbalances. In the first half of 2005, the trade deficit, seasonally adjusted, was around US$343 billion, a rise of around 18 per cent from the same period a year earlier. The significant increase in the US trade deficit means that strong US domestic demand is providing support for the economic performance of other parts of the world. Reflecting higher world prices, the imports of crude oil were valued at US$79.5 billion in the first half of 2005, compared with US$60.3 billion in the first half of 2004.

The bilateral trade deficit of the United States with China was at US$17.6 billion in June 2005, the largest the United States exhibited with any single trading partner. In the first half of 2005, the

Major foreign holders of US Treasury securities

	Dec 2001	May 2005
	US$b	US$b
Asia		
Japan	317.9	685.7
China [a]	126.3	291.1
Chinese Taipei	35.3	70.9
Korea, Rep. of	32.8	58.7
Singapore	20.0	30.3
Thailand	15.7	13.3
Europe		
United Kingdom	45.0	132.5
Germany	47.8	61.2
France	20.6	28.0
Italy	18.9	14.4
Switzerland	18.7	42.0
Latin America		
Mexico	19.3	31.2
Brazil	na	16.8
OPEC	46.8	62.6
Caribbean Banking Centres	33.6	125.9
Total	1 040.1	2 027.0

a Includes Hong Kong. **na** Not available.
Source: US Department of Treasury.

bilateral trade deficit with China was US$90.1 billion, compared with a deficit of $68.5 billion in the same period a year earlier.

The US current account imbalance, seasonally adjusted, increased year on year by 34 per cent to a deficit of US$195 billion (or 6.4 per cent of gross domestic product) in the March quarter 2005. Associated with the rise in the current account deficit in recent years, there has been a significant increase in capital inflows in the United States from other major world economies. Foreign holdings of US Treasury securities, for example, were around US$2.0 trillion in May 2005. This compares with foreign holdings of US$1.0 trillion in December 2001. The rising US current account deficit has generated considerable concern in financial markets about its sustainability, which has placed downward pressure on the value of the US dollar.

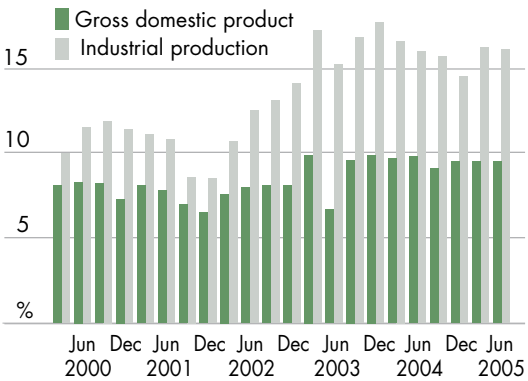
Economic growth in China

Economic activity in China remains strong, with year on year growth of 9.5 per cent in the June quarter 2005, similar to that achieved in the March quarter, but lower than the 10 per cent growth recorded in early 2004.

The significant economic growth in China has been supported by strong increases in industrial production, fixed asset investment spending and exports. Industrial production rose by 16 per cent in the first half of 2005 (in year on year terms), with growth of 13 per cent, 9.7 per cent and 28 per cent respectively in power generation and the production of coal and steel.

Economic performance in China

Quarterly, ended June 2005, year on year growth



Investment spending on fixed assets increased year on year by 25 per cent in the first half of 2005. Significant investment was recorded in the energy related sectors, with year on year rises of 82 per cent, 36 per cent and 36 per cent in coal, oil and gas, and electricity production respectively. In the metal sector, investment was relatively slower, with rises of 19 per cent and 30 per cent in ferrous metal and nonferrous metal production respectively.

Exports grew rapidly in the first half of 2005, achieving year on year growth of 33 per cent. With imports increasing year on year by 14 per cent, China recorded a trade surplus of US$39.6 billion over the same period.

An important issue in the outlook for world economic growth is whether China's economy will continue its robust performance. Despite the strong economic growth achieved in the first half of 2005, many economic commentators forecast that economic growth in China will gradually ease in the short term to annual rates more consistent with its longer term potential of between 8 and 9 per cent. Specifically, growth in fixed asset investment spending and exports is expected to moderate.

Growth in China's textile exports may slow in the remainder of 2005, as the impact of quotas imposed by the United States and the European Union in May and June take effect. Shipments of knit shirts and underwear to the United States on 8 July reached their limit for this year and trouser exports were nearing their cap. The European Union has limited increases in some Chinese clothing imports to between 8 and 12.5 per cent a year until 2007 and announced, on 7 July, that it would widen an investigation into cheap Chinese footwear imports to include leather shoes. Negotiations are currently under way between China and the United States and the European Union (for a detailed discussion, see the cotton note).

In preparing this set of commodity forecasts, economic growth in China is assumed to average 9.2 per cent in 2005, before easing to 8.3 per cent in 2006. This compares with growth of 9.5 per cent in 2004.

Economic activity in Japan and the Republic of Korea

Japan

The Japanese economy was in a weak state in late 2004, growing by only 0.1 per cent in the final quarter of 2004. The weak economic growth stemmed partly from natural disasters that influenced economic activity. A series of typhoons and a strong earthquake in northern Japan severely dampened consumption spending and business activity.

In the first half of 2005, Japan's economy expanded at a faster pace than in 2004. Real gross domestic product increased by 0.3 per cent in the June quarter 2005 and 1.3 per cent in the March quarter. The higher economic growth was driven partly by a recovery in consumer spending, as the effects of the natural disasters ebbed.

Partial indicators released recently indicate that economic growth in Japan is likely to be modest in the short term. Industrial production, for example, fell year on year by 2.2 per cent in July, after rising by 0.2 per cent in June. Nevertheless, the latest business surveys suggest that there has been an improvement in business confident. The unemployment rate, seasonally adjusted, is estimated to have been 4.4 per cent in July 2005, compared with 4.9 per cent in the same month a year earlier.

Deflation, however, persists with the core consumer price index, excluding perishable food prices, falling year on year by 0.3 per cent in July. This is in contrast to a year on year rise of 8.5 per cent in the retail prices of petrol and petroleum products in the same month.

Economic activity in Japan is vulnerable to rising oil prices, despite a significant reduction in the economy's oil dependency over the past three decades. Japan's economy now consumes less than half of what was required to produce the same level of gross domestic product in the early 1970s. Despite this achievement, Japan's economic performance will be adversely affected if oil prices continue to rise.

Higher oil prices have adversely affected Japan's trade performance. The merchandise trade surplus declined year on year by around 25 per cent to US$42.8 billion in the first six months of 2005, as higher oil prices pushed up the value of oil imports. The current account surplus in Japan fell year on year by 15 per cent over the same period.

Key macroeconomic assumptions

World		**2003**	**2004**	**2005 f**	**2006 f**
Economic growth					
OECD	%	1.8	3.1	2.3	2.2
United States	%	2.7	4.2	3.5	3.5
Japan	%	2.5	2.6	1.7	1.5
Western Europe	%	0.6	2.0	1.1	1.2
Germany	%	– 0.1	1.7	1.0	1.0
France	%	0.2	2.5	1.5	1.5
United Kingdom	%	2.3	3.1	2.1	2.0
Italy	%	0.3	1.2	– 0.1	0.5
Korea, Rep. of	%	3.1	4.6	3.7	3.7
New Zealand	%	3.4	4.8	2.4	2.3
Developing countries	%	5.7	7.0	6.0	5.6
Non-OECD Asia	%	7.2	7.8	7.0	6.5
South East Asia **a**	%	4.7	6.3	4.7	4.5
China **b**	%	9.1	9.5	9.2	8.3
Chinese Taipei	%	3.2	5.7	3.5	3.5
India	%	8.2	6.9	7.0	6.5
Latin America	%	1.7	6.0	4.0	4.0
Russian Federation	%	7.3	7.1	5.5	5.5
Ukraine	%	9.3	12.5	7.0	6.0
Eastern Europe	%	4.5	6.0	5.0	5.0
World **c**	%	3.6	4.9	3.9	3.8
Industrial production					
OECD	%	0.7	3.6	2.6	2.4
Inflation					
United States	%	2.3	2.7	2.9	2.5
Interest rates					
US prime rate **d**	%	4.1	4.3	6.0	6.5
US exchange rates **e**					
Yen/US$		115	108	108	109
Euro/US$		0.88	0.80	0.81	0.82
Australia		**2002 -03**	**2003 -04**	**2004 -05 s**	**2005 -06 f**
Economic growth	%	3.2	4.0	2.3	3.0
Inflation	%	3.1	2.4	2.4	2.7
Interest rates **g**	%	8.4	8.7	8.9	9.1
Australian exchange rates					
US$/A$		0.58	0.71	0.75	0.75
Yen/A$		66.7	76.7	81.0	81.8
TWI for A$ **h**		53.0	61.0	63.0	64.0

a Indonesia, Malaysia, the Philippines, Singapore and Thailand. **b** Excludes Hong Kong. **c** Weighted using 2004 purchasing-power-parity (PPP) valuation of country GDPs by the IMF. **d** Commercial bank prime lending rates in the United States. **e** Average of daily rates. **g** Prime lending rates to large businesses. **h** Base: May 1970 = 100. **s** ABARE estimate. **f** ABARE assumptions.
Sources: ABARE; ABS; IMF; OECD; RBA.

The economic outlook for the United States and China will be an important determinant for Japan's export performance. Japan's exports to China were around US$37.2 billion in the first half of 2005, an increase of 6.3 per cent from a year earlier. Exports to the United States were around US$66.1 billion in the same period, a rise of 7.3 per cent from a year earlier. Continued robust economic growth in the United States and China is expected to provide support for Japan's export performance.

Economic growth in Japan is assumed to be 1.7 per cent in 2005, before easing to 1.5 per cent in 2006. This compares with growth of 2.6 per cent in 2004.

Republic of Korea

Export performance in Korea has been adversely affected by higher oil prices, an appreciation of Korea's currency, especially against the US dollar, and the weakness in global demand for information technology equipment. Domestic demand continues to be weak and is being held back by sluggish private business investment spending. Real gross domestic product increased year on year by 3.3 per cent in the June quarter 2005, following growth of 2.7 per cent in the March quarter.

Looking forward, partial indicators released recently indicate that economic growth is likely to remain modest. Industrial production rose year on year by 4.0 per cent in the June quarter 2005, compared with growth of 3.8 per cent in the March quarter. Inflation eased to a year on year rate of 2.5 per cent in July 2005, following an average of 3.0 per cent in the June quarter.

Economic growth in Korea is particularly vulnerable to rising world oil prices. The significant increase in world oil prices is raising corporate costs and damping consumer spending. Around 5 per cent of Korea's annual gross domestic product is spent on oil imports. In July 2005, Korea's government revised downward its growth forecast in 2005, citing higher oil prices as the reason.

In preparing this set of commodity forecasts, economic growth in Korea is assumed to be 3.7 per cent in 2005 and 2006, compared with 4.6 per cent in 2004.

Outlook for western Europe

Economic performance was mixed in western Europe in the first half of 2005. Growth eased in a number of major economies, including Germany, France and the United Kingdom, while stronger performance was achieved in Spain and a number of smaller economies, including the Netherlands, Austria and Belgium. Despite weaker economic growth, the producer price index in the euro area rose year on year by 4.0 per cent in June 2005, partly reflecting the effects of higher oil prices.

Since mid-2005, there have been improvements in consumer and business sentiment, with the European Commission's measure of economic sentiment rising in July to its highest level since early 2005. Surveys of purchasing managers also reported expanding activity in both manufacturing and services in July. However, given rising world oil prices and a strong euro, especially against the US dollar, it is unlikely that a significant increase in economic growth will eventuate.

For western Europe as a whole, economic growth is assumed to be around 1.1 per cent in 2005 and 1.2 per cent in 2006. This compares with growth of 2.0 per cent in 2004.

Germany

In the largest regional economy, Germany, real gross domestic product remained unchanged in the June quarter 2005, compared with growth of 0.8 per cent in the March quarter. While partial indicators released recently suggest that consumer demand is gradually rising, with higher sales of automobiles and durable goods, economic growth is unlikely to strengthen significantly, given structural weakness in the economy and the effects of rising oil prices.

The major issue confronting Germany's economy is the highly regulated labor market and high unemployment. The total jobless is over five million, with the unemployment rate increasing to 11.6 per cent in July 2005 from 10.6 per cent in the same month a year earlier.

Economic growth in Germany is assumed to be 1.0 per cent in both 2005 and 2006, compared with 1.7 per cent in 2004.

France

In France, the economy recorded growth of 0.1 per cent in the June quarter, following growth of 0.4 per cent in the March quarter. In the short term, domestic demand in France is expected to be the main contributor to economic growth. Export performance is not expected to improve markedly because of the strong euro and subdued import demand from its neighboring countries.

Economic growth in France is assumed to be 1.5 per cent in both 2005 and 2006. Higher oil prices remain a major downside risk to the economic outlook.

United Kingdom

In the United Kingdom, economic growth has been easing. Growth in real gross domestic product slowed to a year on year rate of 1.7 per cent in the June quarter, compared with 2.1 per cent in the March quarter. A slowdown in the housing market has been under way, which is expected to adversely affect consumer sentiment and spending. The recent terrorist attacks on London could prove to be another negative factor for economic growth in the short term.

In an attempt to stimulate domestic demand, the Bank of England lowered its key interest rate by 0.25 percentage points to 4.5 per cent in early August. Economic growth in the United Kingdom is assumed to be 2.1 per cent in 2005 and 2.0 per cent in 2006, compared with 3.1 per cent in 2004.

Economic growth in east and south east Asia

In non-OECD Asia, the gradual easing of economic growth that started in mid-2004 has continued so far in 2005. The factors that have contributed to this easing include higher oil prices, softness in international information technology markets and adverse seasonal conditions. In the Philippines, for example, economic growth weakened to a year on year rate of 4.6 per cent in the March quarter 2005 from a recent high of 6.6 per cent in mid-2004, as the effects of El Niño induced a sharp downturn in agricultural output.

In a number of regional economies, inflation has been on the rise, largely reflecting the impact of higher oil prices. In Indonesia, for example, inflation rose to an annual rate of 7.8 per cent in July 2005, compared with an average of 6.1 per cent in 2004. In Thailand, the consumer price index increased by 5.3 per cent over the same period, compared with an average of 2.8 per cent in 2004.

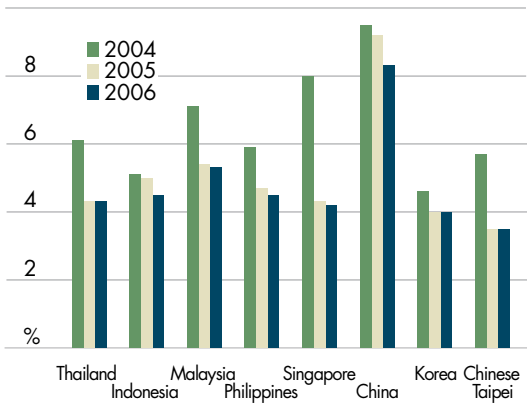
Looking forward, economic growth in the region is expected to ease. For non-OECD Asia as a whole, economic growth is assumed to average around 7.0 per cent in 2005 and 6.5 per cent in 2006, compared with 7.8 per cent in 2004.

In Chinese Taipei, the economy is estimated to have grown year on year by 3.0 per cent in the June quarter 2005, compared with growth of 2.5 per cent in the March quarter. Partial indicators released recently suggest that economic growth is likely to be modest. Industrial production rose year on year by 1.3 per cent in June 2005, following a decline of 0.8 per cent in the previous month.

Trade performance of Chinese Taipei weakened because of a significant increase in the value of oil imports and a decline in exports of information technology products. Trade surplus was around US$2.1 billion in the year ended July 2005, compared with US$16 billion in 2004.

Economic growth in Chinese Taipei is assumed to be 3.5 per cent in both 2005 and 2006, compared with 5.7 per cent in 2004.

Economic growth in Asia



In Thailand, higher oil prices, together with a drought, have adversely affected economic growth. Reflecting an increase in the cost of oil imports and strong demand for capital and intermediate goods, a trade deficit of US$6.7 billion was recorded in the year ended June 2005. Thailand's government announced in mid-2005 a stimulus package to shore up the flagging economy. The Bank of Thailand recently revised downward its forecast of economic growth in 2005.

Economic growth in Thailand is assumed to be 4.3 per cent in both 2005 and 2006, compared with growth of 6.1 per cent in 2004.

In Malaysia, the economy recorded year on year growth of 4.1 per cent in the June quarter and 5.7 per cent in the March quarter, compared with average growth of 7.1 per cent in 2004. The trade sector continues to experience relatively strong export demand with a surplus of US$24 billion in the year ended June 2005. Following the revaluation of China's currency, Malaysia also announced the adoption of a 'managed' float regime for its foreign exchange. In late August, Malaysia's currency, the ringgit, was trading around US26.5c, an appreciation of around 1.0 per cent from the level before the regime change.

Looking forward, Malaysia's export performance is expected to ease and a fiscal consolidation program introduced recently could weaken growth in domestic demand. Economic growth in Malaysia is assumed to be 5.4 per cent in 2005 and 5.3 per cent in 2006, compared with growth of 7.1 per cent in 2004.

For south east Asia as a whole, economic growth is assumed to be 4.7 per cent in 2005 and 4.5 per cent in 2006. This compares with growth of 6.3 per cent in 2004.

Despite the relatively positive economic outlook, there are several downside risks that could significantly weaken economic performance in this region. In broad terms, if there were a significant easing of strong economic growth in the United States or China, there would be adverse flow-on effects to the regional economies. Another downside risk relates to rising oil prices, which have led to considerable inflationary pressures in the region.

Economic prospects in Australia

Economic growth in Australia strengthened in mid-2005. Real gross domestic product, seasonally adjusted, increased year on year by 2.6 per cent in the June quarter 2005, following growth of 1.9 per cent in the March quarter. For 2004-05 as a whole, economic growth averaged 2.3 per cent in Australia.

Australia's current account performance improved in mid-2005, with a seasonally adjusted deficit of $12.6 billion in the June quarter 2005, compared with $15.0 billion in the March quarter. The trade account, seasonally adjusted, recorded a deficit of around $4.9 billion in the June quarter 2005, a decline from a deficit of $6.9 billion in the March quarter.

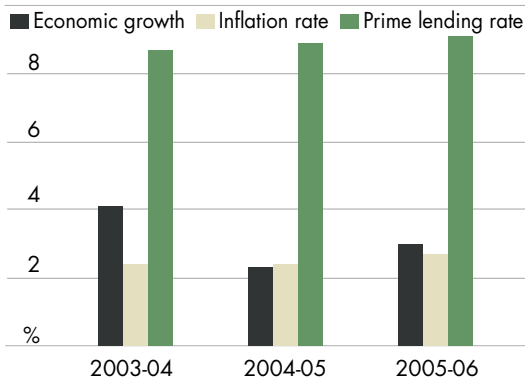
Looking forward, growth in the Australian economy is assumed to strengthen in 2005-06, after a temporary slowdown in 2004-05. Strong world demand for mineral resources will benefit the Australian economy through higher export earnings. While growth in dwelling investment and consumer spending could moderate, business investment and public demand are expected to provide support for economic activity.

Economic growth in Australia is assumed to average 3.0 per cent in 2005-06.

Inflation

Australia's inflationary pressures remained modest in mid-2005, with the consumer price index rising year on year by 2.5 per cent in the June

Australian economic indicators



quarter 2005, following an increase of 2.4 per cent in the March quarter. Contributing most to the increase in the June quarter were rises in automotive fuel, hospital and medical services and motor vehicle repairs and servicing. Partially offsetting these increases were falls in the costs of domestic travel and accommodation, fruit and pharmaceuticals.

Other price indexes released recently suggest that inflationary pressures are likely to remain modest. For example, the producer price index for final commodities rose by 0.8 per cent in the June quarter 2005. While the domestic component of this price index rose by 1.0 per cent in the quarter, this was offset by a decline in the import component that reflected price falls for some capital goods, including electronic equipment and motor vehicles and parts.

Australia's inflation rate is assumed to be 2.7 per cent in 2005-06, compared with 2.4 per cent in 2004-05.

Australian exchange rate

After strengthening significantly in early 2005, the Australian dollar gradually depreciated over the past few months, before a partial reversal in early September. The Australian dollar was trading around US77c and TWI 64 in early September, compared with US74c and TWI 63 in late August and US80c and TWI 65 in early March.

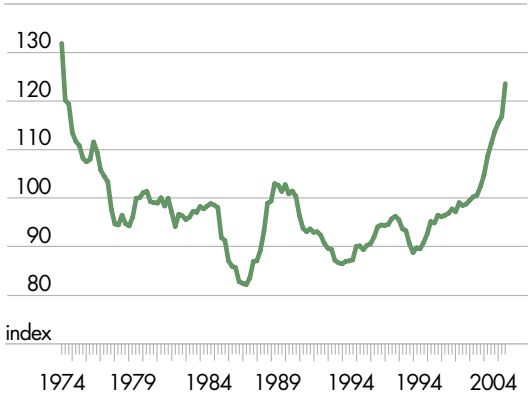
In the first three months of 2005-06, the Australian dollar is estimated to have averaged around US76c and TWI 64. This compares with US75c and TWI 63 in 2004-05.

Looking forward, movements in the Australian dollar are expected to continue to be influenced by three main factors — the strength of the US dollar, Australian's terms of trade and interest rate differentials between Australia and the major world economies.

As mentioned earlier, there have been considerable financial market concerns about the sustainability of large US trade and current account imbalances. This has placed significant downward pressure on the US dollar and is expected to continue to generate volatility in the US exchange rate against other floating world currencies, including the Australian dollar.

Australian terms of trade

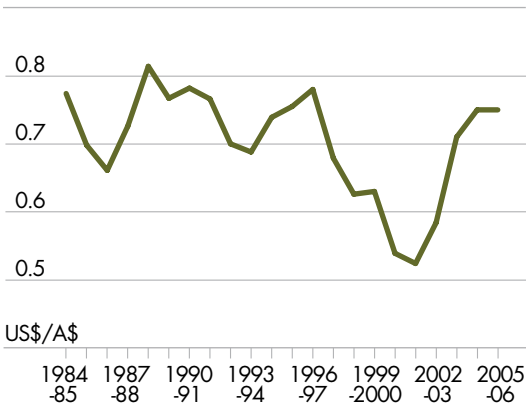
Quarterly, ended June 2005



From a historical perspective, the value of the Australian dollar has been closely associated with changes in Australia's terms of trade, and hence movements in commodity prices on world markets. Reflecting higher world prices for mineral resources, Australia's terms of trade in the June quarter 2005 was around 11 per cent higher than the same quarter a year earlier and 23 per cent higher than the June quarter 2003. This significant increase in the terms of trade has provided support for the Australian dollar.

In response to the outlook for an easing of world economic growth, prices of some Australian commodities on world markets (in US dollar terms) are forecast to average lower in 2006. This could place downward pressure on

Australian exchange rate against US dollar



the Australian dollar, especially in the second half of 2005-06.

Interest rate differentials between Australia and the major world economies are also an important factor that will influence the value of the Australian dollar. The main factor affecting Australian interest rates will be the outlook for economic growth and inflation. Given the modest inflationary pressures, Australia's prime lending rates are assumed to remain around their current levels in the remainder of 2005-06. On year average terms, the prime lending rates are assumed to average 9.1 per cent in 2005-06, compared with 8.9 per cent in 2004-05.

In contrast, US interest rates are expected to increase in the short term, leading to a narrowing of the interest rate differential between Australia and the United States. The US prime lending rates are assumed to average around 6.0 per cent in 2005 and 6.5 per cent in 2006, compared with 4.3 per cent in 2004. Higher interest rates in the United States are expected to provide support for a higher value of the US dollar.

Taking the above into account, the Australian dollar is assumed to average US75c and TWI 64 in 2005-06.

There is considerable uncertainty surrounding the outlook for the Australian dollar. This is because movements in the Australian dollar can be significantly influenced by changes in sentiment in financial markets, leading to strong volatility in the Australian exchange rate.

Over the past year or so, the Australian dollar has fluctuated from a low of US69c and TWI 59 in September 2004 to a high of US80c and TWI 66 in March 2005. Since the floating of the Australian dollar in December 1983, the Australian currency has had an average fluctuation range of around US10 cents a year. Managing the risks associated with fluctuations in the Australian exchange rate remains important for primary producers and exporters.

COMMODITY OUTLOOK

commodity export earnings to rise in 2005-06

Andrew Dickson, Vince O'Donnell, Andrew Maurer and commodity analysts

• Earnings from Australia's commodity exports are forecast to rise by 19 per cent in 2005-06 to $117 billion. Particularly notable are forecast increases in the value of metallurgical coal, iron ore, crude oil and LNG exports. Export earnings from mineral and energy commodities are forecast to rise by 28 per cent, while from the farm sector they are forecast to fall by 2 per cent.

• Hurricane Katrina devastated the US city of New Orleans and disrupted US grains trade, oil production and petroleum refining in the region. At the time of writing it has been assumed that these disruptions will be temporary in nature and will not have a significant impact on annual 2005-06 outcomes, although the human cost of the tragedy is high.

• Widespread rainfall across most of the eastern states and South Australia in mid-June 2005 provided a welcome break to the season. Reflecting this, ABARE's forecast for total Australian winter crop production in 2005-06 has been increased to just over 31 million tonnes.

• Growth in world demand for most major minerals and energy commodities is forecast to decline from current levels through to 2006. Production growth is also forecast to accelerate, and hence prices for most minerals and energy commodities are forecast to decline in 2005-06 from the current high levels.

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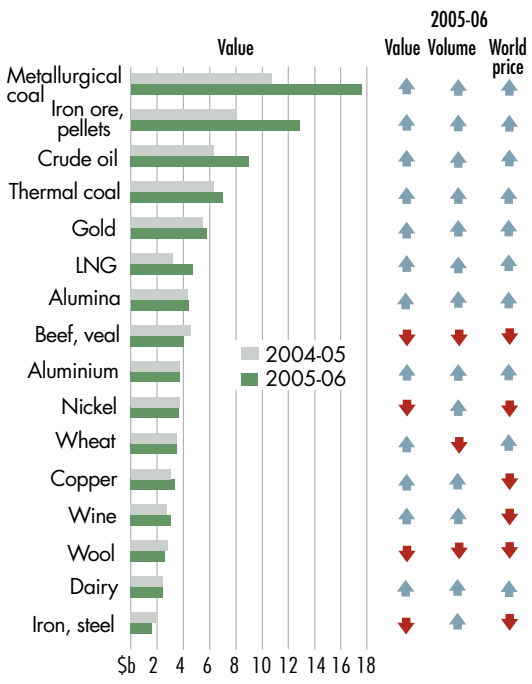
Australian commodity sector

Export earnings rising strongly

Earnings from Australia's commodity exports are forecast to rise by 19 per cent in 2005-06 to $116.8 billion. The forecast increase mainly reflects the effects of higher prices and export volumes for mineral and energy commodities.

For farm commodities, export earnings are forecast to be around $27.2 billion in 2005-06,

Major Australian commodity exports



compared with $27.7 billion in 2004-05. Agricultural commodities for which export earnings are forecast to rise in 2005-06 include wheat, cotton, wine, live sheep and dairy products. However, the effects are more than offset by forecast declines in export earnings from barley, canola, sugar, beef and wool.

For forest and fisheries products, export earnings are forecast to increase by 3 per cent to $3.7 billion in 2005-06, following a decline of 2 per cent to $3.6 billion in 2004-05.

The value of Australia's mineral and energy exports is forecast to rise to $87.2 billion in 2005-06. For energy commodities, export earnings are forecast to rise to $42.2 billion in 2005-06 supported by an increase in the export value of coal, LNG and crude oil. The value of coking coal exports is forecast to rise by 64 per cent ($6.9 billion), following the substantial increase in contract prices negotiated for JFY 2005-06. While not of the same magnitude, increases in thermal coal contract prices are forecast to support an 11 per cent ($690 million) increase in the value of Australia's thermal coal exports in 2005-06.

The value of crude oil exports is forecast to rise by 43 per cent ($2.7 billion), boosted by significantly higher oil prices and higher export volumes. Similarly, the value of LNG exports is forecast to increase by 49 per cent ($1.6 billion) in 2005-06 because of higher output and prices.

Export returns from the metals and other minerals industries are forecast to rise by 17 per cent to $45.0 billion in 2005-06. The only product in this category for which a substantial rise in export values is forecast is iron ore. The forecast rise in iron ore export returns of 59 per cent ($4.8 billion) accounts for three-quarters of the total forecast increase in the value of metals and other minerals exports.

Hurricane Katrina

On 29 August 2005 Hurricane Katrina devastated the United States city of New Orleans and significantly damaged infrastructure in the region, including grain export handling facilities, and oil production and petroleum refining operations. At the time of writing, damage to the Port of New Orleans — the largest in the United States and one of the largest in the world — was still being assessed.

The Port of New Orleans is estimated to move more than 60 per cent of US grain and soybean exports each year. Although the port was closed in the aftermath of the hurricane, at the time of writing US Department of Agriculture reports indicated that the grain elevators at the port were operating at around 63 per cent of capacity, with limited vessel movements, slow barge movements and limited staffing.

The barge transport system, which allows the movement of significant quantities of grain down the Mississippi River to export terminals in New Orleans from inland areas of the country, was brought to a standstill by the disaster. As the domestic harvest of wheat, corn and soybeans gets under way — winter grains are typically harvested from September through October in the United States — the pressure on alternative transport systems and infrastructure is expected to increase.

Reflecting anticipated disruptions to US exports of grains and soybeans, US domestic prices for wheat, corn and soybeans are expected to fall in the short term. Given the position of the United States as the world's largest exporter of wheat, corn and soybeans, there is also some risk that world grain prices will be affected by the disaster. However, the extent of the impact will depend on the time it takes to return the Port of New Orleans to full capacity, the level of stocks being held by consuming countries as well as the extent to which alternative grain export routes can be used. Alternative export options include Pacific Northwest ports such as Seattle and Portland, and Duluth on Lake Superior. The impact of Katrina on world grain markets will only be able to be fully assessed as a more complete picture of the state of the damage becomes available.

In terms of oil production, the US Department of the Interior has reported that while Hurricane Katrina moved through a core area of offshore operations and damaged many production and exploration facilities, early reports indicated that the vast majority of facilities could come back on line in days and weeks, rather than months.

Major indicators of Australia's commodity sector

		2000 -01	2001 -02	2002 -03	2003 -04	2004 -05 s	2005 -06 f	Change from previous year 2004-05 %	2005-06 %
Commodity exports									
Exchange rate	US$/A$	0.54	0.52	0.58	0.71	0.75	0.75	5.6	0.0
Unit returns a									
Farm	index	100.0	108.5	106.8	98.8	98.8	96.7	0.0	– 2.1
Mineral resources	index	100.0	97.5	93.6	88.5	112.2	133.7	26.8	19.2
– energy minerals	index	100.0	99.9	95.9	85.3	117.7	155.3	38.0	31.9
– metals and other minerals	index	100.0	95.4	91.7	90.8	107.9	117.2	18.8	8.6
Total commodities	index	100.0	100.6	97.3	91.4	108.2	123.3	18.4	14.0
Value of exports									
Farm	A$m	29 547	31 072	26 809	26 110	27 708	27 228	6.1	– 1.7
– crops	A$m	14 804	15 874	12 982	13 309	13 710	13 801	3.0	0.7
– livestock	A$m	14 743	15 198	13 827	12 801	13 999	13 427	9.4	– 4.1
Forest and fisheries products	A$m	3 982	4 115	3 961	3 708	3 630	3 741	– 2.1	3.1
Mineral resources	A$m	57 912	56 711	55 808	53 069	68 295	87 239	28.7	27.7
– energy minerals	A$m	25 678	25 411	24 161	20 737	29 653	42 222	43.0	42.4
– metals and other minerals	A$m	32 234	31 300	31 647	32 331	38 643	45 018	19.5	16.5
Total commodities	A$m	90 372	90 596	85 270	81 625	98 404	116 833	20.6	18.7
Farm sector									
Gross value of farm prodn b	A$m	34 432	39 485	32 498	36 861	36 339	35 499	– 1.4	– 2.3
– crops	A$m	18 730	21 260	15 385	20 414	18 502	18 027	– 9.4	– 2.6
– livestock	A$m	15 702	18 225	17 113	16 447	17 837	17 472	8.4	– 2.0
Farm costs	A$m	26 657	27 258	27 767	29 232	29 747	31 092	1.8	4.5
Net cash income c	A$m	12 496	16 353	10 696	12 268	11 908	8 195	– 2.9	– 31.2
Net value of farm production d	A$m	7 776	12 227	4 731	7 629	6 592	4 407	– 13.6	– 33.1
Farm price indexes									
Prices received by farmers	index	108.5	122.5	122.6	116.6	118.1	118.2	1.3	0.1
Prices paid by farmers	index	110.0	112.8	121.2	123.0	127.7	132.6	3.8	3.8
Farmers' terms of trade	index	98.6	108.6	101.2	94.8	92.5	89.1	– 2.4	– 3.7
Volume of farm production	index	113.4	115.2	93.6	111.1	109.0	106.5	– 1.9	– 2.3
– crops	index	116.9	121.7	83.4	121.2	113.0	108.8	– 6.8	– 3.7
– livestock	index	109.1	107.6	104.2	99.9	103.6	102.8	3.7	– 0.8
Crop area and livestock numbers									
Crop area (grains and oilseeds)	'000 ha	21 098	20 627	20 124	22 660	19 957	19 503	– 11.9	– 2.3
Sheep	million	110.9	106.2	99.3	101.3	104.0	105.8	2.7	1.7
Cattle	million	27.7	27.9	26.7	27.5	27.9	28.2	1.5	1.1
Minerals and energy sector									
Volume of mine production	index	113.6	113.7	114.1	111.5	116.5	122.6	4.5	5.2
– energy	index	114.1	115.2	112.5	107.5	108.2	112.1	0.7	3.6
– metals and other minerals	index	112.8	111.7	115.8	115.7	124.8	133.3	7.9	6.8
Gross value of mine prodn	A$m	55 596	54 443	53 576	50 946	65 564	83 750	28.7	27.7
New capital expenditure e	A$m	5 491	7 250	8 766	9 282	10 261	11 475	10.5	11.8
Exploration expenditure									
Petroleum	A$m	1 044	883	995	944	1 115	na	18.1	na
Metallic and other minerals	A$m	684	640	733	787	1 010	na	28.4	na
Total	A$m	1 727	1 523	1 728	1 731	2 125	na	22.8	na

a Base: 2000-01 = 100. **b** For a definition of the gross value of farm production see table 21. **c** Gross value of farm production less increase in assets held by marketing authorities and less total cash costs. **d** Gross value of farm production less total farm costs. **e** Mining industry (ANZSIC subdivision B) only. **s** ABARE estimate. **f** ABARE forecast.
Note: ABARE revised the method for calculating farm price and production indexes in October 1999. The indexes for the different groups of commodities are calculated on a chained weight basis using Fishers' ideal index with a reference year of 1997-98 = 100.
Sources: Australian Bureau of Statistics; ABARE.

Oil and gas production in the Gulf of Mexico is estimated to supply around 29 per cent of US domestic oil production. Immediately following the hurricane (on 30 August), 95 per cent of daily oil production in the Gulf of Mexico was shut in for environmental and human safety reasons. By 9 September this had been reduced to 60 per cent. The US Department of the Interior has estimated that about 90 per cent of Gulf oil production could return to the market in one month if refineries, processing plants, pipelines and other onshore infrastructure are in operation to receive, prepare and transport product.

Katrina also caused the shutdown of at least eight crude oil refineries, idling about 1.8 million barrels a day of refining capacity (more than 10 per cent of the United States total refining capacity). This supported an increase in gasoline futures prices (September delivery) of 20 per cent. However, within almost a week, four refineries (with a capacity of over a million barrels a day) had restarted or were expected to be restarted shortly. In addition, the International Energy Agency (IEA) and the US Government pledged to release 60 million barrels of crude oil from strategic reserves to offset disruptions from Katrina. As a result, the October gasoline futures contract price on the New York Mercantile Exchange has fallen, and at the time of writing was very close to the pre-hurricane level.

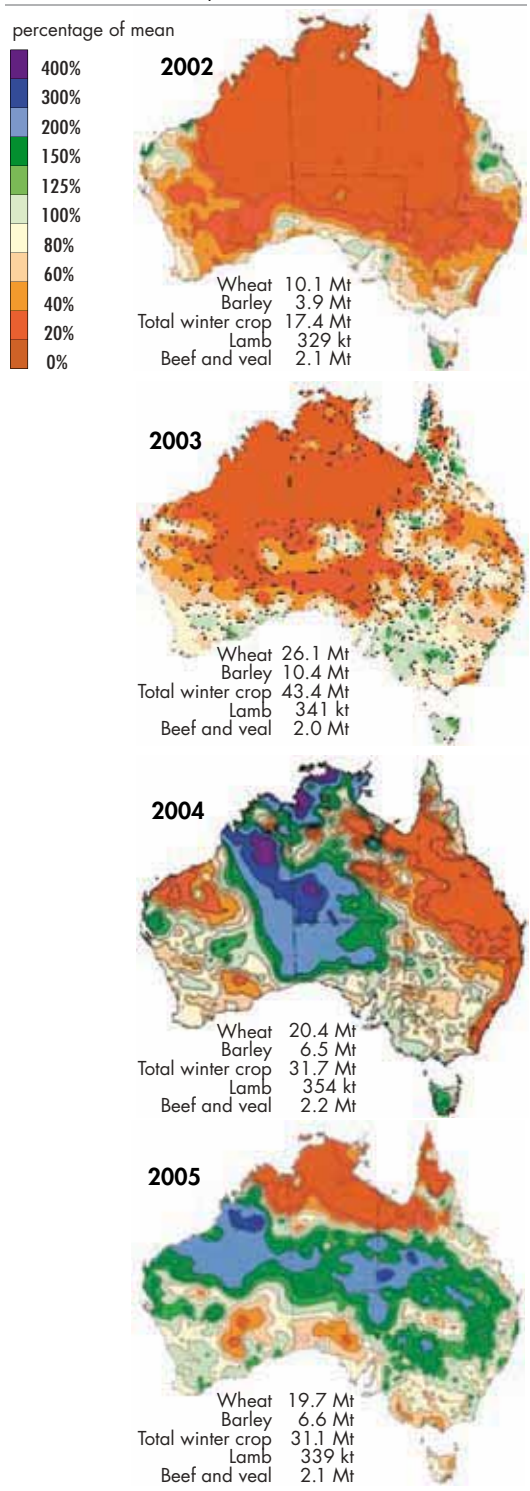
Australia's rural sector

Widespread rainfall boosts farm production forecasts

Widespread rainfall across most of the eastern states and South Australia in mid-June 2005 provided a break to the season and allowed many farmers to commence and/or complete sowing of winter crops. As a result, the forecast for total winter crop production in 2005-06 has been increased since the forecast in the June issue of *Australian Commodities* to just over 31 million tonnes. While the rains did allow the planting of crops, many areas were planted after optimal planting times had passed. Consequently, some yield penalties may be evident later in the season. This is particularly the case

May to July rainfall

Production for financial years (2002=2002-03)



if sufficient spring rainfall is not received or if hot dry weather prematurely finishes the crop growing season.

The rainfall in mid-June also provided sufficient moisture in many regions to ensure improved spring pasture growth. This has led to a reduction in the rate of livestock slaughter as producers have been encouraged to continue herd and flock rebuilding (a process started after the 2002-03 drought). Reflecting this, saleyard prices have increased as restockers compete with lot feeders for quality stock.

The Bureau of Meteorology maps presented here — which show rainfall for the critical period from May to July over a number of years — illustrate how the current season compares with recent previous seasons. While these maps provide a summary view of aggregate rainfall over the period, they do not reflect the timing of that rainfall. In 2005, for example, while above average rainfall was received across large parts of Australia (areas colored green and blue), most of the rainfall was received in mid to late June.

Agricultural trade issues remain important

Australian agriculture relies heavily on exports, with around two thirds of domestic production exported. For some commodities such as wool the proportion is much higher, at around 98 per cent, while for others such as dairy it is around 50 per cent.

The exclusion of US beef from the Japanese market in 2003 has supported Australian beef export prices to Japan. Currently the Australian feedlot sector is operating at around 86 per cent of capacity to meet high demand from both the Japanese and domestic Australian markets. Trade in beef between Japan and the United States is assumed to resume in early 2006 and, at that time, the United States is expected to re-establish its position in the market quickly. As a result, some export quality beef is likely to be redirected onto the Australian domestic market. Coupled with lower export demand, this is forecast to lead to a reduction in saleyard prices for beef.

Australia is also facing challenges from a number of South American countries that are becoming increasingly competitive on world agricultural markets. For example, Brazil currently accounts for around 20 per cent of total world sugar production and over 40 per cent of world sugar exports. Developments in Brazil play a key role in movements of world sugar prices, and in particular on returns received by Australian producers of sugar cane.

Competition from South America is also increasing in key Australian beef export markets. For example, exports of beef from Uruguay to the United States have increased substantially over the past few years, despite attracting a 26.4 per cent overquota tariff for a large proportion of the trade. In 2003, Uruguay accounted for only 3 per cent of US beef imports, but this rose to 11 per cent in 2004 and was 16 per cent for the first half of 2005. Looking forward, Uruguay, Argentina, Paraguay and Brazil all have the potential to provide increasingly tough competition for Australian exports in key markets such as the United States.

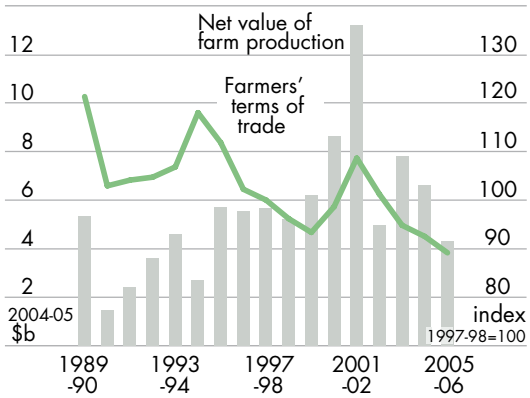
Farm incomes to fall significantly

The gross value of Australia's farm production is forecast to fall by 2.3 per cent to around $35.5 billion in 2005-06. Despite forecast high grains prices, lower total grains and oilseeds production is contributing to the decline in the gross value of production for crops. For the livestock industries, reduced prices for beef and wool, in particular, are contributing to the decline.

The net value of farm production in 2005-06 is forecast to be $4.4 billion, a 33 per cent

Australian farm incomes

In 2004-05 dollars



decline since the previous year. This decline is being driven largely by an increase in farm costs brought about by large increases in the cost of fuel, chemicals and fertiliser.

Productivity gains

Farmers' terms of trade (the ratio of prices received for outputs to prices paid for inputs) is forecast to decline, challenging farmers to continue to improve productivity. The start to this season's winter cropping season in the eastern states and South Australia provides a good example of the advances that have been made in productivity in the grains industry and how these translate into improved financial outcomes on-farm. In particular, modern machinery and improved crop varieties are allowing producers to plant crops in a shorter timeframe than previously possible and further outside what has typically been considered the optimal planting times. For example, despite the very late start to the current season, the area planted to winter crops in South Australia and Victoria is estimated to be down on the 2004-05 crop by only around 2.7 per cent and 7.3 per cent respectively.

Farm costs rising

The index of prices paid by farmers is forecast to increase by around 3.8 per cent in 2005-06. Farm costs are forecast to increase by 4.5 per cent in 2005-06 to $31.1 billion.

Looking in more detail at outcomes for 2004-05, total fuel costs for the Australian agricultural sector in 2004-05 were estimated to be around $2 billion, representing around 7 per cent of the total value of farm costs. Reflecting high forecast oil prices, expenditure on fuel in 2005-06 is forecast to increase by 20 per cent. Prices of nitrogenous fertilisers, chemicals, freight rates and contract expenses are also affected by high oil prices. Aggregate expenditure on fertiliser (all types) was $1.9 billion in 2004-05 and chemicals $1.7 billion. For 2005-06, expenditure on fertiliser and chemicals is forecast to increase by 6 per cent and 3 per cent respectively.

Minerals and energy

World spot prices revised upward

Forecasts of average spot prices in 2005 and 2006 for most minerals and energy commodities have been revised upward from those presented in the June *Australian Commodities*. The exception to this is the outlook for nickel prices.

The largest revision to the price outlook has been made for crude oil. Prices of the commonly quoted West Texas Intermediate (WTI) crude oil were forecast to average around US$50 a barrel in 2005 before falling to around US$45 a barrel in 2006. However, the price of WTI crude oil is now forecast to average around US$58 a barrel in both 2005 and 2006.

Oil prices increased significantly in mid-2005, rising by over 30 per cent in the three months to August to average US$65 a barrel. The main underlying causes of the higher prices over the past few months have been supply disruptions resulting from adverse seasonal conditions in an environment of increasing concerns about the adequacy of global oil supply. Oil prices are forecast to remain relatively high over the remainder of 2005 and 2006 as only limited additional production capacity is expected to become available in the short term. While current high oil prices have provided incentives for oil producers to increase capacity, the expansion is expected to be gradual.

World production of aluminium, copper and zinc is now forecast to increase by a lesser amount than was previously expected. With demand forecasts remaining largely unchanged, available stocks are now forecast to decrease and prices increase in 2005-06.

However, the largest revision to ABARE's base metal price forecasts has been made to copper. Average copper prices were previously forecast to rise by 5 per cent to US$3000 a tonne in 2005 before falling by 24 per cent to US$2280 a tonne in 2006. However, prices are now forecast to rise by 20 per cent to US$3435 a tonne in 2005, before falling by 19 per cent to US$2770 a tonne in 2006. Copper prices in the first eight months of 2005 averaged much higher than expected, at around US$3440 a tonne. In mid-2005 there were a number of disruptions to refined copper

production caused by labor disputes and natural disasters. With stocks already at historically low levels, the losses to production placed significant upward pressure on prices.

The revisions to forecast aluminium prices in 2005 and 2006 are also significant. Prices were previously forecast to fall by 8 per cent to around US$1650 a tonne in 2006, but are now forecast to fall by 3 per cent to US$1780 a tonne. The increase to the price forecasts mainly reflects lower growth in aluminium output associated with smelter closures in Europe and lower growth in China's production and exports (because of the removal of tax concessions).

Zinc price forecasts have been revised upwards for both 2005 (from US$1240 a tonne to US$1295 a tonne) and 2006 (from US$1170 a tonne to US$1315 a tonne). World zinc mine production was disrupted in early to mid-2005 by a range of factors including industrial action (in Canada and Peru), flooding (in Japan) and equipment failure (in Australia and Ireland). The subsequent fall in the availability of ores and concentrates has constrained production of zinc metal and placed upward pressure on metal prices.

Zinc is the only major metal for which an increase in prices is forecast for 2006. While consumption growth is still forecast to moderate in 2006, a less positive assessment of mine expansion plans has led to a decrease in the forecast level of world zinc metal production. As a result, zinc metal stocks are now forecast to decline in 2006 and prices are forecast to rise.

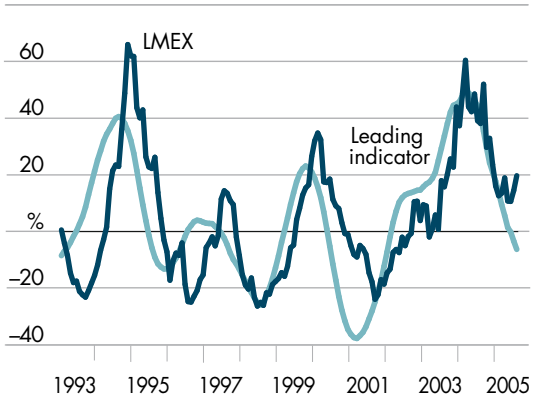
Prices for other minerals and energy commodities that are traded on a spot basis are still forecast to fall in 2006. Given the assumption of lower growth in world industrial activity over the period to 2006, demand growth is forecast to slow for most minerals and energy commodities. In particular, lower economic growth in the United States and associated lower growth in China (through lower growth in demand for their exports) is expected to contribute to this slowdown. As a result, the forecast growth in supply for most minerals and energy commodities (while lower than previously expected) is forecast to be sufficient to push prices lower in 2006.

The profile of forecast price declines in late 2005 and early 2006 is supported by ABARE's leading indicator of base metal (including aluminium) prices — as represented by the London Metals Exchange's index of base metal prices: the LMEX.

World gold prices have also been revised upwards by a modest amount; prices are now forecast to average US$414 an ounce in 2006 compared with the previous forecast of US$400 an ounce. Forecast gold prices have been revised up mainly because of a positive outlook for gold consumption. In particular, higher incomes in the Middle East (associated with higher oil prices) and in India (after a positive monsoon season) are expected to boost jewellery consumption.

LMEX series and leading indicator

Monthly percentage change year on year, ended August 2005



The forecast contract prices for Japanese financial year (JFY) 2006-07 for iron ore, thermal and metallurgical coal remain largely unchanged. Forecast increases in production are expected to allow world stocks to increase sufficiently to place downward pressure on these negotiated prices. Iron ore contract prices are forecast to fall the most (by 18 per cent in JFY 2006-07), reflecting relatively higher expected increases in supply capacity. Forecasts of relatively smaller additions to world coal production are reflected in the lower forecast declines in contract prices for metallurgical and thermal coals (down by 14 per cent) in JFY 2006-07.

Australian mine output to rise in 2005-06

Following a rise of 4.5 per cent in 2004-05, the total volume of Australian mine production is forecast to rise by 5.2 per cent in 2005-06, comprising a rise of under 4 per cent for energy minerals and almost 7 per cent for metals and other minerals.

The forecast increase in the output of energy minerals in 2005-06 is supported mainly by expected rises in production of crude oil and natural gas. Crude oil and condensate production is forecast to increase by 7 per cent, reflecting higher output from Santos' new 100 000 barrels a day Mutineer/Exeter project in the Carnarvon basin in Western Australia, and the expected startup in early 2006 of the 20 000 barrels a day Basker–Manta oilfield in the Gippsland basin in Victoria.

Natural gas production is also forecast to increase (by 10 per cent) in 2005-06, underpinned by higher output from the North West Shelf's fourth LNG train and the startup in 2006 of the new Darwin LNG plant.

The forecast 6.8 per cent increase in Australian production of minerals and metals is expected to come mainly from higher output of iron ore, alumina and nickel. The forecast rise in iron ore output of around 9 per cent mainly reflects the commissioning of new production capacity at Rio Tinto and BHP Billiton operations in Western Australia.

Australia's alumina output is forecast to rise by around 6 per cent in 2005-06, as production ramps up from Comalco's new greenfield alumina refinery at Gladstone and existing capacity expands at the Alcoa and Worsley refineries in Western Australia. Nickel mine output is forecast to rise by 7 per cent in 2005-06, reflecting production increases at several mines in Western Australia, including the Sally Malay and Lake Johnston Project mines.

CROPS

mixed outlook for grains

Leanne Lawrance, Stuart Kinsella and Frank Drum

Wheat

With lower world supplies of wheat and demand remaining largely unchanged, world wheat prices are forecast to increase by almost 3 per cent in 2005-06. The world indicator price for wheat (US hard red winter, fob Gulf) is forecast to average US$158 a tonne in 2005-06, compared with an average price of US$154 a tonne in 2004-05.

Consistent with movements in world grain prices, the pool price for Australian premium white (APW) wheat in 2005-06 is forecast to increase by 3.5 per cent to average A$205 a tonne.

World supplies declining in 2005-06

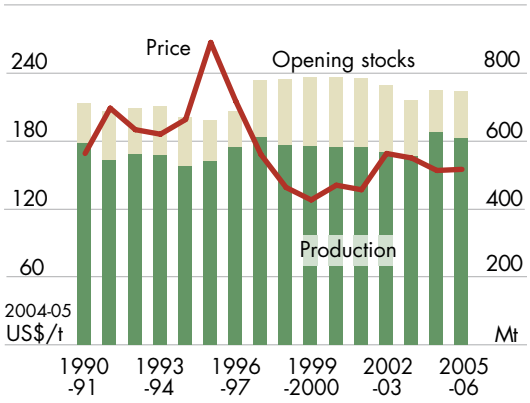
With the harvest of northern hemisphere wheat crops well under way, world wheat production in 2005-06 is forecast to be 608 million tonnes, down 15 million tonnes from the record of the previous season.

Production in the European Union — the world's largest wheat producer — is forecast to decline by around 7 per cent in 2005-06. Seasonal conditions have been variable across the European Union, with Italy, Greece, Spain and Portugal experiencing drought conditions. The hardest hit by the drought has been Spain, with production expected to be 50 per cent lower than in the previous season. In contrast, growing conditions in Germany and Hungary have generally been favorable, with production forecast to remain above the five year average. However, rainfall in late July during harvest in these countries is likely to have an adverse impact on the quality of the harvest.

Balanced against the decline in the European Union is forecast higher production in some of the other major producers including China and the United States. In China, heavy rains in July delayed the harvest of winter wheat in some regions. However, at the same time the rains aided spring wheat crops. Overall, total wheat production in China is forecast to increase by 3 per cent in 2005-06

In the United States the harvesting of winter wheat is approaching completion, with total production expected to increase by nearly 2 per cent. While US wheat production is forecast to increase, the ability to export wheat will be

World wheat



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hampered by the disruption to the operation of port facilities over the next few months caused by Hurricane Katrina (see 'Commodity outlook' for more detail).

Durum production lower

World durum wheat production is forecast to fall by around 15 per cent from the record of the previous year. Drought conditions in the EU countries of Spain and Italy have reduced durum production considerably. Reflecting this, durum production in the European Union is forecast to decline by around 35 per cent in 2005-06.

Canada, on average, produces around 13 per cent of the world's durum wheat. Production in 2005-06 is forecast to decline by 3 per cent to around 4.8 million tonnes. Although production in Canada is forecast to fall, it would still be the fourth highest production level on record.

In Australia, durum production in 2005-06 is forecast to be lower than the 2004-05 crop. Durum wheat is more susceptible to drought than other milling grades of wheat, so with the dry and late start to the 2005-06 winter cropping season in Australia, durum production is forecast to fall.

World demand largely unchanged

World wheat consumption in 2005-06 is forecast to remain close to that of the previous year at around 613 million tonnes.

Feed demand growing in Russia and the Eurpean Union, but falling in China

Total feed wheat consumption is forecast to be 106 million tonnes in 2005-06, 1 per cent lower than 2004-05.

Increased feed wheat demand by the Russian Federation is being driven largely by an expected increase in pig and poultry production. Russian feed wheat consumption is forecast to increase by around 7 per cent in 2005-06. In the European Union, a large supply of feed wheat is expected to lead to lower prices when compared with other grains, and a consequent rise in consumption.

Demand for feed wheat in China is forecast to fall by around 500 000 tonnes in 2005-06 as livestock producers increase the use of corn and oilseed meals in livestock rations in preference to wheat because of the higher price of wheat compared with other feed grains.

Food wheat demand continuing downward trend

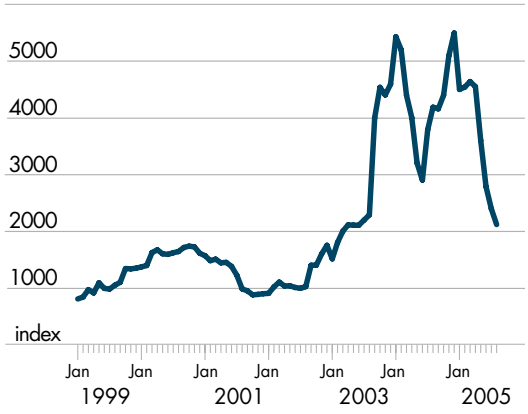
The use of wheat for food purposes is expected to continue the trend decline in per person consumption and is forecast to decline by less than 1 per cent in 2005-06. Worldwide wheat consumption per person has fallen from 71 kilograms in 1997-98 to a forecast 63 kilograms in 2005-06. The decline in food wheat consumption principally reflects changing dietary habits, as consumption of higher protein foods and meat increases, particularly in rapidly developing countries such as China. China's per person wheat consumption has declined from 78 kilograms per person in 1997-98 to a forecast 71 kilograms per person in 2005-06.

Trade volumes relatively unchanged

World trade in wheat is forecast to be around 107 million tonnes in 2005-06, slightly lower than in 2004-05.

