

Western Australian **ECONOMIC SUMMARY**

2006 No. 3



Department of Treasury and Finance
Government of Western Australia

Western Australian **ECONOMIC SUMMARY**

2006 No. 3

Released 19 December 2006

Table of Contents

Overview	1
Households and Housing	5
Price Trends.....	16
Labour Market.....	25
Business Conditions.....	33
Global Markets.....	47
Western Australia's Productivity Paradox	54
Issues For Major Project Assistance Analysis Using Computable General Equilibrium Models ..	75
Statistical Appendix	91

Overview

Western Australia's real Gross State Product rose by 4.9% in 2005-06, following growth of 4.7% in 2004-05.

Economic growth has been underpinned by strong demand and prices for the State's key mineral commodities. This has boosted employment and incomes in the resources sector, and also induced very strong growth in capital expenditure. Western Australia's real business investment increased by 37% in 2005-06, and in the past five years business investment has contributed just over half of the growth in real Gross State Product of 31%, or 5.6% a year (see page 2 for a discussion of GDP growth).

The impetus from the resources boom has also fed through to other sectors of the economy, with most key economic indicators showing more favourable conditions in Western Australia than nationally. The State's retail sales and wider consumer spending measures are growing at a faster pace than nationally, and its consumer and business confidence levels are higher. Western Australia's housing market is comparatively buoyant, and strong growth in house prices in the past three years has raised Perth's median house price to be second only to Sydney of the State capitals.

These robust conditions have produced a very tight labour market. Western Australia has a lower unemployment rate, a higher participation rate and a higher job vacancy rate than nationally, and its wages growth is faster. Although employment growth is decelerating, this reflects supply constraints rather than easing labour demand.

These favourable economic conditions do, however, have some negative consequences. Skills and labour shortages are contributing to cost overruns and delays in investment projects and housing construction. Strongly rising house prices have provided an equity boost for people who already own their own homes, but prospective first-home owners are facing affordability at near-record lows. House prices are largely responsible for the 0.9 percentage point gap between Perth's inflation rate of 4.8% in the year to September, and national average inflation of 3.9%.

There are some signs that the overheating in some parts of the economy may be easing. In the housing market, building approvals are trending downwards and the backlog of residential building work yet to be completed appears to have peaked. The real estate industry reports recent increases in the stock of established houses for sale, and in the average time that properties are on the market.

Average annual growth in household consumption and real retail trade is close to long run averages, representing a moderation from the above-average growth rates experienced in 2005-06.

Perth's consumer inflation is likely to ease in the near future as fruit and fuel prices ease, and will decelerate further if house price growth slows.

The outlook for the world economy in the short to medium term is fairly robust¹, but Australia's commodity prices have levelled off in recent months, and global commodity prices are expected to soften over the next few years².

Production of a number of the State's key resource commodities is likely to increase as the strong investment of recent years (both in Western Australia and globally) raises capacity. The IMF³ and World Bank⁴ predict that prices will remain above historical averages rather than dropping to pre-boom levels. Falling prices could lead to some easing in mining investment in Western Australia, although this will be modest if demand is still robust and prices stay above historical averages⁵.

Current and future trends in commodity prices, and their relationship to productivity and welfare in Western Australia's economy, are discussed in this publication's first feature article on page 54.

The second feature article on page 75 discusses the use of Computable General Equilibrium Models for major project assistance analysis.

State Accounts 2005-06

Western Australia's real Gross State Product (GSP) rose by 4.9% in 2005-06. The GSP growth estimate for the previous year has been revised to 4.7%, up from an initial estimate of GSP growth in 2004-05 rate of 2.7% published in November 2005.

Growth of 10.9% in State Final Demand over 2005-06 was largely driven by business investment (up 37%, and contributing 6.1 percentage points to growth) and household consumption (up 3.9% and contributing 1.9 percentage points to growth).

¹ The International Monetary Fund has noted generally buoyant global economic conditions in its World Economic Outlook (September 2006 edition), with above-trend global economic growth forecast of 5.1% in 2006 and of 4.9% in 2007.

² Access Economics September quarter 2006 Minerals Monitor (the Monitor provides an outline of the views and consensus forecasts of 11 resource commodities forecasters). Also see next two footnotes below.

³ *Australia: Selected Issues*. IMF Country Report No. 06/373, October 2006. pp. 26-37

⁴ World Bank Group (Oil, Gas, Mining and Chemicals Department). 2006. *Background Paper: The Outlook for Metals Markets; Prepared for G20 Deputies Meeting Sydney 2006*. World Bank. Washington. p.ii

⁵ For more information on this and other possible risks to growth, see "Risks to the outlook" section at the end of this chapter.

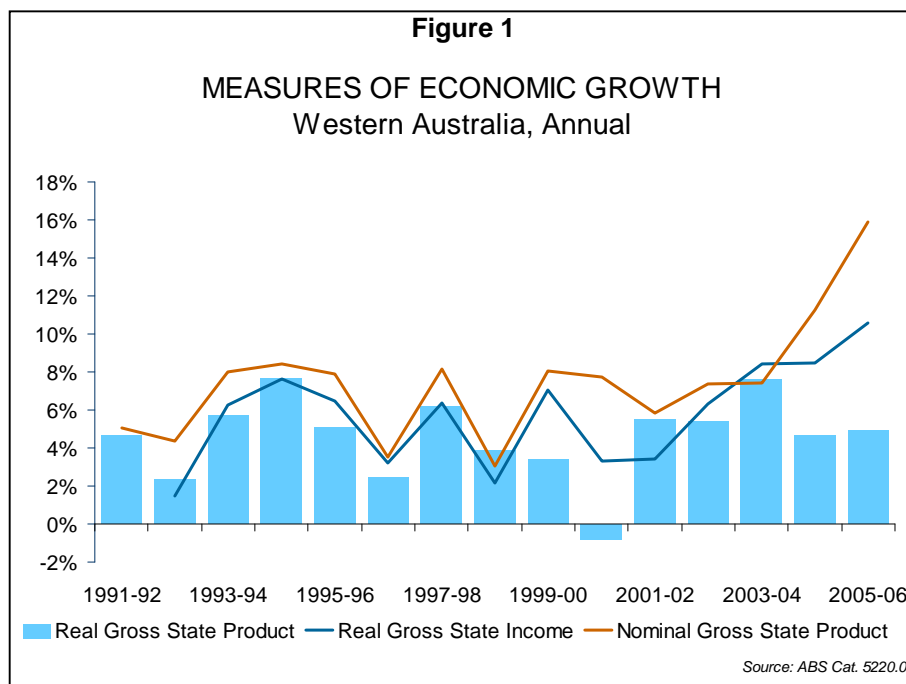
The weaker growth in the broader GSP measure arose partly because real net exports detracted 3.0 percentage points from GSP growth, reflecting both a small fall in the volume of exports and strong imports growth. This does not, however, reflect changes in export values driven by higher commodity prices – while merchandise exports fell by 0.9% in volume terms, they grew in value by 25% due to higher commodity prices.

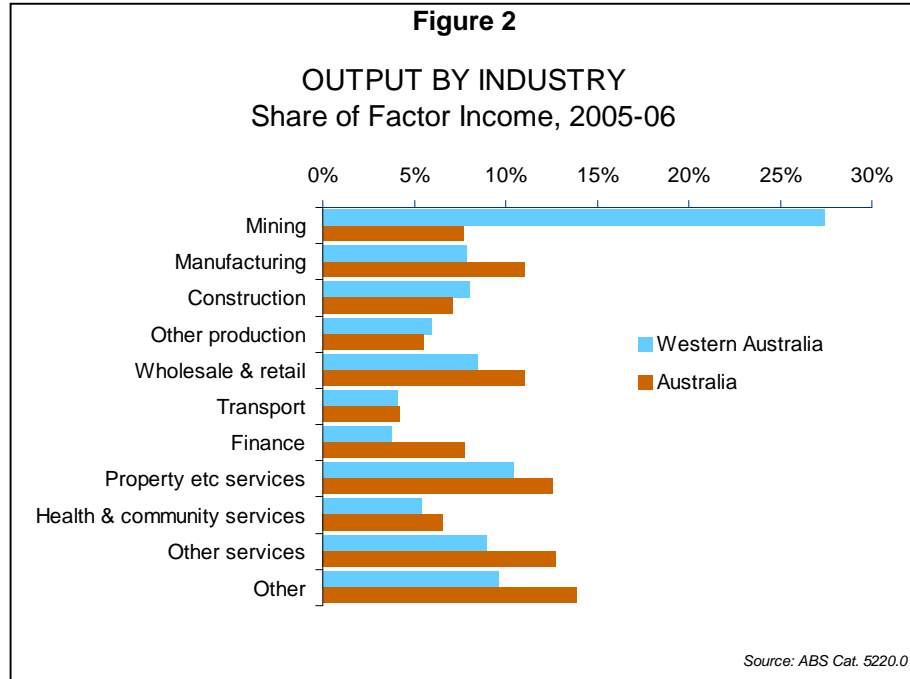
In current prices, the State's GSP grew by 15.9% in 2005-06, which was more than three times the growth in real GSP of 4.9%. The main reason for this strong current price growth was higher export prices, which underpinned growth in the GSP price deflator of 10.5%, while the deflator for domestic demand rose by just 4.5%.

Real GSP growth measures increases in the volume of production. Changes in prices are not reflected in the growth rate, even though such increases can lead to greater spending power throughout the economy. Real GSP can be a poor measure of changes to the community's economic well-being when export prices are rising faster than domestic prices. Rising relative export prices mean that a given volume of domestic production can be exchanged for a larger volume of imports, raising the community's real spending power.

A better indicator of spending power in these circumstances is real Gross State Income, which measures the purchasing power of domestic production by adjusting the volume of exports to reflect changes in the terms of trade.

In 2005-06, Western Australia's real Gross State Income increased by 10.6%, following an increase of 8.5% in 2004-05. Growth in Gross State Income has exceeded GSP growth significantly in recent years, reflecting the effect of rising commodity prices and the increasing terms of trade on the State's real purchasing power (Figure 1).





The State Accounts also contain estimates of factor income (in current prices) by industry. The mining industry recorded the strongest growth in factor income over 2005-06 (of 41.4%), mainly reflecting the effects of higher commodity prices on the value of production. Mining's share of total factor income by industry rose from 22.7% to 27.4% over the year, more than three times mining's share of national factor income of 7.7% (Figure 2).

Factor income in the construction industry also grew strongly (up 31.4%) reflecting increases in both activity and wages.

Households and Housing

Demography

Western Australia's rising population growth has contributed to strong demand for housing, and has also supported growth in household consumption.

Western Australia's population grew by 0.4% in the June quarter 2006 to be 2.0% higher than the June quarter 2005. The annual rise was the highest growth rate in all the states and territories. Overseas migration was the main driver of population growth in Western Australia, contributing 1.1 percentage points to the rise. Natural increase (births minus deaths) contributed 0.75 percentage points while interstate migration added 0.15 percentage points to the increase.

Housing Market

The housing market is showing signs of moderating after three years of strong growth, although activity in both the established and new housing markets remains at historical highs.

Strong economic growth, population growth and the tight labour market (page 25) are contributing to housing demand, but this is being tempered by declining housing affordability caused by high prices and rising interest rates. Capacity constraints have meant that growth in the housing stock has not kept pace with strong demand growth. About a year's supply of new homes is currently under construction, a result of building commencements outpacing completion rates in most quarters over the past few years.

There are signs that some of the heat in the housing market is dissipating. Building approvals are trending downwards, the backlog of residential building work appears to have peaked, and recently there has been an increase in the stock of established houses for sale. Prices may rise for a few more quarters, but probably not at the high rates of growth experienced over the past four years.

Table 1

**POPULATION
June Quarter 2006**

	% Change Over:	
	Change: Quarter	Change Year
NSW	0.2	0.9
Vic	0.3	1.4
Qld	0.4	1.9
WA	0.4	2.0
SA	0.2	0.8
Tas	0.1	0.7
Aust	0.3	1.3

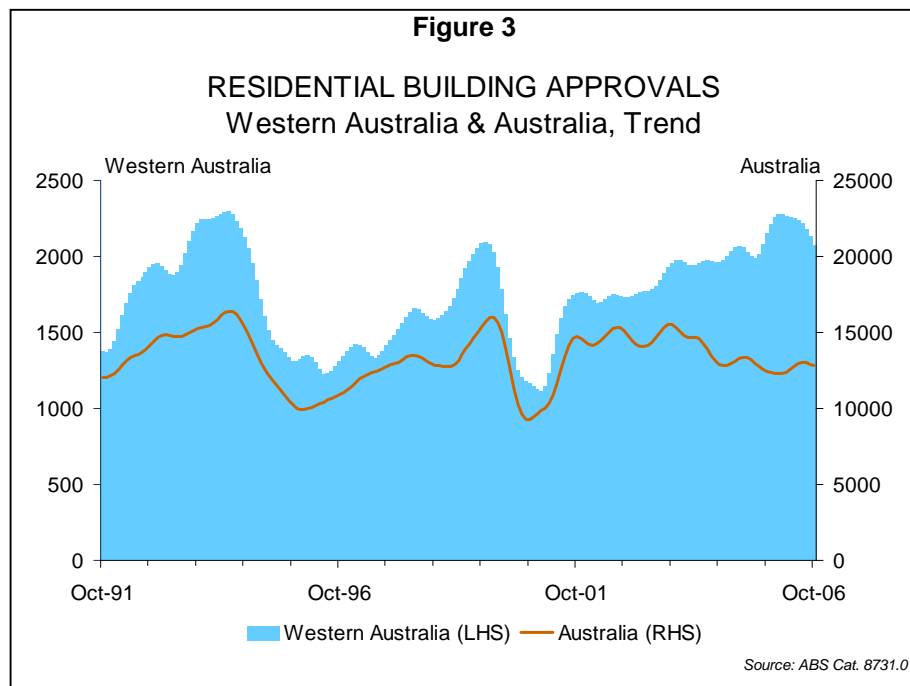
Source: ABS Cat 3101.0

New Housing¹

Dwelling commencements have risen for six consecutive quarters in trend terms, despite declining housing affordability. The number of building approvals has trended downwards since the beginning of 2006, however, suggesting that the pace of growth in new construction may slow².

The seasonally adjusted number of building approvals in Western Australia decreased by 15.0% in October 2006, following an increase of 7.3% in September (revised upwards from 5.4%). In trend terms³, building approvals have recorded eight consecutive monthly falls since March 2006 (Figure 3).

The number of finance commitments for the construction of dwellings and the number of finance commitments for the purchase of new dwellings was 5.0% lower in the three months to September 2006¹ than in the corresponding period of 2005. This growth has slowed from three-monthly rises of 12.7% in August 2006 and 19.9% in July 2006. Interest rate rises, strong price growth and land availability are all likely to have contributed to this moderation in demand.



¹ New housing comprises additions to the stock of dwellings from houses under construction or newly built.

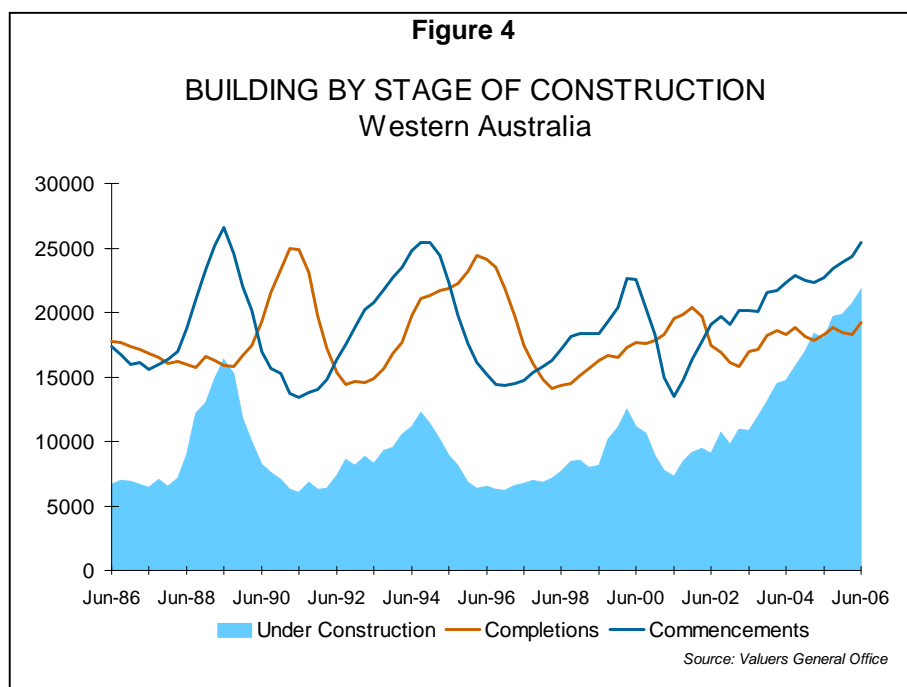
² Although part of this apparent discrepancy with the dwelling commencement data could be explained by timing, as there is typically a delay between when approvals are granted for the building of a new dwelling, and the start date for its actual construction commencement.

³ As seasonally adjusted building approvals figures tend to be volatile, trend data tends to provide a better indication of conditions.

The Urban Development Institute of Australia reports that 730 land lots were available for sale in the Perth metropolitan region at the end of September 2006, only 27% of the long-run average for Perth¹. This nevertheless represents a substantial increase on the 337 lots for sale in the June quarter². The Institute also records that 1,905 lots were sold in the Perth metropolitan region in the September quarter, an increase of 11% on the June quarter 2006 and a 4% increase on the September quarter 2005. The average price of lots sold in the Perth metropolitan region fell by 4% to \$248,652 in September, but was nonetheless 49.4% higher than in the September quarter of 2005.

Preliminary September quarter 2006 data from the Real Estate Institute of Western Australia (REIWA) suggest an 8.4% reduction in the total number of land sales in Western Australia compared to the June quarter 2006, and a 31.5% decrease on the September quarter 2005.

REIWA's data also show a 15.2% increase over the quarter and 62.1% rise over the year in the median land price in Western Australia (including regional locations), to \$235,000. Perth's median land price rose by 23.3% over the quarter and 76.7% through the year to the September quarter, to \$265,000.



¹ March quarter 1992 to September quarter 2006.

² Caution should be exercised interpreting this data as each quarter's results are only based on the stock of houses for sale at a point in time (the final day of the quarter).

The increasing cost of land has been a significant driver of growth in the price of new house and land packages. The Housing Industry Association of Australia recently released time-series data comparing typical new house and land prices by capital city. A standardised 135sqm house on a 700 square metre block in Perth cost a total of \$140,974 in 1993, with the land cost comprising 57% of the this value. In 2006, this had risen to \$379,000, with the land cost representing 71% of the total value.

Despite the trend decline in building approvals and housing finance commitments, the amount of residential work yet to be started and the stock of dwellings currently under construction are still substantial (Figure 4). This should support strong levels of construction activity over the short term.

The trend number of residential buildings commenced in Western Australia has exceeded completions in each quarter since September 2001, leading to a stock of dwellings under construction rising to a record 21,791 in the June quarter 2006. This equates to around one year's worth of supply. Anecdotal evidence suggests that capacity constraints are a contributing factor to the rise in the stock of dwellings under construction.

Established Housing

Conditions appear to have softened in the established homes market in recent months. REIWA data¹ indicate that the number of dwellings sold in the September quarter 2006 fell by 9.3% to 14,700 (relative to the June quarter 2006), while the number of dwellings available for sale at the end of the quarter in Perth increased by 84.2% to 8,829².

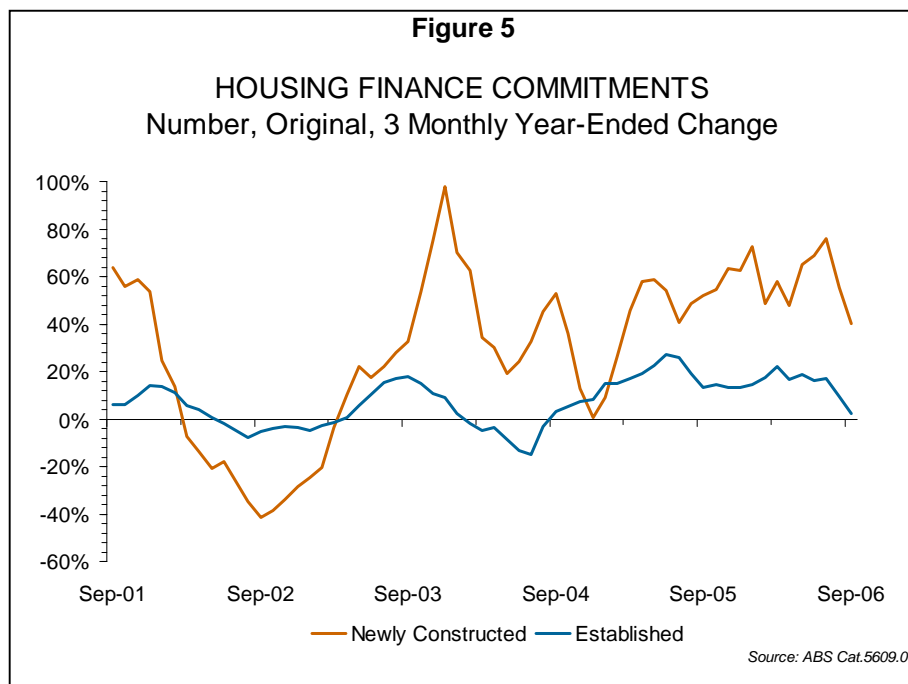
REIWA's sales to listings ratio fell by 39.5 percentage points to 57.5% between the June and September quarters, while the average number of days taken to sell a residential property in Perth rose slightly (by one day to 32 days).

Unpublished data from the Department of Land Information shows that in annual average growth terms, the number of residential properties sold in Perth was 0.2% lower in the year to September 2006 compared to the 12 months ending September 2005. Sales growth has slowed noticeably since March, with annual average growth in the number of residential properties sold in Perth of 26.3% in the year to March and 12.8% in the year to June³.

¹ The REIWA Market Update, September Quarter 2006.

² Data released by REIWA in late November 2006 indicates that this figure had risen again to approximately 11,000 (Source: *September quarter figures released*, REIWA media release, 24 November 2006).

³ The Department of Land Information data records when a contract is lodged with the Department for the sale of a property and is consequently subject to an indeterminable time lag (the date a property is sold and the subsequent lodging of a contract can be anywhere between 5 and 8 weeks). Using annual average growth terms helps 'smooth out' the effect of this lag but caution should nevertheless be expressed when reviewing the results.



Growth in the number of finance commitments for established housing in Western Australia has also eased in recent months. The number of finance commitments for established houses (excluding refinancing) was 2.5% higher in the three months to September 2006 (relative to the corresponding period of 2005), compared to growth of 9.3% in the three months to August, and 17.1% in the three months to July (Figure 5).

House Prices

Perth's median house price rose by 6.2% to \$430,000 in the September quarter 2006, according to REIWA estimates. This represents a 38.7% increase since September 2005.

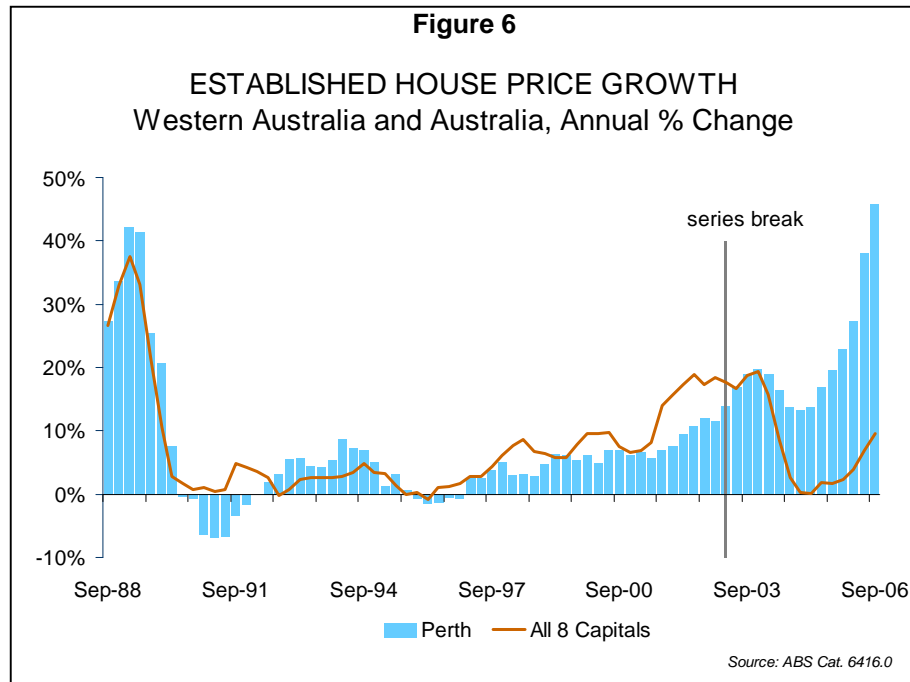
Data from Australian Property Monitors present a similar picture, indicating that the median house price in Perth for the September quarter 2006 was \$491,587, up 5% on the June quarter 2006 and 39% since the September quarter 2005. Perth's median house price is the second highest in the country, after Sydney¹.

Table 2

MEDIAN HOUSE PRICES		
September Quarter 2006		
	Value Quarter	Change Year, %
Sydney	\$520,300	0.6
Melb	\$377,000	6.2
Bris	\$330,000	1.2
Perth	\$430,000	38.7
Adel	\$285,000	3.6
Hob	\$290,000	8.8
Canb	\$375,000	7.1
Darwin	\$385,000	28.3

Source: REIA Market Facts

¹ Source: Australian Property Monitors, September Quarter 2006 Housing Price Series.



Established house price data from the ABS are also broadly consistent with these two price measures, indicating that Perth prices rose by 10.1% in the September quarter 2006 to be 45.9% higher than in the September quarter 2005¹ (Figure 6).

Table 3		
ESTABLISHED HOUSE PRICE INDEX to September Quarter 2006		
Annual Average Growth over:		
	5 years	10 years
Sydney	4.2	7.3
Melb	6.0	10.3
Bris	12.8	8.5
Perth	14.5	10.2
Adel	10.1	8.4
Hob	16.5	8.8
Canb	9.2	7.6
Darwin	11.4	6.4
Weighted Average	7.3	8.4

Source: dX

Perth's strong increase in house prices relative to the other capitals is in part due to its house price cycle being out of synchronisation with the eastern states.

For example, Sydney house prices peaked in late 2003 and have since fallen, prices in Brisbane reached their highest ever levels of growth in the year to December 2003 (when they increased by 38.8%), while only Perth, Darwin and Canberra have recorded double-digit house price growth in the year to September 2006.

Over the past ten years, however, the differences in house price growth between the state capitals have been relatively small (Table 3)².

¹ Note – neither the data collected nor the activity measured is strictly uniform in the three different house price series. The REIWA series uses data collected from APM in NSW, Residex in Queensland, a survey of real estate agents in Victoria and Tasmania, and state land title offices in the remaining states; the APM series uses Valuer General and agent reported sales data in constructing their quarterly series; and sales prices in the ABS measure are determined using Valuer General data combined with data from home mortgage lenders. In addition, the ABS uses regional stratification to control for the quality effect and compositional change. The approach uses location (suburb or postcode) to define regional strata that group together (or cluster) houses that are similar in terms of their price determining characteristics.

² It should be noted that (a) there was a break in the series in March 2002 and (b) the base of each index is: 2003/04 = 100.0.

A number of factors supporting current house price levels are expected to continue over the near term:

- strong economic growth and population growth;
- a tight labour market, and above-average wages growth;
- high commodity prices (though these may soften – see page 47);
- supply constraints with labour, material and land shortages limiting growth in the supply of new housing; and
- a tight rental market. The rental vacancy rate has fallen from 4.2% in December 2003 to 2.1% in the September quarter 2006 while the median weekly rent in Perth increased by 4.3% over the September quarter 2006 to \$250 a week, up 19% compared to the September quarter 2005)¹.

There are a nonetheless a number of other factors that could mean that the house price growth will ease over the next year or so.

The deceleration in property sales noted above has typically preceded easing price growth in previous property cycles.

The three interest rate rises in 2006 could cool demand². Investor demand may also moderate if investors see better returns in other investments. Although Perth's dwelling rents have risen they have not risen as much as house prices, suggesting a decrease in the return on rental property³.

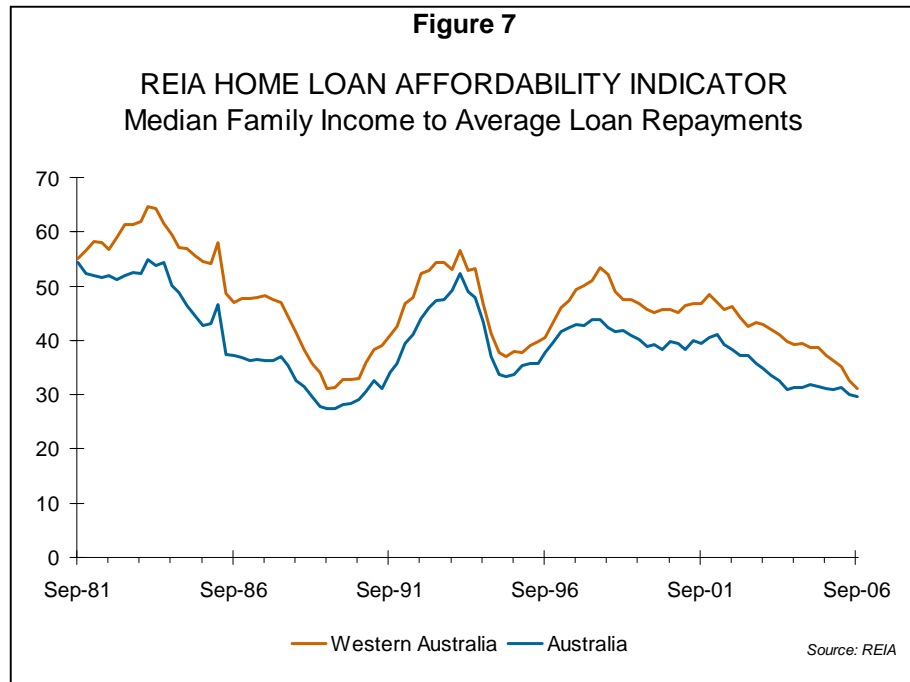
Investors may have entered the market hoping to profit from capital gains rather than rental returns. This source of demand could also soften if investors believe that strong price growth in the State's housing market may be coming to an end, either because the cycle has peaked or because of low affordability and rising interest rates. In its November 2006 newsletter, Residex warned investors who were considering purchasing property in Perth to "be very cautious and don't pay too much." In its opinion, Residex believed that the market in Perth had "turned", and has the potential to "adjust dramatically"⁴.

¹ Source: The REIWA Market Update, September quarter 2006.

² Investors are a significant proportion of the State's housing market, currently accounting for around 40% of the value of housing finance commitments (Lending Finance, September 2006, ABS Cat: 5671.0).

³ Up to the September quarter 2006, the median weekly rent for a unit grew by 4.3% over the quarter and by 26.3% over the year. The median sale price for a unit grew by 3.1% over the quarter and by 33.5% over the year. For houses, the median weekly rent grew by 4.0% and by 18.2% over the year. The median sale price for a house grew by 6.2% over the quarter and by 38.7% over the year. Source: The REIWA Market Update, September quarter 2006.

⁴ Source: Residex Newsletter, November 2006: Market Watch with John Edwards.



Declining housing affordability is also likely to affect demand and hence growth in house prices. According to the REIA housing affordability index, housing affordability in Western Australia is close to historical lows. The ratio of median family income to the average loan repayments for Western Australia declined by 4.9% in the September quarter 2006, to be 16.6% lower than in the September quarter 2005 (Figure 7).

Strong growth in house prices and recent interest rate rises are affecting first home buyers, with Department of Treasury and Finance (DTF) data indicating that the number of first home buyer finance commitments declined towards the end of the September quarter 2006.

The median price of first homes across Western Australia nonetheless rose by around 10% to \$330,000 in the September quarter, similar to the rate of growth of established house prices in Perth.

Consumer Spending

Consumption

Western Australia's real household consumption increased by 1.1% in the September quarter 2006, following growth of 1.2% in the June quarter. In annual average terms, real consumption grew by 4.2% in the year to the September quarter 2006, which is similar to its long-run average growth rate of 3.4% over the last 15 years.