At the time of writing the full damage to the Port of New Orleans (the largest wheat exporting port in the United States) was still being assessed. However, it is clear that the damage will cause some delays with US wheat exports over the next few months. If US exports were to be significantly reduced by the disrup-

Baltic dry index
Monthly, ended August 2005



tions to port facilities, world prices would likely be higher than currently expected.

Wheat imports by Brazil, Turkey, Iraq and north Africa are forecast to increase in 2005-06, following reduced wheat harvests in these countries. China is likely to import less wheat in 2005-06 following a better harvest, although imports are forecast to remain high. World global wheat trade is forecast to fall slightly, and the share of trade by the major five exporters is forecast to fall to 77 per cent, from 80 per cent in 2004-05, as competition from 'nontraditional exporters' such as Kazakhstan, the Russian Federation and the Ukraine increases.

A feature of world bulk commodity markets has been the escalation in freight rates since mid-2003. The world freight rate indicator — the Baltic dry index — reached a peak in December 2004 but has since been on a sharp downward path. This decline in the Baltic dry index has coincided with reductions in China's import demand, additional shipping capacity and improved port facilities. Shipping freight rates are expected to ease further in 2005-06, compared with the high rates in 2004-05. This decline could potentially moderate the forecast increase in world wheat prices.

Improved outlook for Australian wheat production

Widespread above average rainfall was received in mid–late June 2005 across much of the grains belt in eastern Australia and South Australia, improving the outlook for wheat production. With a dry and warm summer and autumn experienced in these states, the rainfall helped in alleviating the dry period and provided an opportunity for late plantings of wheat in these regions. Australia's wheat production is forecast to be 19.7 million tonnes in 2005-06, around 3 per cent lower than production in the previous year.

In Western Australia, above average rainfall in May and June provided an opportunity for wheat to be sown on full soil moisture profiles. However, July was one of the driest on record in Western Australia and wheat crops begun to suffer from moisture stress. The rainfall in mid-late August was timely in alleviating moisture stress of crops, particularly in Western Australia.

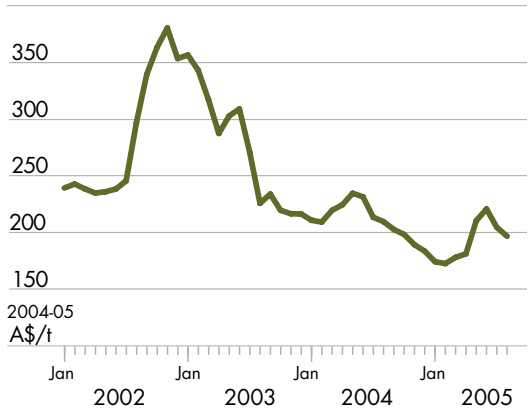
Wheat outlook

		2003-04	2004-05 s	2005-06 f	% change
World					
Production	Mt	555	623	608	*– 2.4*
– China	Mt	87	91	94	*3.3*
– EU25	Mt	106	136	126	*– 7.4*
– India	Mt	65	72	72	*0.0*
– Russia	Mt	34	45	47	*4.4*
– United States	Mt	64	59	60	*1.7*
Consumption	Mt	593	613	613	*0.0*
– human	Mt	429	434	433	*– 0.2*
– feed	Mt	94	107	106	*– 0.9*
Closing stocks	Mt	127	137	132	*– 3.6*
Trade	Mt	102	108	107	*– 0.9*
Exports					
– Argentina	Mt	7	13	8	*– 38.5*
– Australia	Mt	15	16	16	*0.0*
– Canada	Mt	16	15	16	*6.7*
– EU25	Mt	10	13	15	*15.4*
– United States	Mt	32	28	27	*– 3.6*
Price	US$/t	160	154	158	*2.6*
Australia					
Area	'000 ha	13 067	11 991	11 359	*– 5.3*
Production	kt	26 132	20 376	19 703	*– 3.3*
Exports	kt	15 073	15 777	15 557	*– 1.4*
– value	A$m	3 475	3 488	3 538	*1.4*
APW pool return	A$/t	233	198	205	*3.5*

See back tables for details. **s** ABARE estimate. **f** ABARE forecast.

Australian feed wheat price

Monthly, ended August 2005



The timing of spring rainfall will be critical, in all states, for the wheat crop to reach its current potential.

As rain falls, feed wheat prices fall

As the above average rainfall in June 2005 improved the outlook for wheat production (and the prospects for pasture availability by livestock industries) feed wheat prices began to decline. Feed wheat prices reached a high of $230 a tonne in early June 2005 and since then have been steadily declining. In late August, feed wheat prices had fallen to $196 a tonne, the lowest August price for feed wheat since 2001. If seasonal conditions remain favorable, it is expected that feed wheat prices in 2005-06 will be lower than the average price of $195 a tonne achieved in 2004-05.

Coarse grains

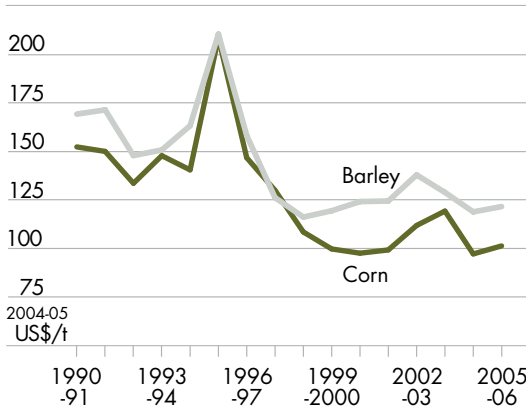
The world indicator price for coarse grains (US corn, fob Gulf) is forecast to increase by 7 per cent to average around US$104 a tonne in 2005-06. The increase in the world indicator price reflects a decline in production of coarse grains from the record levels achieved in 2004-05 in major producing countries, including the United States, the European Union and China. World barley prices are also forecast to increase in 2005-06, reflecting lower production, particularly in the European Union.

The outlook for world prices of coarse grains remains similar to that discussed in June 2005. The world indicator price for coarse grains on world markets in 2005-06 has been revised upwards marginally, which reflects expectations of lower corn production in the United States than forecast in June.

However, there is some upside risk to the forecast world prices of coarse grains after Hurricane Katrina devastated the city of New Orleans in the United States (see 'Commodity outlook' for more detail).

Although the full effects of Hurricane Katrina are yet to be quantified, it is likely that US exports of corn will be disrupted over the next few months. While domestic corn prices are expected to fall, the extent of the impact on world prices is dependent on the time it takes to return the Port of New Orleans to full processing capacity, the level of stocks held by major consuming countries and the extent of the damage to the port and surrounding infrastructure. It may be some time before this is known.

World corn and barley prices



World production second highest on record

World production of coarse grains is forecast to decline by 8 per cent in 2005-06 to 931 million tonnes. However, this would still be the second highest world crop ever recorded. The smaller crop reflects poorer seasonal conditions in major producing countries than in 2004-05, where ideal growing conditions contributed to record yields and record production.

In the United States — the world's largest producer and exporter of corn — total production is forecast to decline by 12 per cent despite a higher area sown to corn. Hot and dry conditions throughout many regions of the US corn belt in June and July have negatively affected crop growth and development. The overall condition of the current corn crop is not considered to be as good as at the same point in 2004-05, leading to expectations of lower yields and a decline in US corn production in 2005-06. While rainfall in mid-August in many areas of the corn belt relieved the dry conditions somewhat, it is

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uncertain whether yields will improve given the lateness in the growing season.

Despite lower domestic production, exports of corn are forecast to rise by around 9 per cent in 2005-06 as production in two of the major export competitors of the United States — China and Argentina — is also forecast to decline in 2005-06. Increased demand for feed grains in China is also expected to limit the availability of corn for export from China.

Production of corn in China is forecast to decline by 2 per cent in 2005-06. This is despite an increase in the area planted, as yields are expected to decline from those achieved in 2004-05. Hot and dry weather in China in June and heavy rain in some corn producing areas in early July are the major contributors to the forecast of lower yields and a decline in production.

In the European Union, dry conditions in Spain, Portugal and some parts of France and Italy are expected to result in lower yields in 2005-06 and lead to a decline in barley production.

In the Russian Federation, cool weather and heavy rainfall delayed the sowing of seed and has contributed to expectations that a lower crop area will be harvested in 2005-06. The current seasonal conditions are reported to be supporting good crop development; however, barley production is forecast to decline marginally in 2005-06, reflecting the lower area under crops.

Poor seasonal conditions in Ukraine, both in the leadup to sowing and during the growing season are expected to lower yields and lead to lower barley and corn production. Barley production is forecast to decline by around 3 million tonnes in 2005-06; however, with expectations of lower domestic consumption in response to rising feed prices, barley exports are forecast to remain similar to 2004-05.

Coarse grains outlook

		2003-04	2004-05 s	2005-06 f	% change
World					
Production	Mt	914	1 010	931	*– 7.8*
– barley	Mt	143	153	133	*– 13.1*
– corn	Mt	624	709	657	*– 7.3*
Consumption	Mt	946	973	960	*– 1.3*
Closing stocks	Mt	136	173	144	*– 16.8*
US corn price (fob Gulf, Sept–Aug)	US$/t	116	97	104	*7.2*
Australia					
Area	'000 ha	6 815	5 525	5 803	*5.0*
– barley	'000 ha	4 477	3 589	3 806	*6.0*
– sorghum	'000 ha	734	659	723	*9.7*
Production	kt	15 630	10 186	10 760	*5.6*
– barley	kt	10 382	6 454	6 640	*2.9*
– sorghum	kt	2 009	1 748	1 980	*13.3*
Exports	kt	5 782	7 187	4 511	*– 37.2*
– value	A$m	1 373	1 412	1 067	*– 24.4*
Feed barley price	A$/t	182	169	176	*4.1*
Malting barley price	A$/t	214	198	205	*3.5*

See back tables for details. **s** ABARE estimate. **f** ABARE forecast.

Slightly lower demand for coarse grains in 2005-06

World consumption of coarse grains is expected to decline marginally in 2005-06 to around 960 million tonnes. Despite higher industrial use of corn, lower demand for coarse grains as feed grains in major countries such as the United States and the European Union is expected to result in slightly lower world consumption in the coming season.

In the United States, demand for feed is forecast to decline from the 2004-05 level, primarily reflecting the rebuilding of cattle stocks. As a higher number of female cattle are expected to be retained for breeding, there will be a lower number of cattle in feedlots in 2005-06.

In the European Union, lower availability of corn and barley for feed is expected to lead to higher prices for these commodities relative to wheat. As a result, demand for coarse grains in the European Union is forecast to decline in 2005-06, while demand for feed wheat is expected to rise. A similar outcome is expected in the Ukraine due to lower coarse grains production.

In contrast to the United States and the European Union, demand for corn in feed is forecast to increase in both Brazil and China in 2005-06. In Brazil, the poultry and pork industries are rapidly expanding. As domestic supplies are low after a drought affected crop in 2004-05, higher imports are expected for the remainder of 2005 until the 2005-06 crop is harvested. Corn production

in Brazil is forecast to increase to around 44 million tonnes in 2005-06.

In China, higher incomes are leading to increased demand for pork and poultry, resulting in increased demand for feed grains. As a consequence, China may soon need to import corn despite the significant levels of stocks currently held in the country.

Demand for malting barley is also expected to increase in countries such as China and the Russian Federation in 2005-06, where strong economic growth and higher incomes are leading to a change in dietary habits, particularly an increase in beer consumption.

Industrial use of corn is forecast to increase in 2005-06, particularly in the United States. The main driver behind this increase is high world oil prices, which is leading to increased demand for corn in the manufacture of corn based ethanol. Ethanol can be used as an octane enhancer or an extender of traditional oil based fuels. As investment in the construction of new ethanol production facilities continues, it is anticipated that a higher proportion of the corn crop in the United States will be diverted toward ethanol production over the medium term.

Coarse grains major producers and exporters

		2003 -04	2004 -05 s	2005 -06 f	% change
Corn					
Production					
– Brazil	Mt	42.0	35.5	44.0	*23.9*
– China	Mt	115.8	130.0	127.0	*– 2.3*
– EU25	Mt	39.9	53.4	47.6	*– 10.9*
– United States	Mt	256.3	299.9	262.9	*– 12.3*
Exports					
– Argentina	Mt	10.4	14.2	13.5	*– 4.9*
– China	Mt	7.6	7.0	3.0	*– 57.1*
– United States	Mt	48.8	46.0	50.0	*8.7*
Barley					
Production					
– Canada	Mt	12.3	13.2	12.3	*– 6.8*
– EU25	Mt	54.8	61.7	52.3	*– 15.2*
– Russia	Mt	18.0	17.2	16.5	*– 4.1*
Exports					
– Australia	Mt	7.0	4.9	4.5	*– 8.2*
– EU25	Mt	1.0	3.3	3.3	*0.0*
– Russia	Mt	1.7	1.0	0.8	*– 20.0*
– Ukraine	Mt	2.6	4.0	4.0	*0.0*

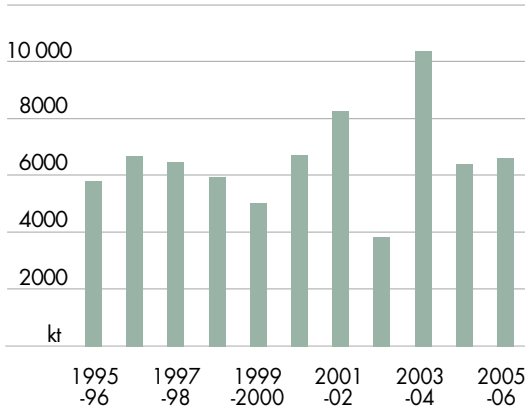
See back tables for details. **s** ABARE estimate. **f** ABARE forecast.

Improved outlook for barley production in Australia

Above average rainfall in the eastern states and South Australia in mid-June has improved the outlook for the production of coarse grains in Australia. Although dry conditions have returned in most regions since this time, the break in the season allowed much of the winter crop to be planted, albeit late, and also assisted the emergence and development of crops that had been dry sown.

Total barley production

Australia



The total area sown to coarse grains in 2005-06 is estimated to have increased by 5 per cent from the previous year to total 5.8 million hectares. This in part reflects the late break in the season in the south eastern states, which resulted in a higher area sown to barley than previously forecast in June. Many growers planted barley because the optimal time for sowing canola and wheat had passed. Despite the good rainfalls in June, subsoil moisture levels still remain low in many regions and good spring rainfall will be critical for continued crop growth and development. Reflecting these factors, coarse grains production is forecast to total around 10.8 million tonnes in 2005-06, up nearly 6 per cent from 2004-05.

Barley production in Australia is forecast to increase by 3 per cent in 2005-06. Although

barley production is forecast to decline by around 23 per cent in New South Wales, higher production in Western Australia and Victoria is expected to lead to higher overall production for Australia. Above average winter rainfall in northern New South Wales and Queensland is expected to result in an increase in the area planted to sorghum in 2005-06 and subsequent increase in production.

Domestic prices for barley are still expected to rise in 2005-06 as demand for feed grains is expected to rise, particularly with a relatively high number of cattle on feed. Feed barley prices are forecast to increase by 4 per cent to $176 a tonne in 2005-06, while malting barley prices are also forecast to increase by 4 per cent to $205 a tonne.

Oilseeds

The world indicator price (soybeans, cif, Rotterdam) for oilseeds is forecast to decrease by 5 per cent to average US$262 a tonne in 2005-06. Since June 2005, the world indicator price has decreased by 10 per cent. Despite a forecast increase in world of oilseeds consumption, world prices are forecast to decline, as world supply increases in 2005-06.

Oilseeds outlook

		2003-04	2004-05 s	2005-06 f	% change
World					
Production	Mt	334	379	377	*– 0.5*
Consumption	Mt	336	365	374	*2.5*
– oilseed meal	Mt	189	201	209	*4.0*
– vegetable oil	Mt	99	106	111	*4.7*
Closing stocks	Mt	24	38	41	*7.9*
Soybeans indicator price	US$/t	321	277	262	*– 5.4*
Australia					
Total production	kt	2 409	2 644	2 059	*– 22.1*
– winter	kt	1 740	1 571	1 161	*– 26.1*
– summer	kt	669	1 073	898	*– 16.3*
Canola					
Production	kt	1 703	1 533	1 125	*– 26.6*
Exports (Nov–Oct)	kt	1 202	999	718	*– 28.1*
Price (Nov–Oct) (delivered Melbourne)	A$/t	389	342	353	*3.2*

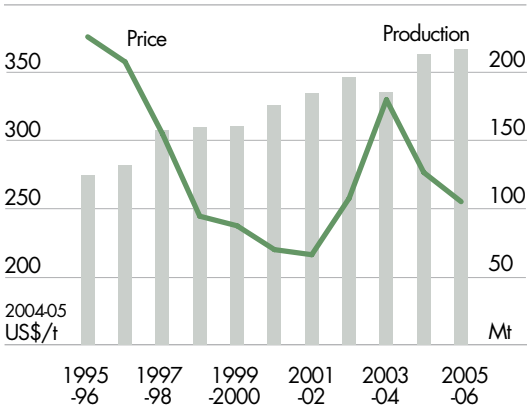
See back tables for details. **s** ABARE estimate. **f** ABARE forecast.

In Australia, lower domestic production and strong domestic demand are placing upward pressure on prices. The price of Australian canola is forecast to increase to average A$353 a tonne in 2005-06.

Small decline in world production

World production of oilseeds is forecast to decline by less than 1 per cent in 2005-06; however, total supplies are forecast to increase by around 3 per cent. In 2004-05, record production of the three major oilseeds — soybeans, canola and cottonseed — contributed to record opening season stocks of oilseeds in 2005-06.

World soybeans



Soybeans are the dominant oilseed grown in the world (over 50 per cent of production) and the United States is the largest producer, followed closely by Brazil. In 2005-06, soybean production in the United States is forecast to decline by around 9.5 million tonnes to 76 million tonnes as yields return to levels more consistent with long term averages.

At the time of writing the devastation from Hurricane Katrina was still being assessed (see 'Commodity outlook' for more detail). As with the other grains, it is expected that soybean exports will be disrupted by the damage caused to the ports and waterways in New Orleans and

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surrounding areas over the next few weeks and months.

An additional concern raised is that the strong winds associated with the hurricane may have spread soybean rust fungus further through the United States. Soybean rust is a windborne disease that affects photosynthesis and can reduce yields. If the disease was spread further by the hurricane, US growers could be faced with increased costs associated with spraying, as well as reduced yields over the medium term.

Brazil experienced particularly dry seasonal conditions in 2004-05. Assuming a return to average seasonal conditions, production is forecast to increase by around 22 per cent to 62 million tonnes in 2005-06. The area sown to soybeans in Brazil is forecast to increase by 1 per cent in 2005-06. The forecast increase is smaller than growth rates observed over the past five years, which have averaged around 10 per cent a year over this period.

The lower harvest in 2004-05 resulted in reduced farmer incomes and has left many farmers in a difficult financial situation. The lower incomes and declining world soybean prices are contributing to the lower growth rate in area planted to soybeans in Brazil.

Canola and cottonseed production also lower

World production of the other major oilseed crops, canola and cottonseed, is forecast to decline by 7 per cent and 9 per cent respectively in 2005-06.

In the European Union — the largest canola producer — production is forecast to decline by 6 per cent from the record harvest in 2004-05, as seasonal conditions have been less than favorable. In Canada — the third largest canola producer and the largest exporter — canola production is forecast to increase by 4 per cent. This reflects an increase in area sown and an improvement in seasonal conditions.

Favorable seasonal conditions in 2004-05 resulted in world cottonseed production increasing to a record high of 45 million tonnes. In China — the largest cottonseed producer — production in 2005-06 is forecast to fall by around 11 per cent, as yields are assumed to return to levels more consistent with long term averages. The Chinese Government has been providing incentives to promote grain production. In 2005-06 this has resulted in a 9 per cent reduction in cotton plantings, as growers increased the area sown to grains.

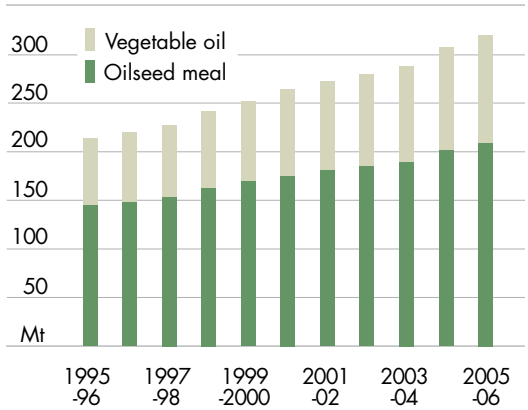
Demand remains strong

Despite an assumed slowdown in world economic growth in 2005 and 2006 demand for oilseeds and oilseed products is forecast to remain strong. World consumption of oilseeds is forecast to increase by 2.5 per cent to 374 million tonnes in 2005-06.

Growth in demand for oilseeds is strongly linked to growth in Asia, particularly China. China is the largest consumer of vegetable oils and the second largest consumer of oilseed meals behind the European Union. In 2005-06 consumption of both is forecast to increase in China. Dietary habits in China have been changing as incomes increase, resulting in increased demand for vegetable oil and high protein meats, such as pig and poultry. The pig and poultry sector uses a high volume of oilseed meals, and with increased production forecast for 2005-06, oilseed meal consumption in China is forecast to increase.

Vegetable oil demand is forecast to increase by around 5 per cent in 2005-06. Vegetable oil consumption has increased steadily over the past decade (average 5 per cent a year), largely

Vegetable oil and oilseed meal



owing to strong demand by the major developing countries in Asia, particularly China. Although economic growth is forecast to ease in China, it is still forecast to average around 9.2 per cent in 2005 and 8.3 per cent in 2006. In the coming year, vegetable oil demand in China is forecast to increase albeit at a slower rate than the previous year.

Australian canola production lower

The area sown to canola is estimated to have declined by 22 per cent to total 895 000 hectares in 2005-06. Total Australian canola production is forecast to be 1.1 million tonnes in 2005-06, 27 per cent lower than in 2004-05.

Widespread above average rainfall was received in mid-June 2005 across the Australian grains belt, helping to alleviate dry condition throughout eastern Australia and South Australia. While this rainfall was beneficial for canola crops that had been dry sown, it was too late to allow for additional plantings, as the optimal planting time for canola had passed.

Despite the June rainfall, soil moisture levels are still low throughout southern New South Wales, Victoria and South Australia (owing to the dry and warm summer and autumn). Good spring rainfall will be critical for the canola crop to reach its potential in these states. In Western Australia, canola production is forecast to increase by 19 per cent in 2005-06, reflecting the positive start to the cropping season in that state.

Lower Australia canola exports

Australia is the world's second largest canola exporter. In 2005-06 exports from Australia are forecast to fall by 28 per cent to around 718 000 tonnes.

Japan is Australia's largest export market and therefore changes in the Japanese market have implications for Australia's exports. On average 44 per cent of Australia's canola exports are destined for Japan. In 2005-06, Japan's consumption of oilseeds is forecast to increase marginally; however, imports by Japan are forecast to fall by 6 per cent as Japan's domestic production of oilseeds increases.

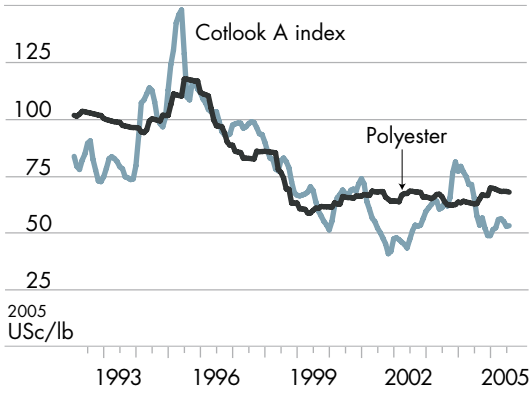
Cotton

With world consumption of raw cotton to marginally exceed world production in 2005-06, the world cotton price (Cotlook 'A' index) is forecast to increase by 5 per cent to average US55c/lb. A 33 per cent increase in year end stocks in 2004-05 is expected to limit any substantial upward movements in the world cotton price.

In 2005-06, net imports of raw cotton in China are expected to double to around 3 million tonnes, as domestic consumption increases and a lower planted area leads to a decline in domestic production.

World polyester and cotton prices

Monthly, ended July 2005



Prices to rise in 2005-06

In April 2005 the Cotlook 'A' index reached the highest monthly average in ten months, of US56c/lb, reflecting market expectations of a lower area planted to cotton in 2005-06. However, larger than anticipated cotton plantings in the northern hemisphere in 2005-06, and a large increase in 2004-05 year end stocks, have led to the cotton price declining to US53.5/lb in August 2005.

World production to decline in 2005-06

In 2005-06, world cotton production is forecast to fall by over 7 per cent to 24.1 million tonnes, based on both a decline in the area planted to

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cotton and forecast lower yields. However, world cotton production in 2005-06 is still forecast to be the second largest crop on record.

The area planted to cotton is expected to fall by only 3 per cent in 2005-06, to 35 million hectares. This is despite world cotton prices being 10 per cent (April 2005) below the ten year average of US62.8c/lb in the leadup to the planting of cotton in India, Pakistan and China. Typically, world plantings of cotton are closely related to global price movements with the planting response generally lagging price movements, by around twelve months. For example, following the 28 per cent decline in the Cotlook 'A' index in 2001-02, the area planted to cotton in 2002-03 fell by 10 per cent. However, high yields from the 2004-05 cotton crop, particularly in India and Pakistan, have offset declining world cotton prices, maintaining cotton producers' incomes and subsequently sustaining the incentive for producers to plant cotton rather than alternative crops in these areas.

The United States and European Union act to slow textile imports from China

Following the expiry of the Multifibre Agreement at the end of 2004, production of clothing and textiles in China, India and Pakistan has increased strongly. This has increased the derived demand for raw cotton. Over the past five years, cotton consumption in these countries has increased by 41 per cent.

The rapid expansion in China's textile trade, competing with US and EU domestic textile producers, has led to the United States and European Union imposing safeguard measures on imports of textiles and clothing from China. Under WTO rules, during the first twelve years of China's integration into the WTO (admitted as a member in 2001) member countries are permitted to impose safeguard measures, where it can be demonstrated that Chinese imports threaten to cause market disruption.

Over the past four months, the Committee for the Implementation of Textile Agreements (CITA) has announced affirmative decisions in eight safeguard cases, allowing the imposition of safeguard measures against eight categories of clothing from China. According to the American Manufacturing Trade Action Coalition, as of June 2005, China held a 32 per cent share of the US textile and apparel import market, up from 23 per cent a year earlier.

These safeguard measures allow the United States to limit growth in textile imports from China (in the eight approved categories) to 7.5 per cent a year. Since these measures were applied, the United States has imposed embargoes on six of the eight categories covered by safeguard provisions — with the rapid expansion in Chinese imports already exceeding the import growth limit. In an effort to avoid further restrictions, the Chinese Chamber of Commerce for Import and Export of Textiles has issued alerts to domestic textile firms warning them to suspend the export of six lines of textile products to the United States.

However, the US Government is currently considering a further five cases. In early August 2005, CITA announced that it was extending the period for making decisions on these cases until the end of August. This extension was made to allow consultation with domestic textile and apparel industries and members of Congress concerning whether to pursue a broader agreement with China on imports of Chinese textile and apparel products to the United States.

In mid-June 2005 the European Union and China signed an agreement to manage the growth of imports of Chinese textiles to the European Union until 2008. The agreement on ten product categories of concern limits growth in these categories to between 8 per cent and 12.5 per cent a year for 2005, 2006 and 2007. Already, import quota limits have been exceeded in two categories, with the EU imposing embargoes against any further import of these categories.

In early September 2005, the US Department of Commerce announced that the United States will increase restrictions on imports of textiles from China, after talks between the two countries did not lead to an agreement by China to voluntarily reduce textile exports. As of mid-September, negotiations between China and the European Union over import allowance levels were still being conducted.

Planted area to increase in India

In India, the area planted to raw cotton in 2005-06 is estimated to have increased by 3 per cent to 9.3 million hectares. Around a quarter of the area planted to cotton is estimated to have been planted to the higher yielding Bt cotton (in comparison, the area planted in 2004-05 was around 6 per cent). However, despite an increase in the area planted to Bt cotton in 2005-06, less favorable seasonal conditions are forecast to result in yields declining by 11 per cent from 2004-05.

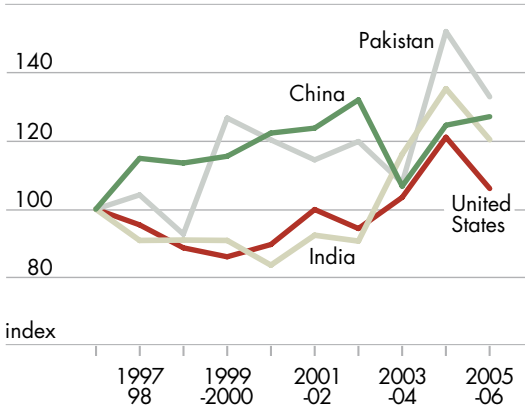
Production to fall in the United States

The area of cotton planted in the United States is estimated to have increased by over 4 per cent in 2005-06 to 5.5 million hectares. Offsetting an increase in the planted area is an expected 12 per cent decline in yields, reflecting less favorable seasonal conditions in 2005-06 (yields reached record levels in 2004-05). While production is forecast to fall by 8 per cent to 4.7 million tonnes in 2005-06, this will still be the second largest crop on record.

Shift to cereals continues in China

The area planted to raw cotton in China in 2005-06 is estimated to have fallen by 13 per cent to around 5 million hectares, as growers increase the area planted to winter cereal crops. China's government is encouraging higher domestic grain production in order to increase food security, with grain producers receiving seed subsidies, tax benefits and direct payments. The reduced area planted to cotton, coupled with lower expected yields, is forecast to result in a 13 per cent fall in raw cotton production to 5.5 million tonnes in 2005-06.

Cotton yields



Seasonal conditions restrict Pakistan production

In Pakistan, unfavorable seasonal conditions in a number of cotton growing regions is expected to lead to yields falling by around 13 per cent in 2005-06. Lower yields, combined with a small decline in planted area is forecast to result in a 14 per cent fall in raw cotton production to 2.1 million tonnes.

World demand to increase in 2005-06

In 2005-06, world raw cotton consumption is forecast to increase by nearly 4 per cent to 24.4 million tonnes. This higher consumption is supported, in part by forecast higher consumption in China, India and Pakistan as textile and clothing production in these countries continues to increase, following the removal of the Multi-fibre Agreement (MFA) in 2004. More recently, trade restrictions have been imposed by the United States and European Union on Chinese clothing and textile exports. However, the restrictions are not expected to affect the final demand for raw cotton (see box on the opposite page).

Cotton outlook

		2003 -04	2004 -05 s	2005 -06 f	% change
World					
Production	Mt	20.7	26.0	24.1	*– 7.3*
Consumption	Mt	21.5	23.5	24.4	*3.8*
Closing stocks	Mt	7.8	10.4	10.0	*– 3.8*
Stocks to consumption ratio	%	36.1	44.3	41.0	*– 7.4*
Cotlook 'A' index	USc/lb	69.5	52.4	55.0	*5.0*
Australia					
Area harvested	'000 ha	198	321	285	*– 11.2*
Lint production	kt	349	645	488	*– 24.3*
Exports	kt	459	410	574	*40.0*
– value	A$m	982	770	938	*21.8*

See back tables for details. **s** ABARE estimate. **f** ABARE forecast.

In addition, cotton prices are currently 28 per cent lower than prices of synthetic fibres (a substitute fibre for cotton), largely because high oil prices have placed upward pressure on synthetic prices. As a result, the use of cotton in mills is forecast to increase in 2005-06.

China's and India's consumption increasing

Despite the import quotas imposed by the United States and the European Union, China's consumption of raw cotton in 2005-06 is forecast to increase by 8 per cent to 8.9 million tonnes. With lower domestic production forecast for 2005-06, and consumption to increase, China's net imports are forecast to increase to around 3 million tonnes.

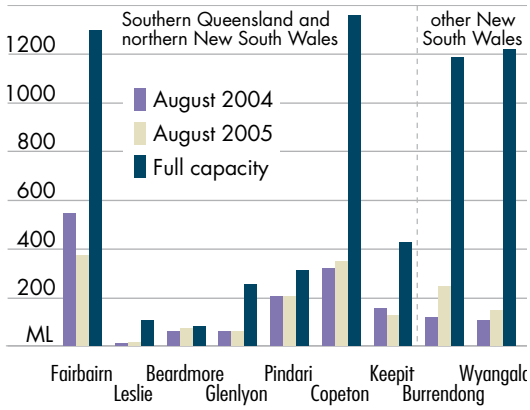
In 2005-06, cotton consumption in India is forecast to increase by 7.3 per cent to 3.5 million tonnes. However, import demand is expected to ease, as domestic mills use carryover stocks from the 2004-05 crop.

Recent rainfall boosts Australian production forecasts

In 2004-05 Australian cotton production increased by 85 per cent to 645 000 tonnes, mainly because of a large increase in yields. Favorable seasonal conditions for the majority of the season led to a substantial increase in yields on irrigated cotton in the majority of key cotton growing regions. For example, in New South Wales, average yields for irrigated cotton increased by 14 per cent to an average of 9.7 bales per hectare. In Queensland, yields on irrigated cotton increased by 23 per cent to an average of 8.9 bales per hectare.

Despite above average rainfall from the beginning of June to the end of August in most parts of northern New South Wales and central Queensland, dam storage levels in key cotton growing regions remain low. As a result, the area planted to cotton in 2005-06 is forecast to fall by 11 per cent to 285 000 hectares. For the area planted to cotton to increase significantly above 285 000 hectares, additional inflows into principal river systems, major dams in key cotton growing regions and on-farm storages will be required between now and the commencement of plantings.

Water storage and availability



Sugar

The world indicator price for raw sugar (New York no. 11 raw spot, fob Caribbean) is forecast to decline by 6 per cent from an estimated US10.5c/lb in 2004-05 to average US9.9c/lb in 2005-06. The forecast decline is smaller than was expected in June, reflecting higher than anticipated world oil prices and expectations that ethanol production in Brazil will now grow by around 12 per cent in 2005-06.

Sugar exports from Brazil — the world's largest producer and exporter of sugar — are forecast to increase by just 3 per cent in 2005-06 compared with 13 per cent in 2004-05 and 21 per cent in 2003-04. In recent months, strong demand for sugar from countries such as Pakistan and the Russian Federation has also contributed to higher world sugar prices.

Increases in world supply driven by Brazil and India

World sugar production is forecast to rise by over 4 per cent to 151 million tonnes in 2005-06, with higher production in Brazil and India expected to be the principal drivers of the increase.

In Brazil, dry weather particularly in the centre-south, the major cane growing region, has allowed crushing of sugar cane to proceed at a pace faster than in 2004-05. The dry conditions have also led to a higher content of sugar within

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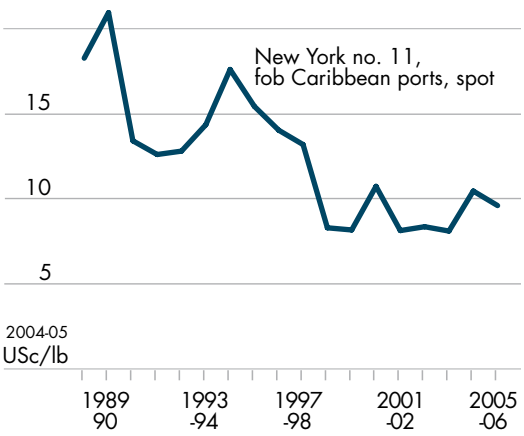
Raw sugar price



the cane. Total cane production in Brazil in 2005-06 is forecast to reach around 405 million tonnes, an increase of more than 6 per cent from the previous year.

A key determinant of the quantity of sugar produced in Brazil — the world's largest sugar producer and exporter — remains the influence of high world oil prices on Brazil's cane–ethanol industry. This is particularly so given the flexibility that Brazilian mills/distilleries have in switching between sugar and ethanol production. Sales of flex-fuel cars, which are able to use ethanol as a substitute or extender of traditional oil based fuels, have been so strong in Brazil that in May 2005, flex-fuel cars represented more than 50 per cent of total light vehicle sales. This is the first time that this has occurred and this upward trend is projected to continue for the foreseeable future. Consequently, demand for ethanol in Brazil is expected to continue to increase in 2005-06.

As world oil prices are forecast to remain high over the short term and as demand for ethanol is forecast to increase, expectations are that more than 50 per cent of the sugar cane produced in Brazil will be diverted toward ethanol production. With a record sugar cane crop forecast for Brazil in 2005-06, increases are expected in both sugar and ethanol production. While sugar production is forecast to rise by just over 3 per cent in 2005-06 to around 30 million tonnes, ethanol production is forecast to rise by 12 per cent to over 15 billion litres.

Brazil sugar production

The continued appreciation of the Brazilian currency, the real, against the currencies of major exporting countries such as Australia, Thailand and the European Union in 2005 is also expected to lower the competitiveness of Brazilian sugar exports. As a result, growth in sugar exports from Brazil in 2005-06 is forecast to be around 3 per cent, well below the growth rates of 21 per cent in 2003-04 and 13 per cent in 2004-05. The forecast weaker growth in Brazilian exports compared with previous years is, in turn, expected to provide support to world sugar prices in 2005-06.

Sugar outlook

		2003 -04	2004 -05 s	2005 -06 f	% *change*
World					
Production	Mt	142.3	144.8	151.0	*4.3*
Brazil	Mt	26.2	29.0	30.0	*3.4*
Consumption	Mt	144.3	147.2	150.5	*2.2*
Closing stocks	Mt	64.1	61.7	62.2	*0.8*
Change in stocks	Mt	– 1.8	– 2.4	0.5	
Price	USc/lb	7.9	10.5	9.9	*– 5.7*
Australia					
Area	'000 ha	448	420	405	*– 3.6*
Production	kt	4 994	5 196	5 021	*– 3.4*
Exports	kt	4 060	4 193	4 034	*– 3.8*
– value	A$m	982	1 374	1 268	*– 7.7*

See back tables for details. **s** ABARE estimate. **f** ABARE forecast.

In India, higher domestic sugar cane prices and favorable seasonal conditions are forecast to result in a 10 per cent increase in the area planted to cane in 2005-06. Total sugar production is forecast to increase by around 30 per cent to more than 18 million tonnes, around 5 million tonnes greater than in 2004-05. Heavy monsoon rains across the country throughout June and July have contributed to an improved outlook for sugar production in 2005-06. This comes after severe drought and insect infestations in the 2003-04 and 2004-05 crops restricted production.

But production falling in other key regions

In the European Union, sugar production is expected to decline 5 per cent to just over 20 million tonnes in 2005-06, as yields decline from the records achieved in 2004-05. Dry conditions in France in particular have had a negative impact on sugar beet development.

Reform of the domestic sugar industry within the European Union could result in significant structural change in the world sugar market over the medium term. In April 2005 the World Trade Organisation Appellate Body upheld a ruling made by the WTO Sugar Panel in September 2004 that the European Union must limit its sugar export subsidies to 499 million euros (A$940 million) on a total quantity of 1.273 million tonnes of sugar a year. The European Union was given a 'reasonable' period of time (around fifteen months) within which to implement these changes. There is a potential downside risk to the current outlook if a larger than anticipated quantity of EU subsidised sugar is released onto the world market in the short term. Over the medium term the reforms could result in EU subsidised sugar exports declining by as much as 4 million tonnes, which would (at least initially) provide positive support to world prices. This would also be a significant change in the world sugar market and, over the longer term, would benefit low cost suppliers.

In Thailand, drought is expected to result in a decline in sugar production for a third successive year. Sugar cane production is expected to fall by 8 per cent in 2005-06 to around 44 million tonnes. The dry conditions, particularly in north eastern areas of the country, have prompted some farmers to move out of sugar cane production and into the production of more drought resistant crops.

China and India to remain net importers in 2005-06

World sugar consumption in 2005-06 is forecast to increase by 2 per cent to around 151 million tonnes. Much of the increase can be attributed to developing countries such as China and India, where demand for sugar is expected to increase as a consequence of higher incomes.

In China, the expansion of domestic supply is limited by the availability of suitable land. Despite a small expected increase in the area sown to sugar cane in 2005-06, domestic consumption is again expected to exceed production. Reflecting this, in 2005-06, imports by China are forecast to remain similar to imports in 2004-05 at around 1.5 million tonnes.

Despite the improved outlook for sugar production, India is likely to remain a net importer in 2005-06 as stocks have been run down considerably in recent years. Domestic consumption is forecast to exceed domestic production for a third consecutive year. However, with increased domestic availability, India's imports of raw sugar are not expected to exceed the 2 million tonnes imported in 2004-05.

Strong import demand from Pakistan has been an important factor in the recent rise in world sugar prices. This is expected to continue in 2005-06. Unfavorable weather conditions are forecast to result in domestic production declining by up to 25 per cent in 2005-06 to just over 3 million tonnes, in comparison with domestic consumption of around 4 million tonnes. Domestic sugar prices have risen recently and have led to the government removing a ban on raw sugar imports from India. The ban was imposed four years ago to protect the domestic industry from a perceived threat of cheaper sugar from India. Imports are expected to rise in the next few months, particularly from India, to service the expected shortfall in domestic production.

Imports in 2005-06 by the Russian Federation — the world's largest importer of raw sugar — are forecast to be around 4 million tonnes,

largely the same as in 2004-05, as the country replenishes stocks that have been drawn down in recent years. However, import demand has been particularly strong in recent months and, along with increased demand from Pakistan, has been a contributing factor to the sustained rise in world sugar prices. Domestic consumption in the Russian Federation is expected to total around 6 million tonnes in 2005-06, while domestic production is expected to decline marginally from the 2.5 million tonnes produced in 2004-05.

Sugar production to decline in Australia

Wet conditions in most cane growing regions in Queensland in June and July are expected to result in a cane crop of around 34.7 million tonnes in 2005-06, similar to that in 2004-05 but higher than anticipated in early June. With similar production to that in 2004-05 also expected in New South Wales and Western Australia, total cane production in Australia in 2005-06 is forecast to be around 37.5 million tonnes. The wet conditions have resulted in delays in sugar cane crushing, with many centres in Queensland reporting that the quantity of cane crushed is well down on the same period in 2004-05. Dry weather for the remainder of the season is needed to ensure that crushing is finished by mid to late November before the onset of the wet season, particularly in northern cane growing areas of Queensland.

Total sugar production in Australia in 2005-06 is forecast to be around 5.0 million tonnes, down by more than 3 per cent from the previous year. This is despite the forecast of a similar sugar cane harvest to 2004-05. This reflects a CCS (commercial cane sugar) value of 13.4, slightly lower than in 2004-05 because of the wet conditions in Queensland. Australian sugar exports are forecast to decline by around 4 per cent to total around 4 million tonnes in 2005-06.

LIVESTOCK

lamb prices bouyant but wool and beef prices falling

Richard Perry, David Bailey and Robert Delforce

Sheep industry

Australian lamb saleyard prices are forecast to remain buoyant for the remainder of 2005 as they follow typical seasonal supply related patterns and export demand remains firm. Forecast lower beef prices in early 2006 are expected to feed through to lower lamb prices at that time. However, for 2005-06 as a whole, relatively tight lamb supplies are forecast to be reflected in a rise in prices of around 2 per cent to average 350 cents a kilogram.

Firm demand for ewes to rebuild flocks is also expected to provide positive support to prices. Saleyard mutton prices are forecast to increase by 11 per cent in 2005-06 to average 180 cents a kilogram.

This outlook, particularly for adult sheep, contrasts with ABARE's previous forecast (finalised prior to the June rainfall), when dry conditions, a lack of feed and a poor seasonal outlook were expected to result in higher slaughter rates and lower prices.

For wool, the outlook for prices is largely unchanged since ABARE's June assessment. The eastern market indicator price is forecast to average 718 cents a kilogram (clean) in 2005-06, down almost 4 per cent from 2004-05.

Sheep meat

The outlook for the Australian sheep industry improved considerably with widespread rainfall across much of Australia in June. However, with the poor seasonal conditions that existed prior to that in late 2004 and early 2005, especially in the eastern states, the number of lambs expected to be marked in 2005 is forecast to decline by around 4 per cent, down from 38.3 million in 2004-05 to 36.6 million in 2005-06. As a result, Australian lamb production in 2005-06 is also forecast to decline moderately and to total 339 million tonnes.

Lower beef prices to constrain lamb price increases

A critical factor in the current outlook for the Australian lamb market is the price of substitute meats, particularly beef. With beef trade assumed to resume between the United States and Japan in early 2006, Australian saleyard prices for beef are forecast to fall at that time.

The United States is expected to re-establish its trade position with Japan relatively quickly. As a result, some of Australia's beef that would otherwise have been exported is likely to be redirected to the Australian domestic market. This, in turn, is expected to place downward pressure on lamb prices.

Counterbalancing this trend, the demand for Australian lamb in key export markets such as the United States, Japan and China remains firm.

The United States is Australia's largest export market for fresh, frozen and chilled lamb exports. Other than US domestic producers, New Zealand is Australia's only other substantial competitor in the US lamb market.

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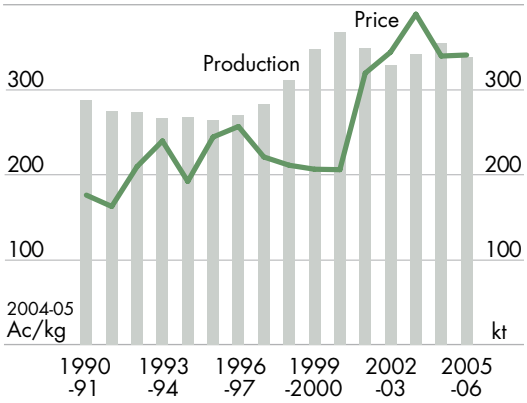
Australian lamb



The European Union is the most important export market for New Zealand's sheep meat producers, accounting for around 51 per cent of New Zealand's sheep meat exports, and most of its higher value cuts. In the United Kingdom, lamb prices remain high because of limited supplies in the wake of the outbreak of foot and mouth disease in 2001 and this situation continues to benefit New Zealand lamb exporters.

In the short term, competition from New Zealand in the US market is likely to be subdued. Following drought conditions in much of New Zealand in 2004-05, New Zealand sheep meat production is forecast to fall by around 1 per cent in 2005-06. New Zealand exporters are also expected to continue to target the lucrative European trade.

Combining these factors — the forecast decline in Australian lamb production, the forecast fall in beef prices, continued strong export demand and limited competition from New Zealand in the US market — saleyard prices for lamb are forecast to increase by 2 per cent in 2005-06.

Sheep meat outlook

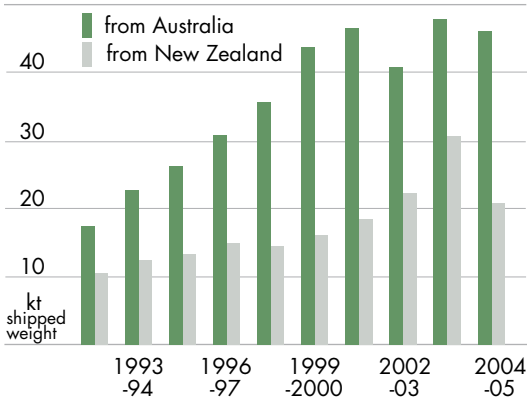
		2003 -04	2004 -05 s	2005 -06 f	% change
Slaughterings					
Sheep	'000	10 421	11 443	11 216	*– 2.0*
Lamb	'000	16 562	17 331	16 395	*– 5.4*
Production					
Mutton	kt	220	237	235	*– 0.8*
Lamb	kt	341	354	339	*– 4.2*
Exports (shipped weight)					
Mutton	kt	129	144	142	*– 1.4*
Lamb	kt	119	128	122	*– 4.7*
– to United States	kt	33	36	37	*2.8*
– value	$m	1 016	1 119	1 137	*1.6*
Live sheep	'000	3 843	3 233	3 686	*14.0*
Saleyard prices					
Mutton	Ac/kg	199	162	180	*11.1*
Lamb	Ac/kg	372	344	350	*1.7*

See back tables for details. **s** ABARE estimate. **f** ABARE forecast.

High prices forecast for adult sheep

Following the season break in June (earlier in the case of Western Australia), the demand for adult ewes increased sharply and provided positive support to saleyard prices in each of the key producing states. Prices have since eased in each of the state markets as yardings have increased, reflecting typical seasonal supply trends. However, with the seasonal outlook for the remainder of 2005 being favorable and the outlook for sheep meats generally being positive, demand from producers looking to rebuild flocks is expected to continue.

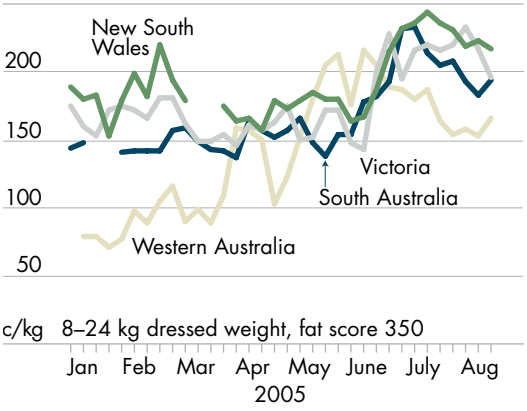
US sheep meat imports



Live sheep exports are also forecast to increase by around 14 per cent from 2004-05 levels, to reach around 3.7 million in 2005-06. Australia has memorandums of understanding in place with four key Middle Eastern markets (Kuwait, Jordan, Saudi Arabia and the United Arab

Ewe saleyard prices

Weekly, ended 25 August 2005



Emirates) for Australian livestock exports covering an estimated 75 per cent of sheep exports to the Middle East. Although forecast exports in 2005-06 are still well below the 5.8 million exported in 2002-03 (prior to the Cormo Express incident in 2003), the outlook is still for modest growth in the short and medium term, which will provide positive support for sheep prices, particularly in Western Australia.

Reflecting these factors, saleyard mutton prices are forecast to increase by 11 per cent to average 180 cents a kilogram in 2005-06.

Wool

The seasonal outlook for wool producers has improved significantly since ABARE's previous market assessment was released in June. The season breaking rainfalls received in mid-June have significantly improved the availability of feed, particularly in New South Wales, Victoria and South Australia, and the seasonal outlook for the remainder of 2005 is positive. However, the outlook for wool prices is largely unchanged from ABARE's June assessment. Wool prices are forecast to again average lower in 2005-06 as the demand for wool continues to follow a well established longer term trend decline.

Australian shorn wool production is forecast to fall in 2005-06 by 5000 tonnes to 470 000 tonnes (greasy) and reflects the generally poor seasonal conditions experienced prior to June 2005. The number of sheep shorn is expected to be lower in all states, especially in New South Wales, Queensland and Tasmania.

Demand continues to weaken

The wool–polyester price ratio has fallen steadily since early 2003, in large part reflecting the trend decline in wool prices. Oil is a key input to the manufacture of synthetic fibres, and with world oil prices forecast to remain high for the remainder of 2005, it is expected that this ratio will fall further in 2005 and 2006.

Despite this, the demand for wool is expected to continue to weaken in the short term. This reflects the effects of changing consumer preferences away from woollen apparel (particularly in the mature European and Japanese markets), competition from lower priced alternative fibres such as synthetics and cotton, and weakening demand in western Europe, mainly owing to lower economic growth.

Wool to polyester price ratio

Monthly, ended August 2005

Chinese currency revaluation

The other major (export) demand factor is China. Australia currently exports around half of its wool production to China. Australian Wool Innovation Limited has estimated that around 65 per cent of Australia's raw wool exports to

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China are absorbed by China's domestic market. This is significant when considering the potential impacts of a revaluation of China's currency because it implies that Chinese consumers are very important to the prospects for Australian wool exports, as are consumers of woollen apparel produced and exported by China using Australian wool.

The 2 per cent revaluation of the yuan in July is considered to be too small to yield any noticable effect on Chinese demand for Australian wool. However, future changes to the valuation of the yuan, if they occur, may have a noticable impact, lowering the price of Australian wool to Chinese importers (in Chinese currency terms) and improving its competitiveness with other fibres. Offsetting this effect would be a reduction in the competitiveness of Chinese woollen textiles and apparel exports in international markets. On balance, China's demand for Australian raw wool is forecast to increase as a result of China's currency revaluation, albeit modestly.

Wool clip changing to meet the market

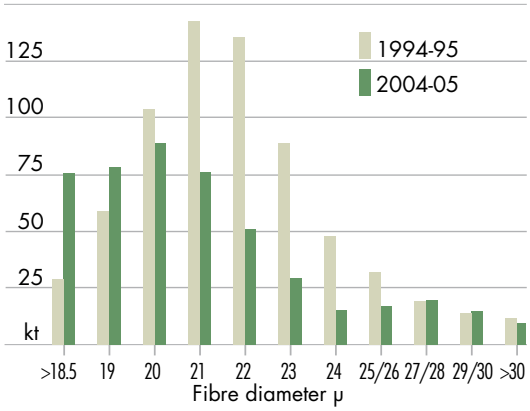
The need to find ways to improve returns to wool production in the face of declining farmers' terms of trade has also prompted producers to change the structure of the Australian sheep flock over the past decade, affecting both wool and sheep meat production.

Wool outlook

		2003-04	2004-05 s	2005-06 f	% change
Sheep numbers	million	101	104	106	*1.9*
Sheep shorn	million	105	110	109	*– 0.9*
Wool production (greasy)					
– shorn	kt	475	475	470	*– 1.1*
– other	kt	48	50	50	*0.0*
– total	kt	523	525	520	*– 1.0*
Total closing stocks					
– weight (greasy)	kt	156	157	160	*1.9*
Wool exports (balance of payments basis)					
– volume (gr. equiv.)	kt	475	515	499	*– 3.1*
– value	A$m	2 778	2 838	2 633	*– 7.2*
Market indicator (clean)					
– eastern	Ac/kg	820	746	718	*– 3.8*
– western	Ac/kg	792	724	696	*– 3.9*
Auction price (gr.)	Ac/kg	533	485	467	*– 3.7*

See back tables for details. **s** ABARE estimate. **f** ABARE forecast.

Wool production by micron



Advances in breeding technologies, such as artificial insemination and stud management software, have enabled wool producers to successfully breed for finer wool. In 1994-95 only 4 per cent of Australia's wool clip was under 18.5 microns. By 2004-05 this share had risen to almost 16 per cent. Currently, over 50 per cent of Australia's wool clip is 20 micron or finer, compared with 28 per cent just ten years previously.

Over the same period the proportion of the clip broader than 27 microns increased marginally, reflecting the significant shift to increased lamb production. Reflecting this, the proportion of merino ewes crossed to merino rams decreased from 74 per cent in 1996-97 to 63 per cent in 2004-05 and the proportion of merino ewes crossed to short wool rams increased from 4.7 per cent to 10 per cent.

Beef and veal

In 2005-06 the Australian weighted average saleyard price is forecast to decline, primarily reflecting reduced demand and prices from key export markets, particularly in Japan. However, with some improvement in seasonal conditions, the retention of cattle for herd rebuilding is expected to provide some support for saleyard prices. Overall, saleyard prices are forecast to

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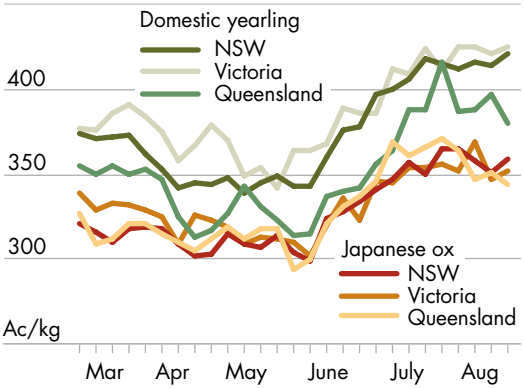
decline by 4 per cent to around 307 cents a kilogram.

Strong demand continues to drive current season prices

In 2004-05, the Australian weighted average saleyard price for beef rose by around 10 per cent to average 320 cents a kilogram. This was a reflection of higher returns from export markets as a result of increased demand in Pacific Rim markets and strong domestic demand from processors, lotfeeders and restockers.

Over the past two months, an improvement in seasonal conditions and reduced availability of cattle (as a result of herd rebuilding) has led to substantial increases in saleyard prices. In July the weighted average saleyard price of around 347 cents a kilogram was nearly 11 per cent higher than the corresponding period in 2004. In August, the saleyard price rose further and averaged 351 cents a kilogram for the month.

Australian saleyard prices
Weekly, ended 2 September 2005

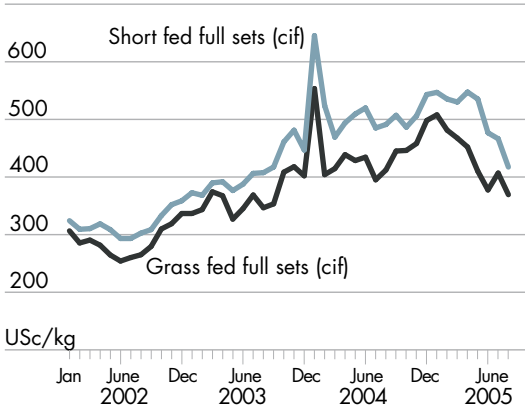


In 2005-06, the expected resumption of trade between the United States and Japan and domestic seasonal conditions are expected to be the major factors influencing saleyard prices in Australia.

Japanese demand for Australian beef expected to ease

Since December 2003, US beef has been excluded from the Japanese market following the discovery of BSE (bovine spongiform encephalopathy or 'mad cow' disease). Following the implementation of this ban, Australian beef export prices and volumes to Japan increased significantly.

Australian beef export prices to Japan
Monthly, ended August 2005



In 2004-05, the volume of Australian beef exports to Japan rose by just under 27 per cent to 419 000 tonnes, accounting for around 90 per cent of total Japanese beef imports. Over the same period, prices for grass fed and grain fed full sets increased by around 8 and 7 per cent, respectively.

In mid-2005, export prices to Japan eased as a result of weaker demand following the release of Japanese stocks of beef in July. These stocks were previously held in bond to avoid the implementation of safeguard provisions in the June quarter. Over this period, prices for grass fed full sets and grain fed full sets declined by 10 per cent and 15 per cent respectively year on year, to around 369 and 417 cents a kilogram.

Timing of US re-entry critical

The timing of the resumption of trade between Japan and the United States is a critical factor in the outlook for beef. Despite reaching a framework agreement for the resumption of trade in October 2004, the assessment of the provisions of the Beef Export Verification program by the Japanese Food Safety Commission's Prion Experts Committee is ongoing and is subject to further public consultation.

On 1 August 2005, the Japanese Ministry of Health, Labour and Welfare announced the removal of blanket testing requirements for domestic cattle aged less than 21 months of age. An evaluation of whether similar arrangements can be applied to imported beef is currently under consideration.

While this development provides a basis for the recommencement of trade between the United States and Japan, there remains considerable uncertainty about the timing.

In preparing this set of forecasts, it is assumed that beef trade between the United States and Japan will resume in early 2006. As a result of this, the demand for Australian beef exports is expected to fall, with much of this beef being redirected to the domestic market. This is expected to place downward pressure on Australian saleyard prices, particularly during the first half of 2006.

As a result, for 2005-06, Australian beef exports to Japan are forecast to fall by over 6 per cent to 392 000 tonnes, with export prices forecast to decline by 6 per cent to 417 cents a kilogram.

Snapback provisions

With the assumed re-entry of US beef exports into Japan, it is likely that 'snapback' provisions will also be implemented (see June *Australian Commodities* for details). The snapback provisions are safeguard measures that apply separately to both Japanese chilled and frozen beef imports and are calculated on cumulative import quantity volumes for the Japanese financial year. If cumulative quarterly imports in the current year exceed the volume in the same period in the previous year by 17 per cent, the safeguard may be applied for the remainder of the financial year. That is, tariffs would increase from 38.5 per cent to 50 per cent.

The possible implementation of safeguard provisions would represent a potential downside risk to the outlook inasmuch as they could further dampen the demand for Australian exports in this market.

US demand to ease further

In 2004-05, export prices for 90CL manufacturing beef rose by nearly 18 per cent compared with the previous financial year, to around 286 cents a kilogram. In this period, bans on imports of Canadian beef in response to the discovery of BSE, the exclusion of beef products from major south American producers, such as Brazil and Argentina owing to foot and mouth disease problems, and reduced US female cattle slaughter all resulted in significant increases in prices for Australian exports to the United States.

In mid-July 2005 the preliminary injunction preventing the implementation of the minimal risk rule, allowing the resumption of imports of Canadian cattle less than thirty months of age, was lifted (see March *Australian Commodities* for details of the minimal risk rule). In preparing this set of forecasts, it is assumed that increased live cattle imports from Canada will contribute to the rebuilding of the US cattle herd and increase US domestic beef production. However, only limited volumes of Canadian beef products, including manufacturing beef, are expected to flow into the United States following the implementation of the minimal risk rule. Consequently, the impact on Australian beef export prices and volumes within the outlook period are expected to be limited.

For 2005-06, Australian beef exports to the United States are expected to fall slightly,

Australian beef and veal outlook

		2003 -04	2004 -05 s	2005 -06 f	% change
Cattle nos	million	27.5	27.9	28.2	*1.1*
– beef	million	24.4	24.8	25.1	*1.2*
Slaughterings	'000	8 779	8 853	8 804	*– 0.6*
Production	kt	2 033	2 162	2 095	*– 3.1*
Exports (shipped weight)					
– to United States	kt	361	363	352	*– 3.0*
– to Japan	kt	331	419	392	*– 6.4*
– to Korea, Rep. of	kt	75	91	78	*– 14.3*
– total	kt	860	948	903	*– 4.7*
– value	A$m	3 793	4 584	4 053	*– 11.6*
Live cattle	'000	578	550	570	*3.6*
Price					
– saleyard	Ac/kg	290	320	307	*– 4.1*
– US import	USc/kg	243	286	264	*– 7.7*
– Japan import	USc/kg	414	444	417	*– 6.1*

See back tables for details. **s** ABARE estimate. **f** ABARE forecast.

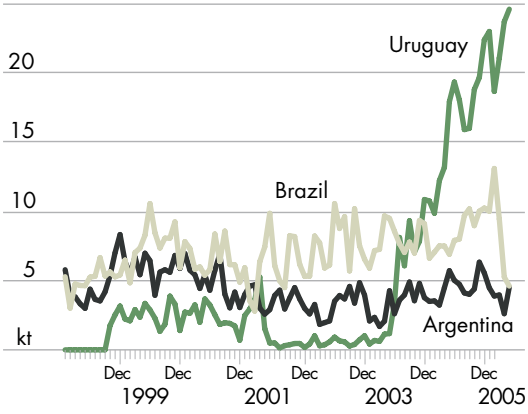
reflecting increased US domestic production, and reduced availability of Australian supplies with the retention of female cattle for herd rebuilding. Overall, Australian beef exports are forecast to decline by 3 per cent to 352 000 tonnes, with export prices forecast to fall by nearly 8 per cent to 264 cents a kilogram.

Uruguay to continue to provide strong competition

Since the re-opening of the US beef market to Uruguay in mid-2003, US imports of Uruguayan beef have increased substantially. In 2004 the United States imported around four times the amount of beef than it did in the previous year, the majority of which was subject to an over-quota tariff of 26.4 per cent.

US beef imports from South America

Monthly, ended June 2005



In the first half of 2005, US imports of Uruguayan beef continued to increase, with volumes nearly double the corresponding period in 2004. Reflecting these developments, the share of the US beef market accounted for by Uruguay has increased from around 3 per cent in 2003 to 11 per cent in 2004 and 16 per cent in the first half of 2005.

With the strength of the Australian dollar relative to the Uruguayan peso and the relative proximity of Uruguay to the US market, Uruguayan beef has some cost advantages over Australian beef (in US dollar terms). In the short and medium term Uruguay is expected to continue to provide strong competition for Australia in the US market.

Australian production

Australian cattle numbers have been increasing gradually in the period following the 2002-03 drought. After falling to 26.7 million in 2003, the Australian cattle herd reached nearly 27.5 million by June 2004. With greater retention of female cattle, the Australian cattle herd is estimated to have increased further, to around 27.9 million by June 2005.

For 2005-06, cattle numbers are forecast to continue to increase, reflecting the lagged effect of efforts to increase numbers in response to high prices and the improved seasonal outlook. As a result, the cattle herd is forecast to increase further to 28.2 million by June 2006.

Despite the retention of female cattle to increase herd numbers, favorable export prices encouraged increased slaughterings in 2004-05, to around 8.85 million. With increased numbers of cattle on feed and higher slaughter weights, production is estimated to have increased by around 5 per cent to 2.16 million tonnes.

With the improved seasonal outlook since June, particularly in the eastern states, restocker

Amendments to the allocation of Australia's US beef quota

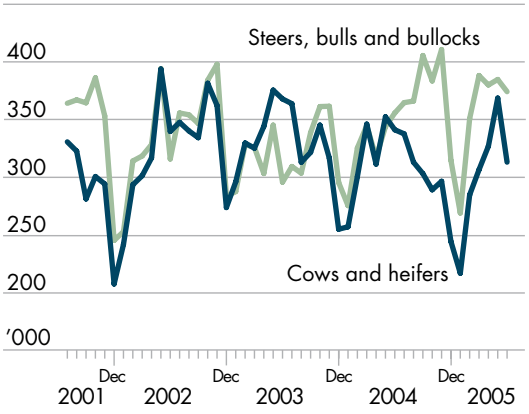
In early August 2005, the Australian Government announced changes to the allocation of Australia's beef quota in the United States. Currently, Australian beef quota entitlements are allocated to individual companies based on export performance.

Under the new arrangement, quota access will be available to all licensed exporters, with certification issued for each consignment. In addition, the amended provisions incorporate a safeguard mechanism. If exports exceed 85 per cent of the total quota amount prior to 1 October, the remaining 15 per cent of the quota will be allocated to exporters based on average shipments over the previous two years. These allocations will be tradable between exporters.

demand has increased sharply, supporting higher saleyard prices. However, with saleyard prices forecast to decline in early 2006, slaughterings are also forecast to increase at that time. The demand for grainfed cattle is also expected to decline in 2006 with the assumed resumption of trade between Japan and the United States, resulting in reduced slaughter weights. Overall, total slaughterings in 2005-06 are forecast to decline by under 1 per cent to 8.80 million and production is forecast to decline by 3 per cent to 2.1 million tonnes.

Australian cattle slaughter

Monthly, ended June 2005



While it is assumed that the United States will re-enter the Japanese beef market by early 2006, any delays in the resumption of this trade would provide positive support to Australian exports and encourage further expansion of the cattle herd. This, in turn, would be reflected in lower slaughterings and production and higher saleyard prices than forecast here.

Live cattle

Australia exported around 550 000 live cattle in 2004-05, a decline of 5 per cent from the previous year. This decline was largely attributable to an appreciation of the Australian dollar, strong domestic demand for cattle, increased demand for beef in export markets and strong competition from cheaper priced substitute meats. However, despite reduced export numbers, higher saleyard prices resulted in an increase in the value of live cattle exports of nearly 7 per cent.

Despite an assumed easing in economic growth in key importing nations, particularly in south east Asia, for 2005-06, lower saleyard prices — as a result of weaker export demand — live cattle exports are forecast to increase. Overall, live cattle exports are forecast to increase by nearly 4 per cent to 570 000.

Dairy

Continued strength in world prices for manufactured dairy products is forecast to result in average farm gate milk prices for Australian dairy farmers increasing to 33 cents a litre in 2005-06. Coupled with a forecast 1 per cent rise in total Australian milk production, this is forecast to result in increased returns to producers in 2005-06.

Slowing growth in world dairy product demand

Economic growth in 2005-06 is assumed to slow from that in 2004-05 across the main dairy product importing countries of the OECD (including Japan, the United States and European Union), Africa, Latin America, the Middle East and the Russian Federation. As income growth in these key importing countries slows, the overall rate of growth in global dairy demand is expected to decline. This is expected to narrow the gap between the growth in world dairy demand and supply in 2005-06, resulting in some downward pressure on current world dairy product prices. However, for the year as a whole, world dairy product prices are forecast to average higher in 2005-06 than in 2004-05.

International dairy prices remain firm

World prices for manufactured dairy products rose strongly in 2004-05 as a result of tight world market conditions. Subdued growth in global milk production resulted in exports of manufactured dairy products being constrained at a time of relatively strong growth in world demand. The average world butter price was 36

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per cent higher than the 2003-04 price, cheese and skim milk powder were each up 19 per cent, and whole milk powder rose 21 per cent.

Combined milk production in Australia and New Zealand in 2005-06 is forecast to recover only slightly as a result of the slow rebuilding of the national dairy herd after widespread drought conditions in Australia. This together with reductions in EU export subsidies is forecast to result in the international supply of manufactured dairy products remaining tight. At the same time, growth in demand in key dairy importing countries is expected to slow compared with 2004-05, in response to lower economic growth. Thus the scope for future price rises seems limited. In 2005-06 the average world spot price for cheese is forecast to rise by just over 1 per cent, while butter and skim milk powder prices are forecast to rise by 0.4 per cent compared with 2004-05.

Cuts to EU export subsidies improve world market prospects

The European Union has been under increasing WTO and internal budget pressures to reduce their Common Agricultural Policy (CAP) support programs. The high world prices of 2004-05 allowed EU CAP administrators to cut export subsidies for key dairy products in the latter part of 2004-05. Export subsidies for cheese were cut by 10 per cent, those for skim milk powder by nearly 60 per cent (the lowest rate of subsidy since November 2001) and those for butter by 30 per cent to the lowest level on record. The European Union has also lowered internal invention prices for dairy commodities from July 2005 by 5 per cent. These changes are expected to provide positive support for world prices in 2005-06. However, the future direction of EU export subsidies is likely to remain a key determinant of the longer term outlook for the world dairy market, and of the specific prospects for nonsubsidised dairy product exporters like Australia and New Zealand.

Constrained growth in world supplies

World stocks of manufactured dairy products were depleted significantly during 2004-05, especially in the European Union and United States where public dairy intervention stocks closed significantly lower. In the European Union the skim milk powder intervention stockpile closed at 20 000 tonnes at the end of June 2005, compared with 180 000 tonnes at the end of June 2004. Similarly the butter intervention stockpile closed 40 per cent lower at 145 000 tonnes. Private and public stocks were sold strongly into world export markets in 2004-05 as world prices were substantially above both EU and US intervention price levels. While milk production rose slightly during 2004-05 in the European Union and the United States, incremental increases in supply were largely absorbed through increases in domestic demand in those markets.

In the southern hemisphere, Australian production is estimated to have risen by around 0.5 per cent in 2004-05. However, this rise was largely negated by a 3.5 per cent fall in milk production in New Zealand. New Zealand production was affected by wetter than average conditions that resulted in poor pasture growth in the first half of 2004-05.

In 2005-06, EU production is forecast to increase only moderately in line with small increases in the EU production quotas. The recent expansion of the European Union from 15 to 25 countries is not expected to lead to a significant increase in EU dairy exports in 2005-06. Milk producers from the new member states

Dairy outlook

		2003-04	2004-05 s	2005-06 f	% change
Cow numbers	'000	2 036	2 041	2 045	*0.2*
Milk yields	L/cow	4 948	4 961	5 001	*0.8*
Production					
Total milk	ML	10 075	10 125	10 228	*1.0*
– market sales	ML	1 992	2 022	2 006	*– 0.8*
– manufacturing	ML	8 083	8 103	8 222	*1.5*
Butter	kt	132	131	127	*– 3.1*
Cheese	kt	386	373	383	*2.7*
WMP	kt	187	189	194	*2.6*
SMP	kt	182	189	187	*– 1.1*
Milk price	Ac/L	27.9	31.0	33.0	*6.5*
Value of exports	A$m	2 210	2 418	2 456	*1.6*
World prices					
Butter	US$/t	1 621	2 209	2 218	*0.4*
Cheese	US$/t	2 358	2 803	2 840	*1.3*
SMP	US$/t	1 862	2 211	2 219	*0.4*

See back tables for details. **s** ABARE estimate. **f** ABARE forecast.

are required to meet EU production and quality assurance standards. With the required accreditation processes expected to be completed relatively slowly, and the relatively strong demand for dairy products in the EU, only modest export growth is forecast.

Australian output likely to be boosted by winter rains

Widespread rainfall in most Australian dairy production regions in June 2005 helped improve water availability and replenish subsoil moisture levels. This in turn should promote spring pasture growth and increased milk yields. With Bureau of Meteorology forecasts of average rainfall and average to above average temperatures in the remainder of calendar year 2005, milk production is forecast to rise by about 1 per cent to 10.2 billion litres in 2005-06.

Australian dairy export returns improve

The total value of Australian exports increased in 2004-05 and this trend is forecast to continue in 2005-06. The significant increases in world dairy export prices in 2004-05 resulted in a 9 per cent increase in the value of Australian dairy exports compared with 2003-04. An 8 per cent increase in the volume of cheese exports also contributed to the increased value of dairy product exports in 2004-05. However, this increase in export values was tempered somewhat by the appreciation of the Australian dollar against the US dollar during 2004-05.

With a mature or relatively static domestic dairy product market in Australia, the expected additional total milk production in 2005-06 is likely to be committed largely to the manufacture of high value export commodities — particularly cheese and whole milk powder — rather than to increased domestic market supply. As a consequence, Australian export volumes of cheese and whole milk powder are forecast to increase in 2005-06.

With the continued strength of world export prices for cheese and whole milk powder, the value of Australian dairy exports is forecast to increase by 1.6 per cent to nearly $2.5 billion in 2005-06. This should flow on to Australian dairy farmers through increased average farm gate prices — forecast to increase from 31 to 33 cents a litre in 2005-06.

ENERGY

oil prices remain volatile

David Bailey, William Mollard, Richard Perry, Jammie Penm, Andrew Maurer and Ian Haine

Oil and gas

World oil prices have continued to exhibit strong volatility over the past few months. After falling below US$50 a barrel in May, the price of the commonly quoted West Texas Intermediate (WTI) crude oil increased significantly to US$67 a barrel in early August. After a partial reversal to US$63 a barrel in mid-August, the WTI oil price rose once again to around US$70 a barrel in late August, before easing to US$65 a barrel in early September.

In broad terms, the underlying causes of the higher prices over the past few months have been supply disruptions as a result of adverse seasonal conditions against a backdrop of increasing concerns about the adequacy of global oil supply.

For example, the significant price rise in July and August was a result of disruptions to shipments in the Gulf of Mexico caused by hurricane activity. Hurricane Dennis affected US offshore oil production and caused significant damage to BP's Thunder Horse platform in mid-July. As a result of Hurricane Emily, the majority of Mexican offshore oil production ceased operation for five days in late July.

In late August, Hurricane Katrina forced oil companies to evacuate platforms in the Gulf of Mexico and caused significant damage to a number of US oil refineries. In response, the International Energy Agency released, in early September, 60 million barrels of crude oil from emergency reserves for market consumption.

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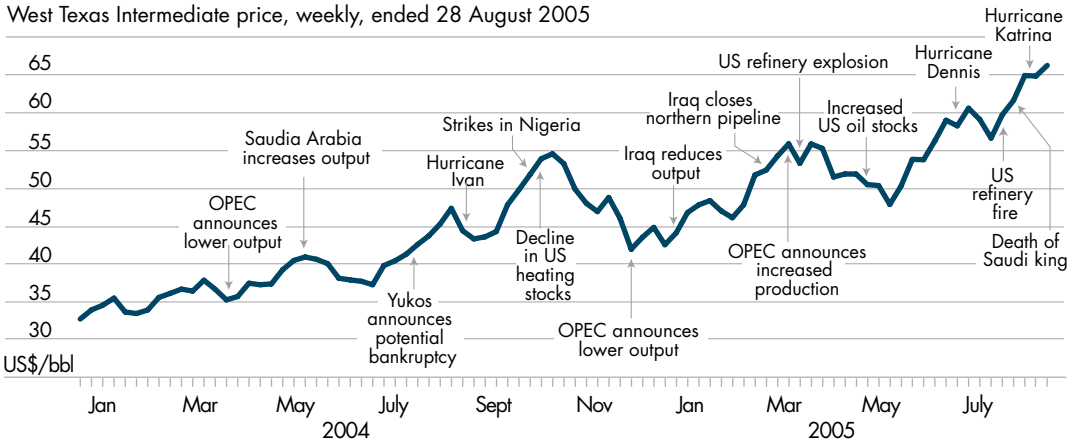
Crude oil prices

West Texas Intermediate price, weekly, ended 28 August 2005



The US Environmental Protection Agency also announced a temporary relaxation of the federal clean air standards in an attempt to increase fuel supply in the United States.

The production loss in the Gulf of Mexico during July and August was the largest in history and will be a major factor affecting overall non-OPEC production in 2005. Added to these were concerns about oil supply security in Saudi Arabia and the adequacy of oil stocks in the United States as a result of increased gasoline demand for the driving season.

Higher oil prices have also pushed up petrol and petroleum product prices worldwide, with disruptions to refining facilities in a number of countries exacerbating the rise in product prices. In the United States, for example, the national retail price for gasoline averaged around US$3.07 a gallon in early September, an increase of around US$1.22 from a year earlier. For diesel, the national retail price averaged US$2.90 a gallon, a year on year increase of around 55 per cent.

World oil markets have become tight

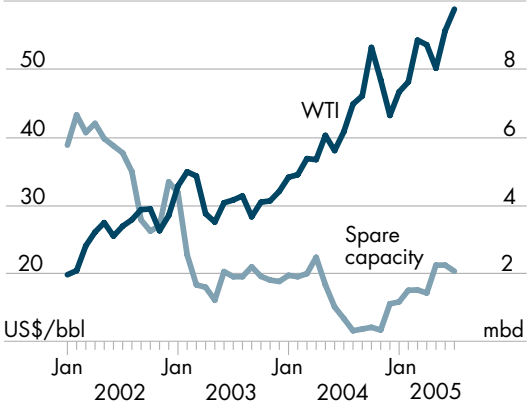
Strong world economic growth in 2004 resulted in global oil consumption rising by 3.7 per cent, the largest annual increase over the past three decades. In particular, strong increases in consumption in China and the United States were the main drivers (growth of 15 per cent and 3.5 per cent respectively).

Although demand growth has eased since the beginning of 2005, the balance between oil consumption and production has tightened and this has continued to place upward pressure on prices.

Against this backdrop, market participants have increasingly focused on issues affecting oil supply and concerns about oil production and spare production capacity have become a denominating factor in price determination.

Over the past few years, oil prices have been particularly sensitive to concerns about the adequacy (or lack) of spare production capacity and the implications for future oil supply. One fundamental issue facing the oil market is that there is limited substitution for oil in the short to medium term and hence demand for oil is relatively insensitive to price movements. Under this situation, any actual or perceived supply disruption can lead to a significant increase in oil prices.

WTI crude oil price and OPEC spare production capacity Monthly, ended July 2005



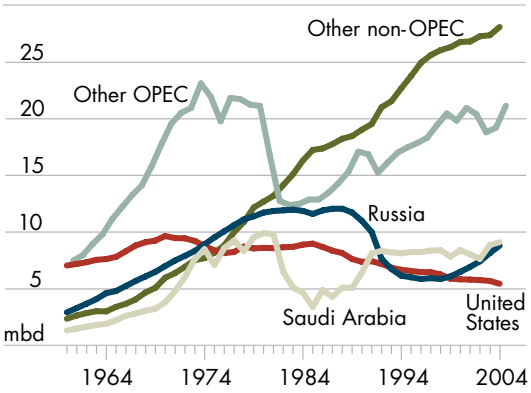
World oil prices could remain high in the next few years

Looking forward, world oil prices are forecast to remain high in the short term. In year average terms, the price of WTI crude oil is forecast to average around US$58 a barrel in both 2005 and 2006. In the first eight months of 2005, WTI crude oil averaged US$54 a barrel.

With significant disruptions to oil production in the Gulf of Mexico caused by Hurricane Katrina, world oil prices are likely to remain at current high levels for the remainder of 2005. Under the assumption of no significant disruptions to oil production, oil prices are expected to ease gradually during the course of 2006. This forecast easing of high oil prices during 2006 is consistent with the outlook for more modest growth in world oil consumption in the short term, as world economic growth is assumed to moderate.

The forecast WTI price in 2006 remains high from a historical perspective. The main factor underpinning this price outlook is the limited amount of additional production capacity that is expected to come on line in the next fifteen months or so. While current high prices have provided incentives for oil producers to increase

World oil production



production, the expansion is expected to be gradual.

World oil production grew by around 4 per cent to 83.1 million barrels a day in 2004, as producers increased production in response to higher prices. Over the first half of 2005, growth in world oil production slowed to a year on year rate of around 2 per cent. Under the assumption of no significant disruptions to production, world oil production is forecast to increase by a further 2.1 per cent to 86.5 million barrels a day in 2006. This compares with a forecast average rise of 1.9 per cent for 2005 as a whole.

While the pace of the increase in world oil consumption is forecast to ease in the short term, it will still be relatively high from a historical

Oil substitutes

A range of technologies exists to produce transport fuels from sources other than crude oil. These include natural gas, biofuels, hydrogen and electricity. Technology also exists to produce oil from other sources, such as tar sands, oil shales and coal.

Compressed natural gas: Gasoline vehicles can be converted to natural gas fueled vehicles after minor modifications to gasoline engines and the installation of a gas tank. Natural gas fueled vehicles currently account for about 0.5 per cent of the world vehicle stock (Gielen and Unander 2005).

Biofuels: Biofuels are generated from biological sources including grain and sugar crops, cellulosic materials, including grasses and trees, and municipal solid waste. The most widely used transport biofuels are ethanol, biodiesel and methanol. In 2003 world ethanol production was approximately equal to around 0.5 per cent of global oil consumption (Gielen and Unander 2005).

Hydrogen: The focus of hydrogen transport research has been on its role in fuel cell vehicles. Hydrogen can be separated from hydrocarbons including natural gas, coal, methanol and residual oil by applying heat or through electrolysis which uses an electric current to split water into its components of hydrogen and oxygen. The cheapest and most commonly used hydrogen production process is the steam reforming of natural gas that converts methane into hydrogen and carbon monoxide.

The potential of hydrogen use in transport is dependent on the ability to establish economic production and transport infrastructure and fuel cell vehicles. Current research and development on fuel cell vehicles is focused on reducing costs, improving reliability and lowering the weight of the vehicle. The onboard storage of hydrogen presents a challenge because of the low energy content of hydrogen on a volume basis.

Electricity: The current focus of research for using electricity in transport is on gasoline–electric hybrids. Batteries currently used in electric vehicles have relatively low energy density and, therefore, require a larger mass to give a vehicle the same performance and range as conventional vehicles (MacLean and Lave 2003). If significant breakthroughs are made in battery performance, electric vehicles may emerge as the preferred long term transport solution in several developed countries.

Nonconventional sources: These are generally heavy oil, tar sands, bitumen and oil shales. Reserves of extra heavy oils are concentrated in Venezuela, while the Russian Federation and Canada both have large reserves of tar sands and bitumen. The United States also has large reserves of oil shales. Recoverable reserves of these nonconventional sources are estimated to exceed conventional oil reserves in the Middle East (IEA 2002). Technologies also exist to produce liquid fuels from coal and gas.

perspective. Oil consumption in the United States, China and many east and south east Asian countries is forecast to increase, accounting for most of the growth in world consumption in the short term.

World oil consumption is forecast to rise by 1.8 per cent to 85.3 million barrels a day in 2006. This compares with a forecast rise of 1.9 per cent to 83.8 million barrels a day in 2005. Given the forecast expansion in world oil production, it is unlikely that world commercial oil stocks will increase significantly in the short term.

Looking beyond the short term, there is a distinct possibility that world oil prices could remain relatively high for a number of years. Unless significant increases can be achieved in world oil production and spare production capacity, a sharp reduction in world oil prices appears unlikely when there is a major demand side shock to the global economy.

While world oil prices are forecast to remain relatively high in the next few years, a gradual decline in prices is projected over the medium term (to 2010).

If high and volatile oil prices were to continue into the medium term, it is likely that more resources would be devoted to research, development and production of fuels from sources other than crude oil (see box on the opposite page). A combination of higher fuel prices and technological advancements will make the production of alternative fuels more economical over the medium term. Increased availability and production of alternative fuels would, in turn, constrain upward pressure on world crude oil prices.

Oil and gas outlook

		2004	2005 f	2006 f	%
World					*change*
Production	mbd	83.1	84.7	86.5	*2.1*
Consumption	mbd	82.2	83.8	85.3	*1.8*
Trade weighted crude oil price	US$/bbl	34.41	49.19	48.03	*– 2.4*
West Texas Intermediate crude oil price	US$/bbl	41.43	57.91	57.75	*– 0.3*
		2003	**2004**	**2005**	
Australia		**-04**	**-05 s**	**-06 f**	
Crude oil and condensate					
Production	ML	27 876	24 338	26 104	*7.3*
Exports	ML	17 526	15 731	17 937	*14.0*
– value	A$m	5 055	6 330	9 039	*42.8*
Imports	ML	23 498	26 079	27 152	*4.1*
Natural gas					
Production	Gm^3	37.0	41.2	45.2	*9.7*
LNG exports	Mt	7.91	10.59	13.23	*24.9*
– value	A$m	2 174	3 199	4 764	*48.9*
LPG					
Production	ML	4 639	4 625	4 684	*1.3*
Exports	ML	2 916	2 844	2 888	*1.5*
– value	A$m	647	804	986	*22.6*
Petroleum products					
Refinery production	ML	39 185	40 202	40 114	*– 0.2*
Other	ML	5 653	5 511	5 783	*4.9*
Exports	ML	2 474	1 816	1 760	*– 3.1*
Imports	ML	10 542	11 257	11 400	*1.3*
Consumption – total net	ML	52 906	53 888	54 544	*1.2*

See back tables for details. **s** ABARE estimate. **f** ABARE forecast.

Concerns about world refining capacity

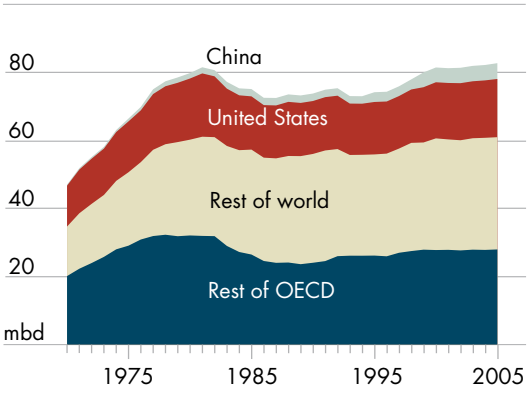
There are growing concerns in the market that a lack of spare oil refining capacity has the potential to increase upward pressure on retail prices for petrol and petroleum products. In the past few months, disruptions to refineries in the Gulf of Mexico and the North Sea also adversely affected sentiment in world oil markets, adding volatility to world oil prices.

Global oil refining capacity increased from around 73.1 million barrels a day in 1994 to 82.3 million barrels a day in 2004. However, as a share of world oil consumption, the percentage declined from around 106 per cent in 1994 to slightly above 100 per cent in 2004.

In the United States, the number of operable refineries has declined from 324 in 1981 to 148 in 2005. In response to increased demand, the remaining refineries have either expanded production capacity or increased the rates of utilisation. During July and August, many refineries operated at around 95 per cent of capacity. Higher utilisation has led to some refineries undertaking unplanned maintenance to avoid breakdowns (EIA 2005).

While financial and environmental considerations make it unlikely that new refineries will be built in the United States, expansions at existing refineries will be the main source of an increase in US refining capacity (DOE 2005). In 2005, US refining capacity is forecast

World refinery capacity



to expand by 231 000 barrels a day. While not adding significantly to the distillation capacity, refineries in the United States have tended to improve product quality through investment in downstream capacity.

The Asia Pacific has been the region with the fastest growing refining capacity. In terms of distillation capacity, for example, the Asia Pacific has surpassed western Europe as the world's second largest refining centre and is only marginally below the capacity in north America. In China, there has been a significant increase in oil refining capacity. In the ten years ended 2004, refinery capacity in China more than doubled to an estimated 4.7 million barrels a day. In 2005, China's oil refining capacity is forecast to rise by 121 000 barrels a day.

While expansions of refinery capacity are forecast in a number of countries, it appears unlikely that a significant increase in world oil refining capacity will be achieved in the short term. In addition to the large capital costs required for expansion, there are considerable community concerns about environmental issues associated with the construction of refineries, especially in developed countries.

Global oil refining capacity is forecast to increase by around 550 000 barrels a day in both 2005 and 2006. However, demand for refined products is expected to increase by more than this in the short term, implying continued high utilisation rates. This lack of spare refining capacity is expected to continue to place upward pressure on refined product prices, as well as adding volatility to world oil prices.

Given the tightening of world spare refining capacity, significant investment in refining capacity will be required to meet world demand beyond 2006. The majority of the increase in refinery capacity will be in developing countries, especially those in non-OECD Asia and the Middle East.

Future investments in the refinery operations of developing countries must include configurations that are more advanced than those currently in operation. It is likely that the new refineries will be called on to meet increased demand for lighter petroleum products, such as transport fuels, in developed countries, which will be subject to more stringent air pollution regulatory policies. An additional requirement will be the ability of the new refineries to supply lighter petroleum products from more heavy and sour crude, as oil quality is expected to continue to decline (see box on next page).

World oil production

OPEC to increase production

On 15 June, OPEC (Organisation of Petroleum Exporting Countries) announced an increase in its production quota to 28.0 million barrels a day. Nevertheless, OPEC production has been consistently above the announced quota since mid-2004. In July 2005, actual OPEC production increased to 29.6 million barrels a day, with an estimated spare production capacity of around 2.1 million barrels a day.

Around half of OPEC's spare production capacity lies within Saudi Arabia, the largest OPEC producer. In response to concerns about future oil supplies, Saudi Arabia announced, in June 2005, its intention to increase production capacity to around 12 million barrels a day by 2009. In the June quarter 2005, oil production in Saudi Arabia averaged around 9.2 million barrels a day.

In the short term, further development of the Haradh oil field by early 2006 is expected to more than offset the decline in output from mature oil fields. Saudi Arabia has also put in place plans

to increase production of light and sweet crude, with expansions to the Shaybah field (0.5 million barrels a day in 2005), the Haradh-3 project (0.9 million barrels a day in 2006), the Abu Hadriya, Fadhili and Khursaniya plan (0.5 million barrels a day by late 2007) and the Khurais field (with a potential of 1.2 million barrels a day by 2009).

OPEC oil production is forecast to increase by 1.4 per cent to 29.8 million barrels a day in 2006. This compares with a forecast rise of 2.6 per cent to 29.4 million barrels a day in 2005.

Non-OPEC production

In 2004, non-OPEC oil production increased by 2.0 per cent to 50.1 million barrels a day. Reflecting lower growth in output from the Russian Federation and seasonal maintenance in north America and the North Sea, growth in non-OPEC production slowed to 0.6 per cent in the first half of 2005.

For 2005 as a whole, non-OPEC production is forecast to increase by 0.8 per cent to 50.5 million barrels a day. In 2006, production is forecast to increase by a further 2.0 per cent to 51.5 million barrels a day. The forecast increase in oil production in 2006 mainly reflects a number of expansion plans in the Caspian Sea region, Latin America and Africa.

OECD oil production

Unplanned maintenance and the impact of adverse seasonal conditions are expected to lead to a decline in OECD production in 2005.

In the United States, for example, weather related shutdowns during July 2005 resulted in a production loss of around 7 million barrels and delays in the installation of several offshore facilities and maintenance work. With the damage by Hurricane Katrina causing an estimated production loss of around 1.0 million barrels a day and repairs to damaged oil production facilities likely to take several weeks, US oil production is forecast to remain largely unchanged at an average of 7.6 million barrels a day in 2005.

In Mexico, adverse seasonal conditions led to a production loss of 10 million barrels in July. Oil production in that country is forecast to average 3.8 million barrels a day in 2005, a decline of 0.5 per cent on 2004.

In western Europe, unplanned shutdowns and disruptions have led to lower production. Oil production in the region is forecast to be around 5.8 million barrels a day in 2005, a fall of around 5 per cent on 2004.

OECD oil production is forecast to average around 20.9 million barrels a day in both 2005 and 2006, a decline of 1.5 per cent on 2004.

Caspian Sea region

Countries in the Caspian Sea region, including Azerbaijan and Kazakhstan, are expected to contribute to higher non-OPEC production in the short term. Oil production in the region will be underpinned by several developments, including the Tengiz and Karachaganak projects in Kazakhstan and the Azeri, Chirag and Gunasli project in Azerbaijan.

The ACG project is expected to increase Azeri production by 300 000 barrels a day in 2005, while the West Azeri project is expected to increase production by around 75 000 barrels a day in 2006. In addition, the completion of the Baku-Tbilisi-Ceyhan pipeline in May 2005 is likely to result in an increase in Azeri exports of between 200 000 to 300 000 barrels a day by the end of 2005, rising to 500 000 barrels a day in 2006.

Kazakh oil production is expected to decline in 2005 because of the problems associated with the flaring of natural gas in the Tengiz field. A plan to reinject the gas at that field is expected to come on line by May 2006, which will contribute to a forecast increase in Kazakh production of around 70 000 barrels a day in 2006.

Africa

In 2004, African oil production increased by nearly 10 per cent to average 3.4 million barrels a day. In the first half of 2005, production was nearly 6 per cent higher year on year, averaging 3.6 million barrels a day.

A significant proportion of the production growth has come from Angola. Crude oil production in that country averaged just below 1 million barrels a day in 2004, a rise of nearly 10 per cent from 2003. In 2005, production is expected to increase by a further 20 per cent, to around 1.2 million barrels a day. This growth will

come primarily from a number of new projects, including the Kizomba-A project, the Xikomba deepwater field, the Jasmin oil field and a smaller contribution from the Bomboco field.

In 2006, production in Angola is forecast to increase to 1.5 million barrels a day. Development of the Kissanje, Marimba and Dikanza discoveries is expected to result in each producing around 250 000 barrels a day.

Brazil

In contrast to lower output from many Latin American producers, oil production in Brazil is forecast to increase by nearly 12 per cent to

Crude oil quality and tightened environmental standards

Measured by the relative density of petroleum liquids, or the so-called American Petroleum Institute (API) gravity, and sulfur content, crude oil can be classified into three groups — light and sweet (high API gravity and low sulfur), heavy and sour (low API gravity and high sulfur) and medium. Compared with the heavy and sour types, light and sweet crude is more suitable for refining into a range of lighter petroleum products, including petrol, gasoil and heating oil, with lower refining costs.

Demand for oil in many OECD markets has increasingly been for light and sweet crude. This has largely been the result of regulations mandating lower levels of sulfur in petrol and diesel fuels. There have been changes to regulations in the United States, Japan, Canada and Europe restricting the level of sulfur in fuels and further restrictions are scheduled for both Japan and Europe in 2006.

While a significant increase in oil production has been achieved in non-OPEC countries, the majority of this increase has been in the heavy and sour types. In 2004, non-OPEC crude output was around 50.1 million barrels a day and the split was around 34 per cent light, 49 per cent medium and 18 per cent heavy. This compares with 41, 44 and 15 per cent respectively in 2000. In terms of sulfur content, 51 per cent of non-OPEC crude production was sour in 2004, compared with 47 per cent in 2000.

For OPEC producers, crude oil production averaged around 28.6 million barrels a day in 2004, with the split for light, medium and heavy crude at 32, 62 and 6 per cent respectively. This represents marginal increases in light and medium crude (30 and 61 per cent respectively in 2000) and a fall in heavy crude (9 per cent in 2000). In terms of sulfur content, 75 per cent of oil production was sour in 2004, compared with 77 per cent in 2000 (OPEC 2005).

Despite this increase in OPEC production, the ratio of light and sweet crude in total world oil production has been declining. There are considerable concerns in the market about this decline and the implications for production and refining costs, as well as the prices for light and sweet crude. To keep up with the demand for light and sweet crude, more costly exploration and developments will be required, leading to higher production costs. As the majority of the additional oil production is expected to be the heavy and sour types in the short term, this could lead to greater upward pressure on the prices for light and sweet crude, including WTI crude.

Over the medium to longer term, upgrading, replacement and expansion will be required for existing facilities to increase the capacity to refine heavy and sour crude into lighter petroleum products that can satisfy the more stringent environmental standards.

Investment decisions to fund upgrading, replacement and expansion of global refining capacity are complicated by uncertainties about oil prices, demand and the time for upgrading and construction (between two and eight years). The experience of overinvestment following record high oil prices in the 1970s and 1980s has also increased the degree of cautiousness that investors exercise in their decisions.

While estimates of the level of investment needed to meet global oil demand vary, the IEA (2004) projects that an annual investment of around US$105 billion will be required between 2005 and 2030 by the oil industry for upgrading and replacing existing production areas, refineries, pipelines and other facilities.

around 2.0 million barrels a day in 2005. Production is expected to increase by a further 14 per cent to nearly 2.3 million barrels a day in 2006.

Greater deepwater production from the Compos Basin is expected to account for the majority of the forecast increase. Specifically, production from new projects, such as Barracuda and Caratinga (150 000 barrels a day) and Albacora Leste and Jubarte (180 000 and 60 000 barrels a day respectively in late 2005), are expected to account for the majority of growth over the outlook period.

World oil consumption

Consumption in China

In 2004, Chinese oil consumption grew by 15 per cent to 6.4 million barrels a day (from a relatively low base), accounting for nearly a third of the total growth in world consumption.

Growth in China's oil consumption eased in the first half of 2005, with apparent consumption estimated to have grown year on year by around 1 per cent.

Looking forward, oil consumption in China is expected to increase in late 2005 and early 2006, reflecting higher seasonal demand coinciding with the northern hemisphere winter. For 2005 as a whole, oil consumption in China is forecast to increase by 4 per cent to an average of 6.7 million barrels a day. In 2006, oil consumption in China is forecast to rise by a further 4 per cent, reaching an average of around 6.9 million barrels a day.

South east Asia

Oil consumption growth in south east Asia also contributed significantly to the growth in global oil consumption in 2004. In an effort to prevent a significant increase in inflationary pressures, many countries in the region implemented policies to subsidise the retail prices of petrol and petroleum products.

However, with higher world oil prices, the budgetary cost of these subsidy schemes has increased significantly. Since early 2005, a number of governments have reduced subsidies and allowed retail prices to increase. In Thailand, for example, the government ended diesel subsidies on 13 July. In Malaysia, the retail prices of gasoline and diesel were allowed to increase by 7 per cent and 19 per cent respectively in late July. As economic growth in the region is assumed to slow, an easing of consumption growth is forecast in the short term.

OECD consumption

Growth in OECD oil consumption is forecast to slow in 2005 and 2006. After growth of 1.7 per cent in 2004, OECD oil consumption is forecast to increase by 1.1 per cent to around 50.0 million barrels a day in 2005, before a further rise of 0.8 per cent to 50.4 million barrels a day in 2006.

In the United States, oil consumption grew year on year by around 0.5 per cent in the first half of 2005. US oil consumption is forecast to increase by 1.0 per cent in 2005, before rising by a further 1.1 per cent to 21.1 million barrels a day in 2006.

In Japan, oil consumption is forecast to rise marginally in 2005, reflecting increased demand from the electricity generation sector as a result of delays in the reopening of nuclear capacity and reduced hydroelectric output as a result of unfavorable seasonal conditions. In 2006, growth in oil consumption is forecast to ease based on an assumption that nuclear power generation will increase from previously unutilised capacity.

Australia

Export earnings to rise in 2005-06

Australian production of crude oil and condensate fell by 13 per cent in 2004-05, to 24.3 gigalitres. Increased condensate production from the Bayu/Undan field has been more than offset by declining productivity from mature fields, particularly in the Gippsland Basin and Timor Sea. Nevertheless, the value of exports rose by around 25 per cent to $6.3 billion because of higher world prices.

Production from the Gippsland field accounted for as much as 90 per cent of Australian oil production in the early 1980s. Between 1999-2000 and 2004-05, however, production fell at an average rate of 17 per cent a year. This

contributed to an annual decline in total Australian oil production of 12 per cent a year over the same period.

In 2005-06, crude oil and condensate production is forecast to increase. This forecast increase largely reflects the ramping up of production from the Mutineer/Exeter field and smaller contributions from the Basker and Manter and Cliff Head developments in the second half of 2005-06. With close proximity to Asian markets, it is assumed that additional production from Mutineer/Exeter and Cliff Head (Carnarvon and Perth basins respectively) will be exported, while production from Basker and Manter (Gippsland basin) is assumed to be consumed domestically.

Australian crude oil production is forecast to increase by 7 per cent to 26.1 gigalitres in 2005-06. Export volumes are forecast to reach almost 18.0 gigalitres, with an export value of $9.0 billion in the year.

With the completion of the North West Shelf joint venture's fourth LNG production train, Australian natural gas production increased by 11 per cent in 2004-05. Australian LNG exports rose by 34 per cent to 10.6 million tonnes, with a value of $3.2 billion in 2004-05.

Australian natural gas production is forecast to increase by a further 10 per cent in 2005-06, supported by production from the John Brookes project from the September quarter 2005, as well as from the Darwin LNG, BassGas and Casino projects in early 2006. Australian export volumes of LNG are forecast to increase by 25 per cent to 13.2 million tonnes in 2005-06. Increased export volumes and higher oil prices (a component of LNG pricing contracts) are forecast to result in a 49 per cent increase in the value of LNG exports in 2005-06, to $4.8 billion.

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Thermal coal

Over the remainder of 2005 and 2006, slowing world economic growth is forecast to lead to lower growth in the demand for electricity, and hence for thermal coal. The impact on coal demand will be exacerbated by substitution away from coal fired electricity generation toward other generation technologies in some countries. During this same period, growth in coal supply is forecast to increase following supply disruptions in the first half of 2005 and increases in coal mining and transport capacity.

Spot prices for thermal coal are therefore forecast to fall over the remainder of 2005 and in 2006. As spot prices in August 2005 were already well below the levels that prevailed when most annual contracts were settled for Japanese financial year (JFY) 2005-06 (April–March), contract prices for JFY 2006-07 are forecast to be subject to downward pressure.

Demand growth to ease in 2006

As world economic growth rates are assumed to ease in 2005 and 2006 (see 'Economic overview' for more detail), growth in the demand for coal in electricity generation is also forecast to decline.

Lower economic growth rates are also expected to curb growth in coal demand in other

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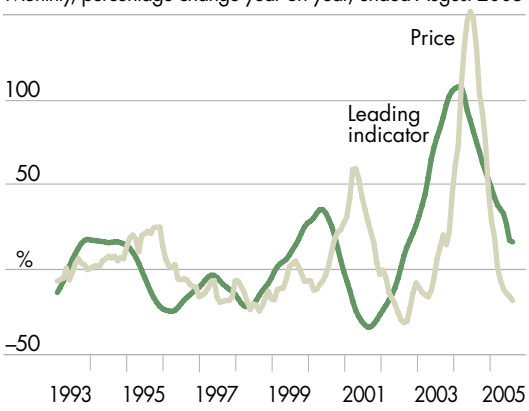
Thermal coal price and leading indicator

Monthly, percentage change year on year, ended August 2005



end uses, such as cement manufacturing and various minerals processing applications.

Mixed outlook for Asian demand

The outlook for thermal coal in key rapidly developing countries in Asia, such as China, is very positive and largely stands in contrast to the global situation. The rapid economic growth of many countries in Asia is forecast to contribute to strong increases in demand for electricity. However, in several key Asian markets, such as Japan and Chinese Taipei, environmental policies will constrain growth in demand for thermal coal as an input to electricity generation.

Continuing rapid economic growth in China is forecast to contribute to strong growth in demand for electricity and thermal coal. In the first half of 2005, fixed asset investment in the electricity sector increased by nearly 36 per cent year on year. Importantly, this investment included expenditure on both generation capacity and on distribution networks, which augurs well for sustained increases in thermal coal use.

While new coal fired plants will account for most of the increase in electricity generation capacity in 2006, China is increasingly investing in a range of generation technologies as part of a broad based electricity supply strategy. For example, the Three Gorges Dam project will increase hydroelectric generating capacity and plans are also under way to invest significantly in nuclear and gas fired electricity generation capacity.

Further, improvements to transport infrastructure will increase the logistical efficiency of coal use in China itself. This will increasingly allow the domestic coal supply chain to operate with lower stocks. Such a decline in the required level of operating stocks will lower the call on new coal supplies as existing stock levels are drawn down; however, this would only be a short to medium term phenomenon.

Despite downward pressure on demand growth rates from these factors, China's demand for thermal coal is still forecast to rise strongly in absolute terms as robust economic growth continues through 2006.

The prospects for Japan's growth in coal demand are far less positive. Low economic growth rates in 2005 and 2006 are expected to support only modest increases in electricity demand. Further, the share of coal in the electricity generation mix is expected to decline as nuclear power output increases.

Japan's largest nuclear power company, Tokyo Electric Power Company (TEPCO), has restarted all of the seventeen reactors that were shut down in early 2003. Kansai Electric Power, Japan's second largest nuclear power company, has also restarted ten of the eleven reactors shut down in 2004. In addition to this, a new 1380 MWe reactor commenced operations in January 2005 and a further 2458 MWe of capacity is expected to be completed by 2006 (see uranium note for further details).

These developments are expected to mainly affect oil fired plants, but output from coal fired plants is also expected to fall.

Additionally, Japan's energy policies favor the use of nongreenhouse gas emitting electricity generation. Nuclear technology is chief among these, but the share of hydroelectric and other renewable sources in the country's energy mix is also expected to increase.

As a result of these factors, Japan's imports of thermal coal are forecast to fall modestly in 2006.

Growth in demand for electricity in Chinese Taipei is also forecast to slow in 2006, largely because of a reduction in economic growth and, similarly to Japan, energy policies that favor alternative energy sources for electricity genera-

tion. In particular, these policies support the use of natural gas based electricity generation (sourced from LNG). As a result, most of the growth in Chinese Taipei's electricity demand is expected to be met through increases in output from gas-fired facilities.

European demand growth to fall

Demand for thermal coal in Europe is forecast to weaken in the remainder of 2005 and through 2006. Several factors contribute to this assessment. Economic growth rates in western European countries are assumed to remain weak, averaging 1.1 per cent in 2005 and 1.2 per cent in 2006. These low growth rates are forecast to support only modest increases in demand for electricity. Further, the share of coal fired electricity generation is expected to fall.

A critical factor affecting the demand for thermal coal in Europe is Europe's new Greenhouse Gas Emission Trading Scheme. The intention of the scheme is to incorporate the environmental cost of carbon emissions into the operating costs of electricity generation technologies. Since January 2005, most electricity generators have been required to hold carbon emission licences (which can be traded at market determined prices) and this is having a direct impact on the relative competitiveness of coal fired electricity generation, and hence on the demand for thermal coal.

Also contributing to weakening growth in European demand for thermal coal in 2005 and 2006 has been a relatively wet summer that has partially refilled previously depleted hydroelectricity water storages. This will allow an increase in the contribution of hydroelectricity to Europe's electricity supply in 2005 and 2006.

EU thermal coal imports are forecast to peak in 2005, mainly because of falling European production, before falling slightly in 2006 as the utilisation of coal fired electricity generation capacity is progressively reduced.

Supply growth to accelerate

In the first half of 2005, growth in world thermal coal exports was limited by a range of factors, including disruptions to production; transport infrastructure constraints; strong demand growth in China; and some switching of production capacity to higher priced metallurgical coals. However, with the impact of many of these factors expected to be lower over the remainder of 2005 and in 2006, growth in world seaborne trade is forecast to increase.

Indonesia is forecast to contribute the largest increase in thermal coal exports in 2005, despite heavy rains in the first half of the year that disrupted many operations. Coal mining conditions are expected to be more favorable in the second half of the year because of seasonally drier weather. Increased production in 2005 and 2006 will also be facilitated by expansions to mining and handling capacity. For example, Kaltim Prima coal is in the process of expanding output from around 20 million to 32 million tonnes a year through upgrades to coal handling equipment.

However, the forecast increase in Indonesia's coal exports needs to be considered in the context of a number of risks. Seasonal weather disruptions, civil and political tensions and an uncertain investment climate all have the potential to disrupt (and lower) coal production and exports.

South African coal exports have been constrained over the past year by rail disruptions. The Richard's Bay Coal Terminal (South Africa's largest coal port) operated below capacity in early 2005 mainly because several major derailments reduced supply of coal to the port. However, rail haulage is expected to increase over the remainder of 2005 and 2006 as upgrades by Spoornet, the state owned rail monopoly, improve the performance of the network.

Growth in exports from Colombia was curtailed in the first half of 2005 by a number of factors. First, heavy rains caused significant damage to transport roads and disrupted production at a number of mines. Second, limited availability of equipment has slowed mine expansions. Third, trade with Venezuela was suspended for six weeks during a diplomatic dispute. Fourth, truck shortages have restricted the resumption of coal transport to Venezuela. Despite these interruptions, increases in mine and handling capacity are forecast to support significant growth in coal exports in 2005 and 2006. For example, Fenoco

are constructing a second rail line between Mina Pribbenow and Cienaga to boost annual capacity by 8 million tonnes to 30 million tonnes.

Coal production in Europe is forecast to continue to decline in 2005 and 2006 as mine profitability deteriorates. Despite increases in prices, returns to producers are expected to fall because of the removal of production subsidies and, in some cases, the depletion of resources. As a result, the coal needs of the region are expected to be increasingly met by imports from suppliers such as Russia and South Africa.

Reliable figures for China's production of thermal coal are not readily available; however, total coal production is estimated to have increased by nearly 10 per cent (or 83 million tonnes) in the first half of 2005. This increase came despite a number of forced mine closures (related to poor safety performance), particularly in the Shanxi province. In mid-August, the official toll of dead and missing in China's coal mining sector in 2005 reached 3400.

Increases in coal output in the remainder of 2005 and 2006 will be constrained by further mine closures. In late August 2005, the State Administration of Coal Mine Safety ordered the closure of 1324 mines and listed an additional 5700 mines where production is to be suspended by the end of 2005. These announcements are likely to be more effective than previous attempts as measures have also been implemented to reduce the financial involvement of local government officials in the coal mining sector.

The government may also be less concerned about restricting growth in coal production as the recent peak summer electricity demand period (July–August) passed with far less brownouts and blackouts compared with the same period in 2004. Moreover, the impact on total coal production of the forced closures is likely to be minimal as the majority of the targeted mines are relatively small and most of the growth in China's production is expected to come from larger state owned mines.

Higher domestic coal requirements led to a reduction in China's exports of thermal coal of around 9 million tonnes (to 36 million tonnes) in the first seven months of 2005, despite the increase in domestic production. However, the availability of coal for export is forecast to increase modestly in the remainder of 2005 as production capacity expands and demand growth eases. A continuation of these trends in 2006 will support further modest growth in exports.

Thermal coal outlook

	Unit	2004	2005 f	2006 f	% change
World					
Total trade					
Thermal	Mt	546.0	556.0	564.0	*1.4*
Thermal coal imports					
Asia	Mt	266.8	271.9	273.7	*0.7*
– Chinese Taipei	Mt	53.0	56.1	57.8	*3.0*
– Japan	Mt	97.1	94.2	92.3	*– 2.0*
– Korea	Mt	58.0	60.4	61.0	*1.0*
– Malaysia	Mt	6.4	7.1	8.2	*15.5*
– Other Asia	Mt	52.2	54.0	56.2	*4.1*
Europe	Mt	196.0	197.3	195.0	*– 1.2*
– EU 25	Mt	160.4	161.6	161.0	*– 0.4*
– Other Europe	Mt	28.7	30.1	29.5	*– 2.0*
Other	Mt	83.3	86.8	93.5	*7.7*
Thermal coal exports					
Australia	Mt	106.9	107.1	110.5	*3.2*
China	Mt	80.2	74.5	75.5	*1.3*
Colombia	Mt	51.2	55.0	60.0	*9.1*
Indonesia	Mt	102.3	109.0	114.5	*5.0*
South Africa	Mt	66.4	67.7	71.1	*5.0*
United States	Mt	19.0	17.5	17.1	*– 2.3*
Other	Mt	120.1	125.1	115.3	*– 7.8*
		2003-04	**2004-05 s**	**2005-06 f**	
Australia					
Production	Mt	173.1	174.8	178.3	*2.0*
Exports	Mt	106.7	106.4	109.0	*2.4*
– value	A$m	4 372	6 336	7 025	*10.9*

See back tables for details. **s** ABARE estimate. **f** ABARE forecast.