Consumer confidence and spending have been buoyed in recent years by employment and wages growth (especially in the resources sector), low unemployment, rising real wages and wealth effects flowing from rising prices of equities and property.

Signs of a slight deceleration in real retail turnover (adjusted for inflation) are however beginning to emerge. In the September quarter 2006, real retail turnover rose by 1.5%, down from growth rates of 2.2% and 2.5% in the June and March quarters respectively.

The three interest rate rises in 2006 may dampen consumer spending further over the next few quarters.

Personal income tax cuts¹ and a fall in petrol prices are aiding consumption growth. Fuel prices in the Perth metropolitan area have fallen from 135.6 cents a litre for unleaded petrol in May 2006 to 116.3 cents a litre in October 2006². ABS data for the year ended 31 October 2005 show the average distance travelled by a passenger vehicle in Western Australia at 13 800km, consuming 11.3L of petrol for every 100km travelled³. Using this data, the fall in the price of unleaded petrol would lead to average savings of approximately \$23 a month for each passenger vehicle in Western Australia.

Consumer Confidence

The Westpac-Melbourne Institute of Consumer Sentiment Index⁴ fell nationally and in Western Australia, after both the August and November interest rate rises (Table 4).

Table 4

WESTPAC-MELBOURNE INSTITUTE INDEX OF CONSUMER SENTIMENT							
2006	NSW	VIC	QLD	WA	SA	TAS	AUS
January	111.8	108.9	106.3	126.3	116.4	96.6	111.8
February	108.4	107.7	106.6	129.4	109.6	117.2	110.2
March	105.2	112.2	116.7	126.2	117.5	114.0	111.5
April	108.8	113.2	110.7	114.4	117.5	111.1	111.4
May	105.1	102.1	99.4	115.8	109.3	108.2	104.3
June	103.3	97.3	104.6	118.6	105.5	104.9	103.8
July	107.3	103.5	104.6	129.1	103.2	106.5	107.4
August	86.7	90.9	88.6	108.0	83.9	81.5	90.0
September	96.5	99.1	104.5	117.6	97.6	110.2	101.2
October	100.6	106.2	105.2	118.7	104.4	103.8	105.2
November	93.6	92.2	97.7	110.2	85.6	100.4	95.0
December	102.1	106.0	109.8	116.4	102.3	105.4	106.2

Source: Westpac Melbourne Institute via Data Stream

¹ Source: www.budget.gov.au. \$36b worth of federal tax cuts over the next four years came into effect on 1 July 2006.

² Source: www.fuelwatch.wa.gov.au

³ Source: Survey of Motor Vehicle Use, Australia, 01 November 2004 to 31 October 2005, ABS catalogue 9208.0

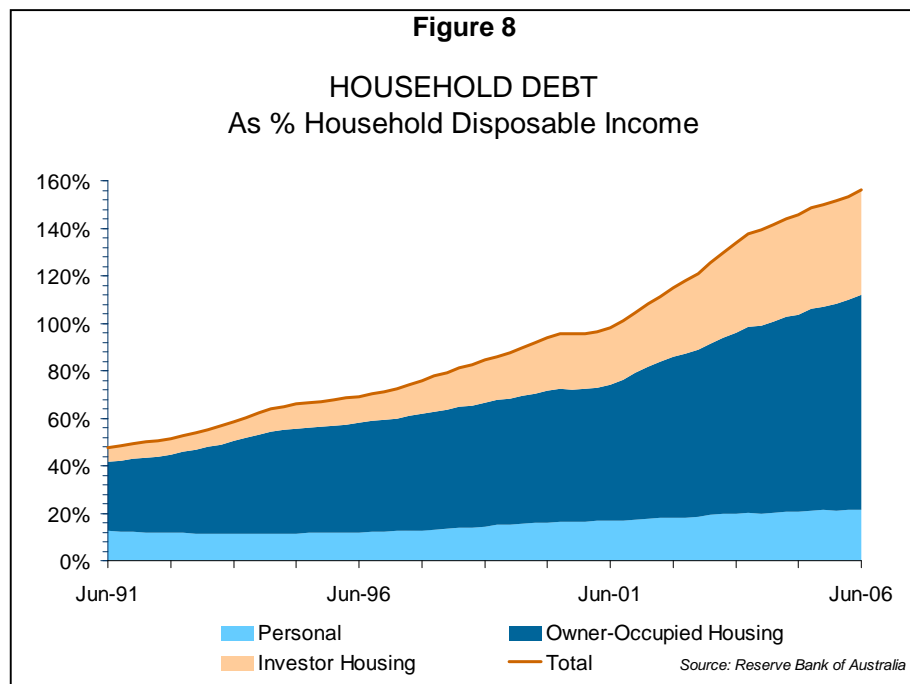
⁴ The index is derived by the percentage of respondents who reported that they were optimistic minus the percentage who believed that they are pessimistic plus 100. For example, if 900 of the 1200 respondents (75%) were optimistic about economic conditions over the next 12 months (a component question applied by WMI) and 300 were pessimistic (25%) then the index for the component question will be 150.0.

The index has proven to be highly influenced by interest rate movements, perhaps because the survey is generally taken in the second week of each month, shortly after monthly interest rates adjustments are usually announced. Although Western Australia's level of consumer sentiment has been significantly higher than Australia's throughout 2006, the falls in August and November could suggest some easing in the levels of consumer sentiment going forward.

Household Finances

In its most recent *Statement on Monetary Policy*, the Reserve Bank of Australia notes that the strength in domestic spending has been broadly reflected in the demand for finance, with total credit growing by 14% over the year. The Bank also notes that there are signs that this growth may now be starting to moderate, pointing to a slight slowing in housing finance commitments in recent months and growth in credit outstanding to the household sector easing in the September quarter.

National household debt (as a percentage of household disposable income) increased by 3.1 percentage points to 156.9% over the June quarter 2006 (Figure 8)¹ and the ratio of interest payments to disposable income rose to 11.4%. Debt has increased at a more moderate pace in recent months, suggesting that interest rate rises may be beginning to influence households' borrowing decisions².



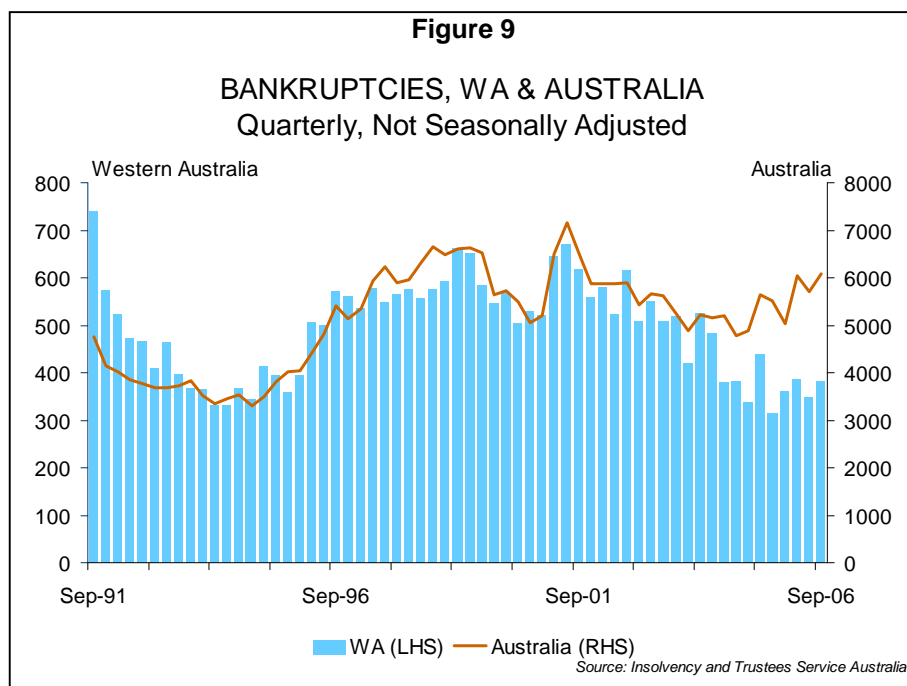
¹ Source: Reserve Bank of Australia – Table B21, Household Finances, Selected Ratios (%), seasonally adjusted). State level data are not available.

² Interest rates have risen three times in 2006; May, August and November – each time by a quarter of a percentage point to take the official cash rate to 6.25% and the standard variable interest rate to 8.05%. See Price Trends.

Other national data released by the RBA indicate that the rate of growth in the number and value of transactions on credit and charge card accounts has also slowed in recent months¹.

At a state level, there is little timely and reliable information on overall household finances. Personal finance data indicate that the value of personal finance commitments in Western Australia fell by 15.9% between their June 2006 peak and September 2006, but were still 27.2% ahead of their level in September 2005².

Bankruptcy data provide an indicator of financial stress³. Data from the Insolvency and Trustee Service of Australia showed a 22% increase in the number of Western Australian bankruptcies between the September quarters of 2005 and 2006. The magnitude of the rise was mainly because of a very low bankruptcy figure for the September quarter 2005⁴. Western Australia's bankruptcies remain well below their historical average⁵ (493 per quarter since September 1991) and are lower per capita than in any other State.



¹ Source: Reserve Bank of Australia – Credit and Charge Card Statistics – C1

² Source: Lending Finance, September 2006, ABS Cat. 5671.0.

³ Bankruptcy data tend to be a lagged indicator of household finance stress, as an individual or household's financial position could be deteriorating for some time before bankruptcy is declared. It should be noted that these numbers include both individual and small business bankruptcies.

⁴ Which at the time was the lowest quarterly number since 1990.

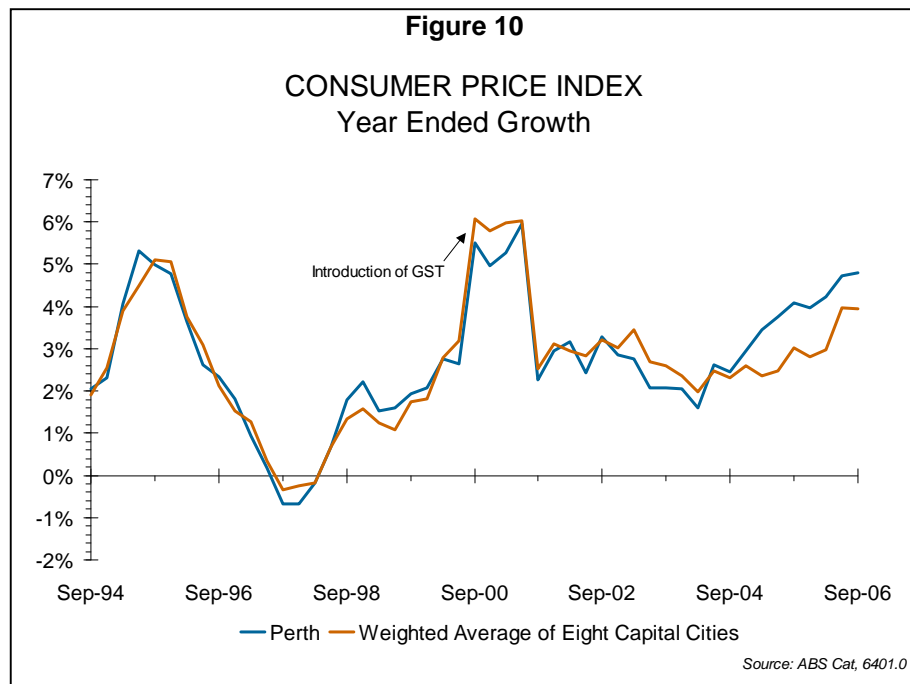
⁵ Source: Insolvency and Trustee Service Australia, September quarter 2006.

Price Trends

Consumer Prices

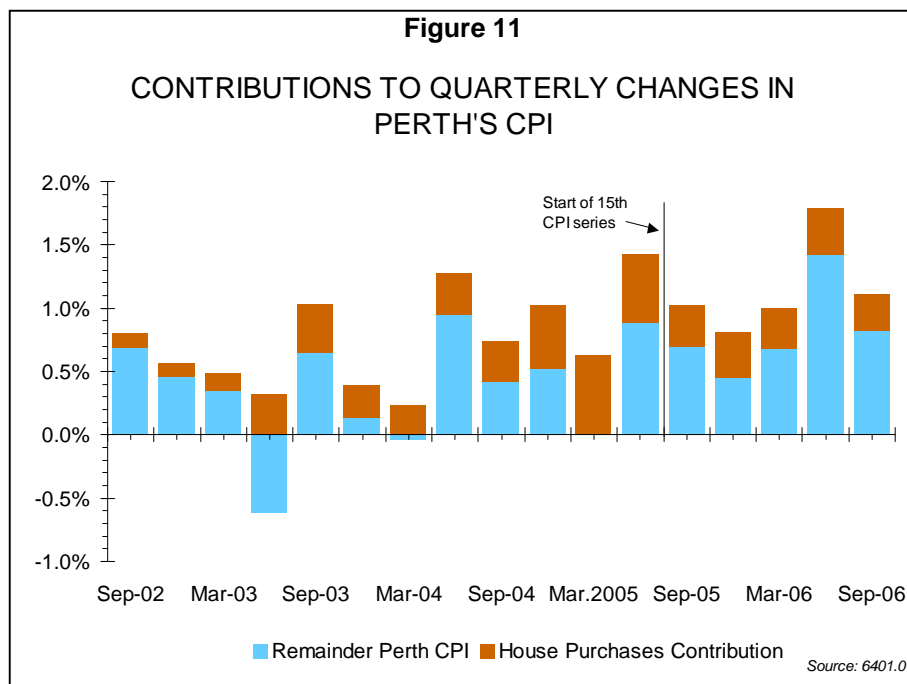
Western Australia's inflation rate has been above the rest of Australia over the past two years, a trend that continued into the September quarter 2006. Western Australia recorded quarterly and annual growth in its Consumer Price Index (CPI) of 1.1% and 4.8% respectively for the September quarter, compared to 0.9% and 3.9% for Australia¹.

The two main drivers of the acceleration in Australia's inflation in recent quarters have been in the categories of transportation (mainly fuel prices) and food (predominantly fruit and vegetables - particularly the price of bananas, which rose sharply after cyclone Larry devastated the north Queensland banana crop in March). These exceptional price movements mean that headline inflation is running significantly ahead of the key measures of core or underlying inflation².



¹ Eight capitals weighted average.

² Underlying measures of inflation exclude the more volatile items in the CPI basket, or those with exceptional price movements in a give quarter.



Perth's rising inflation in recent quarters has in part also been driven by these same factors. Fruit¹ contributed just over 18% of Perth's CPI growth over the quarter (up by 75.7% compared to the September quarter 2005) while automotive fuel slightly detracted from CPI growth over the quarter (but rose by 9.3% in the year from September 2005). In addition to sharing these nationwide inflation pressures, annual CPI growth for Perth has been above the national annual growth rate for the past ten quarters (Figure 10).

The main reason for the difference in inflation between Perth and the all-capitals' average has been the rising costs of house purchases in Perth, due to very strong house price growth².

House purchases were responsible for approximately 26% of CPI growth in Western Australia over the September quarter, compared to a contribution of 2% to Australian price growth over the same period.

¹ Published CPI data do not include price indexes for individual components, but the ABS reports that bananas contributed most of the recent national increase in fruit costs due to Cyclone Larry in north Queensland destroying a large proportion of Australia's banana supplies earlier this year. However, a separate ABS survey of the prices of selected commodities shows that Perth's banana prices increased by 249% in the June quarter, and then rose by another 45% in the September quarter, to be three times higher compared to the September quarter 2005 (Average Retail Prices of Selected Items, Eight Capital Cities, September 2006, Catalogue 6403.0).

² The housing component of the CPI comprises house purchases, rents, utility costs (e.g. for electricity, gas and water), property rates and charges, and home repairs and maintenance. The house purchase category measures only price changes associated with net additions to the housing stock through newly constructed residences (not land), and major improvements to existing homes. However, it excludes prices for the purchase of established houses, and imputed rent or capital accumulation for existing owner-occupiers (also see Box 1 "What does the CPI actually measure?").

Table 2

CONSUMER PRICE INDEX
Growth (%), September Quarter 2006

	% Change Over:	
	Quarter	Year*
Sydney	0.9	3.7
Melbourne	0.7	3.4
Brisbane	0.8	4.4
Perth	1.1	4.8
Adelaide	1.1	3.8
Hobart	0.7	3.3
Australia	0.9	3.9

**Past quarter on same quarter a year earlier
Source: ABS Cat. 6401.0*

Box 1**What does the CPI actually measure?**

The ABS publishes CPI data for the eight Australian capitals on a quarterly basis. The CPI measures changes in consumer prices over time by referencing price information from a wide ranging 'basket' of consumer goods and services (it is therefore not a measure of economy-wide inflation).

This 'basket' is of a constant quality and similar characteristics, with goods and services selected (and weighted as a part of the total CPI) on the basis of typical household expenditure patterns. This means that in calculating an average of price changes across all of the basket's items between periods, some items will be more important than others in terms of their share of household expenditure (or weight). While these weights are typically fixed between quarters, the ABS revises such weights about every five years (typically this follows the release of data from the Household Expenditure Survey). This is to ensure the basket remains representative of household expenditure patterns over longer periods of time.

The CPI's construction method means that despite rising banana prices, expenditure weights in the basket have remained the same (that is, it is an implicit assumption of the CPI that consumers will keep buying the same quantity of bananas). While this may be the case for some consumers, others may have substituted bananas for cheaper fruit, a behaviour that the CPI would not capture. Similarly, higher fuel prices might have resulted in people driving less. This may mean that the impact of banana and fuel prices on the CPI may have overestimated the cost of living.

However, it is equally important to note that such impacts also work the other way (as prices fall). The sharp rise in banana prices will eventually fall as banana plantations in north Queensland recover and supplies return to more typical levels. The Reserve Bank of Australia¹ predicts that the unwinding of banana prices (combined with lower petrol prices) will see the Australian headline rate of inflation fall over the next year with "a rate with a two in front of the decimal place relatively soon" not surprising. Falling banana prices would therefore likely have a similar effect on the Perth CPI (notwithstanding the effect of other price movements, especially house prices in Western Australia).

Another aspect of the CPI's construction worth noting in the context of current price movements is that it measures price changes for consumption goods and services, rather than for classes of investments. This means that costs associated with housing in the CPI reflect only any service (or consumption) components. So for housing, price changes associated with land, the purchase of established houses, and capital accumulation (and imputed rent) for existing owner-occupiers are all excluded items, while net acquisitions by the household sector are included (e.g. those arising from purchases outside the household sector, such as from businesses such as builders and developers, and expansion of the housing volume through alterations and additions).

1 Source: The Reserve Bank of Australia, "Measuring Underlying Inflation" (speech, 28 November 2006), http://www.rba.gov.au/Speeches/2006/sp_so_281106.html.

Inflation in Western Australia and Australia is likely to ease over 2006-07 as exceptional factors such as the prices of fuel and fruit (particularly bananas) either plateau or decrease (see Box 1).

Even so, Perth's inflation rate could remain a little above the rate for the rest of Australia for as long as its house price growth exceeds the national average by a significant margin. Perth's relatively strong recent growth in house prices is partly due to its house price cycle being out of synchronisation with the eastern states. For example, Sydney house prices peaked in late 2003 and have since fallen, and only Perth and Darwin recorded double-digit house price growth in the year to June 2006. But over the past 10 years the differences in house price growth between the state capitals have been relatively small (see *House Prices* on page 9).

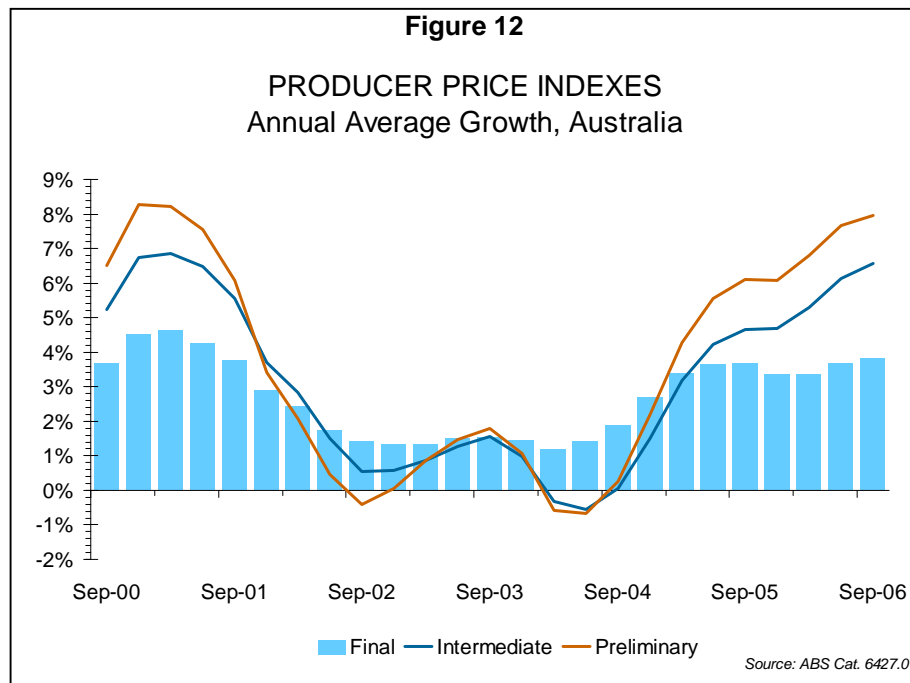
Taken over the longer term, however, CPI inflation for Perth has been similar to national inflation, with average annual growth over the past ten years of 2.7% a year in Perth comparable to the 2.6% average annual growth recorded nationally. Over the past fifteen years, the annual average growth rate in the CPIs for both Perth and the eight capitals weighted average has been identical (at 2.6% a year).

Input Prices

The strength of Western Australia's economy has led to accelerating growth in input costs.

The latest Western Australian Chamber of Commerce and Industry/BankWest *Business Expectations Survey's* index of input costs rose to a record high level for the second consecutive quarter. The increasing cost of inputs has also seen investment projects increase their project cost estimates. (For more information on how this has affected investment in Western Australia see the Business Conditions chapter on page 33).

National Producer Price Indexes¹ data show that, over about the last year and a half, firms have been absorbing cost of production increases rather than passing them on to consumers (Figure 12). The intermediate and preliminary goods price indexes show rising costs since September 2004 (in annual average terms) while final prices have not grown as sharply over the same period.



¹ The three stage of production Producer Price Indexes track price changes as commodities flow through production processes. The construction of the Indexes is similar to the CPI, with fixed weighted items observed and periodically reviewed. The CPI and final goods indexes will differ. The CPI measures the actual retail price paid by households for products, while the final goods index measures the price received by the producer exclusive of any taxes on products and transport and trade margins. The coverage of the two indexes differs (the CPI covers both goods and services while the producer price indices cover only goods); and the indexes have different weighting bases. While available at a national level, the producer price indices are not available at the State level.

However, the Western Australian Chamber of Commerce and Industry/BankWest *Business Expectations Survey* reported an increased number of Western Australian firms (compared to previous surveys) indicating their intention to increase prices in the December quarter, illustrating that firms might be moving away from absorbing price pressures.

The same survey also indicated that half of the respondents rated labour costs as having a more negative effect on them than fuel prices and interest rate rises (see section on wages below for further information).

Wages

Wage Price Index

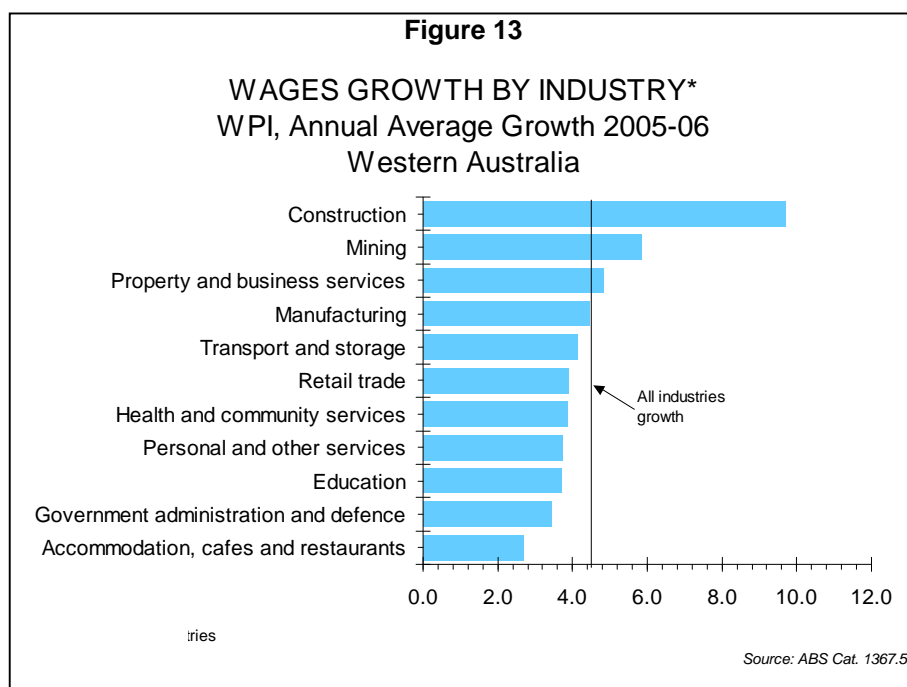
Western Australia's Wage Price Index rose by 1.3% over the September quarter and 4.4% over the year to September (in annual average terms) while Australia's Wage Price Index rose by 4.0% over the same period.

Western Australia's wages growth is above its long-term annual average of 3.5%, but given the tightness of the labour market, it is still reasonably constrained, running only a little ahead of the national average.

Recent wages growth reflects the effect of the resources and housing booms on the State.

WAGE PRICE INDEX		
Growth (%), September Quarter 2006		
	% Change Over:	
	Change:	Change
	Quarter	Year*
NSW	1.2	4.0
Vic	0.8	3.7
Qld	1.3	4.5
WA	1.3	4.4
SA	1.2	3.7
Tas	1.5	4.1
Aust	1.1	4.0

**Annual average change
Source: ABS Cat. 6345.0*



Data on growth in the Wage Price Index by industry for the June quarter¹ show the construction and mining industries experiencing the fastest growing wages in Western Australia (both up by 2.6%), while over 2005-06 the fastest growing industries (in annual average terms) were in the construction (up by 9.7%), mining (up by 5.8%) and property and business services (up by 4.8%). All other industries¹ experienced wages growth equal to or below that recorded for the State as a whole.

Earnings

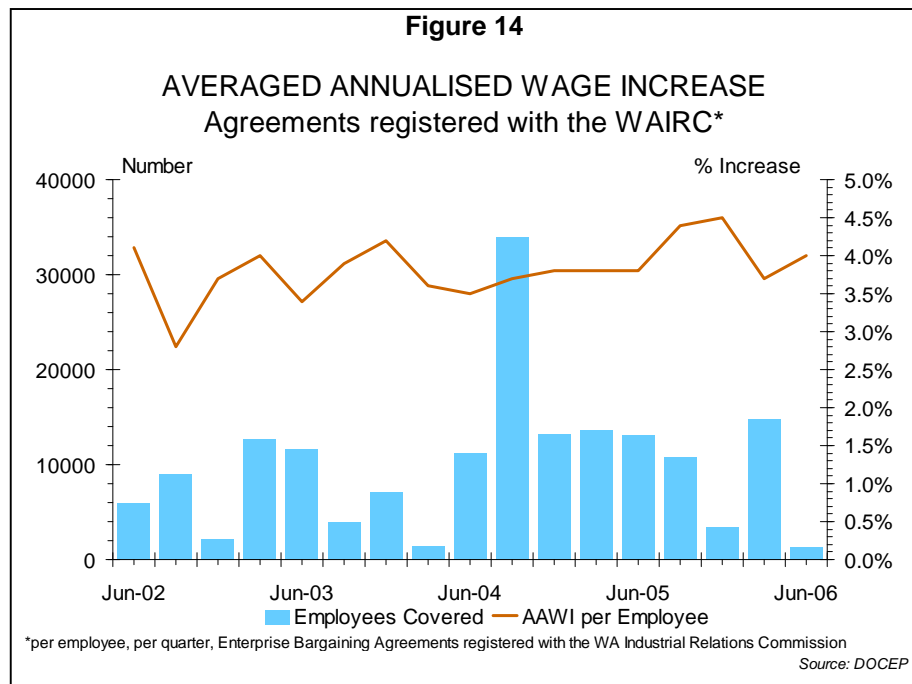
In contrast with the stable and fairly modest growth in the Wage Price Index in recent quarters, measures of earnings growth have tended to be very volatile.

Average weekly full-time ordinary times earnings grew by 4.4% over the September quarter, following weaker than expected June quarter growth of 0.2%. Over the year to September 2006, full-time ordinary time earnings grew by 6.2% in annual average terms, compared to 7.0% over the year to September 2005.

In the September quarter 2006, average weekly full-time ordinary times earnings in Western Australia reached \$1,121.10, overtaking New South Wales to become the highest of all States (but not the Territories).

Table 4		
AVERAGE WEEKLY ORDINARY TIME EARNINGS		
Growth (%), September Quarter 2006		
	% Change Over:	
	Change:	Change
	Quarter	Year*
NSW	1.0	3.8
Vic	-1.4	2.6
Qld	0.9	6.3
WA	6.1	4.9
SA	1.3	8.9
Tas	-3.2	0.8
Aust	0.5	4.6

*Annual average change
Source: ABS Cat. 6302.0



¹ The latest published industry by State data are for the June quarter 2006.

Average Weekly Earnings have recorded a similar pattern of volatile growth in recent quarters, with quarterly growth of 6.1% in September following a decline of 0.2% in June, and annual average growth of 4.9% in the year to September.

The greater volatility of the earnings measures compared to the Wage Price Index probably reflects changes in the composition of the workforce, which affect average earnings data but not the Wage Price Index, which measures movements in the wages of a fixed basket of jobs (Box 2).

Box 2

What do the main earnings indicators actually measure?

The Wage Price Index, Average Weekly Earnings and Average Weekly full-time Ordinary Time Earnings are three key ABS published wages measures. The Wage Price Index is DTF's preferred measure of wages growth.

The Wage Price Index is an index of the cost of a fixed basket of jobs, designed to measure changes in wages over time for a fixed quantity and quality of labour input. It is designed to measure wage changes rather than levels, and is analogous in its construction to the Consumer Price Index. As such, it is less subject to the influence of compositional change and hence is less volatile than the average earnings measures.

The main reason why it is preferred over average earnings is that changes in average earnings may be affected not only by changes in the level of earnings of employees, but also by changes in the composition of employment. Both earnings measures can be affected by variations in the occupational distribution within and across industries; variations in the distribution of employment between industries; and variations in the proportion of male and female employees and junior employees. In addition, aggregate average weekly earnings data can be affected by variations in the proportions of full-time, part-time and casual workers. Such compositional effects may differ within and between different states and territories, and over time.

However, the Wage Price Index has shortcomings, and so should not be seen as a definitive measure of employment-related costs. It excludes non-wage remuneration and does not reflect individuals' earnings changes, as it tracks the pay associated with a fixed basket of jobs, rather than tracking a group of employees

¹ Some industries are too small for data to be released by the ABS due to reliability of the data and confidentiality safeguards. Data for these industries is not included in the discussion on industry data for Western Australia.