Australian export response muted

Reflecting higher contract prices, the average unit return for thermal coal exports from January to June 2005 was 36 per cent above that achieved in the same period in 2004. However, in the case of metallurgical coal, average unit returns for exports increased by 62 per cent over the same period. Higher returns from metallurgical coal exports have led to some mine production capacity being diverted away from thermal coal to metallurgical coal.

This has happened where capacity constraints in transport and handling infrastructure apply in

regions producing both metallurgical and thermal coals. For example, Rio Tinto has reportedly wound back production at Queensland's largest thermal coal mine, Blair Athol, to allow higher production and exports from metallurgical coal mines that rely on shared port and rail facilities at the Dalrymple Bay Coal Terminal.

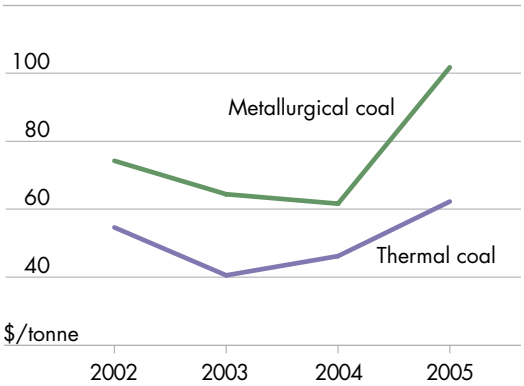
In New South Wales, which produces proportionally less metallurgical coal than Queensland, thermal coal production and exports have continued to expand in 2005, despite several supply disruptions. Nevertheless, the same pattern of greater emphasis on increasing metallurgical coal production is evident. New developments that will boost thermal coal production and exports in 2006 include Excel Coal's new Wambo opencut mine; the Xstrata/Mitsubishi Development Ulan longwall expansion; and, the Xstrata/Sumitomo/Itochu Rolleston opencut mine.

Exports values up

Reflecting increased export volumes and significantly higher US dollar contract prices, the value of Australian thermal coal exports rose by 45 per cent to $6.3 billion in 2004-05. The value of Australian exports is forecast to rise by a further 11 per cent in 2005-06 to $7 billion. The expected increase in 2005-06 reflects the positive impact of higher contract prices and forecast volumes more than offsetting the negative impact of forecast lower spot market prices over the remainder of 2005 and in 2006.

Australian coal export unit values

Year to July

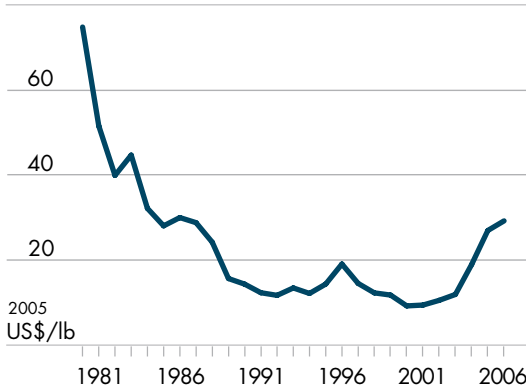


Uranium

World U_3O_8 prices are forecast to rise in the short term, with the underlying deficit between uranium supply (mine production and secondary sources) and consumption leading to a decline in stocks.

In response to a large increase in uranium prices over the past two years, uranium exploration expenditure in Australia has increased substantially. However, increased exports in the short term will come from higher production at existing Australian uranium mines.

Spot uranium price



Uranium prices increasing strongly

The dwindling supply of uranium stocks, particularly among commercial nuclear power plants, and increased concerns over the future supply of secondary sources of uranium have resulted in a strong increase in world spot prices for uranium mine output (U_3O_8) in 2004 and the first half of 2005. In addition, an increase in the prices of non-nuclear energy sources and a growing desire by signatories to the Kyoto Protocol to reduce greenhouse gas emissions has raised interest in increased use of nuclear power over the medium term. Given these factors, investment demand for uranium has increased, reflected in recent purchases of uranium by the Uranium Participa-

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tion Corporation and Adit Capital Management (uranium investment funds).

Prices rose from approximately US$10 per pound in early 2003 to over US$30 per pound in August 2005. Spot uranium prices are forecast to continue to rise in the short term, with the average price of U_3O_8 expected to increase by 46 per cent in 2005, to average US$27 per pound, and by a further 11 per cent in 2006, to average US$30 per pound.

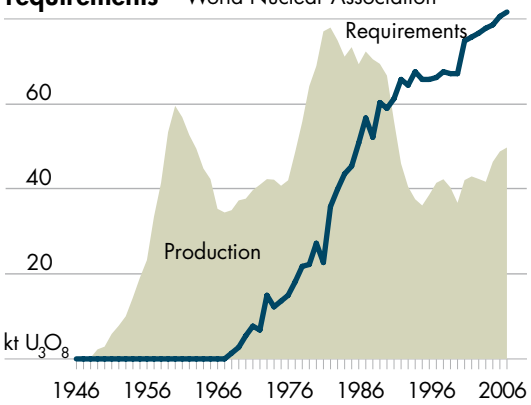
Supply of uranium from secondary sources

Since the early 1990s, a large percentage of world uranium demand has been met by secondary supplies of uranium, particularly from the Russian Federation. Currently, secondary supplies of uranium are predominantly sourced from the reprocessing of spent nuclear fuel and the conversion of highly enriched uranium (HEU) from the disarmament of nuclear weapons. The United States and the Russian Federation currently hold substantial quantities of HEU but the majority of these stockpiles cannot be sold until 2009 (for a more detailed explanation refer to the box on secondary sources of uranium).

The Euratom Supply Agency (responsible for ensuring the supply of nuclear fuels to EU countries) has indicated that given the planned growth of nuclear power in the Russian Federation, supplies of secondary uranium from that country are likely to fall. Tekhsnabeksport's (Tenex), termination of its contract with Global Nuclear Services and Supply in early 2004 also increased uncertainty about the availability of current supplies. Tenex has indicated that, beginning in 2008, it will no longer export HEU feed from the Russian Federation. This will reduce secondary supplies to western markets. While this will not occur during the outlook period, such announcements have raised uncertainty about the future availability of secondary material. Further, as the majority of currently available HEU material is already covered by purchase agreements, new nuclear power plants will have to rely increasingly on uranium sourced from mine output.

Further reductions in the nuclear arsenals of the United States, the Russian Federation and other countries could release additional stocks of HEU onto world markets. However, any further releases of HEU from stockpiles are likely to occur in a controlled manner in order to reduce the impact on the world uranium market.

World uranium mine production and reactor requirements World Nuclear Association



Demand for U_3O_8 to increase in 2005 and 2006

The only significant commercial use for uranium is as fuel for nuclear power plants. As of August 2005 there were 440 nuclear power plants worldwide. The recent rise in electricity generating costs (associated with increases in coal and oil prices), and actions by signatories to the Kyoto Protocol to discourage greenhouse gas emissions, have increased interest in nuclear power.

World demand for uranium is forecast to increase by around 3 per cent in 2005 and by a further 1 per cent in 2006. Capacity increases in

Uranium outlook

		2004	2005 f	2006 f	% change
World					
Production	kt	46.4	48.8	49.8	*2.0*
Consumption	kt	78.5	80.7	81.8	*1.4*
Spot price	US$/lb	18.6	27.1	30.1	*11.1*
		2003-04	**2004-05 s**	**2005-06 f**	
Australia					
Production	t	9 569	10 964	11 434	*4.3*
Exports	t	9 099	11 249	11 434	*1.6*
– value	A$m	364	475	616	*29.7*
– ave price	A$/kg	40.1	42.2	53.9	*28.6*

See back tables for details. **s** ABARE estimate. **f** ABARE forecast.

Secondary sources of uranium

Moves by the Russian Federation and the United States to reduce the size of their nuclear arsenal in the 1990s (following the end of the Cold War) generated a substantial quantity of secondary uranium supplies. This depressed world uranium prices and led to a reduction in mine output. In 2004, mine production accounted for only 57 per cent of total worldwide reactor requirements.

Secondary supplies of uranium are produced in various forms, including reprocessing of spent nuclear fuel and down blending of highly enriched uranium (HEU) from nuclear weapons. HEU contains more than 90 per cent U-235 and must be diluted with depleted uranium (mostly U-238) or natural uranium (0.7 per cent U-235) before it can be used to manufacture fuel rods for nuclear reactors. The supply of most of this material is governed by bilateral agreements between the United States and the Russian Federation.

The US–Russian HEU purchase agreement

This agreement, commonly known as the 'Megatons to Megawatts' agreement took effect in 1993. The aim of the program was to contribute to the nonproliferation of nuclear weapons by diluting 500 tonnes of highly enriched uranium (equivalent to around 150 000 tonnes of natural uranium) from Russian nuclear weapons for sale to commercial nuclear power plants over a twenty year period. As of late March 2005, around 237 tonnes of HEU had been converted under this agreement.

The purchase agreement required the United States and the Russian Federation to appoint an executive agent to implement the commercial contracts. In 1994 Russia selected Tekhsnabeksport (Tenex), the Russian nuclear ministry's foreign trade organisation (now Rosatom), while the United States initially selected its Department of Energy (DOE), but later settled on the United States Enrichment Corporation (USEC). USEC and Tenex signed a contract whereby USEC agreed to purchase the enrichment component of the low enriched uranium (LEU). Under this arrangement, HEU is converted to LEU in the Russian Federation. The LEU is then shipped to the United States and delivered to USEC that, in turn, sells this uranium to commercial nuclear power plants.

The HEU feed deal

In early 1999 a bilateral agreement was signed between the United States and the Russian Federation. The agreement provided for the creation of stockpiles of uranium in both the Russian Federation and the United States. Stockpiles of up to 22 000 tonnes of UF6 equivalent (or 26 000 tonnes of U_3O_8) will be held by both the Russian and US governments until 2009. The day after the deal was signed, Tenex announced that it had signed a commercial deal with Cameco, Cogema and Nukem (known collectively as the Western Consortium) to have an exclusive option to purchase the majority of the natural uranium component of the LEU being delivered to the United States.

Other secondary sources

When USEC was privatised in 1998 it was endowed with over 30 000 tonnes of uranium from the US government inventory. However, the majority of this inventory has already been delivered or is committed to future delivery.

The US Department of Energy is currently considering whether to make 17.4 tonnes of surplus HEU (equivalent to 5200 tonnes of U_3O_8) available to new nuclear power plants under the DOE Nuclear Power 2010 program. This program, announced in 2002, is a joint US government/industry initiative focused on reducing technical, regulatory and institutional barriers to the construction of new nuclear power plants in the United States. However, DOE has indicated that any sales would be done in a manner that minimises market impact.

Increased competition in many electricity markets over the past decade led to a substantial reduction in commercial inventories held by nuclear power plants. However, more recently, nuclear plants have been accumulating inventory in anticipation of higher prices and reduced availability.

the Republic of Korea, India and China, as well as an increase in capacity utilisation in Japan, is expected to more than offset the planned closure of the 600 megawatt Barsebäck 2 reactor in Sweden and the recent closure of the 340 megawatt Obrigheim reactor in Germany.

Japan's largest nuclear power company, Tokyo Electric Power Company (TEPCO), restarted the last of its seventeen reactors (Fukushima-1) in mid-July 2005. This followed the progressive shutdown of all its nuclear units by April 2003 for safety inspections, after TEPCO admitted in late August 2002 to having falsified routine plant inspection reports.

Kansai Electric Power, Japan's second largest nuclear power company, closed its eleven reactors in 2004 following a fatal accident that occurred during preparations for maintenance inspections. As of mid-2005, ten of those units had been restarted.

Also in Japan, Chubu Electric Power's 1380 MWe Hamaoka-5 reactor commenced operations in January 2005. Tohuku Electric Power's 1100 MWe Higashidori-1 reactor is expected to begin commercial operations in the second half of 2005. In addition, the 1358 MWe Shika-2 reactor in Japan is expected to begin commercial operations in 2006. These new reactors will increase Japan's total nuclear power generation capacity to 48 gigawatts.

In Korea, commercial production from Korea Hydro and Nuclear Power's 1000 MWe Ulchin-6 reactor commenced in June 2005. As a result, Korea now has twenty nuclear power reactors. In China, the 950 MWe Tianwan-2 reactor is expected to begin commercial operation in December 2005.

In India, the 540 MWe Tarapur-4 unit began commercial production in August 2005. Tarapur-3 is expected to commence production in 2006. Smaller reactors are also expected to be completed in India and Iran by the end of 2006, with a combined capacity of around 1400 MWe.

World mine production

The recent increase in U_3O_8 prices has encouraged higher mine output and exploration activity. However, mine production is expected to grow only modestly in 2005 and 2006 given the considerable lead time associated with developing new uranium mines.

Global mine production of uranium is forecast to increase by 5 per cent in 2005, driven largely by higher production in Canada, Australia and Namibia. In 2004, Canada and Australia accounted for an estimated 30 and 25 per cent of the world's uranium mine production respectively. In 2005, production from Rio Tinto's Rössing mine in Namibia is targeted at 3800 tonnes of U_3O_8, a 7 per cent increase on production in 2004. First production from Paladin Resources' Langer Heinrich deposit (1180 tonnes of U_3O_8 a year), also in Namibia, is expected in late 2006.

Cameco, the world's largest producer of uranium, plans to increase production at its Canadian mines by over 3 per cent in 2005. This increase could be larger if the proposed capacity increases at McArthur River and Key Lake are approved. Cameco has applied for a licence to increase combined annual production capacity

Uranium enrichment

Natural uranium contains approximately 0.7 per cent U-235. As such, natural uranium cannot be used in light water reactors because the content of fissile U-235 is too low to sustain a nuclear reaction. Enrichment is the process of increasing the concentration of U-235 while decreasing the concentration of U-238. The majority of nuclear power reactors require low enriched uranium of between 3 and 5 per cent U-235. The work required to perform enrichment is measured in terms of separative work units (SWU). An increase in the amount of SWUs used in the enrichment process reduces the quantity of U-235 in the tails (waste material) and lowers the quantity of natural uranium required in the enrichment process.

Enrichment facilities are currently operating at high capacity levels. Therefore, the extent to which a higher level of SWUs can be used in the enrichment process is limited. As such, consumption of U_3O_8 over the outlook period is expected to grow in line with growth in nuclear power generation.

by 18 per cent. The expected level of Cameco's total production capacity has also been boosted by an extension of the mine life of the Rabbit Lake uranium mine to 2007 after additional reserves were identified.

In 2006, world uranium production is forecast to rise only modestly as increases in Canada and China (including the 200 tonne expansion of the Fuzhou mine) will be partly offset by the expected closure of the Rozna mine in the Czech Republic. Uranium production in Canada is expected to increase marginally, as higher output at existing operations offset any reduced production from mine closures. Construction of Cameco's Cigar Lake operation (the world's second largest high grade deposit) will begin in early 2005 and take an estimated 27 months to complete.

The future of Rio Tinto's Rössing mine in Namibia is currently being assessed. In December 2003, Rössing Uranium Limited (the mine operator) announced that the mine may close in 2007 because of pressure on profits associated with the strong appreciation of the South African rand (to which the Namibian dollar is linked) against the US dollar. However, Rössing Uranium is in the process of developing a proposal to extend the life of the mine.

Domestic exploration expenditure on uranium increasing strongly

Australian uranium exploration expenditure increased by 52 per cent in 2003-04 to $10.5 million, stimulated by significant rises in world spot prices. In the first three quarters of 2004-05 uranium exploration expenditure increased by close to 80 per cent over the corresponding period in 2003-04.

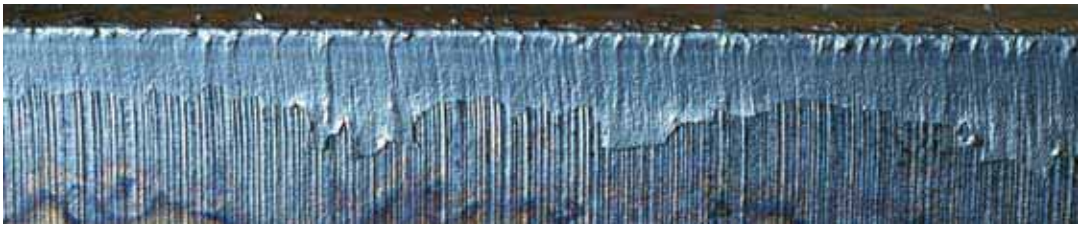
Australia has the world's largest resources of low cost uranium (recoverable at less than US$40 a kilogram of uranium), accounting for around 39 per cent of total world resources (Geoscience Australia, *Australia's Identified Mineral Resources, 2004*). However, Australia has only three uranium mines currently operating: BHP Billiton's Olympic Dam mine in South Australia; Energy Resources of Australia's Ranger mine in the Northern Territory; and Heathgate's Beverley mine, also in South Australia. Development of Southern Cross Resource's Honeymoon project in South Australia is currently on hold, despite having approval to proceed to production. In early August, Southern Cross Resources stated that it would make a final development decision on the Honeymoon project by the end of 2005.

BHP Billiton's Olympic Dam mine has reasonably assured resources, which are recoverable at less than US$40 a kilogram of uranium, of over 499 000 tonnes of uranium. This makes Olympic Dam the world's largest deposit of low cost uranium. An expansion of the Olympic Dam copper/uranium mine is being investigated and could underpin a significant increase in domestic U_3O_8 production over the medium term.

Australian production to rise modestly in the short term

Virtually all of Australia's production of U_3O_8 is exported. Australia's exports of U_3O_8 increased by 24 per cent in 2004-05 to around 11 250 tonnes. This came from an increase in production at Olympic Dam and a return to normal production at the Ranger mine in the Northern Territory, which was interrupted in 2003-04. Corresponding mainly with higher export volumes, export earnings in 2004-05 increased by over 30 per cent to $475 million.

In 2005-06, Australia's production of U_3O_8 is forecast to increase by over 4 per cent to over 11 400 tonnes, largely reflecting higher expected production from BHP Billiton's Olympic Dam mine. With a modest increase in domestic U_3O_8 production and an increase in export prices, Australia's export earnings from uranium are forecast to increase by 30 per cent to $616 million in 2005-06. The average unit value of uranium exports is forecast to increase by less than the forecast rise in spot prices as a large proportion of Australia's uranium mine production is sold under long term contracts (that reflect previously low spot prices).



METALS

consumption growth to slow in 2006

William Mollard, Simon Richmond, Ryan Wilson, Frank Drum, Ian Haine and Andrew Maurer

Steel and steel making raw materials

World steel production is forecast to rise by 3 per cent to 1.09 billion tonnes in 2005, before reaching 1.15 billion tonnes in 2006. With blast furnaces expected to account for the majority of the growth in output, the outlook for metallurgical coal and iron ore remains positive.

Global steel consumption

World steel consumption is forecast to rise by 4.5 per cent to 1.10 billion tonnes in 2005, and to increase to 1.15 billion tonnes in 2006.

After rising by 14 per cent in 2004, growth in steel consumption in the United States is expected to ease in 2005, mainly as a result of lower demand from the automobile sector. In the first seven months of 2005 the manufacture of motor vehicles in the United States declined by around 1.2 per cent to 6.7 million units. Over the remainder of 2005, the further tightening of monetary policy by the Federal Reserve and high fuel prices are expected to dampen demand for new automobiles. Reflecting these factors, many US producers (such as General Motors and Ford) have announced production cuts for the third quarter of 2005.

While demand from the automobile sector has eased, growth in demand for steel from the construction sector remains buoyant. For example, new housing starts increased by 5.3 per cent in the first seven months of 2005.

In China, apparent steel consumption rose by 33 per cent year on year in the first six months of 2005, to total 164 million tonnes. Despite measures that were implemented over the past year targeted at slowing growth in those industries that use steel intensively, such as the automobile and construction industries, growth in Chinese steel demand has remained robust.

In the first six months of 2005, investment in factories, bridges and other fixed assets rose by 25 per cent year on year. This is significantly higher than the government target rate of 16 per cent and highlights the strong underlying growth in infrastructure investment in China. However, growth in steel demand is forecast to moderate in late 2005 and 2006 as economic growth slows both in China and in key markets for exports of steel intensive manufactured goods.

Steel production and raw material demand

In the first half of 2005, global crude steel production rose by 7.6 per cent year on year to reach 546 million tonnes. Strong growth in China and India offset falls in higher cost producing regions, such as north America and Europe, where producers reduced output in response to falling prices and weak demand growth. For the remainder of 2005, global steel production is forecast to continue to rise, mainly as a result of higher output in China, with full year production forecast to be around 1.09 billion tonnes.

In 2006, a forecast recovery in steel output in the United States and Europe, combined with continued production growth in China, is forecast to support global steel production rising at a faster pace.

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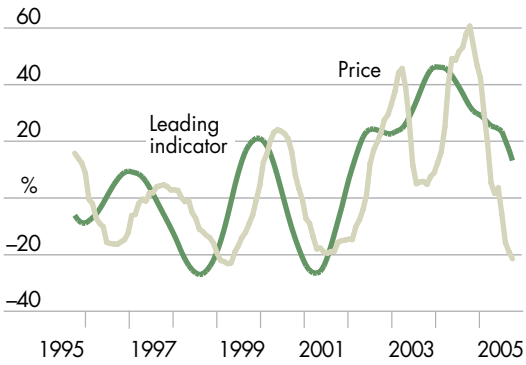
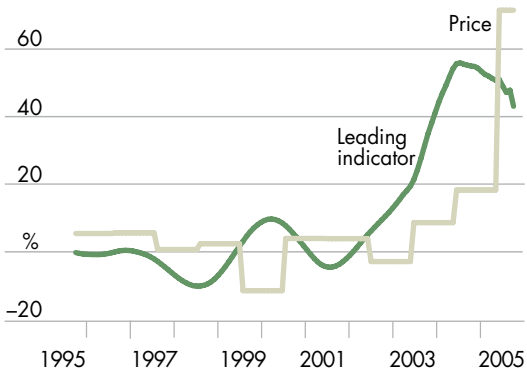
Steel price and leading indicator

Monthly percentage change year on year, ended August 2005



Iron ore price and leading indicator

Monthly percentage change year on year, ended August 2005



North America and Europe

After rising strongly in 2004, output of crude steel in north America and Europe is expected to fall in 2005 as producers curtail output in response to falling prices and increasing stocks.

For example, Mittal steel (the world's largest steel producer) announced that it will cut production by 1 million tonnes: split equally between its European and north American operations. Other producers, such as Arcelor, Corus and US Steel have also announced cuts in output.

These cuts in production are expected to be sufficient to allow the significant volume of inventories that were built up in late 2004 and early 2005 to be drawn down, even despite the moderate forecast growth in consumption. As inventories decline against a backdrop of rising consumption, steel prices are expected to recover in late 2005.

Reflecting higher prices and the positive outlook for global steel demand, both north American and European steel production is forecast to rise in 2006.

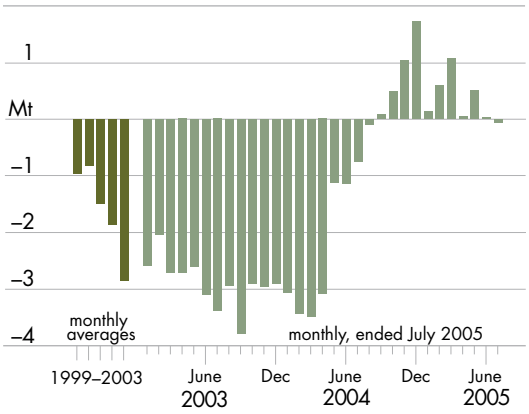
China's increasing steel output …

In the first six months of 2005, Chinese crude steel production rose by 33 per cent year on year to reach 164 million tonnes, accounting for 94 per cent of the increase in world steel output.

Over the past decade, China has been largely self sufficient in lower quality steel products, but has had to import higher quality steel products. For example, in the first half of 2005, China's output of long products (such as rebar and wire rod, that are typically consumed in the construction industry) rose by 21 per cent to reach 100 million tonnes. This accounted for 61 per cent of China's total steel output.

However, rising demand from the expanding automotive and shipbuilding sectors and improved technological capability has supported a significant increase in the production of higher end flat products, such as coils and plates. In the first half of 2005, Chinese output of hot and cold rolled flat products rose by 44 per cent and 33 per cent to 37.3 million tonnes and 9.4 million tonnes, respectively. At the same time the growth in steel plates rose by a 17 per cent to

Chinese net steel exports



total 14.8 million tonnes. The increase in production capacity of high quality steel products will displace imports and support further growth in China's net exports.

In less than three years China has grown from being the world's largest steel importer (in 2003) to a net exporter. While the total volume of exports in 2005 has been small, the significant turnaround in China's net export position has had a significant impact on world steel markets and contributed to the fall in steel prices experienced in early 2005.

However, following changes in regulations, growth in China's total steel exports slowed in mid-2005. On 1 April, the export rebate on semifinished products (which accounted for 37 per cent of China's total exports in the first three months of 2005) was abolished and on 1 May the rebate on finished steel products was reduced from 13 per cent to 11 per cent. In June, China's net steel exports totaled 32 000 tonnes, significantly below the March level of 1.07 million tonnes. The sharp decline in net exports between March and June was largely brought about by a major increase in exports prior to the reductions in rebates. Over the full course of 2005 and 2006, the expansion of China's steel making capacity is expected to be sufficient to lift net exports to

World steel outlook

	2003	2004	2005	2006
	Mt	Mt	Mt	Mt
Consumption				
European Union 25	173	184	185	187
North America	121	138	141	145
Brazil	17	18	19	19
Eastern Europe	52	57	58	60
China	258	285	320	353
Japan	77	79	79	80
Korea, Rep. of	47	48	49	50
Chinese Taipei	24	24	25	25
India	35	36	38	39
World steel consumption	970	1 049	1 096	1 147
Production				
European Union 25	184	194	188	191
North America	109	115	109	112
Brazil	31	33	34	36
Eastern Europe	114	120	118	119
China	220	272	323	359
Japan	111	113	113	113
Korea, Rep. of	46	48	48	49
Chinese Taipei	19	19	19	20
India	32	33	35	38
World steel production	968	1 057	1 092	1 147

China's new steel policy

On 20 July, the Chinese government announced its 'Development Policy for the Steel Industry' which outlined the new rules and regulations governing the future direction of steel production in China.

The plan envisages that the ten largest steel mills will account for 50 per cent of output by 2010, and 70 per cent by 2020. As only fifteen of China's 871 steel producers had an annual output of more than 5 million tonnes in 2004, significant industry consolidation through merger and acquisition activity is required to meet this objective.

Restrictions have also been implemented such that all new projects will have to meet both local and state environmental protection criteria. By 2010, all blast furnace based steel mills are required to consume no more than 0.73 tonnes of coal and 8 tonnes of water per tonne of steel output, and by 2020, 0.7 tonnes of coal and 6 tonnes of water per tonne of steel output. By comparison, Japan's blast furnance based steel mills consume an average of around 0.63 tonnes of coal for each tonne of output.

As an estimated 20 per cent (80 million tonnes) of China's crude steel output is produced by small–medium size steel plants, which currently do not meet these new regulations, these plants will either be forced to upgrade their technology or close.

Measures have also been implemented that restrict foreign steel companies from holding controlling stakes in domestic steel companies. In addition, only those steel companies that have intellectual property in steel making technologies and have an annual output of more than 10 million tonnes of crude steel are able to take a minority stake in new Chinese steel making facilities.

3.1 million tonnes and 5.2 million tonnes respectively.

China's exports of steel intensive manufactures goods are also a key driver of China's steel industry. Growth in these exports, and the development of infrastructure to support the export capability, has accounted for a significant proportion of recent growth in China's steel demand. As a result, economic developments in China's export markets have a significant impact on China's exports of durable goods, and as a result, steel demand.

The United States is China's largest export market. In 2004, China's net trade surplus with the United States rose by 31 per cent to reach US$162 billion. Over this period, exports of a range of steel intensive goods rose strongly. For example, exports of refrigerators and washing machines rose by 34 per cent and 32 per cent respectively. Growth in China's exports of motor vehicles was even higher, increasing by 226 per cent, albeit from a relatively low base.

In the first half of 2005, China's net trade surplus with the United States continued to rise, increasing by 32 per cent year on year to US$90 billion. However, as US household debt is at historically high levels, an expected further tightening of monetary policy by the Federal Reserve is expected to dampen growth in US consumer spending and, as a result, lower growth in import demand for consumer durables from China.

… supporting iron ore …

In 2005, China's iron ore consumption is forecast to continue to increase (albeit at a slower pace), in line with lower growth in blast furnace output. With limited new domestic mine production capacity due on line in 2005 and with lower domestic prices, the growth in demand is forecast to be increasingly met by imports. As a result, China's iron ore imports are forecast to rise by 50 million tonnes to be around 258 million tonnes in 2005 before reaching 301 million tonnes in 2006.

The sharp rise in China's iron ore demand over the past eighteen months led to an increasing amount of iron ore imports being met by shipments negotiated on a one off (spot) basis at prices far higher than the benchmark negotiated

Average price paid for Indian iron ore, 2004 Monthly, ended July 2005

prices. Most of the growth in spot tonnages has been supplied by India. As a result, the average unit value of iron ore imports in China has been significantly higher than in nations where long term contracts meet the majority of the import requirements, such as Japan.

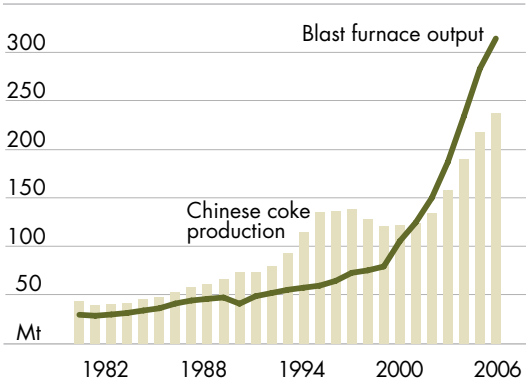
However, as growth in imports has slowed and new export capacity has become available in Australia, India's market share has fallen. In the three months to June 2005, China's imports of Indian iron ore fell by 6 per cent compared with the previous three months to 18.9 million tonnes. In comparison, iron ore sourced from Australia rose by 15 per cent to 28.1 million tonnes over that period.

These trends are forecast to continue over the remainder of 2005 and in 2006. As a result, growth in China's iron ore imports is forecast to be increasingly met under long term contracts from Australia and Brazil at the expense of the relatively higher cost Indian iron ore.

… and coal imports

Strong demand from its expanding steel industry and rising coke prices has supported the rapid expansion of China's coke production. In 2004, China's coke production rose by 21 per cent to 190 million tonnes, accounting for an estimated 45 per cent of world production. Over the outlook period, continued strong growth in blast furnace output is expected to support Chinese coke production rising by a further 15 per cent to

Chinese coke production



218 million tonnes in 2005, before reaching 237 million tonnes in 2006.

Rapid growth in China's coke output has underpinned a rise in imports of high quality hard metallurgical coal. In the first 6 months of 2005, imports of metallurgical coal rose by 31 per cent to 4 million tonnes. Over the remainder of 2005, Chinese metallurgical coal imports are forecast to continue to rise, reaching 10 million tonnes in 2005 and 15 million tonnes in 2006.

Further, a significant proportion of the growth in China's steel output is expected from medium and large scale blast furnaces. These facilities typically require hard coking coals that exhibit higher rank and higher coke strengths. Therefore, Australian coking coals, which exhibit superior quality and higher coke strength relative to Canadian hard coking coal (the second largest world supplier), are forecast to meet the majority of the projected growth in Chinese imports.

Steel making raw materials supply

Metallurgical coal

World seaborne trade in metallurgical coal is forecast to rise by 4 per cent in 2005 to 216 million tonnes before reaching 227 million tonnes in 2006. The strong growth in demand and prices for metallurgical coal has encouraged significant new additions to metallurgical coal production capacity. The majority of the new capacity is expected to be located in Australia and Canada.

Australian exports of metallurgical coal are forecast to rise by 6.5 per cent to 122.9 million tonnes in 2005, and by a further 8.7 per cent to 133.6 million tonnes in 2006. In 2006, Australia

Selected changes to Australian metallurgical coal supply capacity

Mine	Owner	Port used	2005	2006
			Mt	Mt
Greenfield				
Mooranbah	Excel Coal/Millenium	DBCT	0	1.5
Minevra	Felix Resources limited	Gladstone	0.1	0.3
Broadmeadows	BMA	DBCT/Hay Point	1.3	1.9
Curragh North	Wesfarmers	Gladstone	1.1	1.2
Dendrobium	BHP Billiton LTD Illawarra Coal	Port Kembla	1.3	0.7
Brownfield				
Coopabella	MacArthur Coal	DBCT	0.85	0.6
Hail Creek	Rio Tinto	DBCT	0.4	0.7
Mooranbah North	Anglo American	DBCT	2.7	1
Various BMA Qld	BMA	Hay Point/ DBCT/Gladstone	1.8	2.1
Tahmoor North	Austral Coal Limited	Port Kembla	0.3	0.3
Riverside	BHP Billiton	Hay Point/DBCT	–2.1	–0.8
Dawson Central	Anglo Coal Australia/ Mitsui & Co Australia	Gladstone	–0.45	–1.05
Yarrabee	Felix Resources limited	Gladstone	0.2	0.2
Others			0.5	1.5

is forecast to account for 59 per cent of worldwide seaborne metallurgical coal trade. Higher output is forecast to be sourced from both relatively new operations (that are ramping up) and the expected commissioning of a number of new projects over the outlook period.

Canada

Significantly higher coal prices are forecast to underpin Canada's exports of metallurgical coal rising by 12 per cent in 2005 (to 28 million tonnes) and by 20 per cent in 2006 (to 34 million tonnes). Canada has sufficient port and rail capacity to support this growth as a result of mine closures during previous periods of low prices.

Higher output is expected from the recommissioned Cheviot Creek hard coking coal mine as it ramps up toward total capacity of 2.8 million tonnes a year in late 2005. Strong demand for low volatile PCI coals has also supported the recent redevelopment of Pine Valley Mining's 2 million tonnes a year capacity Willow Creek mine in British Columbia.

On a smaller scale, higher output is expected from Western Canadian Coal following the development of the Brule and Dillon coking coal mines in 2006 (with combined capacity of 1 million tonnes).

Iron ore

Seaborne trade in iron ore is forecast to rise by over 9 per cent in 2005 (to 652 million tonnes) and by 7 per cent in 2006 (to 699 million tonnes). As most of the forecast growth in steel production is expected to come from blast furnaces, particularly in China, growth in demand for iron ore is forecast to remain strong over the outlook period.

Brazil

Significant additions to iron ore capacity from the world's largest iron ore producer, CVRD, are expected to support increases in Brazilian exports of iron ore of 13 per cent in 2005 (to 229 million tonnes) and by a further 10 per cent in 2006 (to 251 million tonnes)

World metallurgical coal trade

	2003	2004	2005	2006
	Mt	Mt	Mt	Mt
Imports				
Japan	65.7	67.0	65.8	65.7
Chinese Taipei	8.0	8.4	8.5	8.6
Korea, Rep. of	19.1	19.9	20.2	20.4
India	14.3	13.9	14.7	19.2
China	2.6	6.4	10.1	15.5
European Union 25	58.8	61.8	61.5	62.7
Brazil	16.4	17.8	18.3	21.4
Other Asia	1.8	1.7	2.2	2.1
Other	12.0	11.4	14.5	11.8
World seaborne imports	198.6	208.3	215.8	227.4
Exports				
Australia	110.1	115.4	122.9	133.6
Canada	24.1	25.1	28.1	33.7
United States	19.2	24.6	25.0	21.9
China	13.1	5.8	3.4	3.6
Russian Federation	10.0	13.1	13.5	13.7
Other	22.1	24.3	22.9	20.9
World seaborne exports	198.6	208.3	215.8	227.4

World iron ore trade

	2003	2004	2005	2006
	Mt	Mt	Mt	Mt
Imports				
European Union 25	131	142	140	142
Asia				
– Japan	132	135	135	136
– China	148	208	258	301
– Korea, Rep. of	43	44	45	46
– Chinese Taipei	16	16	16	16
Other Asia	6	7	10	10
Rest of the world	55	44	49	48
World seaborne imports	531	596	652	699
Exports				
Australia	188	211	245	280
Brazil	184	203	229	251
India	57	68	70	57
Canada	27	27	27	28
South Africa	24	24	25	27
Sweden	16	16	16	16
Others	36	46	41	40
World seaborne exports	532	596	652	699

Capacity of the Carajàs mine is being increased by 15 million tonnes to 85 million tonnes a year by 2006. The development of three new mines (Fabrica Nova, Brucutu and Fazendao) is expected to add combined capacity of around 36 million tonnes a year in 2006. Higher output is also expected from the development of the 14 million tonnes a year capacity Fazendao mine in 2006.

Australia

Over the outlook period, Australia is forecast to capture an increased share of world seaborne iron ore trade as a result of both newly available mine and port capacity, and the freight cost advantages to consumers conferred by Australia's closer proximity to the rapidly expanding Chinese market (compared with Brazil).

In the first half of 2005, Australian exports of iron ore rose by 19 per cent year on year to 117 million tonnes. Exports were bolstered by record shipments by BHP Billiton following the completion of the Mining Area C mine expansion and the new Western stockyards at Port Hedland.

The ramping up of operations at the newly commissioned Eastern Ranges and Yandicoogina mines supported strong growth in Hamersley Iron's mine output. As Hamersley Iron's Dampier port is currently operating at full capacity, higher shipments were made through Robe River Iron's (also controlled by parent company Rio Tinto) port at Cape Lambert.

The most significant increase to Australian iron ore export capacity is expected in late 2005, following the completed expansion of Hamersley Iron's port at Parker Point (near Dampier). The development of two new shipping berths, new ship loader and a car dumper is expected to increase capacity from 74 million tonnes a year to 116 million tonnes a year.

On a smaller scale, higher exports are expected from Portman Mining following the expansion of the Koolyanobbing mine by 2.8 million tonnes to 8 million tonnes by late 2005.

Record Australian exports

In 2004-05, Australian exports of metallurgical coal rose by 12 per cent to 125 million tonnes. Additions to both mine production and port capacity are forecast to support a 5 per cent increase in the volume of Australian metallurgical coal exports in 2005-06.

Increased volumes and significantly higher prices underpinned a 65 per cent rise in Australian metallurgical coal export earnings to $10.7 billion in 2004-05. Further gains in export volumes and contract prices are forecast to support growth in the value of metallurgical coal exports of a further 64 per cent in 2005-06 to $17.6 billion.

Australian exports of iron ore rose by 17 per cent to 228 million tonnes in 2004-05 and are forecast to rise by a further 17 per cent to reach 267 million tonnes in 2005-06, valued at $12.9 billion.

Steel and steel making raw materials outlook

		2003-04	2004-05 s	2005-06 f	% change
Australia					
Production					
Iron and steel **s**	Mt	9.47	7.56	7.80	*3.2*
Iron ore	Mt	221.5	251.8	275.3	*9.3*
Metallurgical coal	Mt	114.4	124.7	132.2	*6.0*
Exports					
Iron and steel	Mt	3.82	2.25	2.28	*1.3*
– value	A$m	2 004	1 952	1 633	*– 16.3*
Iron ore	Mt	194.8	228.2	267.2	*17.1*
– value	A$m	5 277	8 085	12 859	*59.0*
Metallurgical coal	Mt	112	125	131	*4.8*
– value	A$m	6 510	10 730	17 581	*63.8*

See back tables for details. **s** ABARE estimate. **f** ABARE forecast.

Gold

In the first eight months of 2005, the US dollar appreciated by around 7 per cent against the euro. Stronger economic growth in the United States than in the European Union, the rejection of the EU constitution by France and the Netherlands and further increases in US interest rates were the major factors underlying the appreciation of the US dollar. Over the same period, the US dollar denominated gold price increased by 1 per cent as the relationship between the US dollar/euro and the gold price weakened.

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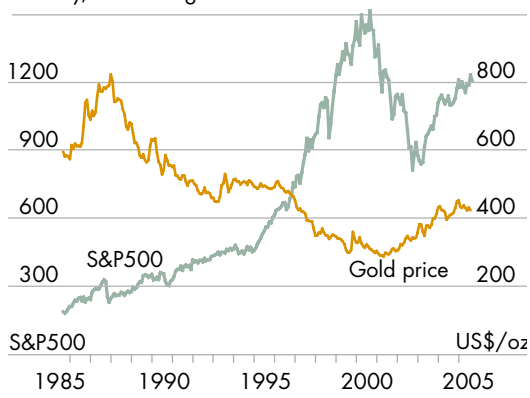
Prices up in 2005, but down in 2006

The close relationship between the depreciation of the US dollar against the euro and increases in the US dollar denominated gold price has been a feature of this market over the past four years. Between mid-2001 and mid-2005, a 45 per cent increase in the gold price was accompanied by a 40 per cent depreciation of the US dollar against the euro.

However, this strong positive correlation has weakened substantially since late May 2005. For example, despite strength in the US dollar and US equities markets, the world gold price remained above US$410 an ounce in the first eight months of 2005.

Gold price and S&P500
Monthly, ended August 2005



US dollar/euro and gold price
Daily, ended 30 August 2005

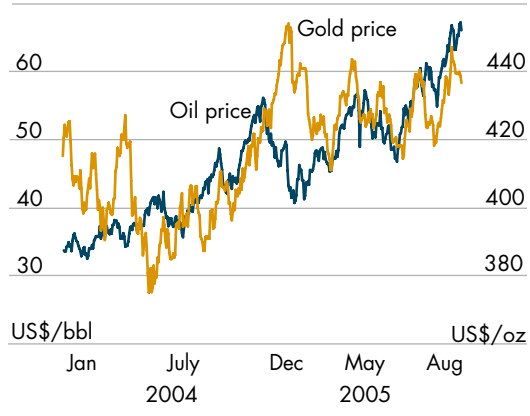
In mid-2005 the gold price appears to have also been more responsive to strengthening of the euro than to strengthening of the US dollar. In the period from the beginning of June to the end of August the US dollar appreciated against the euro on 33 of 66 trading days, by an average of 0.43 per cent. On those days the gold price fell by an average of 0.06 per cent. In contrast, on days where the euro appreciated against the US dollar (by an average of 0.42 per cent), the gold price increased by an average of 0.20 per cent.

In 2005, gold prices have been supported by significant increases in world oil prices (and associated concerns over the possible implications for inflation), terrorist activity in the United Kingdom and Egypt and production disruptions at a number of mining operations in South Africa.

World fabrication consumption is also forecast to increase in 2005, largely because of continued strength in gold jewellery demand in India, China and the Middle East.

The positive impact on prices of these factors is expected to more than offset the downward pressure on gold prices from expected increases in world gold mine production and higher central bank sales of gold. As a result, the world gold price is forecast to rise by 5 per cent to average US$429 an ounce in 2005.

Gold price and WTI oil price
Daily, ended 26 August 2005



In 2006, assumed further increases in short term interest rates in the United States would be expected to widen the current interest rate differential between the United States and European Union. However, the US dollar is assumed to remain relatively unchanged in 2006 as the positive effects of higher short term interest rates in the United States are offset by concerns among some market participants about the large US current account and budget deficits. An increase in world mine production along with less support from dehedging is forecast to lead to a 4 per cent fall in the gold price to an average US$414 an ounce in 2006.

World mine production to increase in 2005 and 2006

World gold production is forecast to increase by 2 per cent in 2005 to 2504 tonnes (80.5 million ounces). Increased production in Australia, Indonesia, China, the United States and south America is expected to offset lower production in South Africa. In Indonesia, production from Freeport's Grasberg mine increased by close to 1 million ounces year on year in the first half of 2005. Newmont's Leeville project in the United States (500 000 ounces a year) is expected to start production in the final quarter of 2005.

Gold outlook

		2004	2005 f	2006 f	% change
World					
Fabrication consumption	t	3 164	3 233	3 259	*0.8*
Mine production	t	2 464	2 504	2 560	*2.2*
Scrap sales	t	828	800	800	*0.0*
Net stock sales	t	– 128	– 71	– 101	*42.3*
– official sector **a**	t	478	550	530	*– 3.6*
– private sector **a**	t	(164)	(371)	(456)	
– producer hedging **b**	t	(442)	(250)	(175)	
Price	US$/oz	409	430	414	*– 3.8*
		2003-04	**2004-05 s**	**2005-06 f**	
Australia					
Mine production	t	267	265	275	*3.8*
Exports	t	315	309	315	*1.9*
– value	A$m	5 510	5 523	5 771	*4.5*
Price	A$/oz	547	562	571	*1.5*

a Sales (purchases). **b** Net Additions (net reductions).
See back tables for details. **s** ABARE estimate. **f** ABARE forecast.

In south America, gold production will be boosted by the commencement of a number of significant gold operations in late 2005. Barrick Gold's Lagunas Norte mine in Peru commenced production in June 2005 and is expected to produce an average of 800 000 ounces a year in the first three full years of production. Barrick's Veladero mine in Argentina (first three full years of production to average 700 000 ounces a year) is expected to commence production in the fourth quarter of 2005.

World gold production is forecast to increase by a further 2 per cent in 2006, to 2560 tonnes (82.3 million ounces). In the second half of 2006, Newmont's Phoenix mine (400 000 ounces a year) in the United States and Ahafo mine (525 000 ounces a year) in Ghana are both expected to commence production.

South African gold production continues to fall

According to the South African Chamber of Mines, gold production in South Africa fell by over 15 per cent to 145.8 tonnes (4.7 million ounces) in the first half of 2005. This largely reflected more closures of unprofitable mines in early 2005. A large increase in water prices, steel prices (which comprise around 10 per cent of the cash production costs of large scale gold mines in South Africa) and labor costs (around 50 per cent of cash costs), as well as a fall in average rand denominated gold prices received by mining companies, have reduced operating margins at gold mines in South Africa.

Labor costs at South African mines will rise further following recent wage negotiations between the Chamber of Mines (which negotiates on behalf of Harmony, Gold Fields and AngloGold Ashanti) and the National Union of Mineworkers, the United Association of South Africa and the Solidarity Union. In early August more than 100 000 South African gold miners went on strike for five days after rejecting an offer from the Chamber of Mines. This was the first wage related strike in the South African gold industry for eighteen years. The strike ended following acceptance of a wage increase of between 6 and 7 per cent by the respective members of the unions.

With mine closures in early 2005 and an estimated 5 tonnes of production lost through industrial activity, South African gold production is forecast to fall by 12 per cent to 300 tonnes in 2005. In 2006, South African gold production is forecast to fall by a further 3 per cent to 290 tonnes.

Central bank sales

The sale of gold by central banks is forecast to increase by 15 per cent to 550 tonnes in 2005. Increased sales by signatories to the new Central Bank Gold Agreement are expected to account for the majority of the increase. An estimated 506 tonnes of gold has already been sold, exceeding the 500 tonnes allowed in the first year of the agreement (which ends in late September 2005). For example, the Swiss National Bank completed its gold selling program at the end of March 2005 after selling 130 tonnes of gold. In addition, the European Central Bank and the Central Bank of Belgium have sold 47 tonnes and 30 tonnes of gold, respectively, under the first year of the agreement.

Dehedging to decline in 2005 and 2006

In 2004, gold mining companies cut a record 442 tonnes from their hedge positions in order to increase their exposure to movements in the gold price. In the first half of 2005 dehedging amounted to an estimated 107 tonnes. Large producers such as AngloGold Ashanti, Barrick, Placer Dome and Newcrest made comparatively smaller reductions to their hedge books.

In 2005 the rate of dehedging by large gold mining companies is expected to slow because of the smaller size of their remaining hedged positions. In addition, a higher contango (the difference between London Interbank Offer Rates interest rates and the gold lease rate) is expected to increase the incentive for gold producing companies to forward sell production. As a result, the aggregate level of dehedging is forecast to fall by 43 per cent, to 250 tonnes, in 2005.

In 2006, a forecast easing in world gold prices, coupled with a higher contango, will further increase the incentive for companies to forward sell production, particularly junior companies that are commencing production at new projects (as hedging is often required to secure project financing). As a result, aggregate dehedging is forecast to decline further in 2006, to 175 tonnes.

Fabrication demand

In 2005, world gold fabrication consumption is forecast to increase by 2 per cent to 3233 tonnes. An increase in gold jewellery consumption is forecast to offset a decline in demand for gold in electronics. In 2006, fabrication consumption is forecast to increase by 0.8 per cent to 3259 tonnes, largely because of further growth in consumption in China.

Hedging by gold mining companies

The profits of gold mining companies are partly determined by movements in the price of gold. Therefore, some companies choose to reduce the risks associated with falls in prices by hedging. One way of doing this is by forward selling all or part of their estimated future production to an investment bank.

To cover forward contracts to buy gold from gold mining companies, investment banks borrow gold from central banks and are charged a fee known as a gold lease rate. This gold is immediately sold at the current market price with the proceeds invested in assets with returns higher than the gold lease rate, typically at the London Interbank Offer Rate (LIBOR). This increases the supply of gold on the spot market. At the expiry of the forward contract the investment bank purchases gold from the gold mining company and uses it to return the gold that was borrowed from the central bank.

Increases in interest rates tend to increase the spread between rates and enables the investment bank to offer a higher forward price to gold producers. Therefore, increases in interest rates tend to increase the incentive for gold companies to hedge production by forward selling.

When gold mining companies reduce the amount of their future production that is covered by forward contracts they are said to be dehedging.

Gold jewellery consumption in the Middle East, China and India is forecast to increase in 2005 and 2006. This will offset an expected decline in gold jewellery consumption in Europe and the United States. In the Middle East, high oil prices are expected to raise regional incomes, resulting in an increase in the demand for gold jewellery. Strong economic growth and expectations of a favorable monsoon season are also expected to lead to an increase in demand for gold jewellery in India. In China, strong economic growth and a corresponding increase in incomes, combined with further deregulation of the gold industry, are forecast to result in an increase in gold jewellery demand.

Australia

Australian gold production declined by around 2 tonnes in 2004-05 to 265 tonnes (8.5 million ounces). This was despite the commencement of gold production at Newcrest's 800 000 ounce a year Telfer mine in Western Australia in the December quarter 2004. Lower production from a number of existing operations and the closure of a number of smaller operations all contributed to this decline.

In 2005-06, however, Australian gold production is forecast to increase by 4 per cent to 275 tonnes (8.7 million ounces). This forecast increase will come largely from the rampup of production at the Telfer mine. Perseverance Corporation's Fosterville gold mine in Victoria (110 000 ounces a year) and NuStar Mining's Paulsens gold mine (80 000 ounces a year) both commenced production in the June quarter 2005. A number of other operations are also expected to commence mining in 2005, including Ballarat Goldfields' Ballarat East mine in Victoria (200 000 ounces a year) and Citigold's Warrior mine in Queensland (40 000 ounces a year). Barrick's Cowal mine (first full three years of production to average around 230 000 ounces a year) is expected to commence operations in the first quarter of 2006.

In line with higher domestic gold production, Australian exports of gold are forecast to increase by 2 per cent to 315 tonnes in 2005-06. The value of gold exported is forecast to increase by over 4 per cent to $5.8 billion, largely because of higher export volumes.

Aluminium

In the first eight months of 2005, world aluminium prices averaged US$1840 a tonne, around 7 per cent higher than 2004 average prices. After reaching a yearly high of US$1982 a tonne in March 2005 (in monthly average terms) prices subsequently fell to a monthly average low for the year of US$1731 a tonne in June. This fall reflected an easing in growth in aluminium demand, mainly in Europe and a consolidation of stocks on the London Metal Exchange (LME). An increase in China's production, coupled with sustained high levels of Chinese aluminium exports also contributed to the downturn in prices.

Prices subsequently recovered to be around US$1870 a tonne in early September. This recovery reflected expectations of increased demand for aluminium, coupled with concerns that aluminium supply could be reduced by foreshadowed smelter closures in Europe, as well as lower exports from China following the removal of tax free toll smelting concessions in that country.

Aluminium prices to decline in 2006

For the remainder of 2005, world aluminium prices are expected to remain around early September levels, supported by continuing strong demand for aluminium, particularly from China, declining stocks, and the supply issues mentioned previously. For 2005 as a whole, world aluminium prices are forecast to be around US$1840 a tonne (US83c/lb), 7 per cent higher than prices in 2004.

In 2006, world aluminium production is forecast to exceed consumption as global demand for aluminium slows in line with assumed lower world economic and industrial production growth. As a result, global stocks of aluminium are expected to rise and world aluminium prices are forecast to ease to around US$1780 a tonne (US81c/lb). These price trends are supported

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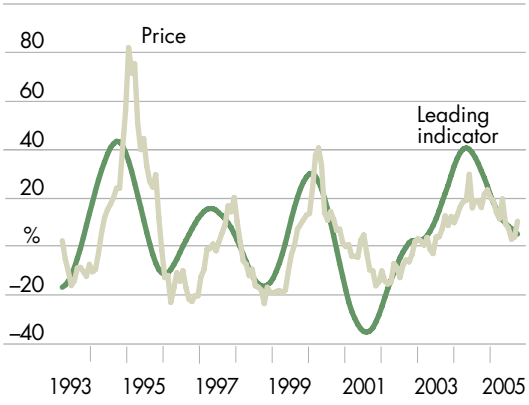
Aluminium price and leading indicator

Monthly percentage change, year on year, ended August 2005



by ABARE's leading indicator of aluminium prices.

If global supply is restricted to a greater extent than expected by potential smelter closures in Europe and the end to toll smelting arrangements in China, aluminium prices would be higher than forecast. These issues are discussed in the next section.

Growth in world production to ease

World aluminium production increased by 4 per cent year on year in the first six months of 2005. China accounted for around 75 per cent of this increase, with production in north America falling, and output in Europe increasing slightly.

For the remainder of 2005 and in 2006, growth in global aluminium production is expected to ease. Smelter capacity closures in Europe are expected to partially offset production increases in Asia and the Middle East.

World aluminium production is forecast to increase by 5 per cent in 2005 and by a further 3 per cent in 2006, to 32.3 million tonnes.

Renewal of power contracts may threaten aluminium supply

Increases in electricity costs have reportedly led to decisions to close two smelters in Germany and one in Hungary by early 2006. According to European power broker GFI Inc, spot power prices in Germany have doubled since the end of 2000 to US$52.60/MWh in early July 2005. The smelters expected to close as a result of escalating power costs have a combined production capacity of 236 000 tonnes a year, around 1 per cent of world aluminium production. However, high electricity prices could lead to more closures, particularly in Europe, as more power contracts come up for renewal.

According to Macquarie Research, it is possible that around 500 000 tonnes or 1.6 per cent of global aluminium production capacity could be closed in 2006. In the short term, capacity closures of this magnitude would be expected to place upward pressure on prices. However, smelter expansions in Asia and the Middle East in 2006 are expected to temper the impact of such a reduction in supply.

In the medium to longer term, new investment in aluminium smelting capacity is expected to take place in countries with reliable and relatively low cost sources of electricity.

The production of aluminium requires a substantial quantity of power, with around 15 MWh of electricity required to produce one tonne of aluminium. On a global level, energy costs are estimated to account for around 26 per cent of total aluminium production costs. Therefore, any increase in power charges can have a significant effect on operating margins.

Over the next few years an estimated 2.3 million tonnes of new aluminium production capacity is planned to be built in the Middle East, Iceland, the Russian Federation and India.

In the Middle East, planned capacity increases at four facilities in Qatar, Oman and the United Arab Emirates amount to over 1 million tonnes, all of which are expected to use the low cost and abundant natural gas resources available in the region.

In India, the 265 000 tonne expansion by Vedanta Resources will source its power from a coal power plant built in conjunction with the expansion. Century Aluminium, which owns the Nordural Smelter in Iceland, has agreed to expand its smelter using hydroelectric power — the cost of this power will be indexed to the London Metal Exchange prices for primary aluminium.

Over the medium term, this trend toward relocation and development of smelters in regions

with comparatively lower power costs is expected to continue, as companies seek to reduce production costs.

Removal of tax concessions to lower China's exports

China's aluminium production increased by around 17 per cent year on year in the first seven months of 2005. China's exports of aluminium also increased significantly, with net exports in the first seven months of 520 000 tonnes, a three-fold increase. This growth in production and exports occurred despite unreliable electricity supplies, high alumina prices and the imposition of a 5 per cent tax on aluminium exports at the start of the year.

However, China's exports of aluminium are expected to fall following the introduction of measures, in late August 2005, to remove tax concessions on alumina imported for the purpose of producing aluminium for export referred to as 'alumina tolling'. Prior to this decision, alumina tolling allowed aluminium producers to import alumina, free of value added tax and import duties, provided the aluminium produced was re-exported within one year.

Alumina and aluminium outlook

		2004	2005 f	2006 f	% change
World aluminium					
Production	kt	29 821	31 300	32 300	*3.2*
Consumption	kt	29 248	31 000	32 150	*3.7*
Closing stocks	kt	2 871	2 911	3 161	*8.6*
– weeks consumption		5.1	4.9	5.1	*4.1*
Price	US$/t	1 716	1 838	1 780	*– 3.2*
	USc/lb	77.8	83.4	80.7	*– 3.2*
World alumina					
Spot price	US$/t	393	414	360	*– 13.0*
		2003	**2004**	**2005**	
Australia		**-04**	**-05 s**	**-06 f**	
Production					
Bauxite	Mt	56.3	58.0	61.8	*6.6*
Alumina	kt	16 690	17 160	18 245	*6.3*
Aluminium	kt	1 877	1 890	1 917	*1.4*
Exports					
Alumina	kt	13 572	14 072	14 508	*3.1*
– value	A$m	3 781	4 381	4 397	*0.4*
Aluminium	kt	1 546	1 513	1 533	*1.3*
– value	A$m	3 441	3 712	3 746	*0.9*

See back tables for details. **s** ABARE estimate. **f** ABARE forecast.

Macquarie Research estimates that 630 000 tonnes or 82 per cent of China's first half gross exports of aluminium ingot and alloy of 769 000 tonnes was based on tolling. A proportion of aluminium that would have been exported under tolling arrangements is now expected to be diverted for domestic consumption. However, the full impact of the measures is not expected to be felt until the second half of 2006, when all current alumina tolling contracts expire.

With high alumina prices (spot prices were around $450 a tonne cif China in August 2005), application of the import duty (8 per cent) and value added tax (17 per cent) is expected to significantly increase the cost structure of aluminium smelters engaged in tolling arrangements. Consequently, some higher cost smelters may become unviable and be forced to close. Both production and exports are therefore expected to be lower than they otherwise would have been, following the introduction of these measures. However, while China's exports of aluminium are expected to decline in absolute terms, its aluminium output is expected to continue to increase, albeit at a slower rate, as planned capacity increases come on line. A lower quantity of exports from China is expected to tighten supplies on world markets and may place some upward pressure on prices.

In 2005, China's aluminium production is forecast to increase by over 17 per cent to 7.7 million tonnes. In 2006, China's production is forecast to increase by 9 per cent to 8.4 million tonnes.

Production expansions expected in other countries

Apart from China, aluminium production increases in 2006 are expected to come from capacity expansions at the Dubal smelter in the United Arab Emirates (an additional 100 000 tonnes a year); the Hindalco smelter in India (35 000 tonnes); the Alcasa smelter in Venezuela (120 000) tonnes; and the Almahdi plant in Iran (110 000 tonnes). In addition, production is expected to increase at the large Alba smelter in Bahrain as it reaches full production capacity, following its 300 000 tonnes a year expansion earlier this year.

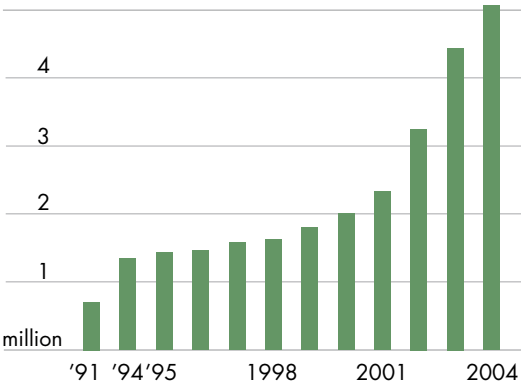
World consumption growth to slow

In 2005, world aluminium consumption is forecast to increase by 6 per cent to 31 million tonnes, with strong growth in China and the United States expected to offset an easing in consumption growth in European countries.

China

In the first half of 2005, aluminium consumption in China increased by an estimated 10 per cent, underpinned by growth in the construction and motor vehicle industries. These industries account for around 30 per cent and 20 per cent of China's total aluminium consumption respectively.

Motor vehicle production in China



In the first half of 2005, investment in fixed assets in urban areas, the major component of construction sector growth, increased by 50 per cent, year on year. Urban fixed asset investment is expected to continue to grow strongly for the remainder of this year and in 2006.

Motor vehicle production in China increased by 6.5 per cent in the first six months of 2005, compared with the same period last year. Growth in motor vehicle output is expected to continue in 2006, as a number of international car manufacturing companies have indicated that they will be increasing their production in China.

However, while consumption growth in these two major industries is expected to remain strong in 2006, growth in a number of other sectors is expected to slow in line with assumed slower growth in China's industrial production. As a result, China's aluminium consumption growth is expected to ease in 2006 to around 8 per cent.

United States

After rising by 2 per cent in 2004, aluminium consumption in the United States increased by 7 per cent, year on year, in the first six months of 2005. Ongoing strength in the US construction industry (around 13 per cent of total US aluminium consumption) was a major contributor to this growth.

Despite progressive increases in short term interest rates in the United States, thirty year mortgage rates have remained relatively unchanged over the past nine months, a factor which has contributed significantly to increased US construction activity.

During the first seven months of 2005, construction spending in the United States increased by around 9 per cent, year on year, to US$618 billion. Housing starts increased by 9.7 per cent year on year in the first half of 2005, indicating that construction activity in the United States will continue to grow strongly over the remainder of 2005.

Prior to Hurricane Katrina, US mortgage interest rates were expected to increase in 2006, reducing construction demand and hence the demand for aluminium. However, the extensive reconstruction activity required in the US Gulf states is now expected to boost demand for aluminium in 2006.

Consumption growth rates in Europe are expected to ease in line with assumed slower industrial production growth. Overall, world aluminium consumption in 2006 is forecast to rise by 4 per cent to 32.2 million tonnes.

Australia's aluminium export earnings to increase

Australia's export earnings from aluminium increased by 8 per cent in 2004-05, to $3.71 billion and are forecast to increase by 1 per cent to $3.75 billion in 2005-06, with both volumes and export prices increasing slightly.

Alumina

World alumina production to increase, but shortage to remain

Low growth in world alumina production and strong growth in China's demand for alumina have combined to limit the availability of alumina on the world spot market and have kept spot alumina prices high over the past two years. Production difficulties at a number of refineries in Australia and Africa in the first half of 2005 have also been a contributing factor. China's imports of alumina increased by 30 per cent year on year in the first half of 2005 to 3.7 million tonnes. Alumina spot prices increased by over 5 per cent to average US$427 in the June quarter 2005, compared with the March quarter.

New refinery capacity is planned to come on line particularly in Australia, Brazil, China, Ireland, the Russian Federation and the Ukraine. In China, the Shanxi phase 3 and Henan refinery expansions are expected to be completed at the end of 2005. These expansions together will add around 1.5 million tonnes of alumina capacity in 2006.

World alumina production in 2006 is forecast to increase by 4 per cent to 70.5 million tonnes. As a result of Hurricane Katrina, there is the potential for alumina supplies in the United States to be temporarily disrupted at two refineries located in Louisiana (including the 1.25 million tonne capacity Gramercy facility). If production is affected, world alumina production could be lower than current forecasts.

Reflecting an easing in demand for alumina, spot alumina prices are forecast to fall by 13 per cent to average US$360 a tonne in 2006.

Alumina export earnings to rise marginally

In 2004-05, Australia's export earnings from alumina rose by 16 per cent to $4.38 billion, because of increases in export volumes.

Export earnings in 2005-06 are forecast to rise by less than 1 per cent to $4.40 billion, because of small increases in both export volumes and prices. The increase in export volumes is expected to come from the new 1.4 million tonne capacity CAR1 refinery at Gladstone, as it completes a full year of operation; the 600 000 tonnes a year Pinjarra refinery expansion, expected to be completed late this year; and the 250 000 tonnes a year Worsley refinery expansion expected to be completed in early 2006.

Nickel

In the first eight months of 2005, strong growth in stainless steel production and constrained nickel supply availability provided support for world nickel prices. Over this period prices averaged US$15 600 a tonne, 13 per cent higher than in 2004.

Prices to ease

Nickel prices rose steadily throughout the first six months of 2005, with prices peaking in mid-May at US$17 660 a tonne. However, prices subsequently fell sharply to around US$14 250 a tonne in July before recovering to above US$15 000 a tonne in early September. The fall in price since May reflected a combination of declining stainless steel production (the main use for nickel) in the United States and Europe and lower Chinese nickel imports. China's imports fell as domestic consumption was partly met by a drawdown of stocks accumulated in late 2004 and early 2005.

While nickel demand growth is expected to moderate over the remainder of the year, supply growth is expected to remain sufficiently weak for prices to be maintained at relatively high levels. World nickel prices are forecast to average US$15 050 a tonne in 2005, 9 per cent higher than in 2004.

World nickel production in 2006, is forecast to exceed consumption and, as a result, nickel stocks are forecast to rise. This, coupled with firming expectations of a significant supply response in 2007, is expected to place downward pressure on prices. As a result, world nickel prices are forecast to fall by 8 per cent in 2006, to average US$13 880 a tonne.

However, with nickel stocks remaining near historically low levels, any disruptions to existing production or delays in production schedules at

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new facilities would place significant upward pressure on prices again.

Significant new capacity in China

Strong growth in China's manufacturing and construction sectors, particularly in the coastal regions, has underpinned a doubling of China's stainless steel consumption in the past four years. China is now the world's largest consumer of stainless steel (after overtaking the United States in 2001) and is expected to contribute over 75 per cent of the forecast growth in world consumption in 2006.

The recent commissioning of Shanghai Baosteel's second 750 000 tonne a year capacity melt shop is expected to support China's total stainless steel production rising by an estimated 39 per cent to reach 3.2 million tonnes in 2005.

In 2006, China's stainless steel capacity is expected to be significantly bolstered by the development of Tiyuan Steel's 1.5 million tonne a year capacity plant in Shanxi province. Higher output is also expected from Lianzhong Steel Corporation, following the completion of the second phase of their recently completed mill in Guangzhou (with capacity of around 800 000 tonnes a year). Reflecting these developments, China's stainless steel output is expected to reach 5.1 million tonnes in 2006, more than double production in 2004.

Stainless steel production falling outside China

Increases in China's stainless steel production capacity are expected to reduce China's import requirements over the outlook period. As a result, growth in nickel consumption in nations that typically export stainless steel to China, such as Japan and the Republic of Korea, is expected to fall.

While European stainless steel producers do not export a significant share of their output to China (an estimated 80 per of China's stainless steel imports are sourced from Asia) the rise in global stainless steel production has placed significant upward pressure on stainless steel raw material prices. For example, in the two years to August 2005, chromium and nickel prices rose by 100 per cent and 57 per cent respectively,

Box: Stainless steel grades and nickel consumption

There is a range of different stainless steels that are used in a wide variety of applications. Different physical properties and price relativities are the main factors determining the use of particular stainless steel series in different applications. The most common types of stainless steel are the 200, 300 and 400 series.

The 300 series has the largest market share and contain around 8–12 per cent nickel. The high nickel content of 300 series relative to the other series gives them superior thermal resistance properties. These steels tend to be used mainly in manufacturing and industrial applications, such as food preparation equipment, oil refining, power generation and petrochemicals production.

The 200 series stainless steels contain a high level of manganese and only around 1–5 per cent nickel. The 200 series steels tend to cost less than 300 series, but most have inferior corrosion resistance and surface appearance. As a result, the use of 200 series stainless steel is concentrated in construction industries.

The 400 series stainless steels contain no nickel but have higher chromium content. These steels tend to have superior corrosion resistance properties compared with the other series and are used mainly in automotive exhaust systems.

There is a degree of substitutability, especially between 200 and 300 series, in many applications. As a result, movements in the relative prices of raw materials affect demand for the various stainless steels. Higher nickel prices over the past few years have encouraged stronger growth in the 200 and 400 series stainless steels, especially in China.

China accounted for around half of world 200 series consumption in 2004. The global share of 300 series stainless steels fell from 71 per cent in 2003 to 68 per cent in 2004. Over this period, the global share of 200 series rose from around 6 per cent to nearly 9 per cent. However, the recent strength in prices for many other alloying elements (such as molybdenum and chromium) are expected to slow substitution of the higher nickel containing stainless steels.

while molybdenum prices rose by 417 per cent. Reflecting significantly higher raw material prices and declining prices for many stainless steels, producers in relatively higher cost nations are expected to reduce their output of stainless steel in late 2005.

For example, ThyssenKrupp (the world's largest stainless steel producer) announced a cut of 120 000 tonnes in cold rolled stainless steel output at their Italian and German operations. Similarly Outokumpu has announced that it is extending scheduled summer shutdowns for maintenance at its UK and Swedish operations. However, this latter development is expected to be partially offset by higher output at the recently commissioned 1 million tonne a year capacity Tornio mill in Finland as it ramps up toward capacity.

On balance, growth in world stainless steel production is forecast to fall from almost 9 per cent in 2004 to 5 per cent in 2005, before rising by 7 per cent in 2006 to reach 27.6 million tonnes.

Reflecting higher output of both 200 and 400 series stainless steel in China, the amount of nickel consumed per tonne of stainless steel output is expected to fall. However, total nickel consumption is forecast to increase because of the magnitude of the expected rise in stainless steel output. Further, as growth in nickel sourced from scrap is expected to slow (in line with historically high scrap ratios over the past three years), demand for primary nickel consumed in stainless steel production is expected to rise.

On a smaller scale, growth in primary nickel demand is also expected to be boosted by higher demand from the world aerospace industries, as gas turbines and jet engines require alloys with high nickel content.

Reflecting these developments, world primary nickel consumption is forecast to rise by 3.8 per cent and 3.5 per cent in 2005 and 2006 respectively, following the modest rise of 1.2 per cent in 2004.

Nickel outlook

		2004	2005 f	2006 f	% change
World					
Production	kt	1 246	1 290	1 347	*4.4*
Consumption	kt	1 249	1 296	1 341	*3.5*
Closing stocks	kt	98	91	96	*5.5*
– weeks consumption		4.8	4.4	4.6	*4.5*
Price	US$/t	13 838	15 050	13 880	*– 7.8*
	USc/lb	628	683	630	*– 7.8*
		2003-04	**2004-05 s**	**2005-06 f**	
Australia					
Production					
Mine	kt	185	198	212	*7.1*
Refined	kt	125	128	135	*5.5*
Intermediate	kt	110	115	113	*– 1.7*
Exports **s**	kt	214	216	223	*3.2*
– value	A$m	3 117	3 707	3 700	*– 0.2*

See back tables for details. **s** ABARE estimate. **f** ABARE forecast.

Nickel output constrained

World nickel production is forecast to increase by 3.5 per cent to 1.29 million tonnes in 2005 before reaching 1.35 million tonnes in 2006. As current producers are assumed to be operating at close to full capacity in response to sustained high nickel prices over the past two years, increases in refined nickel production will rely on new operations and incremental increases at existing facilities.

The largest new plant is expected from China's largest nickel producer (Jinchuan Nickel), a 30 000 tonne a year capacity smelter expected in late 2005. Other significant yet smaller projects include the Coral Bay Nickel Corporation and Sumitomo Metals' recently commissioned 10 000 tonne a year capacity Rio Tuba smelter in the Philippines. Higher output is also expected from Eramet following expansion works on the Doniambo smelter in New Caledonia in 2004. The ramping up of operations at Falconbridge's Montcalm mine in Canada is also expected to contribute to increased world output in 2005.

Higher output from these facilities is expected to be partially offset by lower production from extended shutdowns of Boliden's 50 000 tonne a year capacity smelter in Finland and Inco's Sudbury smelter in Ontario.

In 2006, Inco (the world's second largest producer of nickel) is expected to increase its mine capacity with the development of the 50 000 tonne a year Voisey's Bay nickel mine in Labrador, Canada. However, half of this new production is expected to replace higher cost output sourced

from domestic mines and imports. Output is also expected to be higher from PT Aneka Tambong in Indonesia in 2006 following the construction of a new smelter with capacity of 14 600 tonnes of ferronickel.

However, labor contracts are due for renegotiation at a number of plants over the outlook period and the possibility that nickel production may be disrupted by industrial action is a potential risk to the outlook. For example, labor contracts are due to be renewed at Inco's Thompson refinery in late 2005 and Sudbury refinery in 2006 and also at Falconbridge's Falcondo ferronickel plant in the Dominican Republic in late 2005.

With nickel stocks forecast to remain at relatively low levels in 2005 and 2006, any disruptions to production could place significant upward pressure on nickel prices.

Australia's export earnings to rise

After rising by an estimated 19 per cent in 2004-05, Australian export returns from nickel are forecast to fall slightly to $3.7 billion in 2005-06. A forecast 8 per cent fall in average world prices is expected outweigh a forecast 3 per cent rise in export volumes.

The increase in export volumes will be supported by a rise in refined output at most operations, while higher mine output is expected from the ramping up of new operations and the expected commissioning of a number of new small nickel projects.

Australian mine production is forecast to rise by 7 per cent to 212 000 tonnes in 2005-6. Higher mine output is expected from Lion Ore and Western Areas following the commissioning of the Maggie Hays and Flying Fox mines in 2005 and 2006 respectively. Increased mine output is also expected from the recently commissioned North Mittel, Mariners and Black Swan mines as they ramp up toward capacity.

Australian output of refined nickel is expected to increase by 6 per cent to 135 000 tonnes in 2005-06. Higher metal output is expected from Minara Resources' Murrin Murrin operation, and BHP Billiton's Yabulu and Kwinana refineries. After numerous production disruptions in 2004, Minara Resources is expected to slowly increase its production toward a nominal annual capacity of around 32 000 tonnes. Output at Yabulu and Kwinana is expected to rise mainly as a result of marginal increases in productivity and technical improvements.

Copper

In the first eight months of 2005, world copper prices averaged US$3430 a tonne, 20 per cent higher than the average price in 2004. Significantly, world copper stocks remained very low as growth in world refined production was interrupted by maintenance programs at a number of smelters and by industrial action and other production disruptions.

For the remainder of 2005, growth in world refined copper output is expected to increase following completion of the majority of scheduled maintenance programs. At the same time, demand is also expected to pick up as consumer destocking is expected to come to an end. With stocks at historically low levels, the combination of demand for end use applications and stocks is expected to provide support for prices for the remainder of 2005. The possibility of further industrial action remains a significant risk and may also lend support to prices in coming months.

In 2006, prices are forecast to fall as world refined copper production exceeds world consumption.

Labor disputes and natural disasters lending support to higher prices

In mid-2005 there was an uncharacteristically large number of disruptions to refined copper production caused by labor disputes and natural disasters. In an environment of historically low copper stocks, these disruptions have added substantial support to world copper prices. From the beginning of May to mid-August 2005, monthly average copper prices rose by 16 per cent to over US$3800 a tonne. Total refined copper production lost as a result of these disruptions is estimated at over 30 000 tonnes to the end of July, an amount equivalent to the total

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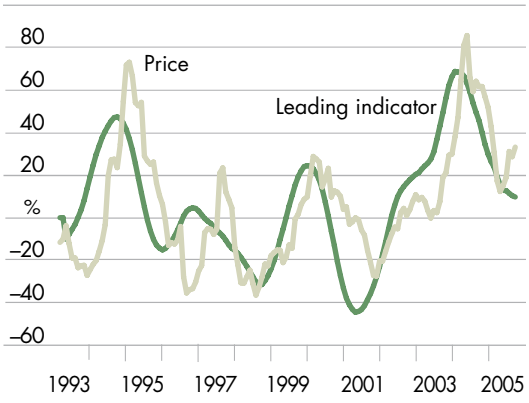
Copper price and leading indicator

Monthly percentage change year on year, ended August 2005



stocks of copper on the London Metal Exchange at the end of July.

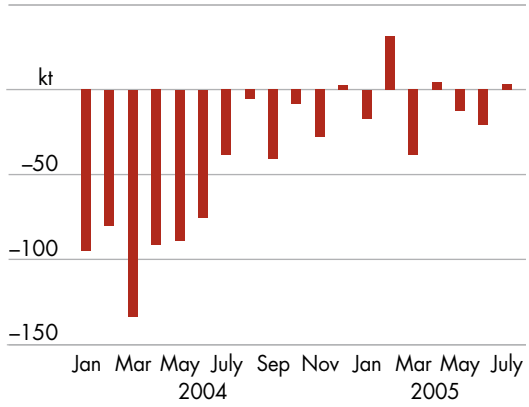
Labor disputes reduced production at several operations in south America, Zambia and the United States. Production at BHP Billiton's Tintaya copper mine (capacity of 120 000 tonnes a year) in southern Peru was disrupted for close to a month, from late May, following riots. Output from Placer Dome's Zaldivar mine in Chile (150 000 tonnes a year) was limited to 120 tonnes a day (around a third of normal production) for around one week in early July following industrial activity.

In Zambia, Vedanta Resources estimates that industrial action at several operations in mid-July resulted in around 7500 tonnes of lost production. Output from Asarco, a subsidiary of Grupo Mexico, was also interrupted from early July following industrial activity at its operations in Arizona and its Amarillo refinery (450 000 tonnes) in Texas.

Natural disasters also affected output at operations in Chile and India. At Cerro Collarado (125 000 tonnes a year), another BHP Billiton operation, refined production was interrupted following an earthquake in mid-June. The Chilean Copper Commission estimates that this resulted in a loss of around 6000 tonnes of copper production. In India, there was a partial stoppage of production from Hindalco's Dahej smelter (500 000 tonnes a year) following heavy rains and flooding in early July.

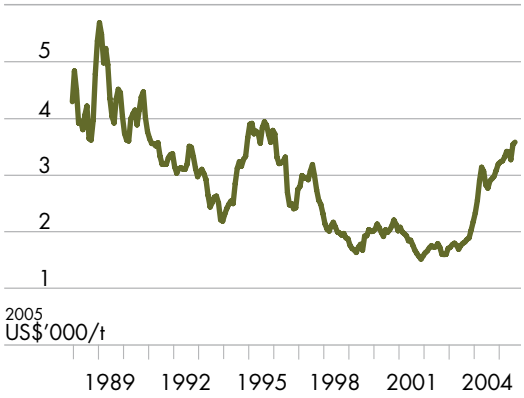
Copper stock drawdown at metal exchanges

Monthly, ended July 2005



Copper price

Monthly, ended July 2005



To the extent that high copper prices are a factor in the current period of industrial unrest, there would appear to be potential for further unrest to emerge as prices are expected to remain high over coming months.

Prices to remain well supported for the rest of 2005 …

While growth in world refined production is expected to increase for the remainder of 2005, growth in global copper demand is also forecast to increase as consumer destocking comes to an end. As a result, the copper market is expected to remain in a tight demand/supply situation, thus providing support for prices.

World copper stocks on metal exchanges (London Metal Exchange, Comex and Shanghai Futures Exchange) remained largely unchanged in the first eight months of 2005 and, at the end of August, were around 120 000 tonnes. However, at this level they remain at very low levels. Total copper stocks (stocks on metal exchanges, producer and consumer stocks) at the end of August were under three weeks of consumption.

Consistent with continued very low copper stocks and disruptions to supply, backwardation in the copper futures market has increased in 2005.

Despite an expected increase in world refined copper production in the remainder of 2005, global copper consumption is forecast to exceed production for the year as a whole. Prices are likely to remain volatile until there is evidence of a sustained increase in stocks. Any further major production disruptions could also lead to additional substantial spikes in spot copper prices. For 2005 as a whole, world copper prices are forecast to rise by 20 per cent to average US$3435 a tonne (US156c/lb) in 2005.

… but to decline in 2006

In 2006, assumed slower world economic growth — and hence slower growth in world copper consumption — together with strong growth in global production are forecast to result in an easing in the tight supply/demand situation. Stocks are expected to increase and world copper prices are forecast to fall by 19 per cent in 2006 to average around US$2770 a tonne (US126c/lb).

World copper demand

Reported world copper consumption declined by an estimated 3 per cent in the first five months of 2005. However, there is evidence to suggest that reported consumption substantially understates actual consumption over this period largely because of consumer destocking in the United States and Europe. Consumers are reported to have delayed purchases because of high copper prices and instead drew down stocks in anticipation of future lower prices. Other evidence such as reasonably strong global growth in industrial

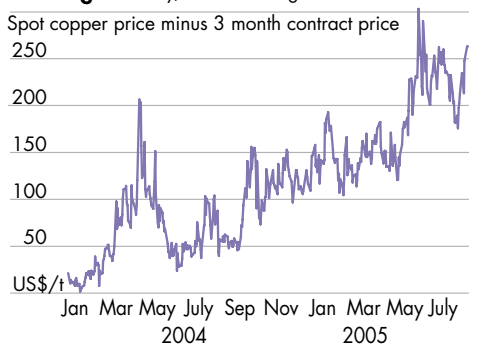
Backwardation in the copper futures market

The relationship between spot and futures prices can provide insight into the availability of stocks.

Under typical market conditions, the price of a physical commodity for future delivery should be approximately equal to the present cash price plus 'the cost of carry.' The cost of carry for a physical commodity measures the cost of storing that asset plus the interest that is paid to finance the asset minus the convenience yield.

The convenience yield reflects the market's expectations about the future availability of the commodity. The greater the likelihood that shortages will occur during the life of the contract, and the higher the likely costs associated with such

Backwardation on the London Metal Exchange Daily, ended 31 August 2005



disruptions, the higher the convenience yield. Therefore, when stocks are high the convenience yield tends to be low.

Under normal market conditions, known as 'contango,' stocks of the commodity are at comfortable levels and the convenience yield is small or nonexistent, with the result that the futures price is higher than the current spot price.

The opposite of contango is 'backwardation' — a market condition where prices for future delivery are below the current spot market price. Backwardation generally occurs because of a high convenience yield (reflecting low stocks and uncertainty associated with supply).

Backwardation in the copper futures market increased to over US$300 a tonne in mid-June 2005, reflecting the fall in copper stocks to their lowest level in eighteen months and supply disruptions.

production — to which copper consumption is highly correlated — supports the view that actual copper consumption rose over this period.

Growth in world copper consumption is forecast to increase in the remainder of 2005 due to an expected end to destocking in the United States and European Union as well as continued strong economic growth in China. World copper consumption is forecast to increase by 3 per cent in 2005 to 16.8 million tonnes and by a further 3 per cent in 2006 to 17.3 million tonnes.

China continues to dominate growth in world consumption

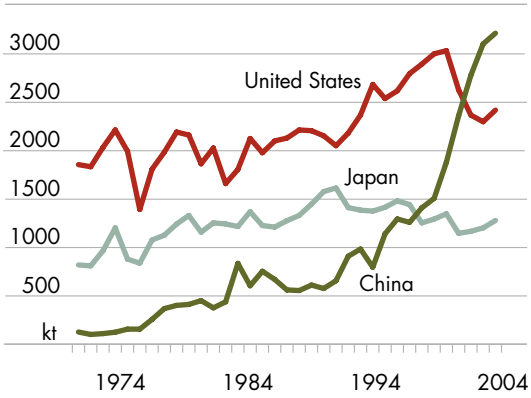
Growth in copper consumption in China is estimated to have increased by around 9 per cent in the first five months of 2005, mainly driven by continued strong growth in industrial production and investment in fixed assets, as well as restocking by China's Strategic Reserves Bureau.

Growth in fixed asset investment increased by over 25 per cent year on year in the first half of 2005. Industrial production growth increased at an annualised rate of over 16 per cent over the same period. In particular, output of copper intensive products in China increased strongly — output of motor vehicles increased by 35 per cent year on year over this period, with output of power generating equipment and electric motors each increasing by around 14 per cent.

While China has stated a desire to slow economic growth to more sustainable levels, the government continues to encourage investment in the copper intensive power sector in an attempt to ease power shortages. Furthermore, it is likely that China's Strategic Reserves Bureau will continue to rebuild its copper stockpile for the remainder of 2005. As a result, growth in China's copper demand is still expected to remain relatively high in the latter part of 2005 and in 2006.

Copper consumption

Selected countries



Consumption growth easing in the United States

Copper consumption in the United States is reported to have fallen by 12 per cent in the first five months of 2005. However, actual consumption is likely to have increased in this period because of ongoing strength in the construction sector, which accounts for around 40 per cent of total US copper consumption, and because US industrial production growth also increased steadily over this period. The decrease in reported consumption is, therefore, expected to reflect significant consumer destocking.

During the first five months of 2005, construction spending in the United States increased by around 10 per cent year on year, to over US$415 billion. Also, in the first half of 2005, US building permits and new housing starts increased by

Copper outlook

		2004	2005 f	2006 f	%
World					*change*
Production	kt	15 777	16 810	17 630	*4.9*
Consumption	kt	16 388	16 840	17 350	*3.0*
Closing stocks	kt	759	729	1 009	*38.4*
– weeks consumption		3.3	3.1	4.3	*38.7*
Price	US$/t	2 866	3 435	2 771	*– 19.3*
	USc/lb	130.0	155.8	125.7	*– 19.3*
		2003 -04	**2004 -05 s**	**2005 -06 f**	
Australia					
Mine output	kt	811	911	942	*3.4*
Refined output	kt	459	478	486	*1.7*
Exports					
– ores and conc.	kt	1 286	1 328	1 477	*11.2*
– refined	kt	301	322	330	*2.5*
– total value	A$m	2 166	3 045	3 367	*10.6*

See back tables for details. **s** ABARE estimate. **f** ABARE forecast.

2.8 per cent and 5.1 per cent respectively, indicating that copper consumption in the housing construction sector will continue to grow in the second half of the year. In addition, rebuilding activity in New Orleans and surrounding regions in the aftermath of Hurricane Katrina is expected to add additional support to the US construction sector.

In 2006, US copper consumption growth is expected to ease in line with assumed lower growth in industrial production.

Mine production rising

World copper mine production is forecast to increase in 2005, by 7 per cent to 15.5 million tonnes. The International Copper Study Group estimates that world mine output increased by just under 6 per cent year on year in the first five months of 2005, with the majority of the increase occurring in Indonesia and the United States. In the first half of 2005 production at Freeport's Grasberg mine in Indonesia more than doubled, year on year, to just under 350 000 tonnes. BHP Billiton's Escondida Norte project (160 000 tonnes a year at full capacity) is expected to commence production in the final quarter of 2005.

In 2006, growth in world mine output is forecast to ease to around 3 per cent, with production forecast to be 15.9 million tonnes. BHP Billiton's Escondida sulfide leach project (180 000 tonnes a year) will account for the majority of the increase, with production scheduled to commence in the second quarter of 2006. The Spence project (200 000 tonnes of copper cathode a year) in Chile, another BHP Billiton operation, is expected to commence production during the last quarter of 2006. Phelps Dodge's Cerro Verde mine expansion (production up from 100 000 tonnes a year to 300 000 tonnes a year) is also expected to commence in late 2006.

Refined production increasing

The International Copper Study Group estimates that world refined copper output rose by around 5 per cent in the first five months of 2005. As previously mentioned, maintenance shutdowns, labor disputes and other production disruptions constrained growth in world refined copper production in the first eight months of 2005. Although the majority of smelter maintenance programs are now complete, labor disputes still have the potential to continue to disrupt refined output in the remainder of the year. This remains a significant risk factor to the current outlook.

However, a number of recent expansions in world smelter capacity are expected to alleviate the bottleneck at the smelter stage of the production process for the remainder of 2005. Greater availability of copper concentrate and increased profitability of smelters has led to substantial growth in China's copper smelting capacity. In India, Vedanta Resources recently completed the Tuticorin copper smelter expansion, which will increase production from 180 000 tonnes a year to 300 000 tonnes a year. Also in India, Hindalco announced in late April 2005 that it had completed the expansion of the Dahej smelter (doubling capacity to 500 000 tonnes a year).

For 2005 as a whole, world refined copper production is forecast to increase by 7 per cent to 16.8 million tonnes. In 2006, world refined output is forecast to rise by 5 per cent to 17.6 million tonnes.

Australian mine production increasing

Mine production in Australia is forecast to increase by over 3 per cent in 2005-06, to 942 000 tonnes. Tritton Resources' new Tritton copper mine, Newcrest's redeveloped Telfer gold/copper mine and Straits Resource's new Whim Creek mine all commenced operations in 2004-05. These mines will account for the majority of the forecast increase in output in 2005-06 as they ramp up to full production.

Australia's refined copper production in 2005-06 is forecast to increase by 2 per cent to 486 000 tonnes, driven largely by the recent commencement of cathode production at the Whim Creek mine. Expected higher output from BHP Billiton's Olympic Dam mine will be offset by lower refined output from Aditya Birla's Nifty mine, which is ceasing cathode production in favor of concentrates.

In 2004-05, Australia's export earnings from copper increased by 40 per cent to over $3.0 billion through increases in both export volumes and prices. In 2005-06, Australian copper export

earnings are forecast to increase by 11 per cent to $3.4 billion, as export volumes of copper concentrates increase.

Zinc

In early September 2005, world zinc prices were around US$1385 a tonne (US63c/lb), 32 per cent higher than average 2004 prices. In the remainder of 2005, a combination of steady growth in world zinc demand, constrained zinc mine supply, actual and potential industrial action and declining world zinc stocks are expected to continue to provide support for zinc prices. Asian, and in particular Chinese, zinc demand growth is expected to remain the main source of global consumption growth in this period.

Despite an anticipated easing in global zinc demand in 2006, a lack of growth in world mine supply is expected to lead to a continuing decline in world zinc stocks and further support for world zinc prices.

Slow supply growth to raise prices

In the first eight months of 2005, world zinc prices averaged US$1284 a tonne (US58c/lb). For much of the first six months of 2005, strong demand in Asia, together with slow growth in zinc mine output, resulted in the steady drawdown of official zinc stocks, thus providing support for prices above US$1200 a tonne. However, following a large and unexpected increase in LME zinc stocks (of around 100 000 tonnes from previously unreported stocks) in mid-June, zinc prices fell to average below US$1200 in July. Following the resumption of the decline in stocks (around 60 000 tonnes of LME stocks were drawn down between mid-June and the end of August) zinc prices recovered strongly to average over US$1300 a tonne in August.

In the remainder of 2005, continued strong demand from Asia, together with limited production growth is expected to result in continuing stock reductions. Total zinc stocks (LME, producer and consumer) at the end of 2005 are forecast to be 6.1 weeks of consumption, a 14 per cent fall from 2004 levels. World zinc prices in 2005 are forecast to average US$1295 a tonne (US59c/lb), an increase of 24 per cent.

Although growth in world zinc demand is expected to slow, reflecting assumed lower world economic growth and industrial activity in 2006, zinc mine output is expected to continue to be significantly constrained, with zinc stocks declining to around 5.9 weeks consumption by the end of 2006. World zinc prices are forecast to average US$1315 a tonne (US60c/lb) in 2006, less than 2 per cent higher than in 2005.

Prior to the delivery to the LME in June of around 100 000 tonnes of previously unreported zinc stocks, it had been assumed that no substantial amounts of unreported (or 'hidden') stocks remained. Subsequently, there has been speculation that as much as 100 000 tonnes of these stocks (representing producer stocks built up in the period 2001–03), are yet to come back onto the market. If this is the case, and substantial quantities of stocks are delivered, then stock levels may be higher, and prices lower, than forecast.

Another significant uncertainty affecting world zinc stocks, especially in the short term, is the impact of hurricane Katrina. In late August / early September just over half (249 000 tonnes) of the LME's total of 562 000 tonnes of zinc stocks were located in warehouses in New

Zinc outlook

		2004	2005 f	2006 f	%
World					***change***
Production	kt	10 167	10 570	10 860	*2.7*
Consumption	kt	10 465	10 680	10 880	*1.9*
Closing stocks	kt	1 017	865	840	*– 2.9*
– weeks consumption		7.1	6.1	5.9	*– 3.3*
Price	US$/t	1 047	1 295	1 315	*1.5*
	USc/lb	47.5	58.7	59.7	*1.7*
		2003 -04	**2004 -05 s**	**2005 -06 f**	
Australia					
Mine output	kt	1 355	1 352	1 429	*5.7*
Refined output	kt	502	464	482	*3.9*
Exports					
– ores and conc.	kt	1 844	1 966	1 984	*0.9*
– refined	kt	396	397	405	*2.0*
– total value	A$m	1 234	1 465	1 602	*9.4*

See back tables for details. **s** ABARE estimate. **f** ABARE forecast.

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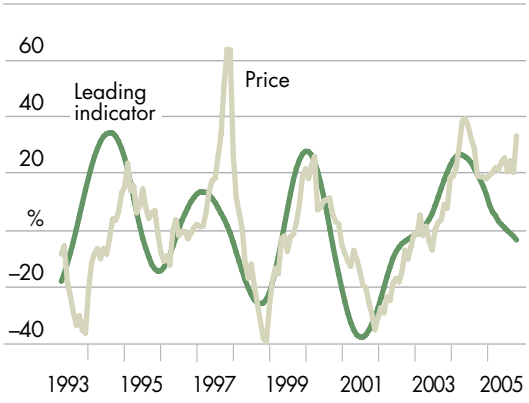
Zinc price and leading indicator

Monthly percentage change year on year, ended August 2005



Orleans. Significant damage to the port at New Orleans is expected to restrict access to these stocks in the immediate future. Upward pressure on prices would be likely if these stocks were to remain unavailable for an extended period.

Concentrate shortage to continue

In the first six months of 2005, zinc concentrate availability continued to be constrained as world mine production grew slowly, increasing by only 2 per cent (year on year), despite strong prices over this period. To a large extent, this slow growth reflects low investment in new mine capacity over several years. However, it also reflects the impact of mine closures in Canada in 2004 and disruptions to production at mines in Canada and Peru (industrial action), Australia and Ireland (equipment failure at the Century and Tara mines respectively) and in Japan (flooding).

On a regional basis, an increase of 5 per cent in production in Asia over the six months to June more than offset falls elsewhere. The increases in Asian production came from the ramping up of operations at the new Lanping mine (capacity of 100 000 tonnes a year) in China and the recently expanded Rampura Agucha mine (capacity increase of 105 000 tonnes a year) in India. Increases also came from the commencement, in early 2005, of Xstrata's Black star mine at Mount Isa (64 000 tonnes a year) and the ramping up of production from a newly developed ore body at Galmoy mine in Ireland.

The possibility of further industrial action at the Peruvian mines and the ongoing strike (since mid-July) at Trail zinc mine in Canada have the potential to adversely affect world concentrate output in the remainder of 2005. Because of the current tightness in world concentrate markets, any significant disruptions are likely to be reflected in price spikes and in a further lowering of zinc treatment charges (the smelting fee for converting concentrates into metal).

For 2005 as a whole, world mine production is forecast to rise by 2.3 per cent to 9.8 million tonnes.

In 2006 the zinc concentrate shortage is expected to continue, with world mine supply expected to grow only slowly. Although there are many proposals to increase mine capacity either under way or in prospect, there are no major projects sufficiently advanced to significantly increase mine supply in 2006. For example, the largest new mine currently under development — the 215 000 tonnes a year capacity San Crisobal project in Boliva — is not scheduled to begin production until mid-2007.

Increases in world mine output in 2006 are therefore expected to come from the rampup to full production at mines that commenced in 2005 (such as Rampura Agucha in India and Black Star in Queensland) and the development of a few relatively small scale new mines such as Neves Corvo in Portugal (25 000 tonnes a year) and Duck Pond in Canada (34 000 tonnes a year). Additional mine supply is also likely to come from incremental expansions at existing operations and restarts of previously closed mines.

In 2006, world mine output is forecast to rise by 1 per cent to 10 million tonnes.

Refined zinc production also constrained

In the first six months of 2005, world refined zinc production increased by 4 per cent compared with the corresponding period in 2004. Strong import demand for scarce concentrates in Asia, and particularly in China, has constrained smelter output in other regions. Production is expected to continue to be constrained by relatively low concentrate availability for the remainder of 2005 and in 2006. World refined zinc production is forecast to increase by 4 per cent in 2005 and

by a further 3 per cent in 2006 to 10.9 million tonnes.

The main contributors to capacity increases to the end of 2006 are expected to be in China and India. Significant increases are expected to come from the rampup of the expanded Chanderiya plant in India (from 160 000 to 400 000 tonnes a year) and by the expanded Chihong and Lanping smelters (both by 100 000 tonnes a year) and the opening of the Yugang Zinc smelter (capacity of 100 000 tonnes a year) all in China.

Consumption growth to ease

According to the International Lead and Zinc Study Group, world zinc consumption grew by a modest 1.4 per cent in the six months to June. However, there were significant differences across countries/regions. Zinc consumption in Asia rose by 6 per cent, with consumption in China, the Republic of Korea and India growing by 9 per cent, 8 per cent and 6 per cent respectively in this period. Consumption growth in Europe was flat, while consumption fell by 1 per cent in the United States. China's consumption growth was driven by a 37 per cent increase in galvanised steel production in the first seven months of 2005 compared with the corresponding period in 2004.

In the United States and western Europe, production cutbacks at major hot dipped galvanising mills and automobile producers resulted in lower galvanised steel production and hence, lower zinc consumption. World zinc consumption in 2005 is forecast to increase by 2 per cent to 10.7 million tonnes.

In 2006, global zinc consumption is forecast to rise again by around 2 per cent to 10.9 million tonnes, in line with assumed lower world economic and industrial production growth. Growth in zinc consumption is closely correlated with industrial production growth. However, despite assumed lower industrial production growth in the United States, US zinc consumption is expected to increase in 2006. This is partly because galvanised steel inventory reduction programs in 2005 have come to an end, with the result that demand in 2006 is expected to be met through production rather than further inventory reductions. Extensive reconstruction activity that will be required in the Gulf states following Hurricane Katrina will also support demand for zinc. However, with US interest rates assumed to rise in 2005 and 2006, the construction sector in the United States is expected to slow more generally, partially offsetting these positive demand factors.

China and the United States together accounted for over a third of world zinc consumption in 2004.

In China the cumulative effects of measures taken by the government to slow domestic economic and industrial production growth (such as increasing interest rates, slowing fixed asset investment, and restricting speculative lending to the property sectors) are expected to result in lower zinc consumption growth in 2006.

Australia's zinc production and exports to increase

After being virtually steady in 2004-05, Australia's zinc mine output is forecast to rise by 6 per cent in 2005-06 to 1.43 million tonnes. Most of the increase in 2005-06 is expected to come from Xstrata's new Black Star open pit mine at Mount Isa, as it ramps up to full production. Black Star commenced production in early 2005.

Xstrata recently announced that it will convert its McArthur River mine in the Northern Territory to an opencut operation. Development work is expected to commence toward the end of 2005. Output is expected to remain at around 160 000 tonnes a year. Teck Cominco recently announced that its currently idled 180 000 tonnes a year Lennard Shelf mine is not likely to be reopened in the next two years.

After rising by 19 per cent in 2004-05, Australia's export earnings from zinc are forecast to rise by over 9 per cent in 2005-06 to $1.60 billion. Higher export prices and a small increase in volumes are expected to be the main contributors to this increase.

TRANSGENIC CROPS

welfare implications for Australia

Stephen Apted, Daniel McDonald and Heidi Rodgers

- **Transgenic crops have become a significant proportion of the world's broadacre crop output since the commercialisation of herbicide tolerant soybeans in the United States in 1996. Australia has participated in this agricultural innovation with commercial plantings of transgenic cotton, but has delayed the commercialisation of other transgenic broadacre food and feed crops.**
- **This article addresses economic aspects of the decision to delay the commercialisation of transgenic canola in Australia; the Office of the Gene Technology Regulator addresses health and environmental issues associated with growing transgenic organisms.**
- **Australia's canola producers suffer an economic loss as a consequence of the current state and territory moratoriums on commercialising transgenic canola.**
- **A continuance of the current moratoriums, and extension to other transgenic broadacre crops, is expected to result in a loss of gross national product of $3 billion, in net present value terms, over the next ten years.**

The basis of the debate from an economic perspective is highlighted in the legislation of the states and territories. It can be summarised as a debate about the marketing implications for Australia of domestic producers adopting transgenic food and feed crops on the one hand, or producing only conventionally developed food and feed crops on the other hand.

Box 1 provides an explanation of the differences between transgenic and conventionally developed plants.

Regulation of transgenic crops in Australia

At the federal level, the Australian Government introduced the Gene Technology Act in 2000 and the Gene Technology Regulations in 2001, and has established the Office of the Gene Technology Regulator to make decisions under the Act. All activities involving the growing of transgenic crops in Australia are subject to regulation under this Act and Regulations.

State and territory governments also have legislation to complement the federal regulatory framework. In addition, state and territory governments have the capacity to determine quarantine regulations and regulate land use in their own jurisdictions. Australian states and territories, with the exception of Queensland and the Northern Territory, currently have legislation in place that allows the responsible minister to prohibit the planting of specific transgenic crops. The effect of this legislation is to apply a moratorium on the commercialisation of particular transgenic crops. An overview of the principal Australian legislation regulating the planting of transgenic crops is presented in table 1.

There has been considerable pressure on Australian governments to regulate biotech-

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1 Current Australian transgenic crop moratoriums

	Moratorium legislation	Moratorium provisions	Moratorium effective until
New South Wales	*Gene Technology (GM Crop Moratorium) Act 2003*	• Responsible minister may order: – prohibition on cultivation of specified GM food plants, or classes of GM food plants – exemptions from prohibition orders • Act expires 3 March 2006	2006
Victoria	*Control of Genetically Modified Crops Act 2004*	• Responsible minister may order: – prohibition on cultivation of specified GM plants in specified areas of Victoria – permissible areas in which specified GM plants or classes of GM plants may be cultivated – conditions that attach to cultivation prohibition or permission orders – exemptions from prohibition orders • Act includes an order prohibiting the cultivation of GM canola in Victoria until 29 February 2008	2008
Western Australia	*Genetically Modified Crops Free Areas Act 2003*	• The Act and associated regulations provide for: – the state, or areas thereof, to be declared a prohibited area for the cultivation of GM crops (declared so from 22 March 2004) – the responsible minister to issue exemptions from conditions of the Act • The Act stipulates it must be reviewed in the sixth year following its commencement (commenced 24 December 2003)	2009
South Australia	*Genetically Modified Crops Management Act 2004*	• The Act and associated regulations provide for: – the state to be declared a prohibited area for the cultivation of GM food crops (declared so from 29 April 2004) – the responsible minister to permit limited and contained experiments and trials of GM food crops • The Act stipulates it must be reviewed within three years of commencement (by 29 April 2007)	2007
Tasmania	*Tasmanian Plant Quarantine Act 1997*	• In 2003, under this Act, the moratorium on the commercial release of GM crops (and animals) was extended to June 2008: – the responsible minister may permit some dealings with GMOs under this Act — for example, for trials of certain GM crops	
	Genetically Modified Organisms Control Act 2004	• Allows for the state to be declared GMO free • Permits to be issued for persons to have dealings with specified GMOs	2008
Australian Capital Territory	*Gene Technology (GM Crop Moratorium) Act 2004*	• Reviewed annually • Responsible minister may order: – prohibition on cultivation of specific GM food plants – exemption from prohibition of specified contained research and field trials approved by the Gene Technology Regulator • Act expires on a date to be fixed (not before 17 June 2006)	2006

nology in agriculture, which has contributed to the existence of the current subnational policy stance. The main reason put forward for the current moratorium is to postpone the commercialisation of transgenic food crops in order to determine that the innovation will not jeopardise the marketability of Australian agricultural output. The New South Wales *Gene Technology (GM Crop Moratorium) Act 2003*, for example, specifically identifies the purpose of the Act as facilitating the identity preservation of transgenic and nontransgenic crops for marketing purpose, as does legislation in Victoria, Tasmania, South Australian and the Australian Capital Territory.

Box 1: Conventional and transgenic plant breeding

Human agricultural development endeavors have very often revolved around plant and animal breeding. At its most basic, an agricultural breeding program is a variation on natural selection. In natural selection, the most successful plants or animals of a species tend to dominate and thus the species evolves to do the best it can in the environment in which it lives.

Human intervention in the process of natural selection is generally intended to influence the dominance of particular characteristics in a species or subspecies. Plant breeders manipulate the genetic makeup of plants with the intention of influencing plant evolution in a direction that suits the needs of humans. In plant breeding, a number of techniques have been developed to facilitate the dominance of desirable plant characteristics. These can be generally classified as conventional or transgenic (genetic modification) techniques.

Conventional breeding

So-called conventional plant breeding generally utilises the plants sexual reproduction mechanism to manipulate the genetics of a plant variety. This type of plant breeding follows the framework of the Laws of Inheritance identified by Gregor Mendel in the mid-1800s.

Plant sexual reproduction usually involves combining two sets of around 25 000 genes. Gene governed traits that differ between the parents reassociate freely to produce a new plant with a new genetic profile. The new traits may be useful or useless, safe or harmful. The recombination of genes that gives rise to new traits presents as a breeding instrument that has been exploited by humans.

Conventional breeding techniques include:

- Human selection — selecting seed from plants expressing the most desirable characteristics, for planting the following year.
- Hybridisation — intervening in the reproduction process to cause cross fertilisation of specific plant lines. This includes generating 'F1 hybrids' by crossing two predetermined parental lines to achieve 'hybrid vigor' in the first generation progeny; and incorporating new genetic material by cross fertilisation with pollen from unrelated or distantly related plants. Triticale, a cross between wheat and cereal rye, is one example of the use of this technique. It was originally developed in the 19th century.
- Induced mutation or 'mutagenesis' — exposing seed to specific radiation or chemical agents in order to facilitate mutations in the hope that the mutation will be useful.
- DNA marker selection — using DNA examination techniques to select plants for breeding, according to whether they possess a particular piece of DNA.

Transgenic breeding

Transgenic or genetic modification of plants generally refers to the incorporation into plant cells of a specific piece of DNA from a foreign source, in order to confer a specific trait on the host plant. The main difference between transgenic breeding and conventional breeding, is that transgenic breeding does not rely on sexual reproduction, with its associated recombining of large numbers of genes.

Current transgenic breeding techniques allow a specific gene to be inserted into plant DNA at a specific point, permitting a precise analysis of the effect of the gene transfer on a range of genetically coded plant characteristics; and avoiding the diversity of effects of conventional breeding gene recombining.

Sources: Nuffield Council on Bioethics (1999); Manshardt (2004).

Transgenic crops currently grown in Australia

As a consequence of the moratoriums, Australia has no commercial plantings of transgenic crops principally grown for food or feed. The only commercial broadacre transgenic crop in Australia is cotton; transgenic carnations are also produced.

Transgenic cotton

Transgenic cotton has been popular with farmers, despite regulations restricting the level of adoption of the technology in cotton production. Between 1996 and 2003, the transgenic proportion of total cotton plantings was regulated to remain below 30 per cent of plantings on each farm. This approach was intended to prolong the effectiveness of the insect resistant transgenes available in that period. The predominance of nontransgenic cotton reduced the evolutionary pressure for the target insects to develop resistance to the insecticidal characteristics of the transgenic cotton plants.

The introduction of a new transgenic variety for the 2003-04 growing season coincided with a change in regulation to permit up to 40 per cent of each farm's cotton plantings to be transgenic varieties if certain conditions were met; and in 2004-05, as a result of the withdrawal from planting of the first generation transgenic cotton varieties, the cap on the transgenic proportion of cotton crops has been removed.

Cotton Australia report that more than 70 per cent of the cotton planted in Australia in 2004-05 was transgenic, with around 95 per cent of cotton farms growing transgenic cotton. This is a high adoption rate for this technology, comparable to the high adoption rates for transgenic crops in north and south America, and in China. This level of adoption of transgenic cotton in Australia shows that Australian farmers, when permitted, are likely to adopt transgenic varieties where net economic benefits exist.

Adoption of transgenic crops (in addition to cotton) has the potential to provide significant environmental benefits, similar to those outlined in box 2.

Transgenic crops globally

In contrast to Australia's moratorium on commercialising transgenic food and feed crops, transgenic food and feed crops have been, and continue to be, adopted by agricultural producers in many countries. Details of the scale of transgenic cropping in the main transgenic crop growing countries are provided in table 2. Generally, countries that have been producing commercial quantities of transgenic crops since the 1990s have a relatively high level of farmer adoption of the technology.

In countries that have been producing commercial transgenic crops for more than five years, oilseeds and cotton crops tend to be mainly of transgenic varieties. The adoption rates for transgenic maize are lower, reflecting the generally lower incidence of producer benefit from that crop.

Globally, the main transgenic crops are maize, oilseeds and cotton. According to James (2004), in 2004, 56 per cent of global soybean plantings, 28 per cent of global cotton plantings, 19 per cent of global canola plantings and 14 per cent of global maize plantings were transgenic varieties. In 2004, around 6 per cent of world arable land was planted to transgenic crops, a significant global rate of takeup of these crops in the nine years since the commercialisation of transgenic broadacre crops.

In the future

The future for transgenic crops seems assured. Current commercial experience with transgenic crops with input trait modifications indicates that plantings of transgenic oilseeds, cotton and maize will continue to expand. Brazil produced 27 per cent of global soybean production in 2003-04 (ERS 2005) and appears poised to push the transgenic proportion of global soybean production close to 70 per cent. India produced 15 per cent of world cotton in 2003-04 (ERS 2005) and is gradually increasing the proportion of transgenic plants in the cotton crop. Transgenic maize is well established in north America and continues to be adopted in developing countries such as the Philippines and South Africa.

Transgenic crops not yet commercialised also have strong prospects for the future of transgenic food crops. China is developing a wide range of transgenic food crops, and is 'on the threshold of commercialising transgenic rice' (Huang et al. 2005, p. 688). The large scale commercialisation of a major food crop, such as rice, is likely to result in an acceleration of the development and adoption of transgenic food crops — particularly if the commercialisation takes place in a country with a government funded biotechnology research and development capacity, such as China, India or Viet Nam (Brookes and Barfoot 2003).

Box 2: Benefits of transgenic cotton in Australia

Australian cotton growers have a high rate of adoption of transgenic cotton varieties. The apparent reasons for the high rate of adoption include both economic and environmental motivations.

Economic benefits

Transgenic, insect resistant (IR) cotton has demonstrated an economic benefit to growers by virtue of generally requiring less insecticide to achieve a successful crop outcome, reducing expenditure on insecticidal chemicals. Not only is the volume of insecticide lower for transgenic IR cotton, but fewer applications are necessary, thus further reducing the costs of applying insecticides.

Sample enterprise budgets from the New South Wales Department of Primary Industries indicate that transgenic IR cotton crops in the northern zone of New South Wales typically apply around 60 per cent less insecticide in half the number of applications required for conventional cotton crops. According to the sample budgets, farmers could expect to lower their insecticide and application costs by around 85 per cent by using Bollgard II® cotton, resulting in a reduction in total variable costs of production of around 2 per cent. Assuming the producer prices for transgenic and conventional cotton are the same, growers of transgenic cotton could expect to improve the profitability of their businesses.

Environmental benefits

In addition to the economic benefits accruing to farmers from the introduction of the latest generation of transgenic cotton, environmental benefits are also evident. The environmental benefits relate to the reduced use of pesticides, and changes to insect management regimes following the introduction of Bollgard II® cotton. In Australia, cotton growers have reduced pesticide use to around 40 per cent of the volume previously used on conventional cotton crops. Compounding the environmental benefits of a general decrease in insecticide use is the reduction in use of some of the more toxic and persistent insecticides, such as endosulfan. Using transgenic IR cotton in an integrated pest management approach has reportedly resulted in a reduction in endosulfan use of around 90 per cent in Australian cotton production.

In addition to reduced pesticide use, weed management systems involving herbicide tolerant transgenic cotton have been shown to be less damaging to the environment than conventional cotton production systems. The environmental benefit is derived from less toxic broad spectrum herbicides that break down rapidly on contact with soil, being used in place of more toxic and environmentally persistent herbicides. Use of broad spectrum nonpersistent herbicides also facilitates the adoption of reduced tillage agricultural practices, a factor in reducing soil degradation on farms.

Health benefits

The potential environmental and health benefits of reduced pesticide use as a result of adoption of transgenic crops is illustrated well by the Chinese experience with transgenic cotton. In China during the years 1992–96, on average each year 54 000 farmers and farm workers were poisoned as a result of pesticide use, with a resultant 490 deaths. The cotton sector, a major user of pesticides, contributed significantly to this tally.