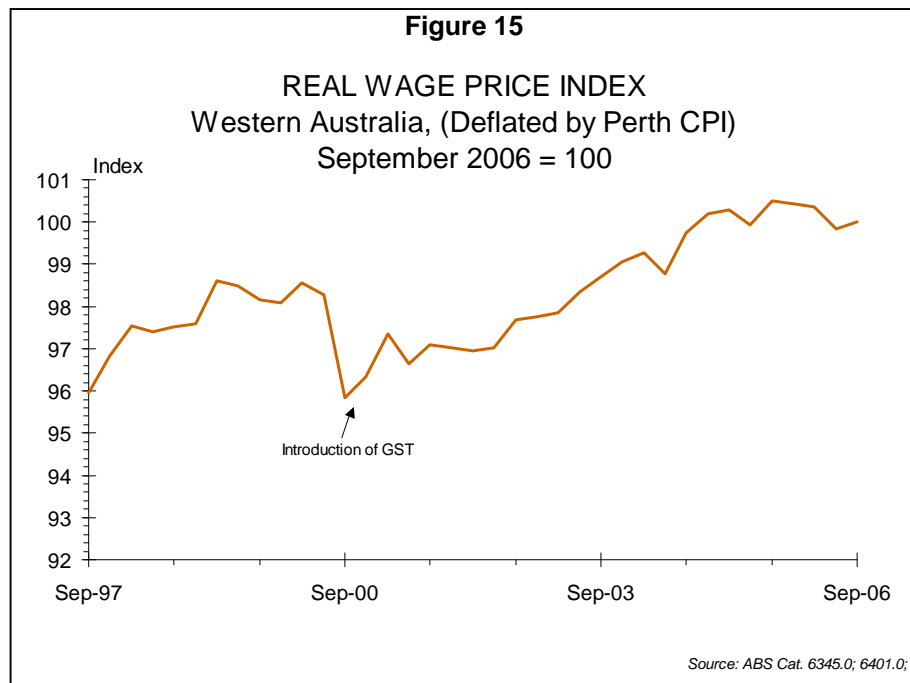
Another measure of wages growth is data on agreed increases in wage levels. This measures general wage increases in registered agreements, and gives an indication of wage responses to changing labour market conditions. The Department of Consumer and Employment Protection collects data on industrial agreements registered with the Western Australian Industrial Relations Commission. Data collected on a quarterly basis are represented as an average annualised wage increase per employee.

June 2006 data¹ show that the average annualised award increase per employee over 2005-06 was 4.0%. In an historical context the increase is fairly low (Figure 14), which provides another indication that wages pressures are still fairly constrained.

Real Wages²

Adjusting Western Australia's Wage Price Index growth for changes in Perth's CPI gives an indication of growth in real wages. Over the September quarter, the Wage Price Index rose by 0.2% in real terms. In less volatile year average terms, the real Wage Price Index remained almost unchanged (down 0.1%) over the year to September 2006 compared to the year to September 2005 (Figure 15).

These results reflect comparatively strong inflation over the period, rather than weak wages growth. Real wages in Western Australia have been fairly flat over the past two years, because high wages growth has been matched by high inflation (see *Consumer Prices* on page 16).



¹ Latest available data.

² Real wages are wages adjusted for inflation, as measured by the CPI.

Labour Market

Employment and Unemployment

Employment

Western Australia’s employment growth has decelerated from the rapid expansion experienced in 2004 and 2005. Rather than reflecting a decline in labour demand, however, this slower growth appears due to supply constraints, reflected in low unemployment rates, high labour force participation rates and a near-record proportion of the adult population in employment.

Labour demand indicators, such as advertised job vacancies and reported skills shortages, show few signs of easing.

In the year to November 2006 Western Australia’s employment increased by 1.9% in trend terms, the slowest through-the-year growth since the year to February 2004, and slower than national trend employment growth of 2.6% over the year. Of the States, only Tasmania and New South Wales recorded weaker trend employment growth in the year to November (Table 5).

Western Australia’s monthly trend employment growth has been decelerating since May 2006, but remains positive. Annual trend employment growth peaked at 6.5% through the year to July 2005.

Table 5

TREND EMPLOYMENT GROWTH
Year to November 2006

NSW	1.7%
Vic	2.6%
Qld	4.4%
SA	2.7%
WA	1.9%
Tas	-0.9%
NT	4.6%
ACT	6.1%
Aus	2.6%

Source: ABS Cat. 6202.0

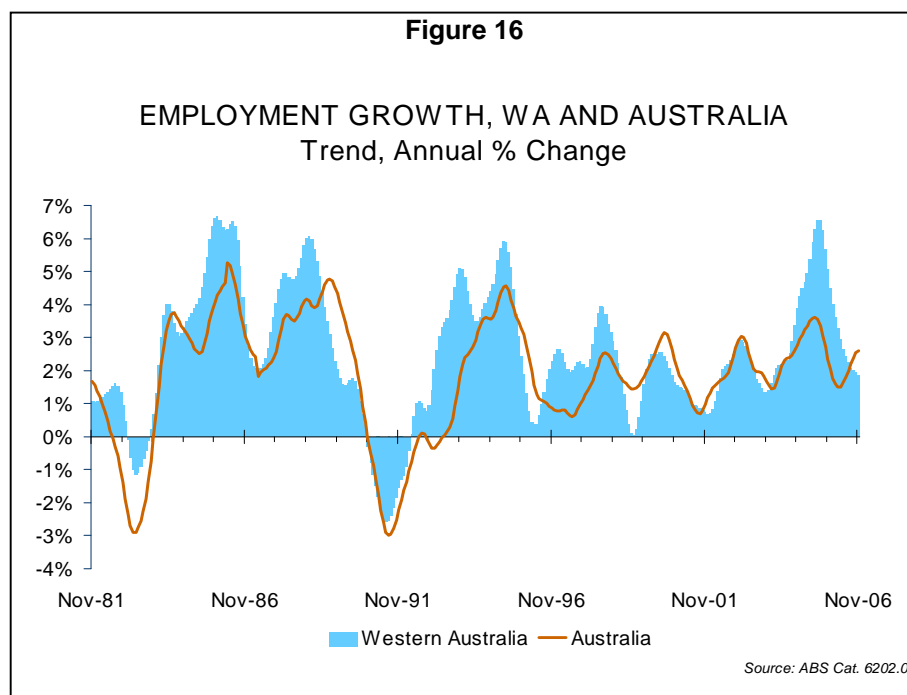


Table 7
**TREND
UNEMPLOYMENT
RATES
November 2006**

NSW	5.2%
Vic	4.6%
Qld	4.2%
SA	4.9%
WA	3.4%
Tas	6.3%
NT	4.6%
ACT	5.2%
Aus	4.6%

Source: ABS Cat. 6202.0

Employment growth has been fastest in those sectors enjoying strong growth in output and economic activity (see page 4 for a discussion of output by industry), most notably construction and mining (see page 28).

Unemployment

Western Australia's seasonally adjusted unemployment rate fluctuated between 3.1% and 3.7% in the second half of 2006, with the less volatile trend rate stable 3.4% between August and November. Strong labour demand has helped to maintain Western Australia's trend unemployment rate at its lowest level since the mid 1970s.

Western Australia's unemployment rate is the lowest of the states and it is the only state to record unemployment rates consistently below 4%.

The trend number of unemployed people in Western Australia fell to 37,900 in November, the lowest level since August 1981.

Participation

The extent to which strong labour demand has drawn people into the Western Australia labour market is reflected in the State's high participation rate¹ as well as its low unemployment rate. Although Western Australia's trend participation rate has drifted down a little from its record high of 68.1% in mid-2005, it remains higher than at any time prior to 2005, at 67.3% in November 2006.

Western Australia typically has a higher participation rate than the other States (though not the two Territories), reflecting its comparatively young demographic profile (with a large proportion of the population of working age) as well as relatively strong labour demand.

Labour Market Segments

Gender and Employment Type

The 1.9% trend increase in Western Australia's employment in the year to November was driven entirely by a 3.3 rise in full-time employment, as part-time employment decreased by 1.5% through the year. National full-time employment growth has also been faster than part-time employment growth, although the difference was less marked, at 2.8% compared to 2.0% in the year to November.

Western Australia's male employment growth was a little faster than female employment in the year to November (2.1% compared to 1.5%), in contrast with the national trend for female time employment to grow more rapidly than male (2.8% compared to 2.5%).

Table 6
**TREND
PARTICIPATION
RATES
November 2006**

NSW	63.2%
Vic	64.4%
Qld	67.1%
SA	63.0%
WA	67.3%
Tas	60.1%
NT	69.1%
ACT	74.7%
Aus	64.8%

Source: ABS Cat. 6202.0

¹ The participation rate is the percentage of the adult population that is active in the labour force. The labour force is people willing and available able to work, comprising both the employed and the unemployed.

More recently Western Australian full time employment growth has slowed markedly, growing at an annualised¹ rate of 1.0% in the three months to November, and just 0.2% between October and November. This is mainly due to rapid growth in male part-time employment, as the number of female part timers has trended downwards in the past three months.

Total female employment has been flat in trend terms in the past three months, while male employment growth remains positive, although it has decelerated (Table 8).

EMPLOYMENT BY TYPE AND GENDER							
Trend Series, Annualised Changes							
	Level	Annualised % Change Over					
	000s	1 Month	3 Months	1 Year	2 Years	5 Years	10 Years
	<i>Nov 06</i>	<i>Oct 06</i>	<i>Aug 06</i>	<i>Nov 05</i>	<i>Nov 04</i>	<i>Nov 01</i>	<i>Nov 96</i>
Australia							
<i>Males</i>							
Full-time	4,793.9	0.4%	0.9%	1.7%	2.1%	1.9%	1.3%
Part-time	864.2	5.9%	6.9%	6.9%	3.0%	3.7%	4.5%
Total	5,658.1	1.2%	1.8%	2.5%	2.2%	2.2%	1.7%
<i>Females</i>							
Full-time	2,554.9	2.6%	3.5%	5.0%	3.0%	2.8%	2.1%
Part-time	2,076.3	-2.1%	-1.2%	0.1%	2.5%	2.6%	2.9%
Total	4,631.3	0.5%	1.3%	2.8%	2.8%	2.7%	2.5%
<i>Persons</i>							
Full-time	7,348.9	1.2%	1.8%	2.8%	2.4%	2.2%	1.6%
Part-time	2,940.6	0.2%	1.1%	2.0%	2.6%	2.9%	3.3%
Total	10,289.4	0.9%	1.6%	2.6%	2.5%	2.4%	2.1%
Western Australia							
<i>Males</i>							
Full-time	524.5	0.5%	1.6%	3.5%	4.4%	3.2%	2.0%
Part-time	80.9	4.6%	1.5%	-5.9%	-1.1%	2.0%	3.9%
Total	605.4	1.0%	1.6%	2.1%	3.6%	3.0%	2.2%
<i>Females</i>							
Full-time	243.2	0.0%	0.0%	2.8%	3.4%	3.6%	2.2%
Part-time	226.9	-0.5%	-0.2%	0.1%	3.0%	2.2%	3.0%
Total	470.1	-0.3%	-0.1%	1.5%	3.2%	2.9%	2.6%
<i>Persons</i>							
Full-time	767.6	0.2%	1.0%	3.3%	4.1%	3.3%	2.1%
Part-time	307.9	1.2%	0.4%	-1.5%	1.9%	2.1%	3.2%
Total	1,075.5	0.4%	0.9%	1.9%	3.4%	2.9%	2.4%

Source: ABS Cat. 6202.0

¹ Annualised growth rates show the growth in employment that would occur if the rate of growth in a particular period was sustained for a single year. It allows for easy comparisons of growth rates over periods of less than and more than a year, as in the Table above.

Industry

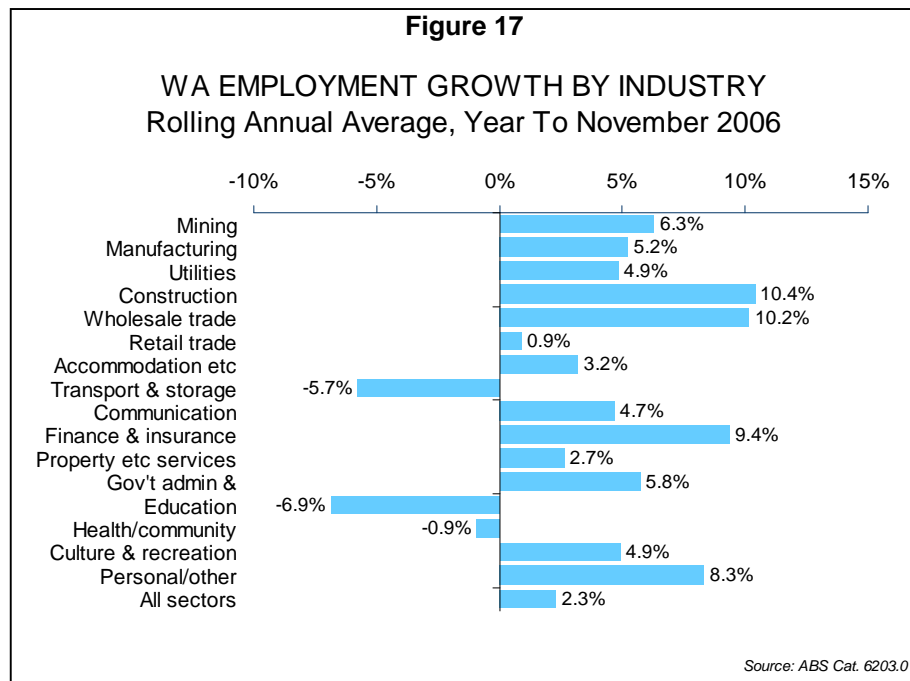
The trends in employment growth by industry are consistent with broader evidence of economic activity by sector, with rapid employment growth in the booming mining and construction sectors.

Wholesale sector employment rebounded in 2006 after falling sharply between 2004 and 2005, and finance and insurance employment has also risen rapidly.

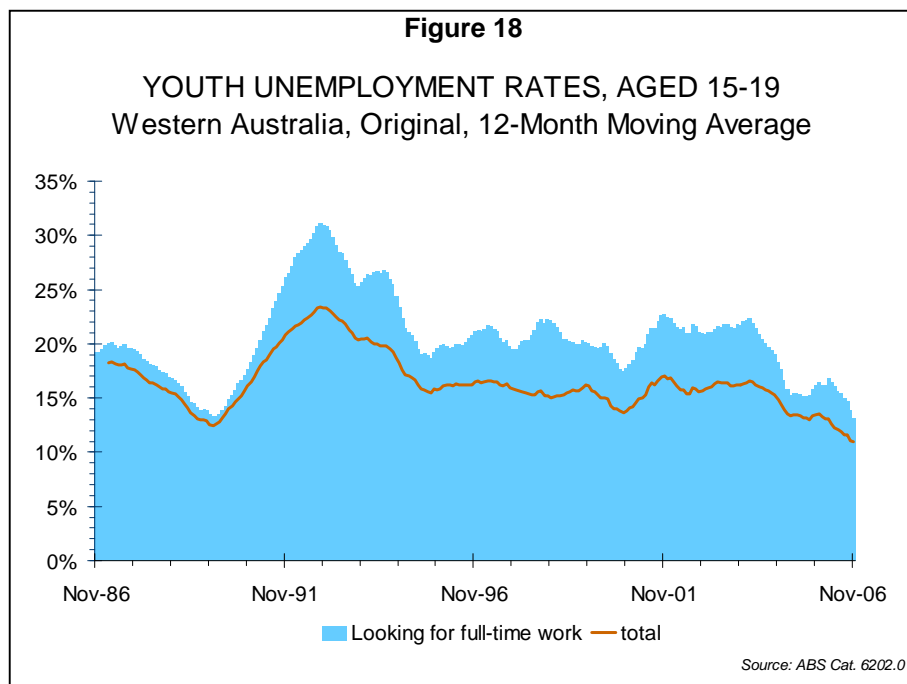
Employment data by sector can be highly volatile, especially in smaller States like Western Australia. To offset this volatility the data in Figure 17 are presented as the change in four-quarter moving average levels of employment by sector in Western Australia.

Even so the data can be erratic, so caution should be used in interpreting these employment data by sector.

The high level of the skilled vacancy index¹ for Western Australia suggests widespread skill shortages, particularly in the trades, with current demand especially strong for workers in the construction trades, metal trades and electrical and electronic trades. Demand for building and engineering professionals has declined over the year to be slightly below the demand level of October 2005.



¹ The Skilled Vacancy Index is compiled by the Department of Employment and Workplace Relations



Youth

Western Australia's youth unemployment rate averaged 10.9% in the 12 months ended November 2006¹, while the unemployment rate of young people looking for full-time work averaged 13.9%². Both measures of youth unemployment have trended sharply downwards in recent months (Figure 18).

Nationally, youth unemployment rates are also trending downwards, but are significantly higher than in Western Australia. In the year to November Australia's overall youth unemployment rate averaged 15.2%, and the unemployment rate among 15-19 year olds looking for full-time work averaged 20.5%.

Regions

Labour market conditions diverge markedly across the State's regions, although unemployment rates are low by historical standards in most areas of the State. Table 9 shows Department of Employment and Workplace Relations estimates of the labour force and unemployment rates in Western Australia local government areas (Cities, towns and shire) outside the Metropolitan area, for areas with employment of 2,000 or more.