Surveys in China in the period 1999–2001 revealed that use of IR transgenic cotton (Bt cotton) resulted in a decline in the quantity of pesticides used, and a decline in the number of farmers and farm workers reporting cases of pesticide poisoning. The decline in quantity of pesticides used included declines of more than 50 per cent in the most toxic pesticides used on cotton.

Sources: Crossan and Kennedy (2004); Hossain et al. (2004); Larkin (2005); NSW DPI (2004a).

2 Main transgenic crop producers in 2004

	Commercialised transgenic broadacre crops	Total transgenic crops	Commodities	Estimated share of crop that is transgenic
		million ha		
United States	1996	47.6	Soybeans, maize, cotton, canola	85 per cent of soybeans 76 per cent of cotton 45 per cent of maize
Argentina	1996	16.2	Soybeans, maize	100 per cent of soybeans
Canada	1996	5.4	Canola, maize, soybeans	77 per cent of canola
Brazil	2003	5.0	Soybeans	22 per cent of soybeans
China	1997	3.7	Cotton	66 per cent of cotton
Paraguay **a**	2004	1.2	Soybeans	60 per cent of soybean
India	2002	0.5	Cotton	6 per cent of cotton
South Africa	1998	0.5	Maize, soybeans, cotton	50 per cent of soybean 85 per cent of cotton 15 per cent of maize
Uruguay	2001	0.3	Soybeans, maize	nearly 100 per cent of soybean
Australia **b**	1996	0.25	Cotton	70–80 per cent of cotton
Romania **a**	1999	0.1	Soybeans	50 per cent of soybean
Mexico **a**	1996	0.75	Maize, cotton	10 per cent of maize
Spain	1998	0.58	Maize	12 per cent of maize
Philippines **a**	2003	0.52	Maize	20 per cent of maize

a Transgenic proportions derived using Foreign Agricultural Service of the US Department of Agriculture PS&D tables and transgenic crop areas from James (2004). **b** Transgenic proportion based on Cotton Australia 'Biotechnology' fact sheet.
Source: James (1997,1998, 2004); US Department of Agriculture (2004).

Implications for Australia in domestic and world markets

Global commercialisation of transgenic crops potentially has impacts for Australia in overseas export markets and in the Australian domestic market. The potential impacts differ depending on whether Australia produces transgenic crops or not, and on the degree of transgenic crop production in competitor nations.

In international markets, transgenic crops with productivity enhancing input traits, such as those being rapidly adopted globally, can be expected to exert downward pressure on the prices for those crops. Given that Australian producers are price takers in these competitive world markets, preventing the commercialisation of transgenic crops in Australia means that Australian producers receive a reduced benefit from their crop. This will manifest itself as reduced market share and reduced profitability for Australian producers, compared with the outcome if Australian producers were permitted to grow transgenic crops commercially.

Trade data indicate that Australian producers currently compete in a number of export markets in which transgenic crops have a significant market share. Australian producers also participate in a number of markets in which transgenic crops have the potential to be significant competitors for conventionally bred crops in the future.

Canola

Japan, China, Pakistan and Bangladesh were the main destinations for Australian canola seed in the years 2000–04 (ABARE 2004). Over that period, 41 per cent of the export returns to Australian canola seed where derived from the Japanese market, 21 per cent from China, 17 per cent from Pakistan and 10 per cent from Bangladesh — that is, 88 per cent from these four Asian markets (UN 2005).

These four markets for Australian canola seed are dominated by Australian and Canadian canola, with European producers playing a minor role. For example, Australian and Canadian producers met 95–100 per cent of Japanese import demand in the period 2000–04; in the Chinese market, Canada supplied 68 per cent and Australia 24 per cent of import demand.

Canadian producers of transgenic canola have not lost market share in their main export markets for canola seed, and they appear to have a production cost advantage over Australian producers by virtue of lower costs in their weed suppression regimes. Lower costs of production in Canada are a potential threat to the continued viability of Australian exports of canola seed, but there is no apparent threat to Australian canola seed exports from the commercialisation of transgenic canola in Australia (Lloyd 2003).

Given the lack of evidence of a price premium for Australian nontransgenic canola (Foster 2003), Australian canola seed producers receive no economic benefit from forgoing the potential productivity gains from growing a suitable transgenic canola variety. In fact, they suffer an economic loss as a consequence of the current moratoriums.

Cereal grains

China is potentially a growth market for a number of Australian broadacre crops. Two factors are likely to converge in the near future, revealing China as a large market for transgenic crops. China has developed a large state supported agricultural biotechnology research and development capacity and is likely to commercialise transgenic food grains in the near future (Huang et al. 2002); and China's growing affluence and changing dietary preferences are likely to result in increased demand for malting barley, feed grains and high quality food grains (Roberts and Andrews 2005). These factors point to a potential opportunity to increase Australian grain exports, including transgenic grains, into a very large and expanding market.

Research and development impacts

Agricultural innovations such as transgenic crops have the potential to provide benefits to producers and consumers. While consumers will tend to benefit from lower prices for agricultural products in the long run, the level of benefit flowing to producers depends partly on whether they are early adopters of innovation or not.

Early adopters tend to accrue benefits from increased yields or lower costs compared with the majority, which translates into improved profitability. Late adopters are essentially catching up to the majority. In a competitive commodity market, late adopters reduce their costs, for example, after the reduced costs of the majority have lowered the market price, while early adopters reduce their costs under the existing higher market price.

To be well positioned to take advantage of opportunities such as those mentioned above, Australia needs to maintain a significant level of research and development in the agricultural biotechnology field. In order to maintain or increase investment, private companies and government research facilities require a reasonable level of certainty about their future opportunities to generate an economic return on their investment.

The state bans on commercialising transgenic canola are contributing to uncertainty in Australia's biotechnology research and development effort — Fitzgerald (2004) reports that Monsanto has withdrawn from developing transgenic canola in Australia as a result of regulatory restrictions and the moratorium on producing transgenic canola.

A reduction in research and development capacity in this field has the potential to impact negatively on future Australia grain trade. The policy stance of the Australian states appears to

be jeopardising the future benefits from transgenic crop developments.

Quantifying the impact of the moratoriums

Since 2001, a number of studies have attempted to quantify the economic impacts of transgenic crop commercialisation (Nelson et al. 2001; Stone, Matysek and Dolling 2002; Abdalla et al. 2003; Anderson and Jackson 2005).

While these studies have varied in terms of the assumptions used in their economic modeling, they tend to agree in their broad conclusions: generally, given the current level of transgenic broadacre cropping, and under a range of possible future scenarios, economic benefits would tend to accrue to Australia from the commercialisation of transgenic crops in Australia, compared with not commercialising transgenic crops.

Box 3: Assumed productivity gains in selected crops

In order to quantify the welfare implications of Australia either commercialising or not commercialising the transgenic food and feed crops involved, productivity improvements for maize, canola, wheat and barley were modeled. These crops were chosen as they are important to Australian agriculture and transgenic varieties of these commodities have been developed in Australia and elsewhere.

The productivity gains in maize and canola are based on published results of field trials and/or commercial production experience in the relevant countries. There are no commercial plantings of transgenic barley or wheat — productivity gains assumed for these commodities are based on published estimates of productivity improvements from trials, and on estimates of gross margin changes resulting from changed herbicide application regimes as a result of transgenic varieties expressing tolerance to particular herbicides.

Sources: Foster (2003); James (2003); Johnson, Lin and Vocke (2005); NSW DPI (2004b).

In order to quantify the welfare implications of the debate concerning whether Australia should commercialise transgenic food and feed crops, and to update earlier modeling results using current estimates of productivity gains, current levels and rates of adoption, and current indicators of likely future developments, this study included an economic modeling exercise as set out below.

The potential impacts on Australia of adopting transgenic crops were estimated using ABARE's global trade and environment model (GTEM). GTEM is a dynamic computable global general equilibrium model of the world economy that provides a suitable framework for analysing domestic and international policy changes, as it takes into account the interactions between sectors within a country as well as the linkages between countries brought about by trade and investment.

Two scenarios simulated

- Australian states prohibit commercial plantings of transgenic grain and oilseed crops, while there is further transgenic crop adoption in other countries.
- Australia adopts transgenic varieties of wheat, barley and canola.

In these scenarios, the adoption of a transgenic crop is assumed to result in a productivity improvement for the sector adopting the new technology — that is, for a given level of inputs, output expands by the productivity improvement percentage.

Background information on the assumed productivity improvements is provided in box 3. It is assumed that all productivity improvements are phased in over the five years from 2006 to 2010. Additionally, no trade barriers relating to transgenic adoption are considered in the simulation as it is assumed that there are still sufficient nontransgenic producers, such that there is no nontransgenic premium in world markets. Likewise, no adverse impact on domestic consumers from the adoption of transgenic crops is considered. Finally, any identity preservation and segregation costs are not explicitly modeled — these are the subject of ongoing research by ABARE and others.

The timeline used in the modeling has been chosen to demonstrate the near-future magnitude of the potential benefits of commercialising transgenic crops in Australia. Transgenic crops, including wheat and barley, continue to be developed and could potentially be commercialised in the near term, while commercially viable transgenic varieties of canola have already been developed for Australian conditions.

Results

In the first scenario, Australia does not adopt any transgenic crops. Meanwhile there is further transgenic adoption in other countries. The assumed productivity gains are:

- a 5 per cent productivity gain for wheat in the United States/Canada, Brazil, Argentina, China and India; and
- a 10 per cent productivity gain for maize in Brazil, India and China. (The United States/Canada, and Argentina are assumed to already be at their maximum level of adoption of transgenic maize.)

In the second scenario, in addition to the transgenic crop adoption modeled in the first scenario, some transgenic crop adoption is assumed for Australia. As in scenario one, transgenic crop adoptions are assumed to be phased in over the five years from 2006 to 2010. The assumed productivity gains for Australia are:

- a 5 per cent productivity gain for canola,
- a 5 per cent productivity gain for wheat and
- a 10 per cent productivity gain for barley.

The gross national product (GNP) difference between these two scenarios represents the difference in national economic welfare of Australia either adopting or not adopting transgenic grain and oilseed crops in the face of further global uptake of transgenic crop technology.

Results of the modeling indicate that Australia can derive substantial benefit from transgenic crop technologies. Productivity gains from commercialising transgenic varieties boost Australian production of wheat, barley and canola.

The model indicates that the benefits to Australia increase over time as the level of uptake of the technology increases, with the 2005 net present value (in 2004 Australian dollars) of the total benefits in the period 2006–15 being approximately $3 billion (table 3).

3 GNP gains for Australia from transgenic crop adoption **a** In 2004 Australian dollars

	Gain
	$m
Assumed productivity gains	2 952
Sensitivity analysis	
Productivity gains halved	1 492
Productivity gains doubled	5 770

a Net present value in 2005 of gains in gross national product to 2015.

In the light of uncertainty over the productivity gains that would actually be realised from transgenic technology adoption, a sensitivity analysis was conducted. This analysis involved simulating the impacts of halving the assumed productivity gains from transgenic crop adoption, and simulating the impacts of doubling the assumed productivity gains.

The sensitivity analysis indicates that the net present value of Australian GNP growth would be between $1.5 billion and $5.8 billion. Even allowing for variation from the assumed productivity gains there are still significant potential gains to Australia from adopting transgenic grain and oilseed crops.

Concluding comments

Transgenic broadacre crops are proving their value to producers and consumers the world over. Levels of adoption are already high for transgenic maize, cotton and oilseeds. Developments in countries such as China, India and Brazil point to a continued expansion of transgenic crop plantings, with transgenic food grains likely to be commercialised in the near future. In contrast to the increasing global adoption of transgenic crop technology, most Australian states and territories have legislated to prohibit the commercial production of transgenic canola.

There is no apparent economic justification for Australia to delay the commercialisation of transgenic canola. Australian canola seed

producers compete with transgenic canola seed in their main export markets. Those markets willingly accept transgenic canola. In the absence of a defined market and a price premium for nontransgenic canola, the moratoriums are generating an economic loss for Australia. Australian canola producers are prevented from sharing the economic benefits of transgenic canola that are being enjoyed by the other major supplier of Australia's canola export markets, Canada.

Likely future developments in markets, in Asia in particular, and in transgenic crops will result in expanding opportunities for broadacre transgenic crops in Australia. There is evidence that the transgenic canola moratorium threatens Australia's capacity to react to emerging opportunities in the field of crop development.

While the debate on the commercialisation of transgenic crops in Australia is yet to be concluded, ABARE modeling indicates that a failure to commercialise transgenic crops now and in the near future could, by 2015, cost Australians between $1.5 and $5.8 billion in forgone gross national product.

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NATIVE VEGETATION

cost of preservation in Australia

Alistair Davidson, Lisa Elliston, Phil Kokic and Kenton Lawson

• The current regulatory approach to preserving remnant native vegetation is imposing a large cost on the farm sector.

• The cost of meeting native vegetation regulations is likely to be an important factor in determining the future competitiveness of Australia's broadacre agricultural industries on world markets.

• A more flexible approach to native vegetation conservation may achieve better environmental outcomes at a lower cost to the farm sector.

Australia's agricultural input markets are showing signs of becoming increasingly subject to regulatory control. Labor, fertiliser, seeds, chemicals, genetic technology and land (through regulatory control of vegetation management) are just some of the key farm inputs that have been subject to increased regulatory control.

According to a recent paper from the Productivity Commission, 'business is in revolt over regulation' (Banks 2005, p. 1). The broad based complaint is that 'there is too much regulation and that it is too costly — both to business and the economy at large' (p. 1). Such concerns have also been raised in the rural sector, particularly regarding the regulatory approach to native vegetation management that has been adopted by state and territory governments.

Legislation restricting broad scale clearing and management of existing native vegetation, apparently intended to meet increased community demands for improved environmental, outcomes has become more restrictive in many states over the past decade or so. While there are many possible reasons for this, it is possible that governments are attempting to meet expectations and demands for improved environmental outcomes that have previously not been considered a priority or affordable (Banks 2005). However, the question whether society is better off as a result of the implementation of native vegetation legislation has remained largely unanswered.

In this article, evidence is offered suggesting that native vegetation legislation could be imposing a large cost that has not been fully considered in the formulation of environmental policies. This cost reflects farmers' inability to continue to combine farm production inputs as efficiently as otherwise would have been the case to generate productivity gains and maintain international competitiveness on world markets. Further, there are concerns that reducing farmers' viability may affect their ability to deliver against some intended environmental outcomes.

The need for productivity growth

Australian broadacre and grazing farmers have a long history of making productivity gains. It is estimated that in the 26 years to 2002-03, the broadacre and grazing industry achieved an average productivity growth of 2.3 per cent a year (table 1). These productivity gains have largely offset the fall in farmers' terms of trade (the ratio of prices received for farm products

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relative to the prices paid for farm inputs), which are estimated to have been declining at around 2.3 per cent a year over the same period.

Decomposition of the productivity growth estimates across the different broadacre and grazing industries reveals significant differences in the gains achieved. For example, cropping specialists have recorded the strongest gains in productivity, at around 2.7 per cent a year, more than offsetting the estimated annual 2.3 per cent decline in their terms of trade (table 1). In contrast, sheep specialists have recorded the smallest productivity gains, at 0.6 per cent a year, falling well short of the estimated annual 1.7 per cent decline in their terms of trade.

Analysis of these differences in productivity growth indicates that cropping specialists have been able to make greater gains in productivity through advances in plant breeding, the development of new herbicides, larger scale farming, advances in tractor and machinery design, as well as improvements to bulk handling equipment and infrastructure (Alexander and Kokic 2005; Knopke, O'Donnell and Shepherd 2000). In contrast, the livestock industries have reported lower productivity gains from improvements in production technology and management techniques (Knopke et al. 2000).

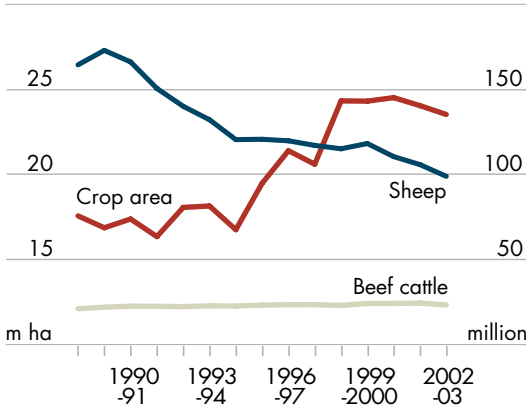
The average productivity growth achieved by the broadacre agriculture sector in Australia is also partly attributable to the changes in land use that have occurred over the past decade or so. This includes the significant shift out of wool production following the collapse of the wool price stabilisation scheme in the early 1990s as farmers moved into relatively more profitable and productive cropping and beef activities (figure A).

This trend is also apparent in the industry composition of broadacre agriculture, with the proportion of cropping specialists increasing from less than 10 per cent in 1988-89 to around 20 per cent in 2003-04 (figure B). The proportion of beef specialists also increased significantly, from 20 per cent to 34 per cent over the period. At the same time, the number of sheep specialists and the number of farmers with mixed crop–livestock enterprises declined across the country.

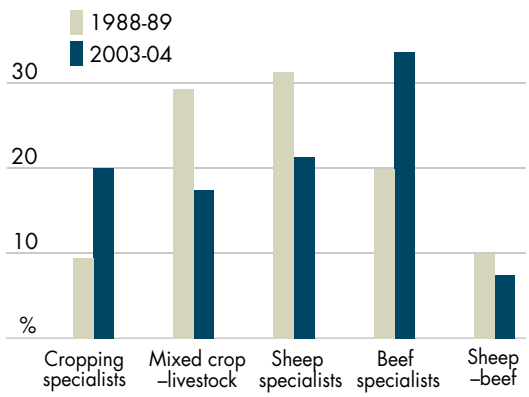
1 Annual productivity growth and terms of trade, 1977-78 to 2002-03

	Productivity growth	Terms of trade
	%	%
Crop specialists	2.7	–2.3
Mixed crop–livestock	2.2	–2.2
All crop farms	2.6	–2.3
Sheep specialists	0.6	–1.7
Beef specialists	1.7	–1.3
Sheep–beef producers	0.7	–1.4
All broadacre farms	2.3	–2.3

A Australian broadacre activity



B Composition of broadacre industries
Australia



These findings suggest that the ability of farmers to continue making similar improvements in productivity growth over time is likely to depend on their capacity to continue to expand grain production and to adopt new technologies that make production more efficient.

Impact of native vegetation regulation

Controls over clearing native vegetation on grazing and cropping properties have a direct impact on farmers' management strategies in five broad ways, according to the Productivity Commission (2004):

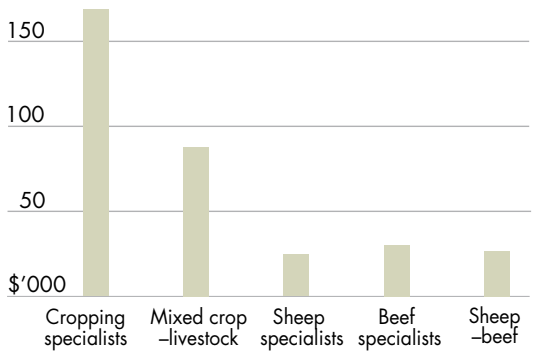
- preventing the expansion of some agricultural activities;
- preventing changes in land use (for example, from grazing to cropping);
- inhibiting the adoption of, or limiting the full exploitation of, on-farm efficiency gains arising from the adoption of new technologies (such as precision agriculture using global positioning system (GPS) guidance systems);
- inhibiting the cost effective routine management of vegetation regrowth and clearing of woodland thickening to maintain areas in production; and
- inhibiting the cost effective management of weeds and vermin.

Accordingly, native vegetation regulations are limiting the ability of some farmers to pursue options to maintain productivity. For example, a survey of farmers in western and central New South Wales in 2004-05 indicated that farmers in the area wanted to develop, on average, a further 15 per cent of their total farm area for cropping. The current native vegetation regulations in that state prohibit broadscale clearing, which means that farmers may be unable to develop grazing land into arable land. This imposes costs on farmers by limiting their ability to capture the higher returns earned by cropping specialists and mixed livestock–croppers relative to the returns reported by the livestock industries. For example, in 2003-04, cropping specialists reported an average farm income of almost $170 000, and mixed crop livestock producers reported average farm incomes of almost $90 000 (figure C). In contrast, beef and sheep specialists reported lower farm incomes of around $30 000 and $25 000 respectively, in the same year.

The protection of isolated trees in paddocks — even dead trees — to provide habitat for native birds and animals and to provide connectivity across the landscape may be imposing further costs on broadacre farms, preventing additional productivity gains. Isolated trees in paddocks can limit the uptake of more efficient technologies. For example, farmers with isolated trees may be unable to invest in centre pivot irrigation to improve water use efficiency on their property. Even where adoption of technology is widespread, isolated trees can limit the full exploitation of on-farm efficiency gains resulting from adoption of the new technology. For example, a survey of landholders in central and western New South Wales found that almost all of those farmers that had adopted GPS guidance systems reported problems with isolated trees on their property.

Native vegetation regulations can also erode the current productivity of farms. For example, a survey of landholders in central and western New South Wales found that, on average, 70 per cent of farmers with livestock had experienced a decline in the carrying capacity of their land as a result of encroachment of woody weeds and other invasive species into previous native pasture land. Native vegetation regulations can have an impact on graziers in two ways: by

C Average farm cash income, by industry
2003-04 Australia



limiting or by prohibiting the use of privately optimal vegetation management techniques (such as chain clearing) that may involve collateral damage to species that are of high public value but low private benefit.

The ability of farmers to make productivity gains is likely to have significant implications for the viability of farming in some regions. For example, in north west New South Wales, some farmers are already facing pressures to adjust because of low real wool prices and historically low rates of productivity growth. The regulations to manage native vegetation in regions such as these are likely to represent an additional source of pressure, accelerating the rate of structural adjustment. In addition, impacts on farm productivity growth have implications for the Australian agriculture sector in its ongoing effort to maintain international competitiveness on world markets.

Impacts on international competitiveness

Australian farmers are highly dependent on world markets. It has been estimated that in recent years exports have accounted for around 65 per cent of Australia's agricultural production (ABARE 2000a). Most of any increase in farm production is sold on world markets. The farm sector is also a critical component of Australia's export performance (and therefore income), accounting for approximately 20 per cent of the total value of Australian exports in most years. As such, it is inescapable that any impact on the growth of Australian farm productivity is likely to have a corresponding impact on Australia's export revenue.

The costs of meeting environmental regulations can be important factors in determining the competitiveness of a product since the cost advantages of producers in any one country are often very slim. Thus, additional costs associated with new regulations can have a critical effect on the continued importance of a nation's exports and on its share of the international market (Colyer 2004).

Broader regional impacts

Australia's competitiveness on export markets also has important consequences for rural communities. If broadacre productivity growth is restricted because of regulatory controls over native vegetation, then farm incomes would be expected to decline in real terms. There are then wider consequences, particularly for rural communities and possibly environmental outcomes.

Small towns most likely to be in decline are those that are highly reliant on broadacre farming for their economic survival (ABARE 2000b). Country towns located in broadacre agricultural areas often have limited opportunities for agricultural diversification because of the existing natural resource base and even fewer options since the introduction of native vegetation regulations. For those rural and regional communities that depend heavily on farm incomes, there is a risk that government regulation could accelerate structural adjustment in some regions, with negative impacts in the future.

With nearly two thirds of Australia's land mass managed by farmers, they are vital to the successful delivery of policies intended to improve environmental outcomes. Many farmers undertake activities, such as vermin and weed control, that are of both private and public benefit. However, a decline in profitability induced by native vegetation regulations may lead to some farmers: delivering a lower level of pest control; discontinuing activities for which pest control costs are too high (and thereby avoiding the need for control); or, in extreme cases, abandoning the land altogether. Such outcomes may also lead to increased negative spillover effects on neighboring properties, thereby exacerbating the problem. The consequence for society is that it may forfeit 'free' environmental benefits flowing from activities that many farmers undertake routinely and generally more efficiently than governments.

State specific impacts

The impacts of different native vegetation regulations are likely to differ between states and terri-

tories depending on their degree of regulatory control and potential opportunities for agricultural development. For example, groundcovers and other types of herbaceous vegetation in New South Wales are included within the definition of native vegetation under the *Native Vegetation Act (NSW)* (2003), whereas in Queensland, grass and nonwoody herbage are specifically excluded from the meaning of vegetation under the *Vegetation Management and Other Legislation Amendment Act (Qld)* (2004). Native vegetation regulation in New South Wales therefore has broader coverage, with the potential for wider impacts on both graziers and croppers, than in the other states.

Potential opportunities for agricultural development are likely to be higher in Queensland than in New South Wales. This in part reflects the lower extent of clearing of native vegetation in Queensland since European settlement than in other states (Productivity Commission 2004).

The combination of greater regulatory control with larger potential development opportunities in New South Wales and Queensland is likely to result in larger opportunity costs to farmers in these states. For states where the native vegetation regulations have the greatest impact, the negative impacts on production, employment and investment are likely to result in factors of production (such as farm labor and capital) relocating to other states or out of the sector.

Regulation imposes a big cost

ABARE has undertaken a survey in an area of western and central New South Wales of around 150 000 square kilometres to estimate the impact of native vegetation regulations on broadacre farmers. If all land considered appropriate for cropping (according to land capability criteria) were developed over a fifteen year time horizon, the estimated gain to farmers in the survey region could be as high as $460 million in net present value terms. To the extent that the vegetation regulations prevent this development from occurring, farmers incur a cost of forgone cropping opportunities. Under this particular scenario, the total costs to the region may be an underestimate because it excludes a range of limitations that the regulations impose on private landholders, including graziers seeking to maximise their livestock productivity. The results indicate that the total cost of the regulatory approach to preserving native vegetation on private land in New South Wales is likely to be large.

Despite affecting a large proportion of the state, the New South Wales vegetation regulations have the greatest impact on a relatively small group of landholders (Sinden 2004). For example, it is estimated that the median cost of forgone cropping development is $36 500 per landholder. This means that 50 per cent of farms in this region had forgone development costs greater than this value. The estimated cost for 5 per cent of farms exceeded $1.3 million per landholder in net present value terms.

There are many reasons why such a large regulatory cost is being imposed on a relatively small proportion of the population. These reasons are likely to include two key factors that have been identified by the Productivity Commission's chairman, Gary Banks — prosperity and fiscal stringency. Rising income may have brought increased expectations or demands on governments to meet environmental goals that may previously have not been considered as priorities (Banks 2005). The other plausible reason raised by Banks that 'may have lent impetus' to further adoption of the regulatory approach is that such an approach can provide an off-budget solution for delivering environmental policy objectives during a time of 'greater fiscal stringency'. However, as Banks points out, budgetary considerations simply compound the natural (and therefore likely) tendency for governments to address policy objectives using regulation in the first instance.

Although the rural sector bears the brunt of the impacts of a regulatory approach to native vegetation conservation, the total cost falls on society as a whole. These costs include not only the direct opportunity costs faced by farmers and the accompanying economywide ramifications, but also the transaction costs borne by governments in administering, monitoring and enforcing the legislation as well as the largely undeterminable, indirect costs faced by landholders adjusting to a shifting regulatory environment.

This article adds to the growing body of literature confirming that the current regulatory approach to preserving remnant native vegetation on private land is costly and may ultimately fail to deliver some of the anticipated environmental outcomes if farm viability is jeopardised. Society is often forced into making tradeoffs between competing policy objectives, and this is particularly evident in the native vegetation debate. As a consequence, an in-depth understanding of the associated costs and benefits of such policies is required. Newly developed research techniques for estimating the impacts of native vegetation regulation on broadacre agriculture over large regions or even whole states will enable a more holistic evaluation of the net benefits of native vegetation policies to be undertaken for the first time.

While the total costs faced by society could be considerable, there is ongoing uncertainty about the point at which the total costs exceed the intended benefits of native vegetation legislation. There are a number of reports emerging that suggest that in the case of native vegetation regulation, the public gains and private losses could be of the same order of magnitude in some areas (Lockwood et al. 2000; Sinden 2004). Furthermore, the investigations by Lockwood et al. (2000) suggested that under a range of conceivable conservation scenarios, the costs were likely to exceed the benefits. A fuller appreciation of the tradeoffs involved in a regulatory approach to native vegetation conservation could lead policy makers to seek more efficient policy instruments.

A more flexible approach to native vegetation conservation may achieve greater environmental outcomes at a lower cost to the farm sector than blanket regulation. Such an approach would recognise that both the environmental benefits to society and the costs to both farmers and society (costs associated with monitoring, administering and enforcing compliance of a vegetation policy) are likely to differ markedly across agricultural landscapes. This heterogeneity provides the opportunity to realise gains from trading environmental outcomes, particularly in areas where environmental improvements are likely to be marginal, but agricultural productivity improvements are likely to be significant.

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AGRICULTURAL TRADE

improving market access through the WTO

Andrew Jacenko, Troy Podbury, Ian Shaw, Roneel Nair and Don Gunasekera

• The Doha Round of multilateral trade negotiations provides an opportunity to improve economic welfare globally by reducing impediments to trade in agricultural products. Welfare improvements can be achieved by allowing unhindered flows of efficiently produced agricultural goods between trading countries. Reducing impediments to trade will provide economic benefits to efficient producers and exporters of agricultural products and reduce the burden on consumers and, in some cases, taxpayers in countries where the farm sector is highly protected.

• By using information on trade, shares of world consumption and tariffs, a number of key markets for commodities can be identified that could provide significant scope for additional imports if substantial tariff cuts were achieved.

Objective for WTO negotiations

A key objective in the World Trade Organisation (WTO) negotiations is to achieve substantial reductions to all bound tariffs in each member country. If all WTO members adopted this common objective, the complexities relating to the number of members and the number of products with tariffs would not hinder an agreement being reached. However, the disparity in ambition of WTO members has resulted in the wide divergence of the already suggested approaches to tariff reduction.

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Difficulty in achieving success in the negotiations has stemmed from the complexity of agreeing to a formula approach to tariff reductions, which cover the large number of WTO member countries and existing tariff lines. The WTO currently consists of 148 member countries. Agricultural tariff lines in member countries range from a low of 500 in some countries to a high of 2000 tariff lines in others. These factors make it a challenging and also a necessary task to identify important markets for each key commodity that can help provide substantial trade expansion and welfare improvements from tariff cuts. Identifying these markets will reduce the complexity of market access negotiations and allow negotiators to focus on the critical issue of achieving agreement on substantial tariff reductions and address other market access issues.

Framework for identifying key markets

An approach that is typically used to identify tariff lines of importance is to look at current patterns of trade. While it is important to look at current export destinations, limiting the analysis to just such destinations has a major drawback. The current pattern of trade will be heavily targeted to markets that already have low tariff barriers (Gallezot 2003). Just focusing on current trade patterns is likely to ignore markets with high tariff barriers that have the potential to generate substantial trade if bound tariffs were reduced.

An alternative approach is to use a range of indicators to identify markets with potential for large increases in imports. The key concept here is that substantial increases in imports can only occur if there are large changes in production or consumption in protectionist countries or regions. It is possible to use information on consumption, imports and tariffs to identify markets that could generate significantly increased imports after tariff cuts.

For tariff cuts to lead to increased imports of a product in a protected country, production must fall and consumption rise. The changes in production and consumption will result from reductions in internal prices. If a country is already a major consumer of a commodity, the production and consumption impacts of even small changes to internal prices could be sizable relative to other markets. For other countries, large changes to internal prices would be required to influence world markets.

The potential change to internal prices will depend on the initial size of the tariff and the magnitude of the tariff cut that is agreed through WTO negotiations (see box 1).

Potentially important markets

Potentially important markets from a trade expansion perspective will fall into two categories (see Podbury et al. 2005):

- Countries with a large proportion of world consumption and moderate to high tariffs.
- Countries with a small to moderate proportion of world consumption that rely heavily on domestic production to meet internal consumption and have very high tariffs.

Countries or regions in either of these categories could provide increased trade and global welfare improvements from cuts to bound tariffs. This overall framework is used below to identify important markets for a number of key bulk agricultural commodities.

Important beef markets

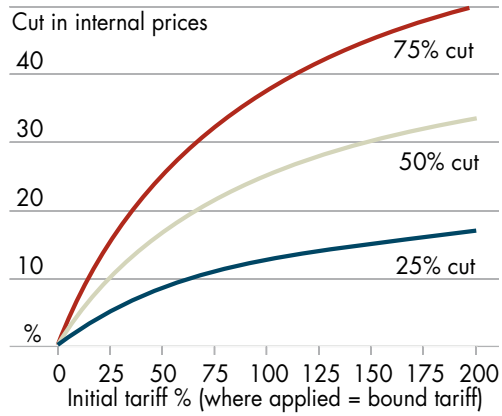
In 2004, just seven countries/regions accounted for 82 per cent of total world beef consumption (figure A). Of these, three are unlikely to be a major source of additional market access — the Russian Federation, Brazil and Argentina. The Russian Federation is not yet a WTO member and Brazil and Argentina are efficient exporters.

Box 1: Tariff cuts and the effect on internal prices

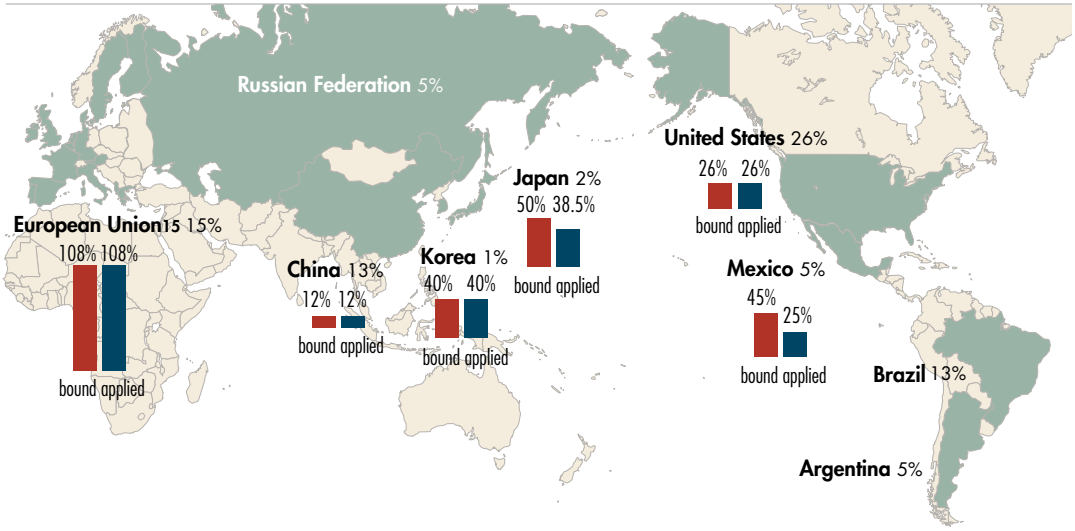
The same percentage cut to a tariff will have a different impact on internal prices, with the difference primarily reflecting the size of the initial bound tariff. If it is assumed that the applied tariff is equal to the bound tariff, this relationship is as illustrated in the diagram.

If an applied tariff is not prohibitive, the internal price should equal the landed world price plus the applied tariff. As such, the larger the tariff, the greater is the share of the tariff in the internal price. As the tariff cut only reduces the tariff component of the internal price, the fall in the internal price will always be smaller than the cut to the tariff. In addition, for a given percentage cut in tariff, the fall in the internal price will be larger when the initial tariff is higher. If the applied tariff is less than the bound tariff, the reduction in internal prices will be even smaller than if the applied tariff was equal to the bound tariff.

Maximum internal price fall for tariff cut



A Beef – share of world consumption, and tariffs, 2004



In the remaining four countries/regions — the United States, the European Union, China and Mexico, which account for 59 per cent of world beef consumption — applied tariffs range from 12 per cent in China to 108 per cent in the European Union (figure A). These countries/regions are heavily reliant on domestic beef production, with the share of imports in consumption being 13 per cent or below. Reductions in the EU beef tariff have the potential to have a sizable impact on world markets.

While reducing tariffs on beef in countries such as China and Mexico can provide benefits, the scope for additional exports to these markets will be limited because the likely falls in internal price as a result of tariff reductions will be relatively small, as existing tariffs on beef in these countries are relatively low.

The United States is a large beef market compared with world consumption and has a tariff of 26 per cent. There is potential for modest gains to flow from tariff reductions in the United States. While the tariff in the United States is similar to the applied Mexican tariff, the larger size of the US market could provide greater benefits following sizable tariff reductions.

Japan and the Republic of Korea are large importers relative to their domestic consumption and have moderate applied tariffs of 38.5 and 40 per cent respectively. There is scope for some sizable reductions in internal prices if substantial tariff cuts can be agreed. For Japan, this potential is reduced because the bound tariff is 50 per cent. As such, at least a 23 per cent tariff reduction is needed before there is any impact on internal prices.

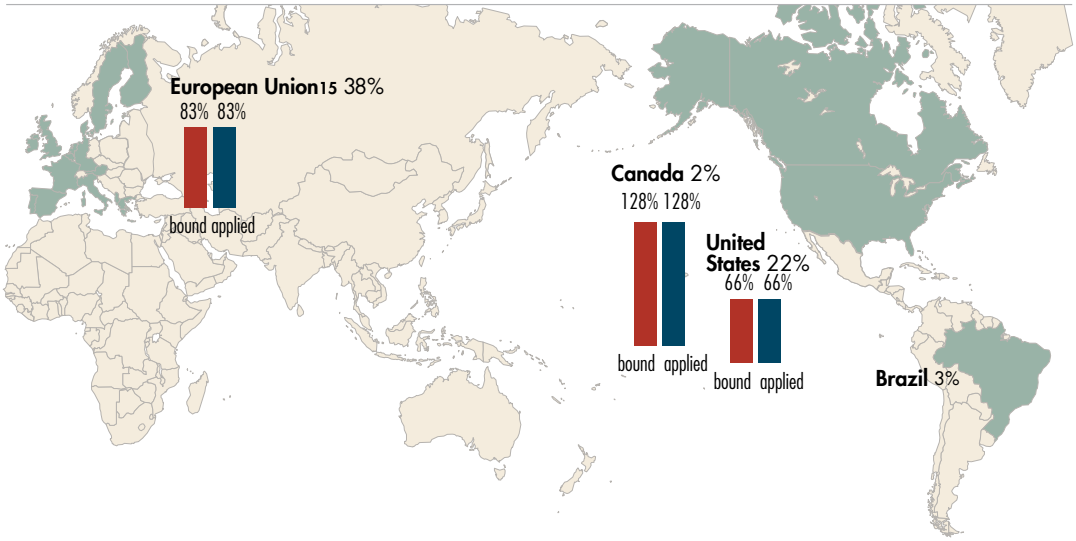
Important cheese markets

For cheese, the United States and the European Union together accounted for 60 per cent of world consumption in 2000 (figure B). The next largest country, Brazil, accounts for only 3 per cent of global consumption.

The European Union and the United States both have significant tariffs on cheese and most consumption is sourced from domestic production. Given this, there is the potential for substantial additional market access to result from tariff reductions in these countries.

Despite the European Union and the United States importing only 2 per cent and 5 per cent of domestic consumption respectively, these imports accounted for 27 per cent of world imports in 2000. As such, even small increases in trade by these two countries can result in large changes on world markets. Reductions to cheese tariffs will therefore be of importance for efficient dairy exporting countries.

B Cheese – share of world consumption, and tariffs, 2000



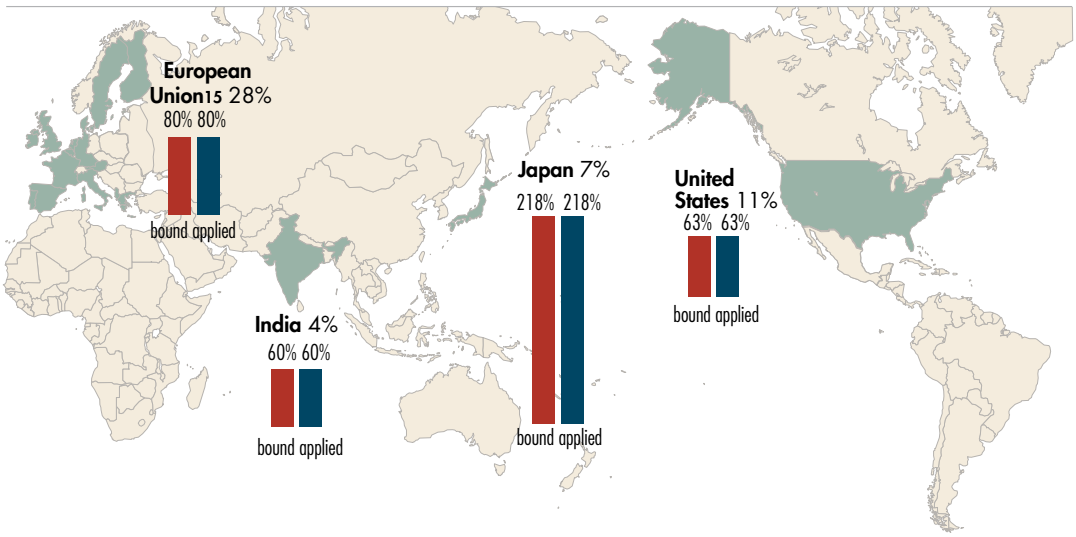
With tariffs of 128 per cent and a heavy reliance on domestic production, Canada could provide scope for benefits from sizable reductions in tariffs. Currently, Canada only imports 7 per cent of their domestic cheese consumption.

Important skim milk powder markets

For skim milk powder, just three countries or regions accounted for 46 per cent of total world skim milk powder consumption in 2000 (figure C). The European Union, the United States and Japan all have significant tariffs on skim milk powder and source most of their consumption from domestic production.

The European Union currently imports only 9 per cent of domestic production, accounts for 6 per cent of world imports and has an 80 per cent tariff on imports. The United States imports 2

C Skim milk powder – share of world consumption, and tariffs, 2000



per cent of domestic consumption, but this is less than 1 per cent of world trade. The US applied tariff is presently 63 per cent.

Even small changes in EU and US internal prices could have large impacts on world markets. If sizable tariff cuts can be achieved, the Japanese market provides considerable market access potential, with a tariff of 218 per cent and with just under a quarter of domestic consumption being sourced from world markets.

In 2000, India accounted for 4 per cent of world consumption, but is only importing 1 per cent of domestic consumption. This heavy reliance on domestic production, and a tariff of 60 per cent, indicates that considerate increases in trade are possible if sizable tariff cuts can be achieved.

Important butter markets

For butter, four countries/regions accounted for 52 per cent of total world butter consumption in 2000 (figure D). India, the European Union and the United States account for 18 per cent of world butter imports, but each region respectively imports a relatively small amount of their domestic consumption. With high tariffs, including 40 per cent for India, 90 per cent for the European Union and 92 per cent for the United States, there is significant potential for market access from sizable tariff cuts in these countries and regions.

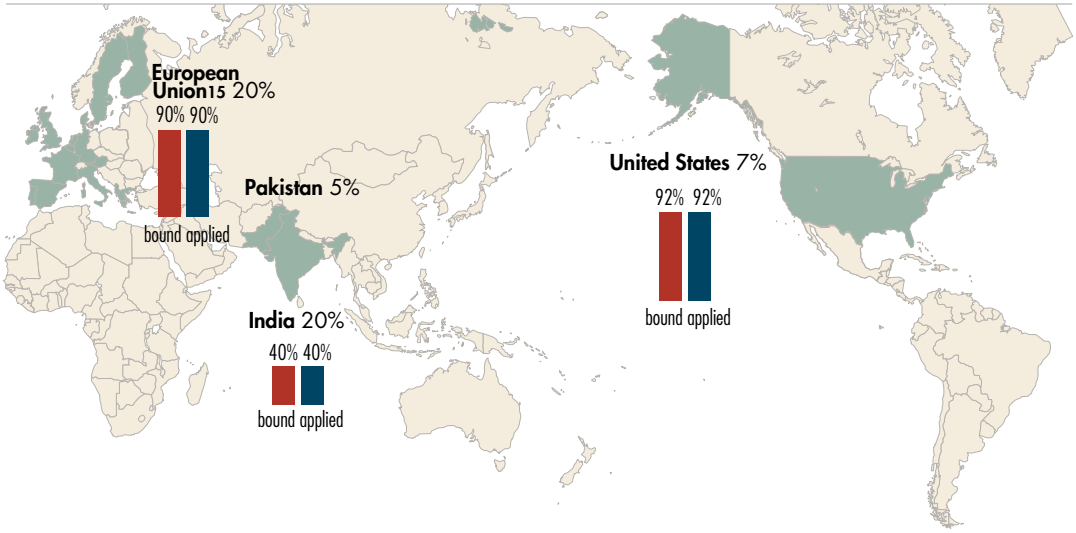
There are three other countries that are modest butter consuming regions, with significant market access potential from sizable tariff cuts. Canada, Japan and Switzerland have extremely high tariffs of 299 per cent, 360 per cent and 842 per cent respectively. These markets are highly protected and currently rely heavily on domestic production, which only remain competitive because of the existing tariff barriers. Currently, tariffs in these countries make trade prohibitive and large tariff cuts would be required for trade to occur.

Important sugar markets

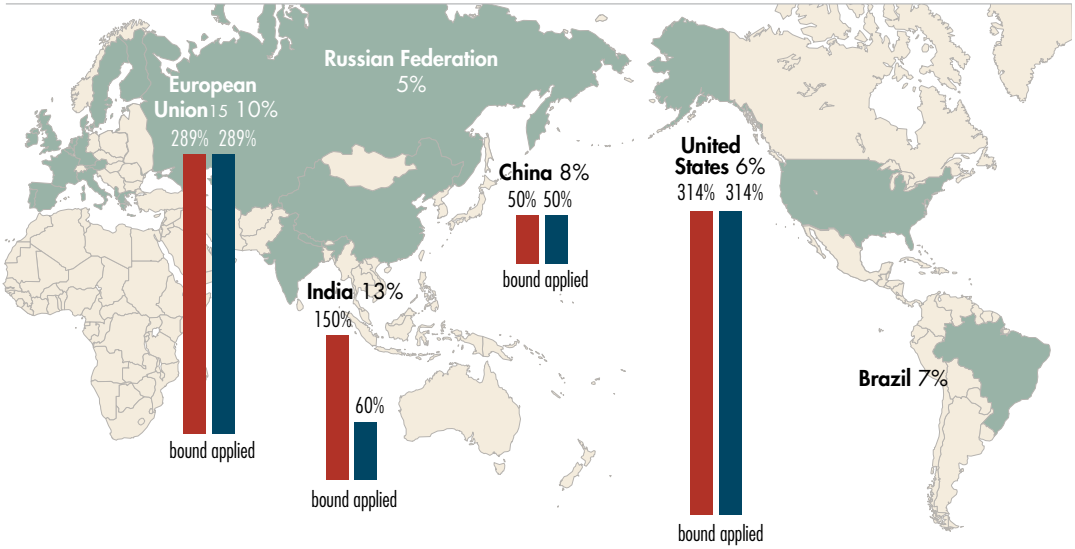
For sugar, six countries or regions accounted for 49 per cent of total world sugar consumption in 2003 (figure E). Of the seven countries/regions, there is unlikely to be additional market access from Brazil, which is an efficient sugar exporter with low tariffs, or from the Russian Federation.

The European Union and the United States are two of the world's most important importing countries or regions. Both are highly protective of their domestic sugar industries and make use of the special safeguard provision. The safeguard provision allows importing countries to

D Butter – share of world consumption, and tariffs, 2000



E Sugar – share of world consumption, and tariffs, 2003



increase tariffs when import prices are below a trigger level or there is a significant increase in imports.

In 2003 the United States and the European Union accounted for approximately 9 per cent of world sugar imports. The United States has a 314 per cent tariff (comprising a bound tariff of 171 per cent and a safeguard component of 143 per cent), while the European Union has a 289 per cent tariff (including a safeguard component of 64 per cent).

In India, which has an applied tariff of 60 per cent, there is scope for substantial additional imports of sugar. However, the potential is limited as India has a bound tariff of 150 per cent. As such, a tariff reduction of over 60 per cent is needed before there is any impact on internal Indian sugar prices.

China is part of the top seven sugar consuming countries/regions and imports just 8 per cent of its domestic consumption. China has a tariff on sugar of 50 per cent. Reducing this tariff has the potential to generate increased imports. This is supported by increasing consumer income and the changing dietary tastes, particularly the increased consumption of highly processed foods, which contain more sugar than traditional foods.

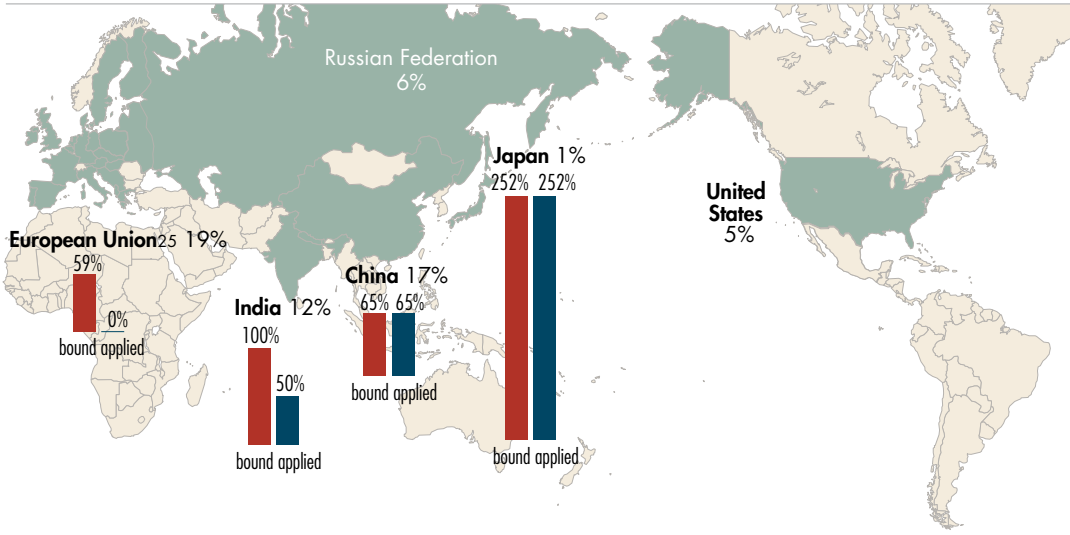
Important wheat markets

For wheat, just five countries/regions accounted for 59 per cent of total world wheat consumption in 2004 (figure F). Of the five, there is unlikely to be additional market access from the Russian Federation, the United States and China. The United States has bound tariffs below 5 per cent. China has a tariff quota with an in-quota tariff of 1 per cent and the quota is less than 20 per cent filled.

There is little market access potential to the European Union, regardless of a present applied tariff of 0 per cent. Imports of high quality EU wheat (more than 14 per cent protein content) are subject to complex trading arrangements that ensure that the tariff inclusive price of imports is at least equal to an administratively set price. Under this arrangement, imports of high grade wheat are unlikely to occur. All other wheat is subject to a 59 per cent tariff, which is currently not allowing trade to occur.

The potential for increased trade from tariff cuts in India is limited because of the gap between bound and applied tariffs. Indian bound tariffs on wheat are presently set at 100 per cent, but applied tariffs are only 50 per cent, meaning that the bound tariffs would need to be reduced by over 50 per cent before there was any effect on internal Indian wheat prices.

F Wheat – share of world consumption, and tariffs, 2004

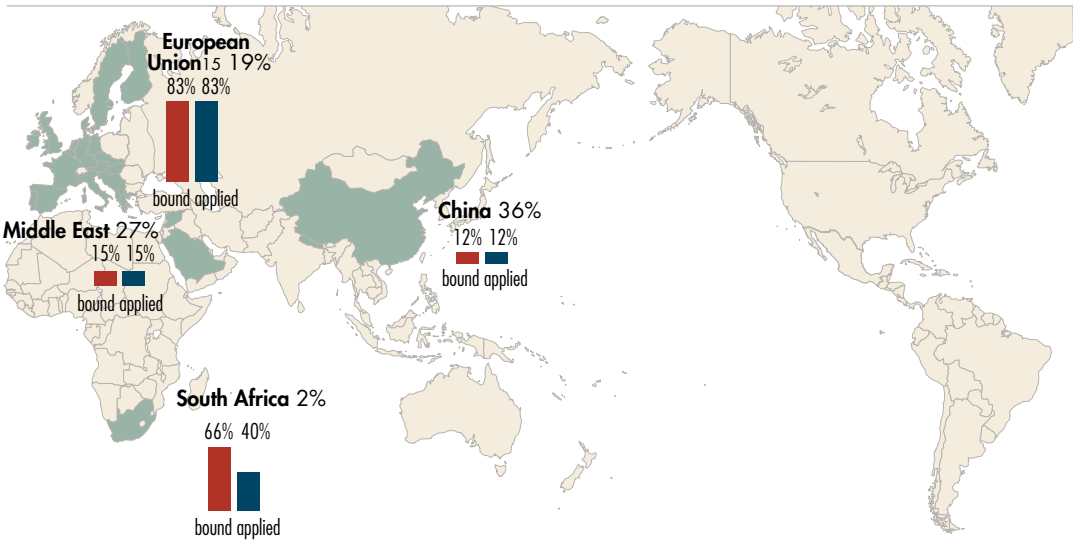


Japan is currently a significant importer, accounting for 5 per cent of world imports. Even though Japan has a 252 per cent tariff on wheat, 95 per cent of consumption is already being sourced from imports. The main scope for further trade will be from increased additional consumption. Again increased consumption in a high income country such as Japan will be driven largely by changing consumer tastes and possibly by falling internal prices as a result of tariff reductions.

Important sheep meat markets

For sheep meat, three countries or regions accounted for 82 per cent of world sheep meat consumption in 2000 (figure G). The tariffs for sheep meat are fairly small for most major sheep meat consuming countries/regions. China has a

G Sheep meat – share of world consumption, and tariffs, 2000



12 per cent bound and applied tariff and most Middle Eastern WTO members have tariffs in the range 5–15 per cent.

Middle East and EU sheep meat imports accounted for 53 per cent of world sheep meat imports in 2000. As such, even small increases in trade by these two regions can result in large changes on world markets. The European Union currently has a bound and applied tariff of 83 per cent and imports accounted for only 20 per cent of domestic consumption in 2000. Sizable tariff cuts may have a substantial impact on world trade.

South Africa is a smaller consuming region that provides potential for significant additional imports because of an applied tariff of 40 per cent. However, with a bound tariff of 66 per cent, a tariff reduction of at least a 40 per cent is needed before there is any impact on internal prices. Also, South Africa is able to implement a special safeguard, which can temporarily raise tariffs beyond the bound level. Since 1995, South Africa has not applied a special safeguard, but the ability to do so remains.

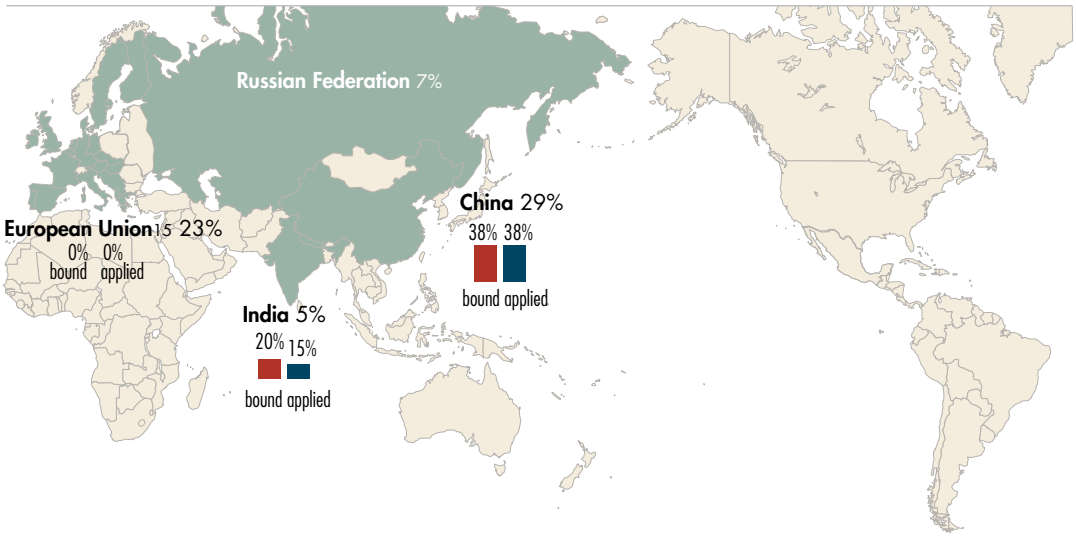
Important wool markets

China and the European Union together accounted for 52 per cent of world wool consumption (figure H) and 65 per cent of world wool imports in 2002. The next largest consuming countries, the Russian Federation and India, were responsible for 7 per cent and 5 per cent of world consumption respectively.

The tariff barriers facing efficient wool exporting countries like Australia and New Zealand are fairly low, with the European Union having a bound and applied tariff of 0 per cent. China has a bound and applied tariff of 38 per cent and is importing 52 per cent of domestic consumption. All of these imports are occurring under a tariff quota, with an in-quota rate of 1 per cent. The quota was 60 per cent filled in 2003. While the tariff being charged on imports is only 1 per cent, it is possible that the quota could be filled in the future and a tariff of 38 per cent would then be applied to out-of-quota imports.

India is importing 98 per cent of domestic consumption of wool and has a bound tariff of 20 per cent and an applied tariff of 15 per cent. This means that the main scope for additional trade is from increased consumption. For wool, increased consumption will be mainly for clothing and textile production. A tariff cut of greater than 25 per cent would be required for there to be any impact.

H Wool – share of world consumption, and tariffs, 2002



Issues hindering market access

Identifying markets that could provide significant benefits from tariff reductions is just one step in the market access negotiations for agriculture in the WTO. In addition, there are issues beyond market access that need to be addressed. Countries use various barriers or support mechanisms to protect their farm sectors from import competition. The 'three pillars' of farm support — market access, domestic support and export competition — have been used for many years in different combinations and to varying degrees by a range of developed and developing countries. Tariff reductions will therefore alone not assure increased market access.

The July 2004 'framework' adopted by WTO members has guided negotiations for establishing modalities in agriculture in the leadup to the Hong Kong Ministerial Conference in December 2005 (see box 2 for framework details). In market access, the framework seeks to implement a tiered structure to group bound tariffs for tariff cuts, with progressivity of tariff cuts being achieved by larger cuts to higher initial tariffs, both within a tier and between tiers. The concept of progressivity in tariff cuts provides greater potential economic benefits than, for example, constant percentage cuts across all tariffs.

The framework also includes a number of measures that will create additional complications in achieving market access improvements. While the framework requires that 'substantial improvements in market access will be achieved for all products', it permits members to 'designate an appropriate number of tariff lines to be treated as sensitive' (WTO 2004). Some difficulties arise in interpreting these elements of the framework and ministerial declarations. In particular, a range of positions are held by many member countries based on varying interpretations of the terms 'substantial' and 'appropriate'.

The 'sensitive' products provision will allow countries to specify a number of tariff lines as sensitive, allowing lower tariff reductions. These lower tariff cuts will be compensated for by tariff quota expansion on the sensitive products. By allowing countries to apply lower tariff cuts for some products, the scope for additional market access will be lessened. As such, the number of products that are permitted to be designated as sensitive and the size of tariff quota expansion required for sensitive products will be critical determinants of the overall market access outcome of the negotiations.

Another provision under the July 2004 framework that will have a potential impact on market access is the continuation of special and differ-

Box 2: WTO July 2004 framework on market access

The following summarises the framework principles guiding the negotiations (WTO 2004):

- each member other than least developed countries will make a contribution, with special and differential provisions for developing countries;
- substantial improvements in market access will be achieved for all products;
- substantial overall reductions will be achieved for tariffs, with the reductions being made from bound rates;
- progressivity in tariff reductions will be achieved through deeper cuts in higher tariffs, with flexibilities for sensitive products;
- tariff reductions will be made through a tiered formula, with the number of bands, the thresholds for defining the bands and the type of tariff reduction in each band remaining under negotiation;
- the role of a tariff cap in a tiered formula with distinct treatment for sensitive products will be further evaluated;
- members are to negotiate the appropriate number of sensitive products for which substantial improvement in market access will apply through combinations of expanded tariff quotas and tariff reductions less than those required under the tiered formula; and
- the size of the deviation from the tariff cut required under the tiered formula will determine the amount of tariff quota expansion for sensitive products.

ential treatment for developing countries. In previous multilateral trade negotiations, special and differential treatment for developing countries has included lesser tariff reduction commitments and tariff quota expansion than required by developed countries. During the current negotiations, developing countries are seeking to retain these provisions, but also to have increased flexibility.

Developing country members will also have the flexibility to designate an appropriate number of 'special products' based on the criteria of food security, livelihood security and rural development needs. Tariff cuts on these 'special' products will also be less than the cuts that developing countries will generally have to apply.

In addition to these elements of the framework agreement that will limit the size of tariff cuts actually applied to many products, some countries also have the ability to change the form of agricultural support in a way that will further limit the scope for market access. For example, the European Union is altering support arrangements for dairy products. This has involved reducing internally supported prices but providing direct payments to dairy farmers in compensation. Lowering the internal price, such as has occurred for skim milk powder, will mean that the applied tariff will need to be reduced by more before imports will occur, therefore also requiring greater bound tariff cuts to increase market access. While the lower internal prices will result in greater consumption, the direct payments will encourage the continued production of dairy products, limiting the benefit of the internal price change.

At present, most forms of direct domestic support payments are not currently limited under WTO rules. This represents a major impediment to achieving real reform of agricultural policies. There are substantial potential benefits that could flow from market access reform for agriculture, but these benefits are dependent on the support from market access barriers not being replaced by distorting domestic support arrangements, particularly in the United States and European Union (see Anderson and Martin 2005).

Conclusion

There is clear potential to improve economic welfare globally by reducing tariffs for agricultural products in key markets. With the recent expansion of membership, the current WTO negotiations provide an unparalleled opportunity to achieve tariff reductions globally. However, the market access negotiations are influenced by divergent views of member countries and the increasing number of tariff lines covered by the negotiations.

By using information on trade, shares of world consumption and tariffs, a number of key markets for important commodities have been identified in this article that could provide significant scope for additional imports, if substantial tariff cuts can be achieved. While this information will assist the negotiations, substantial other challenges remain.

Some of the challenges facing the negotiators include flexibility to apply lower tariff cuts and the ability to replace tariff based support with direct government payments in forms that are not currently limited. If substantial reform is to be achieved in the current Doha Round of trade negotiations, significant progress on these issues needs to occur before the Hong Kong Ministerial conference in December 2005.

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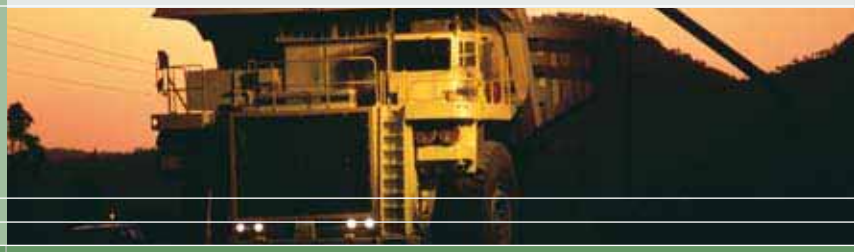
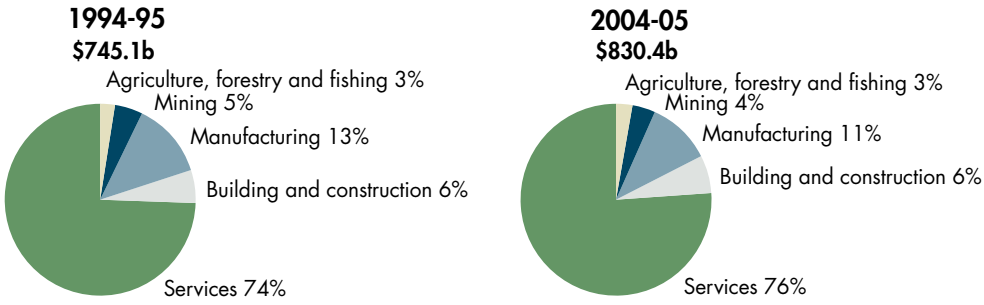
australian**commodities**



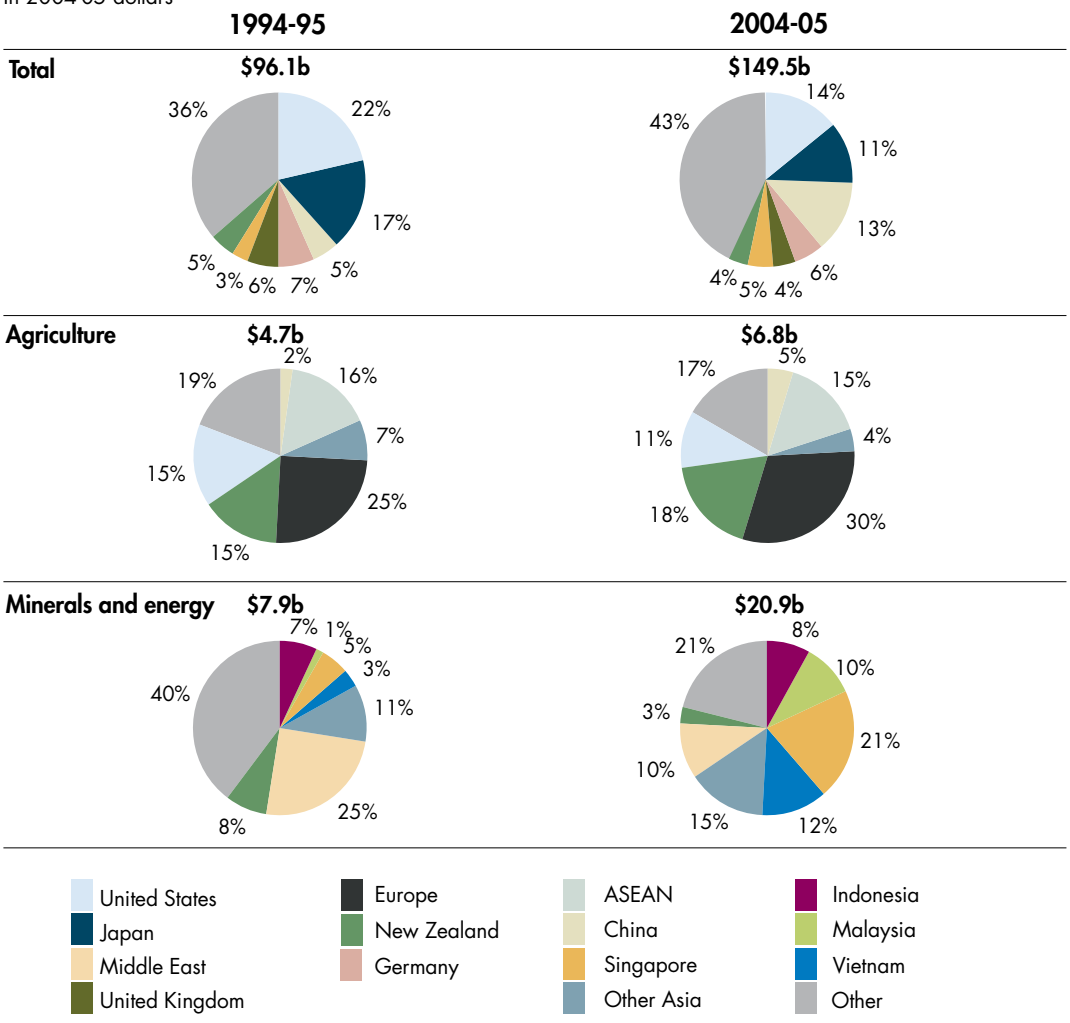
statistical tables

Contribution to GDP, Australia

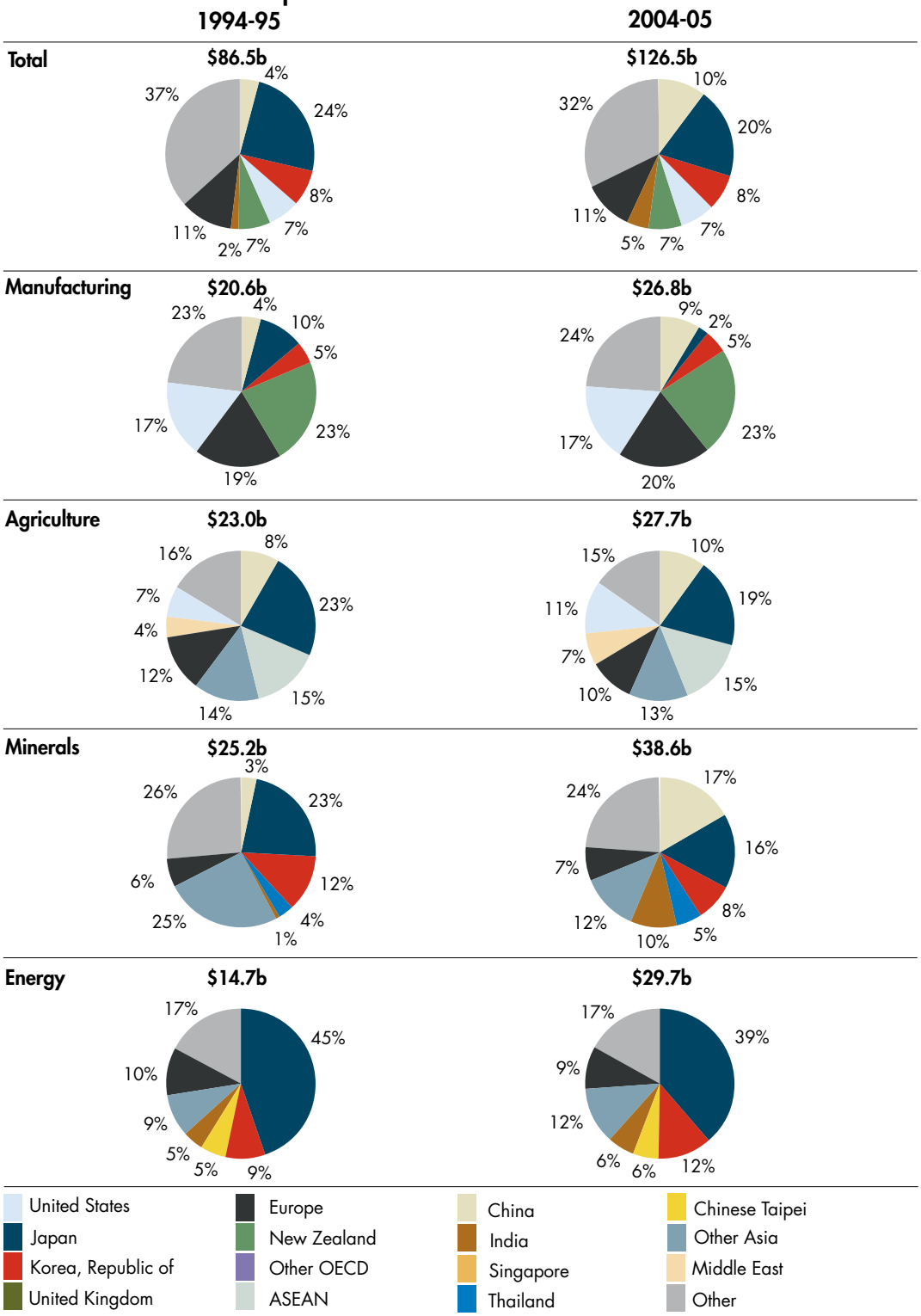


Share of Australian imports, by source

In 2004-05 dollars

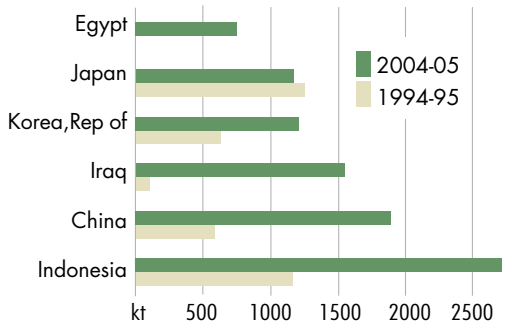


Markets for Australian exports In 2004-05 dollars

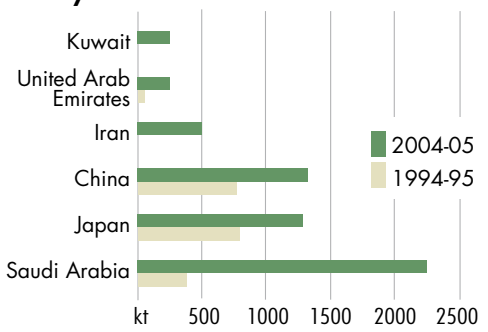


Principal markets for Australian agricultural exports

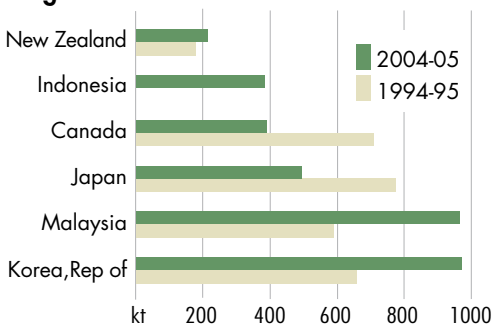
Wheat



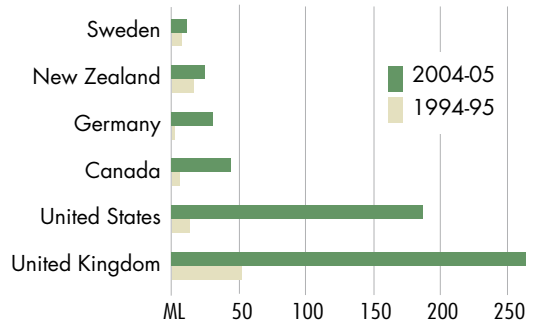
Barley



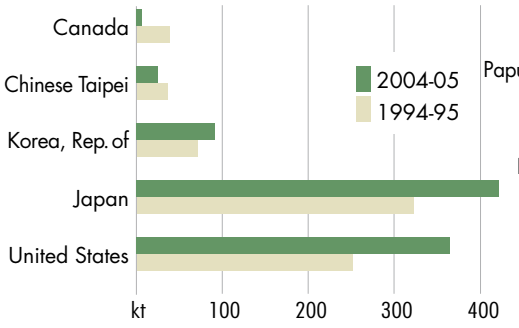
Sugar



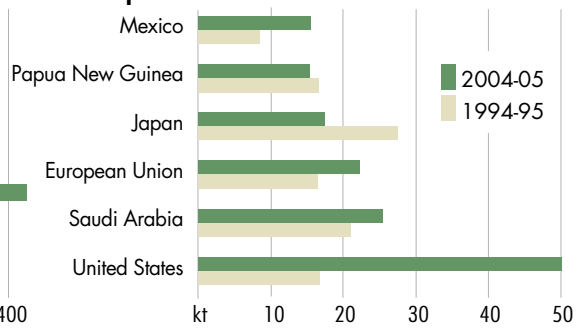
Wine



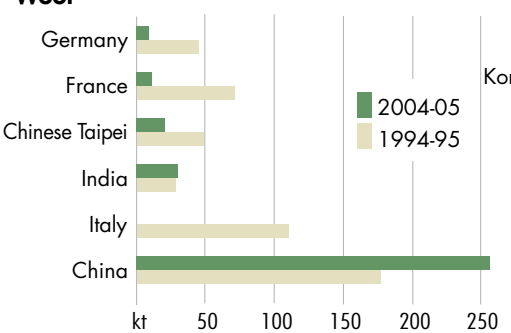
Beef and veal



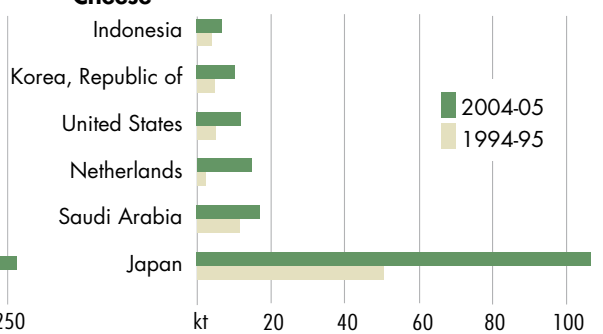
Sheep meat



Wool

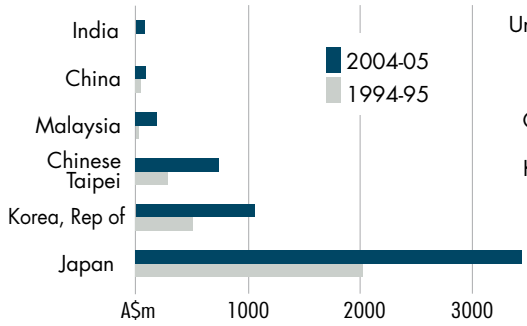


Cheese

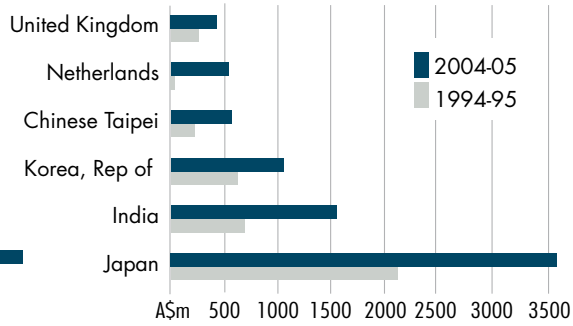


Principal markets for Australian mineral and energy exports

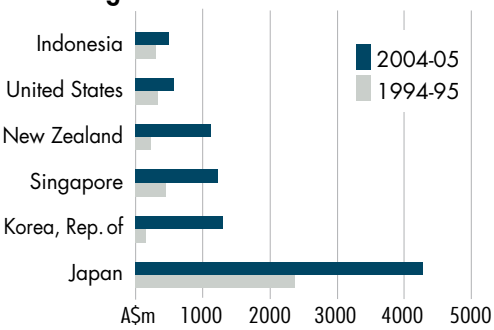
Thermal coal



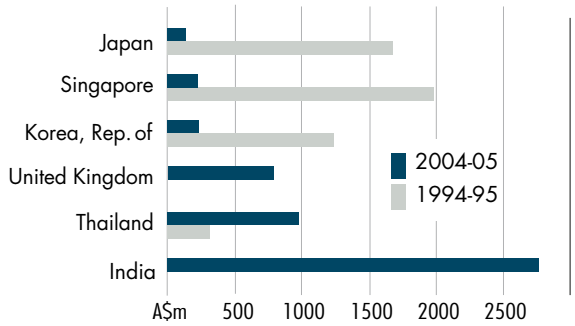
Metallurgical coal



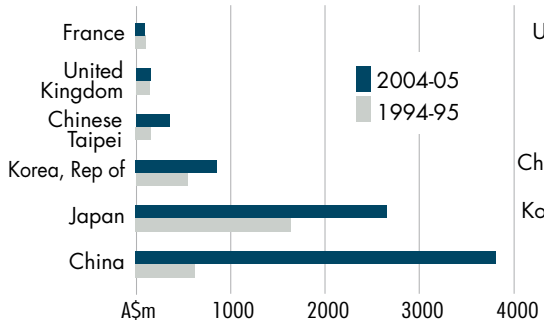
Oil and gas



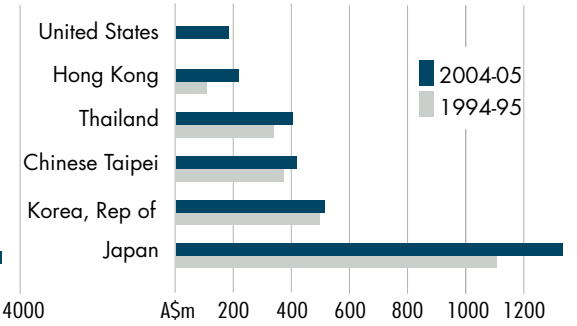
Gold



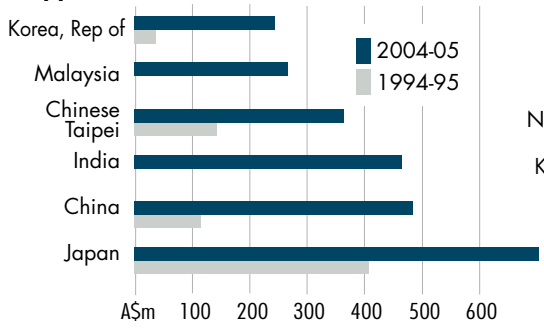
Iron ore



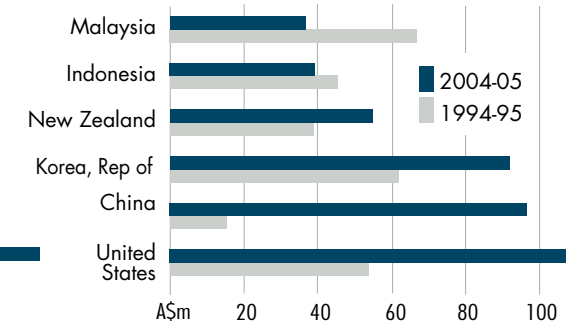
Aluminium



Copper



Iron and steel



1 Indexes of prices received by farmers

	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05 s	2005-06 f
Crops sector							
Grains							
Winter crops							
Barley	107.9	125.1	130.8	159.9	105.3	113.1	117.1
Canola	80.1	79.6	99.7	100.9	105.1	92.5	95.4
Lupins	74.3	104.9	127.7	149.0	115.0	93.8	117.9
Oats	77.5	96.5	128.2	160.3	106.3	146.5	156.1
Wheat	98.7	117.4	132.3	134.4	110.1	108.0	111.8
Summer crops							
Sorghum	72.6	85.1	102.2	120.9	98.1	106.0	112.2
Total grains **a**	94.5	108.7	123.7	134.0	105.6	106.8	110.4
Cotton	97.4	106.1	92.7	100.1	88.2	87.0	78.6
Sugar	72.2	70.4	88.5	83.2	75.8	74.9	79.4
Hay	100.0	110.7	104.2	155.0	125.0	128.0	125.4
Fruit	100.0	102.0	117.8	108.9	123.9	114.3	115.6
Vegetables	100.4	107.5	104.3	123.8	124.6	122.2	124.9
Total crops sector	94.9	104.7	113.6	118.7	106.4	104.0	105.5
Livestock sector							
Livestock for slaughter							
Cattle	119.3	144.2	167.7	145.0	160.2	174.2	165.6
Lambs **b**	94.8	104.1	167.2	176.7	189.4	174.9	178.1
Sheep	69.5	117.9	204.7	185.4	229.5	186.3	207.0
Live sheep for export	95.3	111.4	156.1	179.3	178.0	164.1	192.5
Pigs	110.2	113.7	123.6	109.7	109.3	120.3	113.9
Poultry	90.2	90.1	93.0	98.5	97.7	101.6	103.0
Total	108.4	126.0	151.5	139.1	149.0	156.3	152.6
Livestock products							
Wool	81.4	98.3	113.9	153.2	116.4	117.0	112.6
Milk	87.9	97.0	110.5	90.7	93.4	103.9	110.6
Eggs	84.0	79.1	82.8	92.4	89.2	85.4	82.5
Total	84.5	95.6	109.0	114.0	101.4	106.9	108.6
Store and breeding stock	105.0	126.0	145.3	139.1	149.1	156.3	152.6
Total livestock sector	97.9	113.0	133.4	128.1	129.1	135.7	134.1
Total prices received	96.3	108.5	122.5	122.6	116.6	118.1	118.2

a Total for the group includes commodities not separately listed. **b** Lamb saleyard indicator weight 18–20 kilograms. **s** ABARE estimate. **f** ABARE forecast.
Note: **1** ABARE revised the method for calculating these indexes in October 1999. The indexes for commodity groups are calculated on a chained weight basis using Fisher's ideal index with a reference year of 1997-98 = 100. Indexes for most individual commodities are based on annual gross unit value of production. **2** Prices used in these calculations exclude GST.
Source: ABARE.

2 Indexes of prices paid by farmers, and terms of trade

	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05 s	2005-06 f
Farmers' terms of trade a	93.3	98.6	108.6	101.2	94.8	92.5	89.1
Materials and services							
Seed, fodder and livestock							
Fodder and feedstuffs	90.0	93.6	105.5	167.5	148.3	151.0	158.2
Seed, seedlings and plants	102.7	105.2	112.9	118.3	104.9	99.6	112.5
Store and breeding stock	105.0	126.0	145.3	125.9	143.8	155.3	148.4
Total	94.7	102.7	116.1	149.8	141.4	145.7	149.5
Chemicals	101.6	103.3	105.6	108.0	110.0	111.9	114.2
Electricity	100.2	99.9	100.4	100.5	100.0	101.3	103.0
Fertiliser	99.8	106.4	104.3	104.5	103.6	106.2	108.8
Fuel and lubricants	112.0	137.6	122.9	121.7	138.6	168.4	202.1
Total	101.1	109.0	112.9	125.4	125.1	130.8	136.6
Labor	107.1	110.1	113.3	117.9	121.6	125.7	129.1
Marketing	105.0	109.3	112.4	115.9	118.7	121.5	124.8
Overheads							
Insurance	105.1	109.8	118.6	124.5	128.8	133.4	138.0
Interest paid	98.8	111.2	104.2	110.7	118.1	123.7	129.9
Rates and taxes	107.1	112.4	115.5	119.1	121.9	124.8	128.2
Other overheads	104.1	108.7	111.9	115.4	118.1	121.0	124.2
Total	102.5	111.3	109.9	115.2	120.6	125.1	130.1
Capital items	106.1	111.9	115.2	118.3	121.3	124.4	127.9
Total prices paid	103.2	110.0	112.8	121.2	123.0	127.7	132.6
Excluding capital items	102.7	109.6	112.3	121.4	123.1	128.0	133.0
Excluding capital and overheads	102.7	109.2	112.9	122.8	123.6	128.6	133.7
Excluding seed, fodder and store and breeding stock	104.7	111.3	112.0	115.3	119.2	123.9	129.1

a Ratio of index of prices received by farmers and index of prices paid by farmers. **s** ABARE estimate. **f** ABARE forecast.
Note: **1** ABARE revised the method for calculating these indexes in October 1999. The indexes for commodity groups are calculated on a chained weight basis using Fisher's ideal index with a reference year of 1997-98 = 100. **2** Prices used in these calculations exclude GST.
Sources: Australian Bureau of Statistics; ABARE.

3 Farm costs and returns

	Unit	2000-01	2001-02	2002-03	2003-04	2004-05 s	2005-06 f
Costs							
Materials and services							
Chemicals	$m	1 664	1 760	1 550	1 649	1 691	1 742
Fertiliser	$m	1 920	1 980	1 820	1 827	1 851	1 963
Fuel and lubricants	$m	1 671	1 580	1 520	1 626	1 765	2 118
Marketing	$m	3 198	3 395	2 435	3 507	3 286	3 193
Repairs and maintenance	$m	2 262	2 328	2 392	2 453	2 522	2 644
Seed and fodder	$m	3 072	3 226	4 874	4 317	4 365	4 606
Other	$m	3 184	3 339	3 329	3 378	3 473	3 719
Total	$m	16 971	17 608	17 919	18 757	18 953	19 986
Labor	$m	3 360	3 367	3 226	3 588	3 661	3 707
Overheads							
Interest paid	$m	2 249	2 087	2 295	2 448	2 579	2 716
Rent and third party insurance	$m	389	400	412	422	432	444
Total	$m	5 998	5 854	5 933	6 458	6 672	6 867
Total cash costs	$m	22 969	23 463	23 852	25 215	25 626	26 853
Depreciation **a**	$m	3 687	3 796	3 915	4 017	4 122	4 239
Total farm costs	$m	26 657	27 258	27 767	29 232	29 747	31 092
Returns							
Gross value of farm production	$m	34 432	39 485	32 498	36 861	36 339	35 499
Gross farm cash income **b**	$m	35 465	39 815	34 548	37 483	37 533	35 049
Net returns and production							
Net value of farm production **c**	$m	7 776	12 227	4 731	7 629	6 592	4 407
Real net value of farm production **d**	$m	8 645	13 216	4 960	7 815	6 592	4 289
Net farm cash income **e**	$m	12 496	16 353	10 696	12 268	11 908	8 195
Real net farm cash income **d**	$m	13 893	17 676	11 215	12 568	11 908	7 976
Gross value added **g**	$m	21 827	22 597	16 870	22 540	21 257	20 683

a Based on estimated movements in capital expenditure and prices of capital inputs. **b** Gross value of farm production less increase in farmers' assets held by marketing organisations. **c** Gross value of farm production less total farm costs. **d** In 2004-05 Australian dollars. **e** Gross farm cash income less total cash costs. **g** Chain volume measures at basic prices. Reference year is 2003-04. **s** ABARE estimate. **f** ABARE forecast.
Note: Prices used in these calculations exclude GST.
Sources: Australian Bureau of Statistics; ABARE.

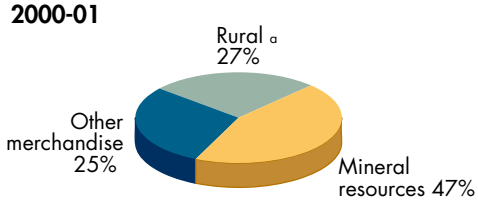
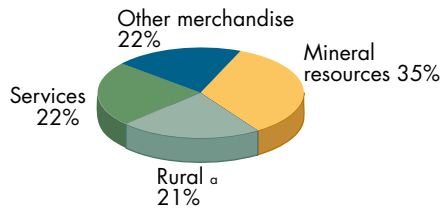
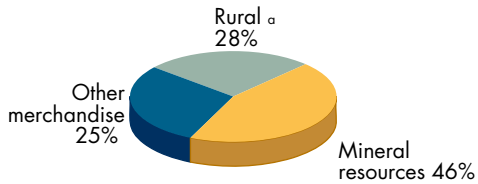
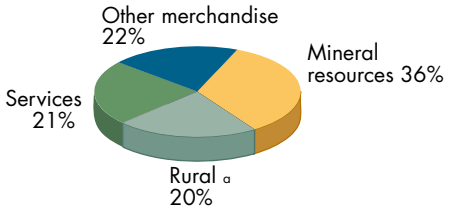
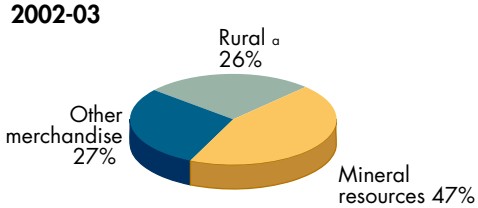
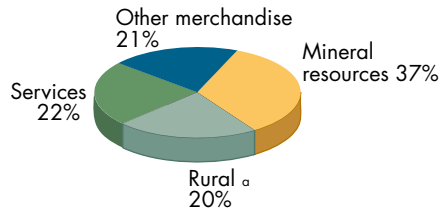
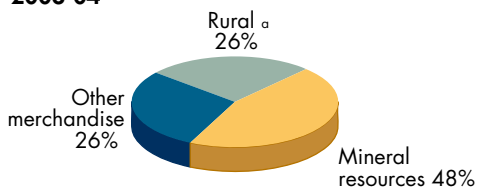
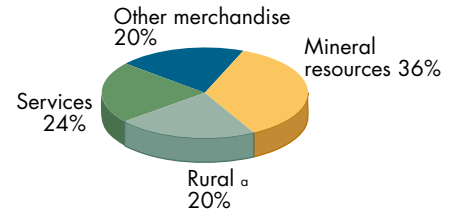
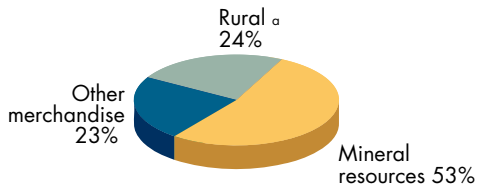
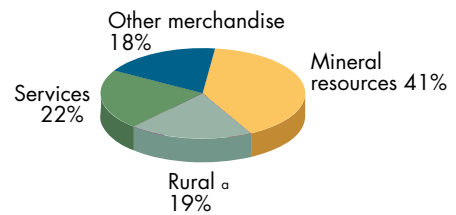
4 Australian unit export returns

Annual indexes a	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06 f
Farm	90.4	108.7	118.0	116.1	107.3	107.4	105.1
Energy minerals	110.4	141.0	140.8	135.2	120.2	166.0	219.0
Metals and other minerals	98.0	115.6	110.3	106.0	105.0	124.7	135.5
Total mineral resources	102.7	125.4	122.3	117.4	111.0	140.7	167.7
Total commodities	99.7	120.7	121.4	117.4	110.3	130.6	148.8

	2003-04	2004-05				2005-06			
Quarterly indexes b	June	Sep.	Dec.	Mar.	June	Sep. p	Dec. s	Mar. f	June f
Farm	109.2	109.3	105.1	108.2	107.1	111.8	105.6	104.3	98.8
Energy minerals	146.5	163.3	166.7	164.5	209.6	223.9	240.2	243.5	221.3
Metals and other minerals	126.6	131.5	128.0	130.7	150.1	147.9	148.6	149.9	140.4
Total mineral resources	134.6	144.2	143.3	144.3	173.5	177.9	184.6	186.7	172.2
Total commodities	124.8	131.5	129.4	130.8	149.9	154.8	157.2	158.2	147.0

a In Australian dollars. Base: 1989-90 = 100. **b** In Australian dollars. Base: 1994-95 = 100. **p** Preliminary. **s** ABARE estimate. **f** ABARE forecast.

5 Contribution to exports by sector Balance of payments basis

	Proportion of merchandise exports	Proportion of exports of goods and services
2000-01		
2001-02		
2002-03		
2003-04		
2004-05		

[a] Includes farm, forest and fisheries products. Source: Australian Bureau of Statistics; ABARE.

6 Annual exports summary Balance of payments basis

	2000-01 $m	2001-02 $m	2002-03 $m	2003-04 $m	2004-05 s $m	2005-06 f $m
At current prices						
Rural						
Cereal grains and products	5 937	6 481	4 487	5 094	5 157	4 846
Sugar and honey	1 330	1 610	1 363	1 123	1 645	1 451
Meat and meat preparations	5 796	6 246	5 655	5 758	6 944	6 305
Wool and sheepskins	3 897	3 687	3 545	2 778	2 838	2 633
Other rural **a**	15 677	16 340	14 901	14 188	14 141	15 085
Total	32 637	34 364	29 951	28 941	30 725	30 320
Mineral resources						
Coal, coke and briquettes	10 844	13 430	11 987	11 001	17 063	24 601
Other mineral fuels	13 464	10 940	11 049	8 766	11 121	15 313
Metalliferous ores and other minerals **bs**	15 839	15 286	15 312	15 419	20 380	27 283
Gold	5 229	5 300	5 718	5 839	5 755	6 014
Other metals **cs**	11 638	10 995	10 967	11 348	13 025	12 883
Total **s**	57 013	55 951	55 033	52 373	67 345	86 095
Total commodities sector s	89 650	90 314	84 984	81 314	98 070	116 414
Other merchandise **s**	30 566	30 636	30 816	28 190	29 251	na
Total merchandise s	120 216	120 950	115 800	109 504	127 321	na
Services	33 547	32 250	32 493	33 980	34 987	na
Total goods and services	153 763	153 200	148 293	143 484	162 308	na
Chain volume measures **d**						
Rural						
Cereal grains and products	5 426	5 520	3 754	5 094	5 502	4 831
Sugar and honey	933	1 058	1 123	1 123	1 176	1 118
Meat and meat preparations	6 200	5 942	6 010	5 758	6 409	6 235
Wool and sheepskins	3 918	3 416	2 735	2 778	3 161	3 171
Other rural **a**	14 427	16 471	14 153	14 188	12 441	12 940
Total	30 904	32 407	27 775	28 941	28 689	28 295
Mineral resources						
Coal, coke and briquettes	9 730	9 970	10 438	11 001	11 649	12 344
Other mineral fuels	11 005	10 818	10 129	8 765	8 917	10 019
Metalliferous ores and other minerals **bs**	13 481	13 983	14 881	15 418	16 783	20 648
Gold	5 645	5 248	5 485	5 838	5 621	6 136
Other metals **cs**	10 616	11 191	11 506	11 348	10 507	10 736
Total **s**	50 477	51 210	52 439	52 370	53 478	59 883
Total commodities sector s	81 381	83 617	80 214	81 311	82 167	88 179
Other merchandise **s**	26 756	24 822	27 927	28 193	30 955	na
Total merchandise s	108 137	108 439	108 141	109 504	113 122	na
Services	36 097	33 730	33 070	33 980	33 945	na
Total goods and services	143 880	142 136	141 242	143 485	147 066	na

a Includes other farm, forest and fisheries products. Includes exports of wine and of paper and paperboard, which are not included in this balance of payments item by the ABS. **b** Includes diamonds, which are not included in this balance of payments item by the ABS. **c** Includes ABARE estimates for steel and nickel which were confidentialised by the ABS. **d** For a description of chain volume measures, see ABS, *Introduction of chain volume measures,* in the Australian National Accounts, cat. no. 5248.0, Canberra. Reference year is 2003-04. **s** ABARE estimate. **f** ABARE forecast. **na** Not available.

Sources: ABS, *Balance of Payments, Australia,* cat. no. 5302.0, Canberra; ABARE.

7 Quarterly exports summary Balance of payments basis

	2003-04	2004-05				2005-06			
	June	Sep.	Dec.	Mar.	June	Sep. p	Dec. s	Mar. f	June f
	$m	$m	$m	$m	$m	$m	$m	$m	$m
At current prices									
Rural									
Cereal grains and products	1 754	1 614	1 245	1 319	979	1 224	1 086	1 231	1 306
Sugar and honey	268	396	368	453	428	587	444	216	204
Meat and meat preparations	1 710	1 703	1 826	1 520	1 895	1 974	1 650	1 379	1 302
Wool and sheepskins	795	696	777	616	749	596	761	637	640
Other rural **a**	3 909	3 872	3 501	3 091	3 678	4 004	3 777	3 442	3 862
Total	8 436	8 281	7 717	6 999	7 728	8 385	7 717	6 905	7 313
Mineral resources									
Coal, coke and briquettes	3 432	3 748	3 866	3 925	5 524	5 804	6 235	6 711	5 852
Other mineral fuels	1 967	2 733	2 745	2 707	2 936	3 202	3 896	4 082	4 133
Metalliferous ores and other minerals **bs**	4 345	4 536	4 893	4 644	6 308	6 624	6 744	7 237	6 679
Gold	1 404	1 393	1 532	1 381	1 449	1 441	1 490	1 517	1 566
Other metals **cs**	3 137	3 258	3 149	3 194	3 424	3 161	3 135	3 346	3 242
Total **s**	14 285	15 668	16 185	15 851	19 640	20 231	21 499	22 892	21 471
Total commodities sector s	22 721	23 949	23 902	22 849	27 369	28 617	29 216	29 797	28 785
Other merchandise **s**	7 411	7 160	7 811	6 418	7 863	na	na	na	na
Total merchandise	30 132	31 109	31 713	29 267	35 232	na	na	na	na
Services	7 733	8 563	8 472	10 126	7 826	na	na	na	na
Total goods and services	37 865	39 672	40 185	39 393	43 058	na	na	na	na
Chain volume measures **d**									
Rural									
Cereal grains and products	1 725	1 645	1 375	1 432	1 050	1 204	1 070	1 247	1 311
Sugar and honey	274	376	339	227	234	448	341	162	166
Meat and meat preparations	1 596	1 558	1 694	1 408	1 749	1 568	1 659	1 432	1 575
Wool and sheepskins	832	744	847	695	875	734	873	727	838
Other rural **a**	3 904	3 292	3 111	2 654	3 384	3 329	3 329	2 953	3 329
Total	8 331	7 615	7 366	6 416	7 292	7 284	7 272	6 520	7 219
Mineral resources									
Coal, coke and briquettes	2 908	2 828	2 895	2 902	3 024	3 057	2 998	3 124	3 164
Other mineral fuels	1 825	2 178	2 258	2 223	2 258	2 385	2 415	2 565	2 653
Metalliferous ores and other minerals **bs**	3 981	3 938	4 343	4 093	4 409	4 957	4 998	5 310	5 382
Gold	1 372	1 346	1 463	1 373	1 439	1 478	1 507	1 561	1 590
Other metals **cs**	2 682	2 586	2 589	2 633	2 699	2 661	2 652	2 752	2 672
Total **s**	12 767	12 876	13 548	13 225	13 828	14 540	14 571	15 312	15 461
Total commodities sector s	21 099	20 492	20 914	19 641	21 120	21 823	21 843	21 832	22 680
Other merchandise **s**	7 295	7 576	8 067	7 042	8 270	na	na	na	na
Total merchandise	28 394	28 068	28 981	26 683	29 390	na	na	na	na
Services	7 688	8 406	8 225	9 795	7 519	na	na	na	na
Total goods and services	36 125	36 473	37 207	36 478	36 908	na	na	na	na

a Includes other farm, forest and fisheries products. Includes exports of wine and of paper and paperboard, which are not included in this balance of payments item by the ABS. **b** Includes diamonds, which are not included in this balance of payments item by the ABS. **c** Includes ABARE estimates for steel and nickel which were confidentialised by the ABS. **d** For a description of chain volume measures, see ABS, *Introduction of chain volume measures,* in the Australian National Accounts, cat. no. 5248.0, Canberra. Reference year is 2003-04. **p** Preliminary. **s** ABARE estimate. **f** ABARE forecast. **na** Not available.
Sources: ABS, *Balance of Payments, Australia,* cat. no. 5302.0, Canberra; ABARE.

8 Industry gross value added [a]

	Unit	2000-01	2001-02	2002-03	2003-04	2004-05
Agriculture, forestry and fishing						
Agriculture	$m	21 827	22 597	16 870	22 540	21 257
Forestry and fishing	$m	1 716	1 711	1 714	1 834	1 911
Total	$m	23 571	24 341	18 549	24 373	23 168
Mining						
Mining (excludes services to mining)	$m	31 736	31 599	31 115	30 132	30 819
Services to mining	$m	2 985	3 019	3 237	3 047	3 222
Total	$m	34 745	34 635	34 345	33 178	34 044
Manufacturing						
Food, beverage and tobacco	$m	16 925	16 777	16 860	16 799	16 994
Textile, clothing, footwear and leather	$m	3 407	2 975	2 673	2 514	2 065
Wood and paper products	$m	5 334	5 641	5 760	5 771	5 814
Printing, publishing and recorded media	$m	9 816	9 965	9 893	10 100	9 889
Petroleum, coal, chemical, etc.	$m	14 953	15 415	16 739	16 289	16 247
Non–metallic mineral products	$m	3 838	4 130	4 435	4 587	4 826
Metal products	$m	10 678	11 326	11 393	11 603	11 368
Machinery and equipment	$m	15 637	15 968	16 851	17 373	17 462
Other manufacturing	$m	3 125	3 573	3 787	3 992	3 659
Total	$m	83 449	85 622	88 232	89 028	88 324
Building and construction	$m	37 172	41 585	48 306	51 494	53 711
Electricity, gas and water supply	$m	17 645	17 536	17 699	17 829	17 942
Taxes less subsidies on products	$m	61 878	66 055	69 577	71 594	73 765
Statistical discrepancy	$m	– 1	1	0	1	–2 286
Gross domestic product	$m	727 841	756 227	780 426	811 642	830 400

a Chain volume measures, reference year is 2003-04.
Source: ABS, *National Income, Expenditure and Product,* cat. no. 5206.0, Canberra.

9 Volume of Australian production indexes

	2000-01	2001-02	2002-03	2003-04	2004-05 s	2005-06 f
Farm						
Grains and oilseeds	118.0	130.1	59.3	138.8	103.6	103.2
Total crops	116.9	121.7	83.4	121.2	113.0	108.8
Livestock slaughterings	110.7	108.0	109.8	104.4	109.2	106.3
Total livestock	109.1	107.6	104.2	99.9	103.6	102.1
Total farm sector	113.4	115.2	93.6	111.1	109.0	106.1
Forestry a						
Broadleaved	117.5	107.8	119.6	112.2	116.4	112.3
Coniferous	115.3	127.0	136.2	133.5	126.2	121.6
Total forestry	116.5	118.0	128.5	123.5	121.8	117.5
Mine b						
Energy minerals	114.1	115.2	112.5	107.5	108.2	112.1
Metals and other minerals	112.8	111.7	115.8	115.7	124.8	133.3
Total minerals	113.6	113.7	114.1	111.5	116.5	122.6

a Volume of roundwood equivalent removed from forests. **b** Uranium is included with energy. **s** ABARE estimate. **f** ABARE forecast.
Note: ABARE revised the method for calculating production indexes in October 1999. The indexes for the different groups of commodities are calculated on a chained weight basis using Fishers' ideal index with a reference year of 1997-98 = 100.
Sources: Australian Bureau of Statistics; ABARE.

10 Employment a

	1999-00 '000	2000-01 '000	2001-02 '000	2002-03 '000	2003-04 '000	2004-05 p '000
Agriculture, forestry and fishing						
Agriculture	385	373	386	326	320	312
Forestry and logging	9	13	13	10	12	12
Commercial fishing	16	19	18	17	16	14
Total (including services)	440	435	444	379	375	365
Mining						
Coal	20	18	20	21	21	23
Oil and gas extraction	4	6	4	4	6	7
Metal ore	29	30	34	35	38	35
Other mining (including services)	25	24	23	26	27	29
Total	78	79	81	88	97	103
Manufacturing						
Food, beverages and tobacco	177	179	182	183	171	196
Textiles, clothing, footwear and leather	86	84	74	73	65	55
Wood and paper product	68	70	70	74	78	71
Printing, publishing and recorded media	114	118	105	115	110	109
Petroleum, coal and chemical product	110	107	107	112	100	91
Non–metallic mineral product	49	42	43	47	44	36
Metal product	178	175	155	164	157	139
Other manufacturing	318	319	324	323	309	294
Total	1 107	1 113	1 081	1 114	1 070	1 066
Other industries	7 225	7 414	7 542	7 803	7 987	8 207
Total	8 850	9 041	9 149	9 384	9 528	9 741

a Average employment over four quarters. **p** Preliminary.
Source: ABS, *The Labour Force, Australia,* cat. no. 6291.0, Canberra.

11 Business income

	1999-00	2000-01	2001-02	2002-03	2003-04
	$m	$m	$m	$m	$m
Farm					
Net value of farm production	5 245	7 776	12 227	4 731	7 629
Company profits in selected industries a					
Mining	10 451	14 801	14 895	15 092	12 133
Manufacturing					
Food, beverages and tobacco	2 716	3 146	4 820	4 074	na
Textiles, clothing and footwear	242	143	439	539	na
Wood and paper products	988	870	1 314	1 754	na
Printing, publishing and recorded media	1 628	1 292	2 006	2 556	na
Petroleum, coal and chemical product	2 254	1 536	1 878	2 861	na
Non–metallic mineral product	1 158	675	994	1 358	na
Metal product	1 043	2 139	4 169	4 869	na
Machinery and equipment	1 373	1 400	2 433	2 534	na
Other manufacturing	174	74	692	723	na
Total	11 576	11 275	18 744	21 268	20 797
Other industries (including services)	15 898	18 726	27 895	40 289	50 922
Total (including services)	37 925	44 802	61 534	76 649	83 852

a Company profits before income tax. **na** Not available.
Sources: ABS, *National Income and Expenditure and Product,* cat. no. 5206.0, Canberra; ABS, *Company Profits, Australia,* cat. no. 5651.0, Canberra; ABS, *Business Indicators,* cat. no. 5676.0, Canberra; ABS, *Australian Industry* , cat. no. 8155.0, Canberra; ABARE.

12 All banks lending to business a

	2002-03		2003-04				2004-05		
	Mar. $b	June $b	Sep. $b	Dec. $b	Mar $b	June $b	Sep. $b	Dec. $b	Mar $b
Agriculture, fishing and forestry	27.2	29.0	29.9	31.6	31.8	34.1	35.4	36.0	37.1
Mining	6.5	6.1	5.7	5.4	5.0	5.2	5.4	6.0	5.5
Manufacturing	29.1	29.2	29.9	31.0	31.4	31.8	31.6	31.4	31.9
Construction	13.4	14.4	14.9	16.0	16.4	17.7	17.6	18.2	19.4
Wholesale, retail trade, transport and storage	41.9	43.9	44.4	47.3	47.5	49.3	49.8	51.9	53.4
Finance and insurance	43.9	42.7	44.5	41.3	44.7	46.9	51.0	52.4	51.0
Other	131.9	133.2	138.1	147.1	149.6	153.9	157.9	161.9	164.9
Total	293.9	298.6	307.5	319.7	326.5	338.9	348.7	357.9	363.3

a Includes variable and fixed interest rate loans outstanding plus bank bills outstanding.
Source: Reserve Bank of Australia, *Bank Lending to Business - Selected Statistics* , Bulletin Statistical Table D8.

13 Farm indebtedness to financial institutions [a]

	1998-99 $m	1999-00 $m	2000-01 $m	2001-02 $m	2002-03 $m	2003-04 $m
All banks **a**	20 085	23 240	25 174	26 829	28 957	34 116
Other government agencies **b**	668	677	718	735	773	781
Pastoral and other finance companies	1 093	2 527	2 639	2 691	1 628	3 379
Other farm debt **cs**	1 852	1 901	1 920	1 967	2 017	2 067
Total rural debt	23 698	28 345	30 451	32 221	33 374	40 342

a Derived from all banks lending to agriculture, fishing and forestry. **b** Includes the government agency business of state banks and advances made under War Service Land Settlement. Prior to 1996 includes loans from the Queensland Industry Development Corporation. From 1996 these loans are included in bank lending. **c** Includes loans from life insurance companies, lease agreements and indebtedness to hire purchase companies, trade creditors, private lenders and small financial institutions. **s** ABARE estimate.
Sources: Reserve Bank of Australia, *Estimated Rural Debt to Specified Lenders,* Bulletin Statistical Table D9; ABARE.

14 Capital expenditure of private enterprises

	2000-01 $m	2001-02 $m	2002-03 $m	2003-04 $m	2004-05 $m
At current prices					
Gross fixed capital formation a					
All sectors	145 361	161 937	184 803	199 356	215 535
New capital expenditure					
Mining **b**	5 491	7 250	8 766	9 282	10 261
Manufacturing					
Food, beverages and tobacco	2 206	2 205	2 614	2 274	2 417
Textiles, clothing, footwear and leather	256	213	230	200	269
Wood and paper products	632	593	709	912	712
Printing, publishing and recorded media	735	687	553	538	555
Petroleum, coal and chemical product	1 466	1 284	1 608	2 090	2 388
Non–metallic mineral products	543	554	965	590	717
Metal products	1 254	1 541	2 158	2 689	3 386
Machinery and equipment	1 855	1 854	2 180	1 877	1 873
Other manufacturing	197	251	367	257	328
Total	9 144	9 181	11 385	11 423	12 643
Total surveyed industries	42 621	44 380	50 815	51 247	57 406
Chain volume measures **c**					
Gross fixed capital formation a					
All sectors	148 891	164 669	186 668	199 356	211 071
New capital expenditure					
Mining	5 612	7 261	8 728	9 282	9 874
Manufacturing	8 228	8 237	10 626	11 425	12 751
Other selected industries	24 247	24 751	28 357	30 540	35 496
Total surveyed industries	38 284	40 265	47 706	51 247	58 121

a Estimates taken from ABS national accounts, which include taxation based statistics. **b** Includes industries covered by Division B (for example, the metallic and nonmetallic minerals, coal, oil and gas, construction materials and other nonmetallic minerals industries) as defined in the 1993 edition of the Australian New Zealand Standard Industrial Classification (ANZSIC). **c** Reference year is 2003-04.
Sources: Australian Bureau of Statistics; ABARE.

15 Private mineral exploration expenditure

	1998-99 $m	1999-00 $m	2000-01 $m	2001-02 $m	2002-03 $m	2003-04 $m
At current prices						
Energy						
Petroleum						
Onshore	182.4	110.1	176.9	164.6	191.3	230.5
Offshore	685.4	613.2	866.9	718.1	803.8	713.6
Total	867.8	723.3	1043.8	882.7	995.1	944.1
Coal	39.9	35.3	41.2	50.4	77.8	81.5
Uranium	15.5	11.6	8.4	8.7	6.9	10.6
Total	923.2	770.2	1 093.4	941.8	1 079.8	1 036.2
Metals and other minerals **a**						
Gold	486.2	374.8	370.1	331.3	378.4	397.1
Iron ore	41.6	29.7	23.4	25.2	44.5	63.7
Base metals, silver and cobalt **b**	176.9	156.8	165.3	132.9	142.1	151.9
Mineral sands	19.0	21.5	23.6	33.2	27.3	23.8
Diamonds	41.0	29.8	31.8	35.4	29.9	25.9
Other	17.7	16.9	19.5	23.6	25.9	38.8
Total metals and other minerals **a**	782.4	629.5	633.7	581.6	648.1	701.2
Total expenditure	1 705.9	1 399.4	1 727.4	1 522.8	1 727.6	1 730.7

a Uranium is included with energy. **b** Base metals include copper, lead, nickel and zinc.
Sources: Australian Bureau of Statistics; ABARE.