¹ These data are presented as 12-months averages as the ABS does not publish seasonally adjusted or trend estimates by State, and youth unemployment fluctuates from month to month, especially when school leavers enter the labour market.

² The youth unemployment rate is defined as persons aged 15 to 19 years seeking employment, as a share of the 15-19 year olds in the labour force. The full-time unemployment rate (persons seeking full-time work as a share of the full-time labour force) is often preferred as a measure of unemployment for this group, as a very large proportion of unemployed 15-19 year olds (42% in the year to November) are in full-time education and looking for part time work.

Relatively high unemployment rates of 5% or more were recorded in Mandurah, Geraldton, Denmark, Collie, Northam, and Wyndham-East Kimberley. The lowest unemployment rates were reported for Capel, Harvey, Merredin, Roebourne, Donnybrook-Balingup, Gingin and Ashburton. The average unemployment rate in Perth was a little higher (3.9%) than in the balance of Western Australia (3.6%).

	Unemployed	Employed	Labour Force	U/E Rate
Western Australia:	42,200	1,064,200	1,106,400	3.8%
Perth	31,600	780,500	812,100	3.9%
Balance:	10,600	283,600	294,200	3.6%
Mandurah	1,399	22,329	23,728	5.9%
Kalgoorlie/Boulder	515	18,405	18,920	2.7%
Bunbury	661	17,625	18,286	3.6%
Albany	756	16,482	17,238	4.4%
Busselton	419	12,800	13,219	3.2%
Harvey	278	10,795	11,073	2.5%
Geraldton	604	10,132	10,736	5.6%
Roebourne	216	9,678	9,894	2.2%
Broome	321	7,711	8,032	4.0%
Esperance	263	7,376	7,639	3.4%
Port Hedland	307	7,316	7,623	4.0%
Greenough	312	7,275	7,587	4.1%
Augusta-Margaret River	203	6,215	6,418	3.2%
Manjimup	193	6,151	6,344	3.0%
Murray	269	5,397	5,666	4.7%
Dardanup	163	5,463	5,626	2.9%
Collie	254	4,511	4,765	5.3%
Capel	112	4,321	4,433	2.5%
Wyndham-East Kimberley	203	3,855	4,058	5.0%
Derby-West Kimberley	168	3,774	3,942	4.3%
Carnarvon	168	3,679	3,847	4.4%
Ashburton	55	3,721	3,776	1.5%
East Pilbara	109	3,645	3,754	2.9%
Northam	180	3,274	3,454	5.2%
Donnybrook-Balingup	59	2,704	2,763	2.1%
Narrogin	81	2,571	2,652	3.1%
Plantagenet	96	2,522	2,618	3.7%
Katanning	108	2,378	2,486	4.3%
Coolgardie	67	2,384	2,451	2.7%
Denmark	137	2,314	2,451	5.6%
Bridgetown-Greenbushes	88	2,358	2,446	3.6%
Merredin	55	2,143	2,198	2.5%
Gingin	46	2,146	2,192	2.1%
Toodyay	72	2,115	2,187	3.3%

*Source Small Area Labour Statistics: Australia, September 2006.
Department of Employment and Workplace Relations, and DTF Estimates.*

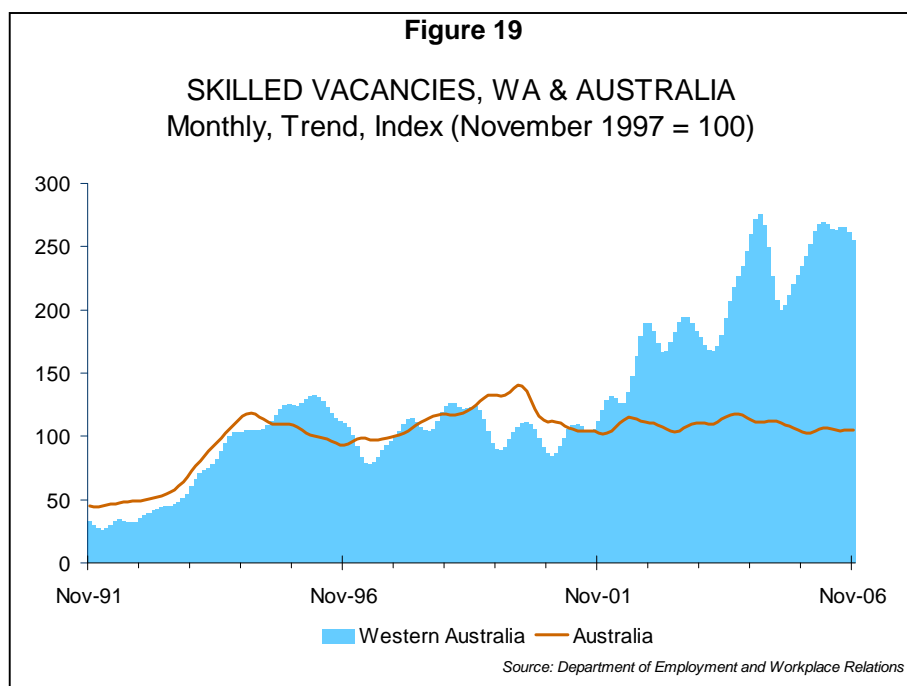
Labour Market Pressures

Recent business surveys, counts of job advertisements and skilled vacancies data suggest that demand for labour in Western Australia remains very strong, although some of these indicators appear to have peaked. On balance the data suggest that skilled labour shortages will continue in the short term.

Job Vacancies

The number of newspaper job advertisements in Western Australia is at near record levels. The ANZ Bank Newspaper Job Advertisements trend series¹ for Western Australia peaked in July 2006 and has since edged down slightly, but nonetheless rose by 12.5% in the year to November. Australia's newspaper job advertisements have trended downwards since November 2004, but this decline has been more than offset by a rise in jobs advertised on the Internet. In the year to November trend total (Internet plus newspaper) Australian job advertisements rose by 18.1%.

Western Australia's trend Skilled Vacancies Index¹ has edged downwards in recent months, but it remains well above its historical average, suggesting that skills shortages in Western Australia persist although they may no longer be getting worse. In the year to November the trend Western Australian Skilled Vacancies Index rose by 8.9%, while the Australian Index rose by 0.9%.



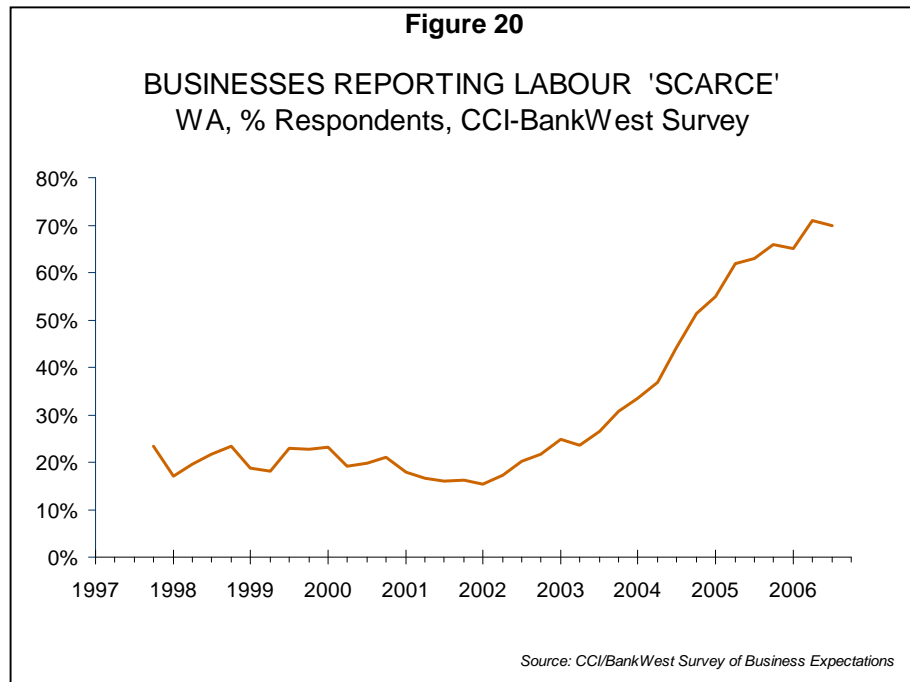
¹ The ANZ Bank has cautioned that newspaper job advertisements are likely becoming a less useful indicator of labour demand due to the growing use of Internet job advertisements. While the ANZ provides an Internet job advertisement series at a national level, data are not available at a State level.

Business Surveys

Both the Access Economics *Business Outlook* and Western Australian Chamber of Commerce and Industry (CCI) *Economic Compass* for the September 2006 quarter have forecast employment growth to continue in the near term in Western Australia.

The September 2006 quarter CCI - Bankwest Survey of WA Business Expectations reported that 70% of businesses surveyed said labour was "scarce" during the quarter, up from compared to 63% a year previously but down marginally from its 71% peak in the previous quarter (Figure 20).

CCI reports that labour shortages are most acute among larger firms and those in the production sector, where around 80 per cent of respondents indicated that labour was scarce. Labour shortages were expected to continue into the December quarter.



¹ Compiled by the Department of Employment and Workplace Relations (DEWR)

Business Conditions

Business conditions have been very positive in Western Australia over the past year. This has been particularly so in mining, the State's largest industry, which is currently enjoying high world prices for resource commodities. Construction activity has also been strong, with residential building from the State's housing boom and resource-related engineering projects pushing the sector towards full capacity.

The strong conditions for the State's resource industry have led to a substantial increase in business investment, which increased in volume by 37% over 2005-06, and 139% in the past five years. Capacity utilisation rates have risen despite this strong investment.¹

However, not all sectors of the economy have grown as strongly as the resources and construction sectors. Furthermore, the strengths of activity in these sectors has led to labour shortages and wage pressures (see Labour Market chapter), rising materials costs and construction delays. Most businesses continue to report increasing costs, particularly for skilled labour, fuel and materials.

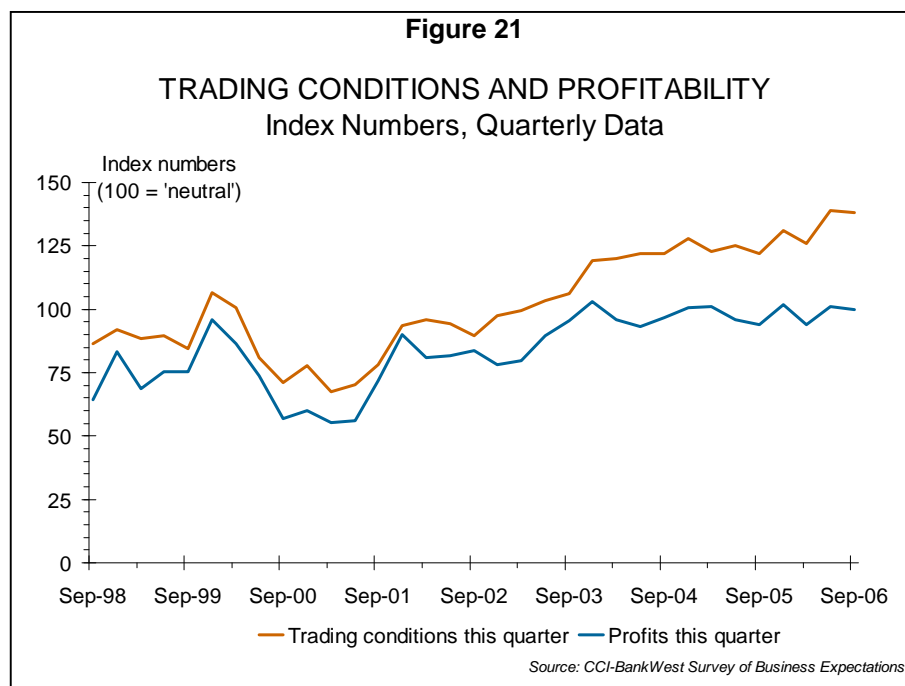
Business Surveys

Business surveys report mixed responses from businesses on economic and trading conditions.

The September quarter 2006 *CCI-BankWest Survey of WA Business*² found that, of the core indicators used in the survey, only the export sales index improved during the quarter. However, this comes after a sharp increase in turnover, profits and trading conditions during the June quarter. Conditions were still strong by historical standards, with trading conditions in particular at near-record highs (Figure 21).

¹ *CCI-BankWest Survey of WA Business* and *NAB Quarterly Business Survey*, both for the September quarter 2006.

² The *CCI-BankWest Survey of WA Business* is a quarterly State-based survey which measures the confidence of Western Australian businesses, covering all sizes and sectors across the State. The views of 399 firms were canvassed for the September quarter 2006 survey. The survey measures the confidence of businesses in both the National and State economies. Businesses are also surveyed on their outlook for general business conditions, the labour force and operating conditions. The figures reported in the survey are not seasonally adjusted and some care needs to be taken in interpreting the results. The index calculations used give weight to the 'extent' to which an indicator is rising or falling (i.e. a response indicating that employment this quarter is "much less" than last quarter is given a higher weight than one saying it is "less").



The National Australia Bank's *Quarterly Business Survey*¹ indicated that business conditions in Western Australia improved over the September quarter, with improvements in profitability and trading conditions. This was accompanied, however, by a scarcity of suitable labour and an acceleration in labour costs.

The Bank's survey also found that conditions were stronger in Western Australia than in any of the other States. Business confidence in Western Australia was found to have fallen during the quarter, but to still be strong by historical standards.

The *Sensis Business Index – Small and Medium Enterprises*² survey found that in Western Australia, small and medium enterprises' confidence in their own business conditions for the coming 12 months fell slightly compared with the previous quarter, but were well above the national average.

¹ The *NAB Quarterly Business Survey* documents the current performance, as well as the near-term and medium-term expectations, of the non-farm business sector, based on a survey of around 900 SMEs across Australia. Respondents are chosen at random from those firms with 40 or more employees within the major non-rural industry groups.

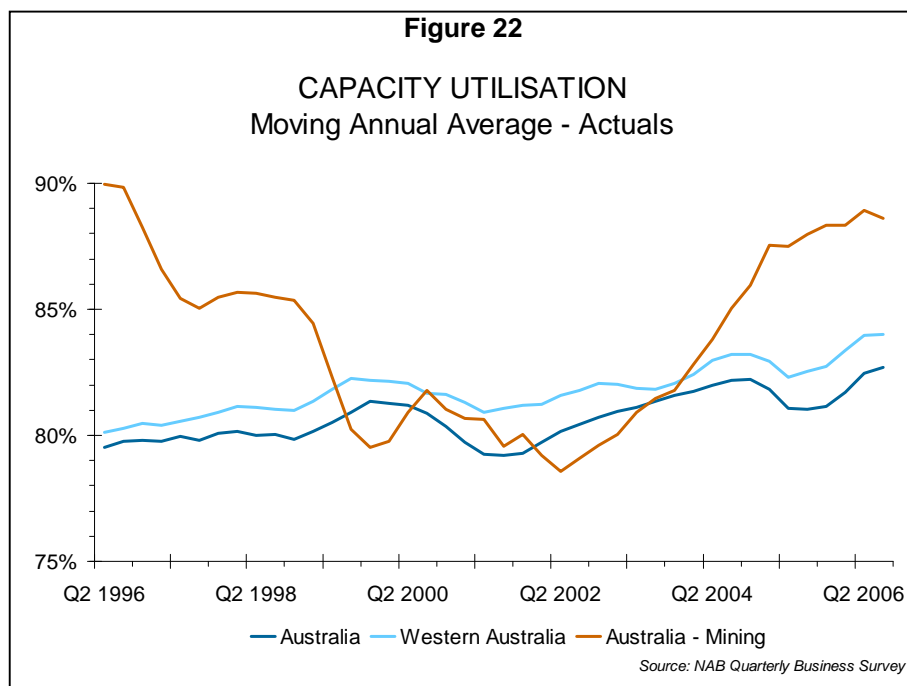
² The *Sensis Business Index – Small and Medium Enterprises* survey documents small and medium sized businesses' assessments of their current conditions and future expectations of sales values, size of workforce, wages bills, prices, profitability and capital expenditure. The latest survey was conducted over the three month period from 25 July to 15 August 2006. Due to the methodology employed in this survey, caution should be used in making inferences from its results. The size of the survey sample was limited to 225 businesses in Western Australia, of which 195 were based in the metropolitan area. The survey used an unweighted 'net balance' approach. For example, if 40% of survey respondents reported business conditions as 'positive' and 20% as 'negative', the net balance index would be 20.