16 Annual world indicator prices of selected commodities

	Unit	2000-01	2001-02	2002-03	2003-04	2004-05 s	2005-06 f
Crops							
Wheat **a**	US$/t	129	128	160	160	154	158
Corn **b**	US$/t	87	90	107	115	97	99
Rice **c**	US$/t	184	192	199	220	278	269
Soybeans **d**	US$/t	201	201	245	321	277	262
Cotton **e**	USc/lb	57.2	41.8	55.4	68.3	52.4	55.0
Sugar **g**	USc/lb	9.8	7.6	8.0	7.9	10.5	9.9
Livestock products							
Beef **h**	USc/kg	196	227	202	243	286	264
Wool **i**	Ac/kg	764	841	1 049	820	746	718
Butter **j**	US$/t	1 293	1 152	1 186	1 621	2 209	2 218
Cheese **j**	US$/t	2 070	2 000	1 775	2 358	2 803	2 840
Skim milk powder **j**	US$/t	2 167	1 619	1 587	1 862	2 211	2 219
Energy							
Crude oil							
Dubai	US$/bbl	25.76	21.83	25.90	29.06	40.72	51.53
West Texas intermediate	US$/bbl	29.45	23.85	29.92	33.76	48.77	62.32
Brent	US$/bbl	27.78	22.79	27.82	31.24	46.23	58.06
World trade weighted average **k**	US$/bbl	26.82	21.59	26.26	29.33	41.18	51.93
Coal **l**							
Thermal	US$/t	25.73	30.14	25.86	29.45	47.14	47.76
Metallurgical	US$/t	36.96	40.75	41.85	43.13	66.84	105.78
Uranium (U_3O_8) **m**	US$/lb	7.88	9.59	10.22	14.90	22.20	29.53
Minerals and metals **n**							
Aluminium	US$/t	1 538	1 360	1 361	1 568	1 807	1 820
Copper	US$/t	1 787	1 508	1 595	2 333	3 150	3 267
Gold **o**	US$/oz	269	288	334	389	422	425
Iron ore (negotiated) **q**	USc/dltu	27.79	28.98	28.28	30.83	36.57	62.72
Lead	US$/t	476	474	445	700	964	848
Manganese (negotiated) **r**	US$/mtu	2.03	2.11	1.97	2.12	2.45	3.98
Nickel	US$/t	7 240	5 919	7 673	12 264	14 971	14 318
Silver **t**	USc/oz	467	442	461	579	695	674
Tin	US$/t	5 406	4 128	4 371	6 617	8 491	7 075
Zinc	US$/t	1 050	791	775	962	1 171	1 306

a US hard red winter wheat, fob Gulf. **b** US no. 2 yellow corn, delivered US Gulf. **c** Prices previously reported by the Thailand Board of Trade are no longer available. From September 1998 the price quoted is the USDA sourced nominal quote for Thai white rice, 100 per cent, Grade B, fob, Bangkok (August–July basis). **d** US cif Rotterdam (October–September basis). **e** Cotlook 'A' index. **g** Average of monthly averages of New York no.11 spot price; basis: fob Caribbean ports (October-September basis). **h** US cif price. **i** Australian Wool Exchange eastern market indicator. **j** Average of traded prices (excluding subsidised sales). **k** World trade weighted average price compiled by the US Department of Energy. Official sales prices or estimated contract terms for major internationally traded crude oils. **l** Average export unit value, fob Australia. **m** Average of weekly restricted spot prices over the period, published by Ux Consulting. **n** Average LME spot price unless otherwise stated. **o** London gold fix, London Bullion Market Association. **q** Australian hematite fines to Japan (fob) for Japanese fiscal year commencing 1 April. **r** Japanese fiscal year commencing 1 April. **t** London silver fix, London Bullion Market Association. Prior to March 2001, Handy and Harman, commercial bar price used. **s** ABARE estimate. **f** ABARE forecast. **na** Not available.

Sources: Australian Bureau of Statistics; Australian Dairy Corporation; Meat and Livestock Australia; Australian Wool Exchange; Cotlook Ltd; Food and Agriculture Organisation; General Agreement on Tariffs and Trade; International Energy Agency; International Wheat Council; ISTA Mielke and Co.; London Bullion Market Association; The London Metal Exchange Ltd; New York Board of Trade; Reuters Ltd; Ux Consulting Company; Platts Oilgram; US Department of Agriculture; US Department of Energy; World Bureau of Metal Statistics; ABARE.

17 Quarterly world indicator prices of selected commodities

		2003-04	2004-05				2005-06		
	Unit	June	Sep	Dec	Mar	June s	Sep f	Dec f	Mar f	June f
Crops										
Wheat **a**	US$/t	165	151	159	156	149	156	156	158	164
Corn **b**	US$/t	128	102	94	97	97	99	95	99	101
Rice **c**	US$/t	240	240	265	295	298	286	269	263	277
Soybeans **d**	US$/t	314	268	258	271	291	287	257	269	260
Cotton **e**	USc/lb	68.0	54.2	48.7	52.3	54.4	53.6	54.5	54.9	57.0
Sugar **g**	USc/lb	8.2	9.1	9.9	10.5	10.3	11.4	10.0	10.3	10.0
Livestock products										
Beef **h**	USc/kg	266	298	283	279	285	286	265	255	248
Wool **i**	Ac/kg	793	788	739	733	723	705	715	720	732
Butter **j**	US$/t	1 842	2 017	2 267	2 333	2 217	2 225	2 230	2 225	2 190
Cheese **j**	US$/t	2 700	2 553	2 842	2 900	2 917	2 900	2 850	2 820	2 790
Skim milk powder **j**	US$/t	2 050	2 167	2 250	2 225	2 200	2 210	2 225	2 230	2 210
Energy										
Crude oil										
Dubai	US$/bbl	32.33	36.53	36.38	41.84	48.15	53.29	52.71	51.35	48.75
West Texas intermediate	US$/bbl	38.35	43.91	48.30	49.71	53.16	64.66	64.11	61.87	58.64
Brent	US$/bbl	34.71	41.61	44.14	47.60	51.58	60.50	59.80	57.51	54.42
World trade weighted average **k**	US$/bbl	32.78	36.50	38.74	42.34	47.13	53.88	53.43	51.56	48.87
Coal **l**										
Thermal	US$/t	40.74	47.25	45.15	45.75	50.40	48.25	49.35	49.35	44.10
Metallurgical	US$/t	51.44	51.74	52.35	51.80	111.47	110.76	110.40	110.23	91.71
Uranium (U_3O_8) **m**	US$/lb	17.98	19.25	20.48	21.75	27.33	29.62	29.50	29.50	29.50
Minerals and metals **n**										
Aluminium	US$/t	1 678	1 709	1 828	1 901	1 790	1 820	1 840	1 820	1 800
Copper	US$/t	2 790	2 850	3 094	3 268	3 388	3 719	3 367	3 100	2 883
Gold **o**	US$/oz	394	401	434	427	427	435	430	420	415
Lead	US$/t	786	914	954	947	981	867	877	847	803
Nickel	US$/t	12 555	14 002	14 094	15 367	16 421	14 405	14 005	14 655	14 205
Silver **q**	USc/oz	625	645	723	697	715	702	670	693	707
Tin	US$/t	9 134	9 028	8 890	8 085	7 963	7 202	7 100	7 000	7 000
Zinc	US$/t	1 046	980	1 113	1 317	1 273	1 266	1 322	1 313	1 323

a US hard red winter wheat, fob Gulf. **b** US no. 2 yellow corn, delivered US Gulf. **c** Prices previously reported by the Thailand Board of Trade are no longer available. From September 1998 the price quoted is the USDA sourced nominal quote for Thai white rice, 100 per cent, Grade B, fob, Bangkok. **d** US cif Rotterdam. **e** Cotlook 'A' index. **g** Average of monthly averages of New York no.11 spot price; basis: fob Caribbean ports. **h** US cif price. **i** Australian Wool Exchange eastern market indicator. **j** Average of traded prices (excluding subsidised sales). **k** World trade weighted average price compiled by the US Department of Energy. **l** Average export unit value, fob Australia. **m** Average of weekly restricted spot prices over the period, published by Ux Consulting. **n** Average LME spot price unless otherwise stated. **o** London gold fix, London Bullion Market Association. **q** London silver fix, London Bullion Market Association. Prior to March 2001, Handy and Harman, commercial bar price used. **s** ABARE estimate. **f** ABARE forecast.

Sources: Australian Bureau of Statistics; Australian Dairy Corporation; Meat and Livestock Australia; Australian Wool Exchange; Cotlook Ltd; Food and Agriculture Organisation; General Agreement on Tariffs and Trade; International Energy Agency; International Wheat Council; ISTA Mielke and Co.; Reuters Ltd; London Bullion Market Association; The London Metal Exchange Ltd; New York Board of Trade; Ux Consulting Co.; Platts Oilgram; US Department of Agriculture; US Department of Energy; World Bureau of Metal Statistics; ABARE.

18 Australian gross unit values or prices of farm products [a]

	Unit	2000-01	2001-02	2002-03	2003-04	2004-05 s	2005-06 f
Crops **b**							
Grains and oilseeds							
Winter crops							
Barley	$/t	199	208	255	168	180	186
Canola	$/t	307	384	389	405	357	368
Field peas	$/t	219	288	344	243	242	225
Lupins	$/t	205	250	292	225	184	231
Oats	$/t	132	175	219	145	200	213
Triticale	$/t	150	195	258	143	203	211
Wheat	$/t	232	262	266	218	214	221
Summer crops							
Maize	$/t	188	198	233	196	256	246
Rice	$/t	213	274	348	293	403	337
Sorghum	$/t	144	173	205	166	179	190
Soybeans **c**	$/t	377	353	384	365	350	351
Sunflowerseed **c**	$/t	360	390	400	349	331	315
Industrial crops							
Cotton lint **d**	c/kg	256	194	222	225	167	177
Sugar cane (cut for crushing)	$/t	21	31	28	23	23	24
Wine grapes	$/t	919	844	817	766	697	668
Livestock for slaughter							
Beef **e**	c/kg	266	306	256	290	320	307
– yearling **e**	c/kg	289	335	289	327	359	348
– ox **e**	c/kg	273	314	284	307	331	318
– cow **e**	c/kg	249	285	227	262	289	271
Lamb **eg**	c/kg	196	300	338	372	344	350
Mutton **e**	c/kg	101	180	167	199	162	180
Pig **e**	c/kg	258	281	244	235	258	243
Poultry **h**	c/kg	354	380	385	394	399	405
Livestock products							
Wool **i**	c/kg	764	841	1 049	820	746	718
Milk **j**	c/L	29.0	33.0	27.1	27.9	31.0	33.0

a Average gross unit value across all grades in principal markets, unless otherwise indicated. Includes the cost of containers, commission and other expenses incurred in getting the commodities to their principal markets. These expenses are significant. **b** Average unit gross value relates to returns received from crops harvested in that year, regardless of when sales take place, unless otherwise indicated. **c** Price paid by crusher. **d** Australian base price for sales in the financial year indicated. **e** Average saleyard price (dressed weight). **g** Lamb saleyard weight indicator 18–20 kg. **h** Retail, frozen. **i** Australian Wool Exchange eastern market indicator. **j** Weighted average farmgate price. **s** ABARE estimate. **f** ABARE forecast.
Note: Prices used in these calculation exclude GST.
Sources: Australian Bureau of Statistics; ABARE.

19 World production, consumption, stocks and trade for selected commodities [a]

	Unit	2000-01	2001-02	2002-03	2003-04	2004-05 s	2005-06 f
Farm							
Grains							
Wheat							
Production	Mt	582	582	567	555	623	608
Consumption	Mt	584	586	600	593	613	613
Closing stocks	Mt	202	197	164	127	137	132
Exports **b**	Mt	102	107	105	102	108	107
Coarse grains							
Production	Mt	882	892	873	914	1 010	931
Consumption	Mt	873	905	902	946	973	960
Closing stocks	Mt	142	196	167	136	173	144
Exports **b**	Mt	104	103	104	103	101	98
Rice							
Production **c**	Mt	398	399	378	391	401	405
Consumption **c**	Mt	394	409	405	415	413	414
Closing stocks **c**	Mt	151	139	110	87	75	66
Exports **bd**	Mt	24	27	29	27	26	25
Oilseeds and vegetable oils							
Oilseeds							
Production	Mt	314	325	329	334	379	377
Consumption	Mt	312	324	323	336	365	374
Closing stocks	Mt	19	20	26	24	38	41
Exports	Mt	67	63	70	67	73	78
Vegetable oils							
Production	Mt	90	93	95	101	108	111
Consumption	Mt	89	92	95	99	106	111
Closing stocks	Mt	9	8	7	7	7	7
Exports	Mt	31	33	36	38	40	43
Vegetable protein meals							
Production	Mt	175	183	185	190	202	209
Consumption	Mt	177	183	185	189	201	209
Closing stocks	Mt	5	6	5	5	5	5
Exports	Mt	49	53	54	58	58	60
Industrial crops							
Cotton							
Production	Mt	19	22	19	21	26	24
Consumption	Mt	20	21	21	21	24	24
Closing stocks	Mt	10	11	8	8	10	10
Exports	Mt	6	6	7	7	8	8
Sugar							
Production	Mt	131	137	148	142	145	151
Consumption	Mt	131	136	141	144	147	151
Closing stocks	Mt	61	60	66	64	62	62
Exports	Mt	39	43	42	42	43	43

Continued

19 World production, consumption, stocks and trade for selected commodities a *continued*

	Unit	2000-01	2001-02	2002-03	2003-04	2004-05 s	2005-06 f
Livestock products							
Meat **deg**							
Production	Mt	198	205	205	209	212	na
Consumption	Mt	195	201	202	205	210	na
Closing stocks	Mt	5.4	9.2	12.7	16.4	13.7	na
Exports **b**	Mt	16.6	18.0	18.6	18.0	18.8	na
Wool **h**							
Production	kt	1 361	1 308	1 274	1 231	1 237	1 224
Consumption **di**	kt	1 383	1 311	1 256	1 214	1 237	1 235
Closing stocks **j**	kt	109	106	124	164	163	152
Exports **k**	kt	914	770	567	533	578	560
Butter **dg**							
Production	kt	5 662	5 747	5 759	5 812	5 733	5 200
Consumption	kt	5 402	5 429	5 511	5 651	5 262	5 450
Closing stocks	kt	460	731	733	784	485	235
Exports	kt	630	613	611	635	660	550
Skim milk powder **gl**							
Production **d**	kt	3 294	3 565	3 540	3 020	2 971	2 500
Consumption **d**	kt	2 916	3 027	3 030	3 234	2 556	2 700
Closing stocks **d**	kt	777	1 129	1 044	949	775	575
Exports	kt	981	966	954	1 029	1 110	970
Energy **d**							
Crude oil							
Production							
World **m**	mbd	76.7	76.6	79.6	83.0	84.5	86.1
OPEC **n**	mbd	30.1	28.6	30.7	33.0	33.5	34.3
Consumption **m**	mbd	76.8	77.9	79.8	82.4	84.1	85.8
Closing stocks							
OECD **o**	days	54.0	50.0	50.0	51.0	na	na
Coal **d**							
Production							
Hard coal **q**	Mt	3 794	3 910	4 038	4 102	4 168	4 234
Brown coal	Mt	885	882	886	893	901	908
Exports							
Metallurgical coal	Mt	196	192	199	208	215	225
Thermal coal	Mt	465	477	520	534	544	555
Uranium (U_3O_8) **d**							
Production **rs**	kt	43.5	36.5	41.7	46.4	48.8	49.8
Consumption	kt	75.0	77.5	77.8	78.5	80.7	81.8
Metals **d**							
Bauxite production	kt	137 647	150 463	159 332	171 443	182 073	190 266
Alumina production	kt	53 757	56 123	59 178	63 948	67 913	70 500
Aluminium							
Production	kt	24 541	26 145	28 000	29 821	31 300	32 300
Consumption	kt	23 546	24 925	27 425	29 248	31 000	32 150
Closing stocks **t**	kt	2 561	2 901	3 144	2 871	2 911	3 161
Exports	kt	15 160	15 872	15 407	16 023	16 617	16 980

Continued

19 World production, consumption, stocks and trade for selected commodities a *continued*

	Unit	2000-01	2001-02	2002-03	2003-04	2004-05 s	2005-06 f
Iron and steel d							
Production							
Iron ore	Mt	1 041	1 103	1 216	1 363	1 450	1 512
Pig iron	Mt	549	583	636	688	745	789
Crude steel	Mt	850	904	968	1 057	1 092	1 145
Seaborne iron ore trade	Mt	454	484	529	567	628	669
Gold d							
Mine production	t	2 621	2 590	2 593	2 464	2 504	2 560
Supply	t	3 920	3 972	4 149	3 852	3 854	3 890
Fabrication consumption u	t	3 522	3 172	2 994	3 164	3 233	3 259
Base metals d							
Copper							
Production v	kt	15 686	15 381	15 252	15 777	16 810	17 630
Consumption	kt	14 698	15 065	15 405	16 388	16 840	17 350
Closing stocks w	kt	1 636	1 711	1 414	759	729	1 009
Lead							
Production v	kt	6 579	6 663	6 759	6 821	7 320	7 690
Consumption	kt	6 499	6 655	6 813	7 081	7 340	7 645
Closing stocks w	kt	436	483	388	276	140	160
Nickel							
Production v	kt	1 160	1 183	1 201	1 246	1 290	1 347
Consumption	kt	1 104	1 177	1 233	1 249	1 296	1 341
Closing stocks w	kt	100	97	98	98	91	96
Tin							
Production v	kt	270	269	278	345	375	390
Consumption	kt	281	277	303	338	345	355
Closing stocks w	kt	52	49	38	31	37	43
Zinc							
Production v	kt	9 227	9 712	9 870	10 167	10 570	10 860
Consumption	kt	8 926	9 397	9 828	10 465	10 680	10 880
Closing stocks w	kt	946	1 095	1 181	1 017	865	840
Mineral sands d							
Production							
Ilmenite x	kt	9 623	9 739	9 546	9 440	9 858	10 911
Titaniferous slag	kt	2 225	2 049	1 987	2 130	2 160	2 140
Rutile concentrate	kt	418	435	365	372	442	591
Zircon concentrate	kt	1 090	1 128	1 136	1 100	1 220	1 403

a Some figures are not based on precise or complete analyses. **b** Includes intra–EU trade. **c** Milled equivalent. **d** On a calendar year basis, e.g. 1991-92 = 1992. **e** Beef and veal, mutton, lamb, goat, pig and poultry meat. **g** Selected countries. **h** Clean equivalent. **i** Virgin wool at the spinning stage in 65 countries. **j** Held by marketing bodies and on-farm in five major exporting countries. **k** Five major exporting countries. **l** Nonfat dry milk. **m** Includes crude oil, marine bunkers, refinery fuel, nonconventional oil and natural gas liquids. 1 million litres a year equals about 17.2 barrels a day. **n** Includes OPEC natural gas liquids. **o** Industry stocks in OECD countries at the start of the quarter. **q** Includes anthracite and bituminous coal, and for the United States, Australia and New Zealand, sub-bituminous coal. **r** World production data has been revised to exclude reprocessed uranium. **t** LME and producer stocks. **u** Includes jewellery consumption. **v** Primary refined metal. **w** Commercial stocks excluding former and current centrally planned economies. **x** Excludes some small producers and large tonnages produced from ilmenite–magnetite ore in the Commonwealth of Independent States. **s** ABARE estimate. **f** ABARE forecast. **na** Not available.

Sources: Australian Bureau of Statistics; Meat and Livestock Australia; Commodities Research Unit; Commonwealth Secretariat; Consolidated Gold Fields; Department of Agriculture, Fisheries and Forestry Australia; Economic Commission for Europe; Fearnleys; Food and Agriculture Organisation; Gold Fields Mineral Services; International Atomic Energy Agency; International Energy Agency; International Iron and Steel Institute; International Lead–Zinc Study Group; International Nickel Study Group; International Sugar Organization; International Wheat Council; ISTA Mielke and Co.; Metallgesellschaft A.G.; Ministry of Agriculture, Forestry and Fisheries (Japan); New Zealand Dairy Board; New Zealand Wool Board; UNCTAD Trust Fund on Iron Ore; United Nations; Uruguayan Association of Wool Exporters; US Department of Agriculture; World Bureau of Metal Statistics; ABARE.

20 Australian commodity production

	Unit	2000-01	2001-02	2002-03	2003-04	2004-05 s	2005-06 f
Crops							
Grains and oilseeds							
Winter crops							
Barley	kt	6 743	8 280	3 865	10 382	6 454	6 640
Canola	kt	1 775	1 756	871	1 703	1 533	1 125
Chickpeas	kt	162	258	136	178	116	97
Field peas	kt	456	512	178	487	321	364
Lupins	kt	1 055	1 215	726	1 180	891	912
Oats	kt	1 050	1 434	957	2 018	1 057	1 124
Triticale	kt	841	860	327	826	615	624
Wheat	kt	22 108	24 299	10 132	26 132	20 376	19 703
Summer crops							
Cottonseed **s**	kt	1 140	1 054	546	494	912	690
Maize	kt	345	454	310	395	312	392
Rice	kt	1 643	1 192	438	553	305	650
Sorghum	kt	1 935	2 021	1 465	2 009	1 748	1 980
Soybeans	kt	49	63	18	74	56	69
Sunflowerseed	kt	77	70	25	58	62	95
Other oilseeds **a**	kt	53	48	72	81	81	81
Total grains and oilseeds	kt	39 433	43 515	20 065	46 569	34 839	34 545
Industrial crops							
Cotton lint	kt	819	703	387	349	645	488
Sugar cane (cut for crushing)	kt	31 228	31 424	36 995	36 993	37 485	37 500
Sugar (tonnes actual)	kt	4 162	4 987	5 461	4 994	5 196	5 021
Wine grapes	kt	1 422	1 606	1 411	1 895	1 936	1 879
Livestock slaughterings							
Number slaughtered							
Cattle and calves	’000	8 930	8 587	9 228	8 779	8 853	8 804
Cattle exported live **b**	’000	846	797	968	578	550	570
Sheep	’000	16 628	14 441	13 657	10 421	11 443	11 216
Lambs	’000	18 629	17 400	16 870	16 562	17 331	16 395
Sheep exported live **b**	’000	5 936	6 443	5 843	3 843	3 233	3 686
Pigs	’000	5 016	5 402	5 742	5 591	5 339	5 216
Meat produced							
Beef and veal **c**	kt	2 119	2 028	2 073	2 033	2 162	2 095
Lamb **c**	kt	367	348	329	341	354	339
Mutton **c**	kt	348	296	268	220	237	235
Pig meat	kt	365	396	420	406	388	375
Poultry meat **c**	kt	657	705	726	732	792	830
Total	kt	3 856	3 773	3 816	3 732	3 933	3 875

Continued

20 Australian commodity production *continued*

	Unit	2000-01	2001-02	2002-03	2003-04	2004-05 s	2005-06 f
Livestock products							
Wool **d**	kt	657	605	550	523	525	520
Milk **e**	ML	10 545	11 271	10 326	10 075	10 125	10 228
Butter **g**	kt	172	178	149	132	131	127
Cheese	kt	376	431	368	386	373	383
Casein	kt	13	14	13	10	10	11
Skim milk powder **h**	kt	249	243	215	182	189	187
Wholemilk powder	kt	205	239	170	187	189	194
Buttermilk powder	kt	16	17	16	16	19	18
Forestry							
Roundwood	'000 m^3	24 211	24 542	26 717	25 684	25 300	24 400
Fisheries **i**							
Tuna **j**	kt	16.1	15.9	14.7	14.4	13.2	14.3
Other fish **k**	kt	122.0	137.3	150.8	163.5	132.5	133.0
Prawns	kt	30.1	29.4	26.3	27.2	25.6	26.3
Rock lobster	kt	16.8	14.3	17.1	19.9	17.9	16.9
Abalone	kt	5.7	5.9	5.2	5.8	5.9	5.0
Scallops	kt	9.2	5.6	8.4	9.2	10.4	10.1
Oysters	kt	9.6	10.2	11.4	13.5	11.3	11.6
Other molluscs	kt	10.9	8.7	9.4	10.6	9.1	9.0
Other crustaceans	kt	8.9	8.1	8.0	7.7	7.7	8.7
Energy							
Coal							
Black, salable	Mt	258.2	272.6	274.9	285.9	299.9	313.6
Black, raw	Mt	321.5	344.4	348.9	362.2	387.1	397.0
Brown	Mt	68.0	68.7	68.8	69.8	67.5	67.8
Petroleum							
Crude oil and condensate	ML	38 705	36 100	33 321	27 876	24 338	26 104
Petroleum products **l**	ML	47 690	46 677	46 723	43 486	44 555	44 519
Natural gas **m**	Gm^3	34.3	35.8	36.8	37.0	41.2	45.2
LPG (naturally occurring)	ML	4 056	4 647	4 681	4 639	4 625	4 684
Uranium (U_3O_8)	t	9 549	7 823	9 172	9 569	10 964	11 434
Metalliferous minerals and metals **n**							
Aluminium							
Bauxite	Mt	54.6	53.9	54.5	56.3	58.0	61.8
Alumina	kt	16 098	16 417	16 413	16 690	17 160	18 245
Aluminium (ingot metal)	kt	1 788	1 809	1 855	1 877	1 890	1 917
Copper							
Mine production **o**	kt	876	876	883	811	911	942
Refined, primary	kt	517	561	537	459	478	486
Gold							
Mine production **o**	t	295.5	264.6	277.8	266.7	265.3	275.2

Continued

20 Australian commodity production *continued*

	Unit	2000-01	2001-02	2002-03	2003-04	2004-05 s	2005-06 f
Metalliferous minerals and metals *(continued)*							
Iron and steel							
Ore and concentrate **q**	Mt	175.6	185.3	198.9	221.5	251.8	275.3
Iron and steel	Mt	8.0	8.3	9.4	9.5	7.6	7.8
Lead							
Mine production **o**	kt	724	744	695	677	682	794
Refined **r**	kt	215	275	267	247	234	255
Bullion	kt	153	201	181	143	153	155
Manganese							
Ore, metallurgical grade	kt	1 948	1 850	2 472	3 062	3 554	3 906
Metal content of ores and concentrates	kt	953	994	1 127	1 171	1 734	1 903
Nickel							
Mine production **o**	kt	195	193	183	185	198	212
Refined, class I **s**	kt	108	120	117	112	118	124
Refined, class II **u**	kt	13	11	13	12	10	11
Total ore processed **v**	kt	242	235	230	234	245	265
Silver							
Mine production **o**	t	2 021	2 106	1 905	2 056	2 330	2 386
Refined	t	532	616	672	619	722	658
Tin							
Mine production **o**	t	10 016	8 173	6 222	1 533	2 095	6 065
Refined	t	1 039	829	708	553	445	215
Titanium							
Ilmenite concentrate	kt	2 092	1 843	2 069	1 910	2 006	2 316
Leucoxene concentrate	kt	34	34	43	53	46	87
Rutile concentrate	kt	209	207	208	154	174	219
Synthetic rutile **s**	kt	650	612	673	696	751	789
Titanium dioxide pigment **s**	kt	181	186	189	196	203	207
Zinc							
Mine production **o**	kt	1 483	1 490	1 529	1 355	1 352	1 429
Refined	kt	534	572	570	502	464	482
Zircon concentrate	kt	377	389	458	448	432	503
Other minerals							
Diamonds	'000 ct	22 475	30 676	32 006	24 310	32 446	34 660
Salt	kt	9 492	9 233	10 438	10 705	12 416	11 000

a Linseed and safflowerseed. **b** Excludes animals exported for breeding purposes. **c** In carcass weight and includes carcass equivalent of canned meats. **d** Greasy equivalent of shorn wool (includes crutching), dead and fellmongered wool and wool exported on skins. **e** Includes the wholemilk equivalent of farm cream intake. **g** Includes the butter equivalent of butteroil, butter concentrate, ghee and dry butterfat. **h** Includes mixed skim and buttermilk powder. **i** Liveweight. **j** Tuna captured under joint venture or bilateral agreements or transhipped at sea is included. **k** Includes an estimated value of aquaculture but excludes inland commercial fisheries. **l** Includes production from petrochemical plants. **m** Includes ethane, methane and noncommercial natural gas. **n** Uranium is included with energy. **o** Primary production, metal content. **q** Excludes iron oxide not intended for metal extraction. **r** Includes lead content of lead alloys from primary sources. **t** Products with a nickel content of 99 per cent or more. Includes electrolytic nickel, pellets, briquettes and powder. **u** Products with a nickel content of less than 99 per cent. Includes ferronickel, nickel oxides and oxide sinter. **v** Includes imported ore for further processing. **s** ABARE estimate. **f** ABARE forecast.

Sources: Australian Bureau of Statistics; Australian Dairy Corporation; Consolidated Gold Fields; Coal Services Pty Limited; International Nickel Study Group; Queensland Government, Department of Natural Resources and Mines; Raw Cotton Marketing Advisory Committee; ABARE.

21 Gross value of Australian farm and fisheries production

	2000-01 $m	2001-02 $m	2002-03 $m	2003-04 $m	2004-05 s $m	2005-06 f $m
Crops						
Grains and oilseeds						
Winter crops						
Barley	1 344	1 725	984	1 741	1 162	1 238
Canola	545	675	339	690	547	414
Chickpeas	75	130	65	58	36	32
Field peas	100	147	61	118	77	82
Lupins	217	304	212	266	164	211
Oats	138	251	210	293	212	240
Triticale	126	168	84	118	125	131
Wheat	5 130	6 356	2 692	5 690	4 351	4 356
Summer crops						
Maize	65	90	72	78	80	96
Rice	350	327	153	162	123	219
Sorghum	279	349	300	334	314	376
Soybeans	18	22	7	27	20	24
Sunflowerseed	28	27	10	20	21	30
Other oilseeds **a**	33	23	39	52	50	48
Total grains and oilseeds	8 701	10 875	5 399	9 786	7 405	7 636
Industrial crops						
Cotton lint and cotton seed **b**	1 882	1 499	844	671	1 222	835
Sugar cane (cut for crushing)	657	989	1 019	848	873	893
Wine grapes	925	1 059	1 143	1 469	1 349	1 255
Total industrial crops	3 463	3 548	3 006	2 988	3 444	2 983
Other crops						
Fruit	2 253	2 333	2 408	2 354	2 306	2 360
Vegetables	2 183	2 269	2 126	2 436	2 497	2 447
Other crops nei **c**	2 131	2 236	2 446	2 850	2 850	2 600
Total other crops	6 566	6 838	6 980	7 640	7 653	7 407
Total crops	18 730	21 260	15 385	20 414	18 502	18 050

Continued

21 Gross value of Australian farm and fisheries production *continued*

	2000-01 $m	2001-02 $m	2002-03 $m	2003-04 $m	2004-05 s $m	2005-06 f $m
Livestock slaughterings						
Cattle and calves **d**	5 949	6 617	5 849	6 338	7 331	6 752
Cattle exported live **e**	482	526	562	314	335	346
Sheep **g**	368	544	446	453	397	437
Lambs **gh**	776	1 181	1 182	1 313	1 258	1 224
Sheep exported live	258	392	408	266	207	276
Pigs	822	968	911	878	924	847
Poultry	1 060	1 175	1 281	1 281	1 440	1 533
Total livestock slaughterings **k**	9 738	11 434	10 676	10 879	11 930	11 455
Livestock products						
Wool **i**	2 541	2 713	3 318	2 394	2 418	2 303
Milk **j**	3 053	3 717	2 795	2 808	3 139	3 375
Eggs	333	320	294	326	310	300
Honey and beeswax	38	40	30	40	40	40
Total livestock products	5 965	6 791	6 437	5 568	5 907	6 018
Total farm	34 432	39 485	32 498	36 861	36 339	35 522
Forestry products						
Roundwood	1 341	1 369	1 513	1 482	1 512	1 454
Fisheries products **l**						
Tuna **m**	329	323	317	187	184	198
Other fin fish **n**	490	546	560	551	437	439
Prawns	453	429	360	355	333	340
Rock lobster	481	502	460	408	409	399
Abalone	276	247	216	196	252	202
Scallops	39	23	33	24	26	28
Oysters	55	57	62	72	59	61
Pearls	150	175	150	150	141	132
Other molluscs **o**	78	42	64	72	62	61
Other crustaceans	67	65	61	61	60	62
Total fish q	2 439	2 430	2 305	2 095	1 979	1 939

a Linseed, safflowerseed and peanuts. **b** Value delivered to gin. **c** Mainly fruit, vegetables and fodder crops. **d** Includes dairy cattle slaughtered. **e** Excludes animals exported for breeding purposes. **g** Excludes skin values. **h** Lamb saleyard indicator weight 18–20 kilograms. **i** Shorn, dead and fellmongered wool and wool exported on skins. **j** Milk intake by factories and valued at farmgate. **k** Total livestock slaughterings includes livestock disposals. **l** Value to fishermen of product landed in Australia. **m** Tuna captured under joint venture or bilateral agreements or transhipped at sea is included. **n** Includes an estimated value of aquaculture. **o** Includes Northern Territory aquaculture production. **q** Also includes fish and aquaculture values not elsewhere included. **s** ABARE estimate. **f** ABARE forecast.

Note: The gross value of production is the value placed on recorded production at the wholesale prices realised in the market place. The point of measurement can vary between commodities. Generally the market place is the metropolitan market in each state and territory. However, where commodities are consumed locally or where they become raw material for a secondary industry, these points are presumed to be the market place.

Note: Prices used in these calculations exclude GST.

Sources: Australian Bureau of Statistics; ABARE.

22 Crop areas and livestock numbers

	Unit	2000-01	2001-02	2002-03	2003-04	2004-05 s	2005-06 f
Crop areas							
Grains and oilseeds							
Winter crops							
Barley	'000 ha	3 454	3 707	3 864	4 477	3 589	3 806
Canola	'000 ha	1 459	1 332	1 298	1 211	1 141	895
Chickpeas	'000 ha	262	195	201	152	113	80
Field peas	'000 ha	397	337	380	354	321	290
Lupins	'000 ha	1 180	1 139	1 025	851	663	810
Oats	'000 ha	650	784	911	1 089	864	851
Triticale	'000 ha	389	409	408	445	338	345
Wheat	'000 ha	12 141	11 529	11 170	13 067	11 991	11 359
Summer crops							
Maize	'000 ha	74	83	50	70	75	78
Rice	'000 ha	177	150	46	66	50	75
Sorghum	'000 ha	758	823	667	734	659	723
Soybeans	'000 ha	33	32	10	33	26	37
Sunflowerseed	'000 ha	82	79	40	46	46	75
Other oilseeds **a**	'000 ha	24	14	44	51	55	54
Total grains and oilseeds	'000 ha	21 098	20 627	20 124	22 660	19 957	19 503
Industrial crops							
Cotton	'000 ha	527	409	224	198	321	285
Sugar cane **b**	'000 ha	411	426	448	448	420	405
Winegrapes **b**	'000 ha	111	136	140	146	153	159
Livestock numbers **c**							
Cattle							
Beef	million	24.50	24.74	23.62	24.41	24.81	25.10
Dairy	million	3.22	3.13	3.05	3.06	3.04	3.05
milking herd **d**	million	2.18	2.12	2.05	2.04	2.04	2.05
Total	million	27.72	27.87	26.66	27.47	27.85	28.15
Sheep	million	110.9	106.2	99.3	101.3	104.0	105.8
Pigs	million	2.75	2.94	2.66	2.53	2.49	2.47

a Linseed and safflowerseed. **b** Cut for crushing. **c** At 30 June from 1999-00. Details for establishments with an estimated value of agricultural operations of $5 000 or more. **d** Cows in milk and dry. **s** ABARE estimate. **f** ABARE forecast.
Sources: Australian Bureau of Statistics; ABARE.

23 Average farm yields

	Unit	2000-01	2001-02	2002-03	2003-04	2004-05 s	2005-06 f
Crops							
Grains and oilseeds							
Winter crops							
Barley	t/ha	1.95	2.23	1.00	2.32	1.80	1.74
Canola	t/ha	1.22	1.32	0.67	1.41	1.34	1.26
Chickpeas	t/ha	0.62	1.32	0.68	1.17	1.02	1.20
Field peas	t/ha	1.15	1.52	0.47	1.38	1.00	1.26
Lupins	t/ha	0.89	1.07	0.71	1.39	1.34	1.13
Oats	t/ha	1.62	1.83	1.05	1.85	1.22	1.32
Triticale	t/ha	2.16	2.10	0.80	1.86	1.82	1.81
Wheat	t/ha	1.82	2.11	0.91	2.00	1.70	1.73
Summer crops							
Maize	t/ha	4.66	5.47	6.20	5.64	4.16	5.03
Rice	t/ha	9.28	7.95	9.52	8.38	6.10	8.67
Sorghum	t/ha	2.55	2.46	2.20	2.74	2.65	2.74
Soybeans	t/ha	1.46	1.95	1.77	2.21	2.13	1.86
Sunflowerseed	t/ha	0.94	0.88	0.62	1.26	1.35	1.26
Industrial crops							
Cotton (lint)	t/ha	1.55	1.72	1.72	1.76	2.01	1.71
Sugar cane (for crushing)	t/ha	76	74	83	83	89	93
Winegrapes	t/ha	12.81	11.81	10.08	12.98	12.65	11.82
Livestock							
Wool **a**	kg/sheep	4.31	4.38	4.25	4.51	4.34	4.33
Wholemilk	L/cow	4 846	5 309	5 037	4 948	4 961	5 001

a Shorn (including lambs). **s** ABARE estimate. **f** ABARE forecast.
Sources: Australian Bureau of Statistics; ABARE.

24 Volume of Australian commodity exports

	Unit	2000-01	2001-02	2002-03	2003-04	2004-05 s	2005-06 f
Farm							
Grains and oilseeds							
Winter crops							
Barley **a**	kt	4 142	4 989	3 462	5 308	6 500	4 011
Canola	kt	1 479	1 303	612	1 049	1 019	888
Chickpeas	kt	218	278	89	164	151	95
Lupins	kt	714	414	199	430	408	401
Oats (unprepared)	kt	97	130	177	172	165	111
Peas **b**	kt	387	459	108	209	117	215
Wheat **c**	kt	16 621	16 464	10 845	15 073	15 777	15 557
Summer crops							
Cottonseed	kt	658	594	259	167	214	358
Rice	kt	578	534	216	108	74	76
Sorghum	kt	691	586	70	289	513	378
Other oilseeds **d**	kt	53	23	16	19	28	34
Total grains and oilseeds	kt	25 639	25 774	16 053	22 988	24 965	22 125
Industrial crops							
Raw cotton **e**	kt	834	718	596	459	410	574
Sugar	kt	3 087	3 644	4 167	4 060	4 193	4 034
Wine	ML	339	416	508	581	661	778
Meat and live animals for slaughter							
Beef and veal **gh**	kt	959	902	902	860	948	903
Live cattle **i**	’000	846	797	968	578	550	570
Lamb **g**	kt	116	118	102	119	128	122
Live sheep **i**	’000	5 936	6 443	5 843	3 843	3 233	3 686
Mutton **g**	kt	192	166	162	129	144	142
Pig meat **g**	kt	44	59	63	51	44	42
Poultry meat **g**	kt	21	21	23	20	20	21
Wool							
Greasy **js**	kt	479	403	307	321	373	344
Semiprocessed	kt (gr.eq.)	281	227	169	127	114	106
Skins	kt (gr.eq.)	95	56	28	27	29	49
Total **js**	kt (gr.eq.)	855	686	505	475	515	499
Dairy products							
Butter **k**	kt	120	123	111	83	69	59
Cheese	kt	219	218	208	212	227	216
Casein	kt	10	9	8	8	7	8
Skim milk powder	kt	203	210	181	155	141	139
Wholemilk powder	kt	167	165	142	117	105	126

Continued

24 Volume of Australian commodity exports *continued*

	Unit	2000-01	2001-02	2002-03	2003-04	2004-05 s	2005-06 f
Forest products							
Woodchips	kt	10 096	9 490	10 935	10 630	11 282	10 900
Fisheries products							
Tuna **l**	kt	14.8	13.9	12.6	12.8	10.9	12.1
Other fish	kt	13.3	17.5	17.4	13.2	15.0	15.2
Prawns **m**							
Headless	kt	1.0	0.8	0.6	0.3	0.4	0.5
Whole	kt	10.8	10.9	8.7	8.9	9.6	9.8
Rock lobster							
Tails	kt	1.0	0.9	1.7	2.1	1.8	1.8
Whole	kt	11.9	9.7	9.5	10.9	10.2	9.4
Abalone							
Fresh, chilled or frozen	kt	1.5	2.0	1.7	2.1	2.0	2.1
Prepared or preserved	kt	2.0	2.0	2.5	2.8	2.0	1.7
Scallops **n**	kt	2.1	1.5	1.2	1.5	1.2	1.3
Mineral resources							
Energy							
Crude oil **o**	ML	24 044	23 936	20 950	17 526	15 731	17 937
LPG	ML	2 785	3 211	3 194	2 916	2 844	2 888
LNG **qs**	Mt	7.530	7.600	7.826	7.914	10.589	13.231
Bunker fuel **r**	ML	2 291	2 267	2 238	2 216	2 207	2 220
Petroleum products	ML	4 564	3 409	3 140	2 474	1 816	1 760
Metallurgical coal	Mt	105.5	105.8	107.8	111.7	124.9	131.1
Thermal coal	Mt	88.0	92.0	99.9	106.7	106.4	109.0
Uranium (U_3O_8)	t	9 722	7 367	9 593	9 099	11 249	11 434

Continued

24 Volume of Australian commodity exports *continued*

	Unit	2000-01	2001-02	2002-03	2003-04	2004-05 s	2005-06 f
Mineral resources *(continued)*							
Metalliferous minerals and metals t							
Aluminium **t**							
Alumina	kt	12 721	13 091	13 168	13 572	14 072	14 508
Aluminium (ingot metal)	kt	1 471	1 490	1 551	1 546	1 513	1 533
Copper							
Ore and concentrate	kt	1 150	1 271	1 193	1 286	1 328	1 477
Refined	kt	366	388	359	301	322	330
Gold **v**	t	302	280	282	315	309	315
Iron and steel							
Iron ore and pellets	Mt	157.3	156.1	181.5	194.8	228.2	267.2
Iron and steel **w**	kt	2 931	3 297	3 589	3 818	2 249	2 280
Lead							
Ores and concentrates	kt	433	380	366	417	417	794
Refined	kt	199	236	269	231	243	256
Bullion	kt	119	153	150	113	163	155
Manganese							
Ore **s**	kt	1 522	1 660	2 014	2 603	3 123	3 618
Nickel **vs**	kt	208	210	209	214	216	223
Titanium							
Ilmenite concentrate **x**	kt	1 012	914	1 020	783	633	1 055
Leucoxene concentrate	kt	70	60	41	125	93	87
Rutile concentrate	kt	190	190	195	146	158	208
Synthetic rutile **s**	kt	443	398	456	470	520	568
Titanium dioxide pigment	kt	140	145	147	165	175	168
Refined silver	t	450	547	511	415	517	459
Tin **v**	t	9 660	8 026	5 963	143	1 531	6 524
Zinc							
Ores and concentrates	kt	1 903	1 849	1 913	1 844	1 966	1 984
Refined	kt	452	496	486	396	397	405
Zircon concentrate **y**	kt	375	388	445	426	428	498
Other minerals							
Diamonds	'000 ct	25 513	25 811	32 274	26 667	32 560	34 660
Salt	kt	8 636	8 912	10 172	10 285	12 183	10 780

a Includes the grain equivalent of malt. **b** Includes field peas and cowpeas. **c** Includes the wheat equivalent of flour. **d** Includes soybeans, linseed, sunflowerseed, safflowerseed and peanuts. Excludes meals and oils. **e** Excludes cotton waste and linters. **g** In shipped weight. Fresh, chilled or frozen. **h** Includes meat loaf. **i** Excludes breeding stock. **j** ABS recorded trade data adjusted for changes in stock levels held overseas by Wool International. **k** Includes ghee, dry butterfat, butter concentrate and butteroil, dairy spreads, all expressed as butter. **l** Exports of tuna landed in Australia. Tuna captured under joint venture or bilateral agreements or transhipped at sea is not included. **m** Excludes volume of other prawn products. **n** Includes crumbed scallops. **o** Includes condensate and other refinery feedstock. **q** 1 million tonnes of LNG equals about 1.31 billion cubic metres of gas. **r** International ships and aircraft stores. **t** Uranium is included with energy. **u** Exports of bauxite are confidential. **v** Quantities refer to total metallic content of all ores, concentrates, intermediate products and refined metal. **w** Includes all steel items in ABS, *Australian Harmonized Export Commodity Classification* , ch. 72, 'Iron and steel', excluding ferrous waste and scrap and ferroalloys. **x** Excludes leucoxene and synthetic rutile. **y** Data from 1991-92 refer to standard grade zircon only. **s** ABARE estimate. **f** ABARE forecast.

Sources: ABS, *International Trade,* Australia, cat. no. 5465.0, Canberra; Australian Mining Industry Council; Department of Foreign Affairs and Trade; Department of Agriculture, Fisheries and Forestry Australia; International Nickel Study Group; ABARE.

25 Value of Australian commodity exports (fob)

	2000-01 $m	2001-02 $m	2002-03 $m	2003-04 $m	2004-05 s $m	2005-06 f $m
Farm						
Grains and oilseeds						
Winter crops						
Barley **a**	1 101	1 278	954	1 239	1 274	939
Canola	544	572	289	453	397	333
Chickpeas	113	167	52	71	65	47
Lupins	166	109	57	129	101	115
Oats	22	37	66	66	36	36
Peas **b**	112	157	43	56	33	63
Wheat **c**	4 197	4 612	3 109	3 475	3 488	3 538
Summer crops						
Cottonseed	137	148	82	62	55	68
Rice	369	286	113	68	51	49
Sorghum	122	109	17	61	96	86
Other oilseeds **d**	28	20	21	25	33	20
Total grains and oilseeds	6 910	7 495	4 804	5 705	5 630	5 293
Industrial crops						
Raw cotton **e**	1 957	1 547	1 152	982	770	938
Sugar	1 178	1 430	1 220	982	1 374	1 268
Wine	1 614	1 970	2 386	2 545	2 748	3 082
Total	4 749	4 947	4 758	4 508	4 892	5 288
Other crops	3 145	3 432	3 420	3 096	3 187	3 219
Total crops	14 804	15 874	12 982	13 309	13 710	13 801
Meat and live animals for slaughter						
Beef and veal	4 007	4 189	3 756	3 793	4 584	4 053
Live cattle **g**	482	526	562	314	335	346
Lamb	508	626	554	636	701	678
Live sheep **g**	258	392	408	266	207	276
Mutton	416	490	346	379	418	459
Pig meat	186	265	256	181	150	150
Poultry meat	26	26	22	20	20	22
Total	5 882	6 514	5 905	5 590	6 414	5 985
Wool						
Greasy **h**	2 310	2 271	2 266	1 850	1 994	1 914
Semiprocessed	1 289	1 119	991	632	505	425
Skins	298	297	288	296	339	295
Total **h**	3 897	3 687	3 545	2 778	2 838	2 633
Dairy products						
Butter	291	297	224	182	188	179
Cheese	950	1 033	800	738	875	823
Casein	89	77	43	48	56	65
Skim milk powder	694	698	406	386	420	427
Wholemilk powder	580	571	380	321	324	387
Other dairy products	476	550	549	534	554	575
Total	3 081	3 226	2 401	2 210	2 418	2 456
Other livestock exports	1 884	1 771	1 977	2 224	2 329	2 353
Total livestock exports	14 743	15 198	13 827	12 801	13 999	13 427
Total farm exports	29 547	31 072	26 809	26 110	27 708	27 228

Continued

25 Value of Australian commodity exports (fob) *continued*

	2000-01 $m	2001-02 $m	2002-03 $m	2003-04 $m	2004-05 s $m	2005-06 f $m
Forest products						
Woodchips	744	712	808	794	858	832
Fisheries products						
Tuna **i**	332	326	321	273	166	192
Other fish	146	176	164	137	139	143
Prawns **j**						
Headless	25	19	12	5	7	8
Whole	258	239	193	151	153	156
Rock lobster						
Tails	60	65	113	103	101	98
Whole	461	420	344	318	330	317
Abalone						
Fresh, chilled or frozen	104	123	109	117	124	108
Prepared or preserved	145	140	107	120	139	98
Scallops **k**	53	34	29	35	33	36
Pearls	419	404	332	310	291	281
Other fisheries products	163	153	121	81	60	98
Total	2 169	2 100	1 844	1 652	1 542	1 534
Total rural exports l						
Derived as sum of above	32 460	33 885	29 462	28 557	30 108	29 593
On balance of payments basis **m**	32 637	34 364	29 951	28 941	30 725	30 320
Mineral resources						
Energy						
Crude oil **n**	8 137	6 390	6 402	5 055	6 330	9 039
LPG	830	721	855	647	804	986
LNG	2 671	2 613	2 607	2 174	3 199	4 764
Bunker fuel **o**	899	760	775	696	951	1 145
Other petroleum products	1 844	1 234	1 198	918	828	1 066
Metallurgical coal	6 597	8 038	7 448	6 510	10 730	17 581
Thermal coal	4 204	5 294	4 448	4 372	6 336	7 025
Uranium (U_3O_8)	497	361	427	364	475	616
Total						
Derived as sum of above	25 678	25 411	24 161	20 737	29 653	42 222
On balance of payments basis (excl. bunker fuel)	24 308	24 370	23 036	19 767	28 184	39 914
Metalliferous minerals and metals						
Aluminium						
Bauxite **s**	196	136	159	125	123	184
Alumina	4 507	4 114	3 660	3 781	4 381	4 397
Aluminium (ingot metal)	4 229	3 965	3 696	3 441	3 712	3 746
Copper **p**						
Ore and concentrate	1 037	1 028	1 048	1 242	1 718	1 931
Refined	1 249	1 131	956	924	1 327	1 436

Continued

25 Value of Australian commodity exports (fob) *continued*

	2000-01 $m	2001-02 $m	2002-03 $m	2003-04 $m	2004-05 s $m	2005-06 f $m
Mineral resources *(continued)*						
Metalliferous minerals and metals *(continued)*						
Gold **p**	4 887	4 950	5 133	5 510	5 523	5 771
Iron and steel						
Iron ore and pellets	4 903	5 160	5 342	5 277	8 085	12 859
Iron and steel	1 484	1 484	1 855	2 004	1 952	1 633
Lead **p**						
Ores and concentrates	318	323	289	387	490	832
Refined	167	211	203	199	305	298
Bullion	151	195	165	142	246	253
Manganese						
Ore **s**	261	299	312	371	472	844
Titanium						
Ilmenite concentrate **q**	154	138	135	82	63	101
Leucoxene concentrate	21	23	16	33	25	25
Rutile concentrate	161	167	149	94	114	180
Synthetic rutile **s**	313	296	293	253	308	364
Titanium dioxide pigment	494	460	428	399	422	413
Nickel **s**	2 308	2 036	2 347	3 117	3 707	3 700
Refined silver	142	163	136	118	161	137
Tin **p**	76	49	38	1	9	76
Zinc **p**						
Ores and concentrates	977	735	670	677	851	912
Refined	905	794	757	557	614	690
Zircon concentrate **r**	228	272	282	250	319	415
Total	29 170	28 129	28 071	28 983	34 926	41 198
Other minerals						
Diamonds **s**	634	512	789	531	650	715
Salt	253	267	233	186	226	196
Other	2 177	2 392	2 555	2 632	2 841	2 909
Total mineral resources exports	57 912	56 711	55 808	53 069	68 295	87 239
Total commodity exports						
Derived as sum of above	90 372	90 596	85 270	81 625	98 404	116 833
On balance of payments **t**	89 650	90 314	84 984	81 314	98 070	116 414

a Includes the grain equivalent of malt. **b** Field peas and cowpeas. **c** Includes the wheat equivalent of flour. **d** Includes soybeans, linseed, sunflowerseed, safflowerseed and peanuts. Excludes meals and oils. **e** Excludes cotton waste and linters. **g** Excludes breeding stock. **h** On a balance of payments basis. ABS recorded trade data adjusted for changes in stock levels held overseas by Wool International. **i** Exports of tuna landed in Australia. Tuna captured under joint venture or bilateral agreements or transhipped at sea is not included. **j** Other prawn products included in other fisheries products. **k** Includes crumbed scallops. **l** Sum of farm, forest and fisheries products. **m** The value of exports derived as the sum of published detailed items differs from the balance of payments aggregates shown in table 6 for two main reasons: the ABS makes special adjustments to some recorded trade data for balance of payments purposes; and ABARE derives its own estimates, (using non-ABS sources), for several items as footnoted. For more detail on a balance of payments basis, see table 7. **n** Includes condensate and other refinery feedstock. **o** International ships and aircraft stores. **p** Value of metals contained in host mine and smelter products are not available separately and are included in the value of the mineral product or metal in which they are exported. **q** Excludes leucoxene and synthetic rutile; data from 1991-92 refer to bulk ilmenite only. **r** Data refers to standard grade zircon only. **t** As derived in table 6. **s** ABARE estimate. **f** ABARE forecast.

Sources: ABS, *International Trade,* Australia, cat. no. 5465.0, Canberra; ABARE.

26 Value of Australian imports and exports of selected commodites

	2000-01 $m	2001-02 $m	2002-03 $m	2003-04 $m	2004-05 s $m
Vegetable oilseeds and products a					
Imports	376	399	401	382	352
Exports	743	784	443	603	551
Dairy products					
Imports					
Cheese	149	166	168	158	187
Other dairy products	105	84	92	101	124
Total	254	250	260	259	311
Exports					
Cheese	950	1 033	800	738	875
Other dairy products	2 131	2 193	1 601	1 471	1 542
Total	3 081	3 226	2 401	2 210	2 418
Edible fisheries products					
Imports					
Shellfish b	361	352	360	360	412
Fin fish	509	537	591	545	547
Total	870	889	950	905	959
Exports					
Shellfish b	1 238	1 160	1 000	909	932
Fin fish c	478	502	485	410	304
Total	1 717	1 662	1 485	1 319	1 236
Forest products					
Imports					
Sawnwood	428	443	505	502	492
Wood based panels	152	165	200	191	218
Pulp and paper products	2 792	2 591	2 670	2 624	2 720
Other d	462	529	591	585	587
Total	3 834	3 727	3 965	3 902	4 018
Exports					
Woodchips	744	712	808	794	858
Pulp and paper products	657	872	890	873	839
Other e	412	431	419	388	392
Total	1 813	2 015	2 117	2 056	2 089
Petroleum					
Imports					
Crude oil g	8 753	7 458	8 610	6 594	10 011
Petroleum products h	1 816	1 625	2 050	3 595	5 155
Total	10 569	9 083	10 661	10 190	15 166
Exports					
Crude oil g	8 137	6 390	6 402	5 055	6 330
LPG i	830	721	855	647	804
LNG	2 671	2 613	2 607	2 174	3 199
Bunker fuel j	899	760	775	696	951
Other petroleum products	1 844	1 234	1 198	918	828
Total	14 381	11 719	11 838	9 490	12 112

a Includes peanuts, oilseeds, vegetable oils and vegetable protein meals. **b** Includes all crustaceans and molluscs including canned. **c** Excludes tuna transhipped at sea or captured under joint venture or bilateral agreements. **d** Includes roundwood, other processed wood and minor forest products. **e** Includes roundwood, sawnwood, sleepers, processed wood and minor forest products. **g** Includes condensate and other refinery feedstock. **h** Includes LPG. **i** Naturally occurring and refinery byproduct gas. **j** International ships and aircraft stores. **s** ABARE estimate.

Sources: Australian Bureau of Statistics; Department of Agriculture, Fisheries and Forestry Australia; ABARE.

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