This was reflected in expectations of sales and profitability, which were similarly strong. Sensis attributed the decline in confidence to “anxiety over future economic issues such as fuel prices, consumer demand and interest rates.”

While business confidence was strong during the quarter, businesses in the *Sensis Business Index* survey continued to report growing cost pressures, characterised by higher fuel prices and wage costs, with the growth in the latter being particularly marked (see Labour Market chapter for more information on labour shortages).

In a further indication of the cost pressures on firms, the *CCI-BankWest Survey's* index of input costs rose to a record high in September¹, for the second consecutive quarter, increasing by 2.9% to 176. Despite these increases in costs, businesses reported having difficulty in passing on costs to their customers, due to competitive pressures (see Price Trends chapter for more information on wages and other cost pressures).

With labour and other constraints, it is not surprising that capacity utilisation was very high for Western Australian businesses during the September quarter. The *CCI-BankWest Survey* found capacity utilisation remained high among respondents, whose capacity utilisation rate was 84% on average. This high level of capacity utilisation was virtually unchanged from the record levels reached recently².



¹ This index has been included in the *CCI-BankWest Survey* since December 1997.

² Capacity utilisation has also been included in the *CCI-BankWest Survey* since December 1997.

Similarly, the *NAB Quarterly Business Survey* found that capacity utilisation rates reached record highs in Western Australia and across the country as a whole¹, but with those rates being the highest in Western Australia (Figure 22).

The nationwide capacity utilisation rate for the mining industry is also shown in Figure 22². Capacity utilisation in the mining industry is considerably higher than the averages for either Western Australia or Australia as whole. These tight capacity constraints in the industry at the moment are due to high commodity prices and the long lead-times involved in developing additional capacity through resources projects. As producers are unable to quickly expand their capacity in response to high prices, they must instead work their current projects more intensively in order to increase production.

Despite capacity being stretched, the capital investment intentions of Western Australian businesses were found to have weakened over the quarter by the *CCI-BankWest Survey*³. The *Sensis Business Index* reported a similar finding, although limited to small and medium enterprises. Of the businesses surveyed, more said that they would decrease their capital expenditure than would increase it in the three months to October 2006.

However, these surveys do not weight responses for the size of investment being planned. In Western Australia overall investment activity tends to be dominated by a few very large projects, so the number of businesses planning to increase investment is at best only a partial indicator of likely investment levels.

The Access Economics *Investment Monitor* categorises major investment projects by value and by status, into the categories “under construction”, “committed”, “under consideration” or “possible”. The September quarter publication reported that a total of \$31.2 billion of major projects were under construction in Western Australia, up from \$23.3 billion in June and \$18.8 billion a year previously, in September 2005.

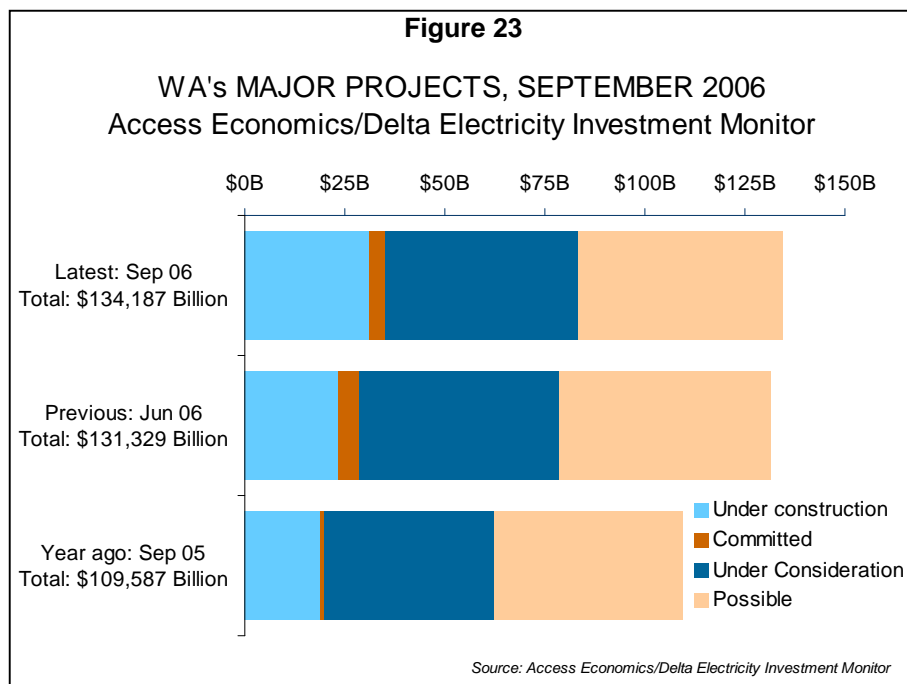
The value of “committed” projects fell during the September quarter, from \$5.6 billion in the June quarter to \$4.0 billion, but was nonetheless substantially higher than the \$1.4 billion recorded in September 2005⁴.

¹ Since the *NAB Quarterly Business Survey* began publication in the December quarter 1994.

² Mining sector capacity utilisation rates are national, as industry data is not provided at the State level. However, due to the large share of Australia’s total mining industry located in Western Australia (45% by total factor income in 2005-06), this series is a reasonable representation of conditions in the State.

³ As this analysis is based on an index that is not adjusted for firm or project size, caution should be taken in using it as an indicator of actual business investment intentions in Western Australia. It also worth noting that the sample size was only 399 firms for this survey.

⁴ It should be noted, however, that the value of “committed” projects was unusually low in the September quarter 2005.



The *Investment Monitor* reports that the total value of projects in all status categories rose from \$109.6 billion in September 2005 to \$131.3 billion in June 2006 and \$134.2 billion in September 2006 (Figure 23).

The *CCI-BankWest Survey* reports that 59% of respondents indicated that the August interest rate rise would not affect their business¹. While the 59% proportion is quite high, it is lower than the response to the May rate rise, which 70% of businesses believed would have no effect on their operations. Most of the firms surveyed were expecting a further rate rise before the end of the year (the survey was conducted before the Reserve Bank of Australia raised the official cash rate target to 6.25% on 8 November 2006), and just over half believed that it would have a negative impact on their business.

Although labour availability improved marginally during the quarter, businesses continued to report that suitable labour was scarce. In the *CCI-BankWest Survey*, 70% of businesses indicated that labour was "scarce" in the September quarter 2006, up from 63% in the September quarter 2005. Labour shortages were reported as a problem by businesses across all sectors and sizes, however the problem was more acute for larger firms and those in the mining, construction and agriculture sectors.

While labour was scarce, recruitment activity and intentions for the coming quarter remained strong, particularly among large firms².

¹ On 2 August 2006 the Reserve Bank of Australia raised the cash rate by 25 basis points, from 5.75% to 6.00%. This followed the rise from 5.50% on 3 May 2006.

² The *CCI-BankWest Survey* found that over 43% of medium-sized firms, and half of all large firms had hired more staff during the September quarter. Overall, 36% of respondents hired more staff during the quarter.

The *CCI-BankWest Survey's* index of wage costs also reached a record high in the September quarter¹.

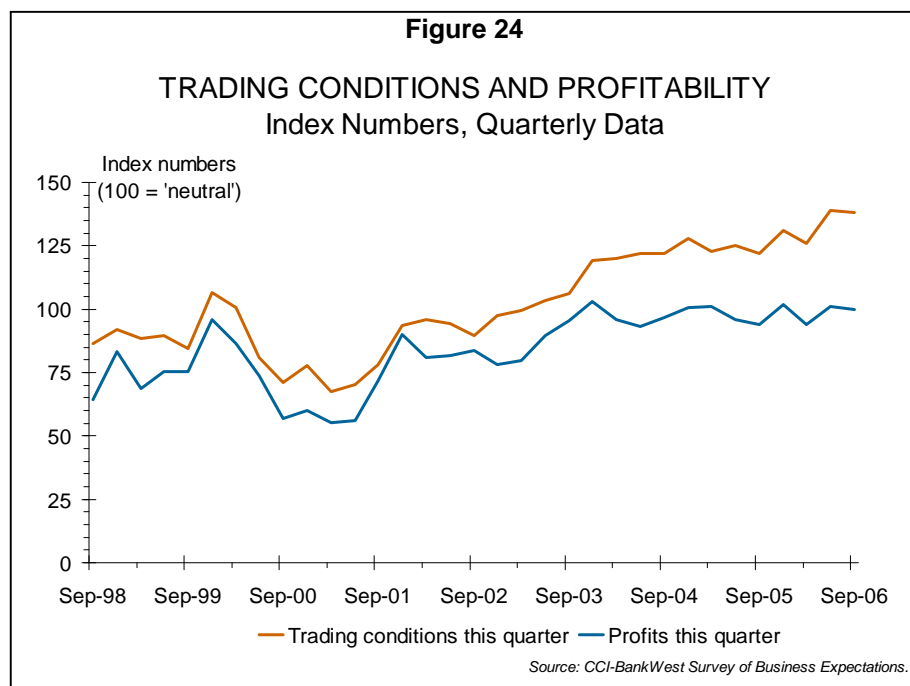
Labour was expected to remain tight in the December quarter. The index of labour availability, based on businesses' expectations for the December quarter, was at 28, only marginally higher than the record low of 27 reached in the June quarter 2006 (See the Labour Market chapter for more information).

Profitability and Business Indicators

Profitability

There are no reliable and timely state-level data on profits, but national data on gross profits by industry show that the mining industry² has experienced rapid growth in profits in the past two years, while in other sectors profit growth have generally been weaker (Figure 24).

The ABS's recent release of annual Gross State Product (GSP) data contains estimates of Gross Operating Surplus¹ that provide a rough proxy of profits.



¹ This was somewhat affected by a seasonal component, as many employers apply annual wage increases at the beginning of the financial year.

² National level data for mining can be a reasonable guide to conditions in the mining industry in Western Australia, see footnote 6 above.

The table below shows that three of the four largest industries² in the State recorded strong rates of growth in Gross Operating Surplus in 2005-06, with mining up 44.9%, construction up 40.9%, and property and business services up 16.9%. Growth in manufacturing Gross Operating Surplus was somewhat lower, at 5.6%.

Table 10

GROSS OPERATING SURPLUS AND GROSS MIXED INCOME
Western Australia, By Industry, Nominal Growth (%)

Industry	2003-04	2004-05	2005-06	%Annual Average Change (over past 3 years)	% Share of WA GOS* (average over past 3 year)
Agriculture, forestry and fishing	66.2	-22.6	1.1	9.1	6.3
Mining	-12.2	52.9	44.9	24.8	40.0
Manufacturing	33.1	-4.5	5.6	10.3	8.3
Electricity, gas and water supply	5.7	4.0	7.7	5.8	4.5
Construction	12.6	6.4	40.9	19.1	7.7
Wholesale trade	17.8	7.7	3.9	9.6	4.0
Retail trade	13.9	-3.6	5.0	4.9	3.7
Accommodation, cafes and restaurants	10.7	9.6	6.4	8.9	1.1
Transport and storage	11.1	12.6	0.9	8.1	4.3
Communication services	5.2	2.4	-4.5	0.9	4.0
Finance and insurance	12.7	-0.2	17.3	9.7	4.8
Property and business services	4.2	15.8	16.9	12.1	8.7
Education	46.4	14.6	27.7	28.9	0.1
Health and community services	12.7	6.3	17.1	11.9	1.4
Cultural and recreational services	34.8	-7.9	4.6	9.1	0.7
Personal and other services	10.6	0.8	3.2	4.8	0.3
TOTAL	7.4	15.4	22.6	15.0	100

**Excludes Ownership of Dwellings and General Government*
Source: ABS Cat. 5220.0

¹ Gross Operating Surplus is derived as the excess of gross output over the costs incurred in producing that output. operations in Australia. The ABS only produces Gross Operating Surplus industry data at a state level on an annual basis.

² These account for around two thirds of all industry Gross Operating Surplus over the **past** three years. Mining is by and far the largest at 40%, followed by Property and Business Services (8.7%), Manufacturing (8.3%) and Construction (7.7%)

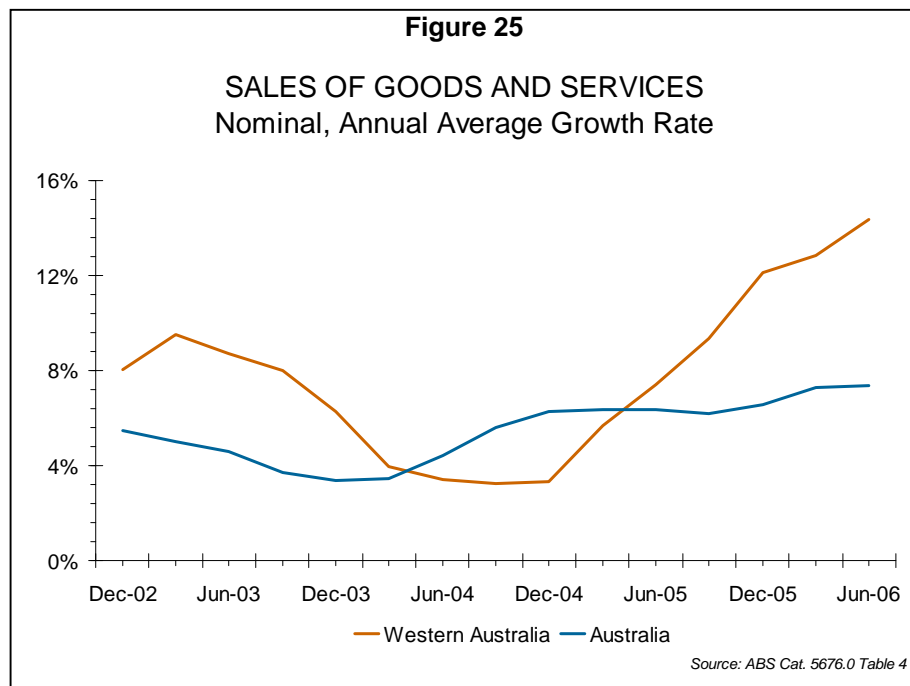
Business Indicators

Growth in sales of goods and services by businesses in Western Australia has been strong over the past few years¹.

Sales grew by 6.8% during the June quarter 2006 and by 14.3% over 2005-06 (in annual average terms) to \$47.4 billion². This growth was considerably higher than the national average (Figure 25). Growth in sales has been underpinned by strong economic conditions, buoyant consumer confidence, steady jobs growth and higher wages.

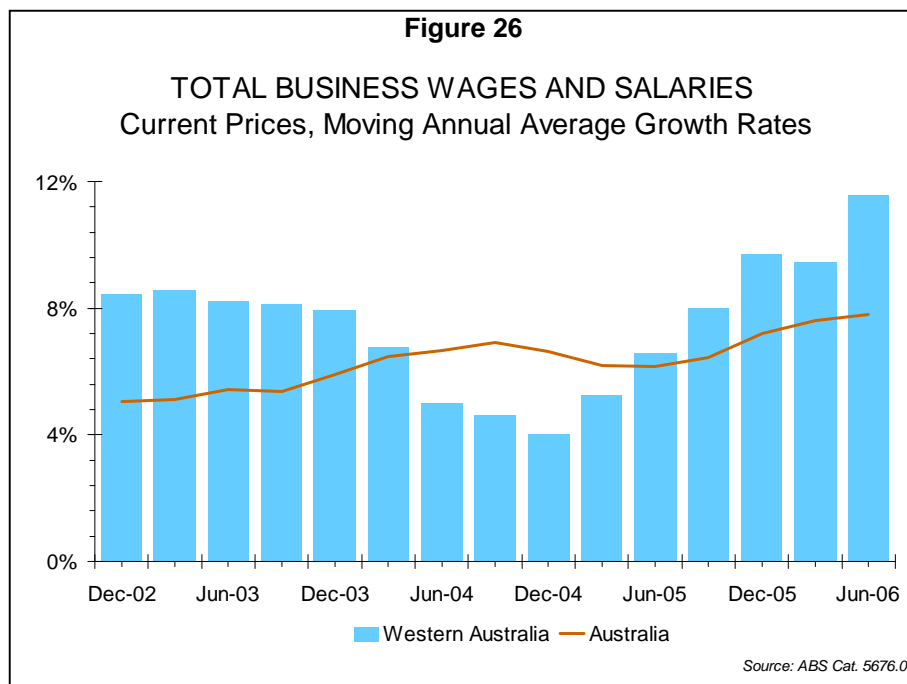
These data are aggregates and are not adjusted for changes in the number of businesses, changes in business size, or changes in industry composition.

Wages and salaries data show that the annual average rate of growth in these costs has increased significantly in Western Australia over the past year and a half. Over the past four years, however, growth in total wages and salaries in the State of 35.2% has been only moderately ahead of growth nationally of 28.7% (Figure 26).



¹ The ABS has only published State-level data since March 2001.

² ABS Quarterly Survey of Business Indicators, Catalogue Number 5676.0



Business Investment

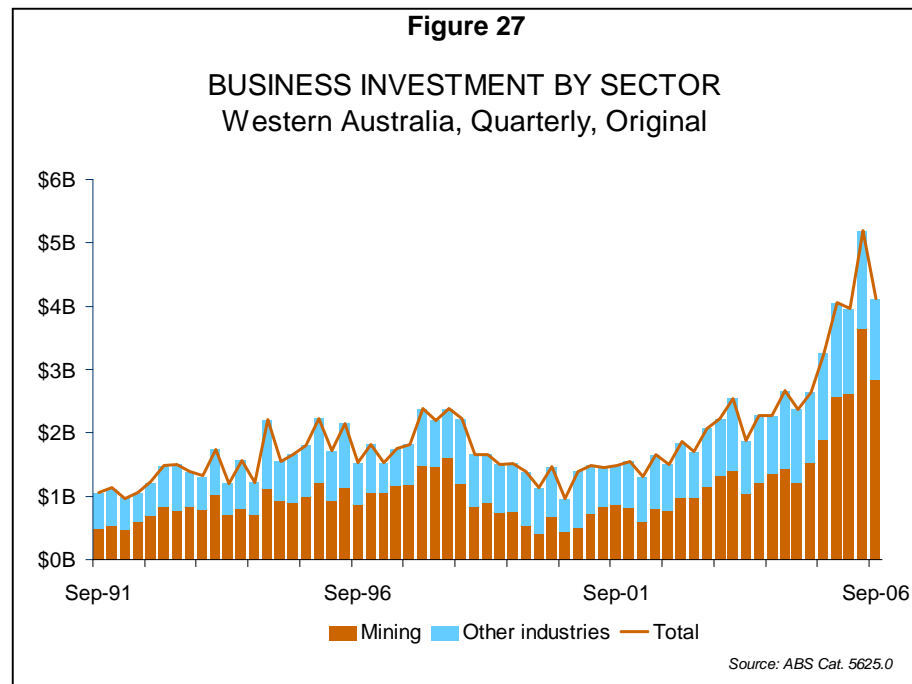
Business investment in Western Australia dropped by 13.7% in the September quarter 2006 compared to its June quarter peak, but was nonetheless 35.7% higher than its level a year previously (Figure 27).

This investment has mainly been driven by large resource-related investments begun in response to strong demand and prices for key commodities overseas, particularly China (see the Global Markets chapter).

Western Australia accounted for 23.4% of capital expenditure¹ in Australia during the 12 months to September 2006². Capital expenditure in Western Australia has grown rapidly in the past few years, and in the four quarters to September 2006 in particular. This growth has been driven primarily by the mining industry (Figure 27).

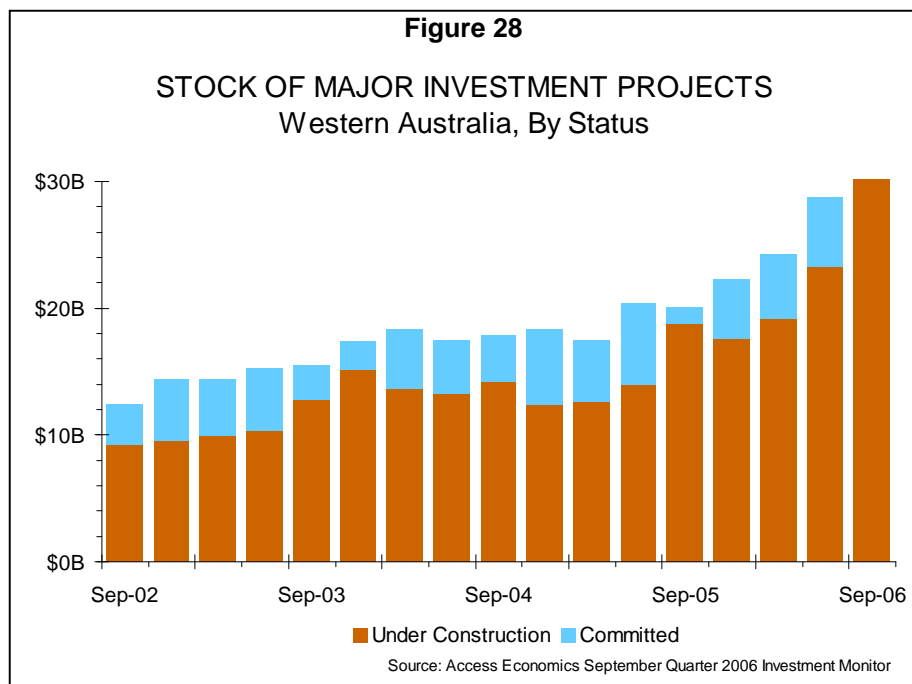
¹ The ABS capital expenditure series is a separate measure from the business investment series that is used in the State accounts. Capital expenditure makes up approximately two thirds of total business investment. Capital expenditure is useful as it provides a breakdown by industry, which the business investment series does not provide.

² ABS, Catalogue Number 5625.0



Business investment in Western Australia has been dominated by large-scale resources projects (Figure 28). Some of the major resource projects categorised as 'under construction' in the September quarter 2006 issue of the Access Economics *Investment Monitor* include:

- BHP Billiton's Ravensthorpe nickel project (\$2.7 billion);
- North West Shelf consortium's LNG project and fifth train (\$2.4 billion);
- Newmont/AngloGold's expansion of the Boddington gold mine, plus 100 megawatt gas-fired power station (\$2.0 billion);
- BHP Billiton's iron ore Rapid Growth Project 3 (\$1.7 billion);
- North West Shelf Consortium's Angel gas field development (\$1.5 billion);
- Hancock Prospecting's Hope Downs iron ore project (\$1.3 billion);
- Rio Tinto's expansion of Argyle diamond mine (\$1.2 billion); and
- Woodside's development of the Vincent oil field (\$1.0 billion).
- The Boddington gold mine expansion, the Angel gas field development and the expansion of the Argyle diamond mine commenced construction during the September quarter 2006.



The value of projects (both current and prospective) in the September quarter 2006 *Investment Monitor* for Western Australia was 22.4% higher than in the same period a year previously. Most of the increase in investment was in the resource sector (including dedicated infrastructure for resource projects), with resource-related projects now accounting for just over 90% of the value of both current and prospective private sector projects in the September quarter 2006 (and just under 90% of those under construction).

Rising materials costs and (more recently) skill shortages have begun to increase the cost of investment. There are shortages of skilled labour, particularly of engineers, tradespersons and other workers needed to service continuing demand for additional resource and infrastructure projects. Examples of projects reported to be experiencing cost increases include BHP Billiton's Ravensthorpe nickel project and the development of the fifth train on the North West Shelf¹.

¹ *Access Economics Investment Monitor* (September quarter, 2006). The cost of the Ravensthorpe Nickel Project increased by 16.5% to \$2.68 billion, between the March and June quarters of 2006. The cost of the fifth train of the North West Shelf development increased by 21.3% to \$2.425 billion between the June and September quarters of 2006.

Commercial property and construction

Commercial building has not grown as fast as engineering construction or residential building. In the four quarters ended September 2006 the volume of non-residential construction increased by 9.1% compared to the previous four quarters (on a year-average basis), compared to growth of 12.1% in residential building and 69.1% in engineering construction¹.

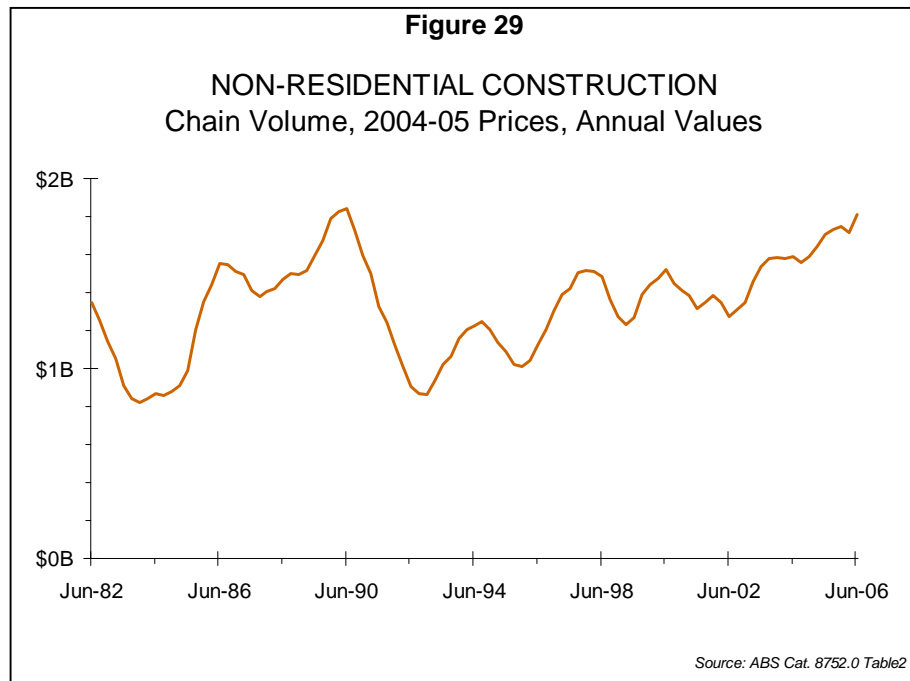
Access Economics notes in the September quarter 2006 issue of *Investment Monitor* that in Western Australia, retail approvals have been lacklustre, while office approvals were only "solid".

It is possible that there is some crowding out due to strong demand for labour and materials, especially in engineering construction.

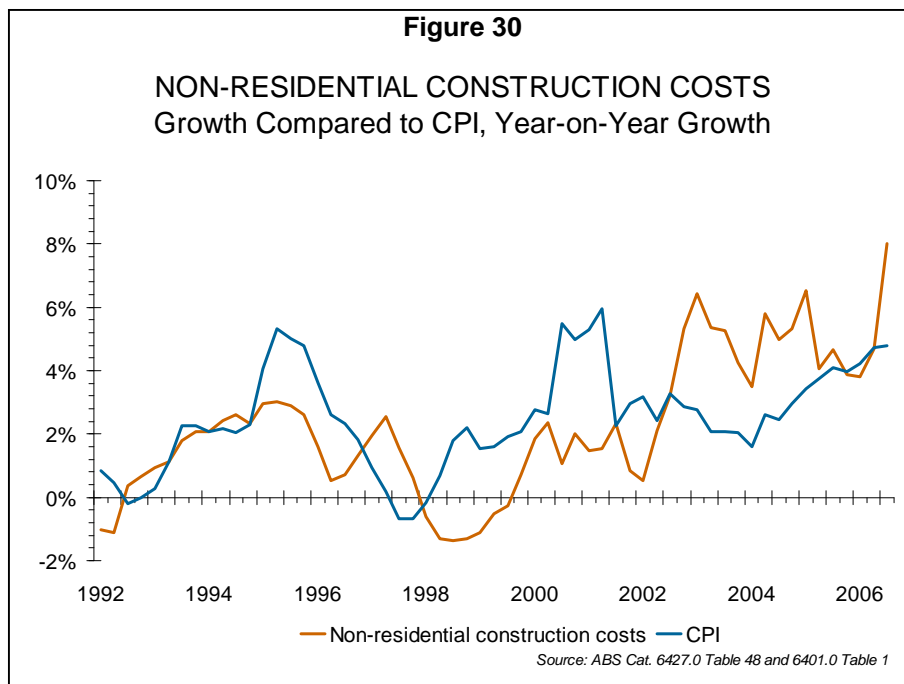
It should be noted that non-residential construction is highly volatile, and significant swings in the value of construction work are not uncommon (Figure 29).

Non-residential building costs have been rising in real terms for the past few years (Figure 30).

The ABS's non-residential construction cost index has been rising at well above the rate of CPI inflation for almost every quarter since December 2002. This contrasts to the period of only minimal growth through the mid-1990s and the early 2000s, when increases in the index were generally below growth in the CPI.



¹ Source: ABS Cat. 8755.0 *Construction Work Done, Preliminary*. September 2006.



Outlook for business investment¹

In its *Business Outlook* publication, Access Economics predicts that business investment growth will be strong again over 2006-07, with growth of 23.8% forecast. However, Access believes that business investment will only increase marginally in 2007-08, with a growth rate of 0.6%.

These forecasts are based on “the stunning strength of engineering construction. Mining-related investment is red hot, which is spurring additional investment in electricity supply, roads and water”².

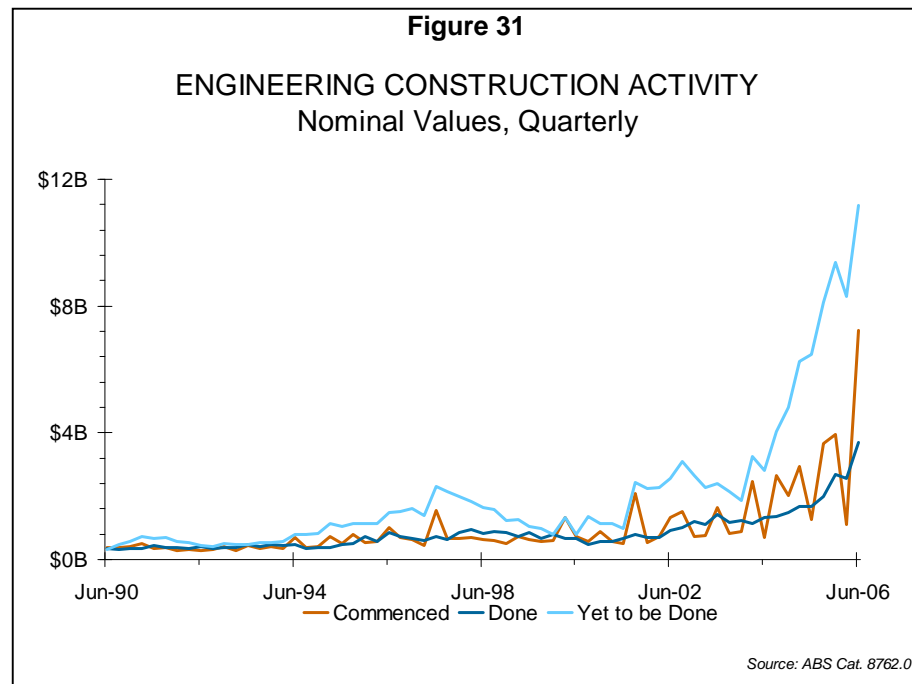
The Chamber of Commerce and Industry of Western Australia (CCI) expects growth in business investment to moderate in 2006-07 and 2007-08. CCI has forecast business investment to grow by 2.75% in 2006-07 and 3.5% in 2007-08³.

¹ The Department of Treasury and Finance publish forecasts of business investment in the forthcoming *Government Mid-year Financial Projections Statement* for 2006-07 (to be published in late December 2006).

² *Access Economics Business Outlook* (September quarter 2006), page 107.

³ Chamber of Commerce & Industry of WA, *WA Economic Compass* (September quarter 2006)

The latest ABS data on engineering work “yet to be done”¹ (June quarter 2006) suggest that strong growth will continue in this component of business investment over the near term. The data show work in the pipeline for Western Australia has grown strongly over the past year or so, and is now at an historical high (Figure 31). Work commenced has also risen quite substantially. However, the ability of the business sector to progress projects in the face of capacity constraints is likely to be a key challenge over coming quarters.



¹ Data are in current prices. Engineering is only a subset of total business investment, averaging around 27% of total business investment over the past five years.

Global Markets

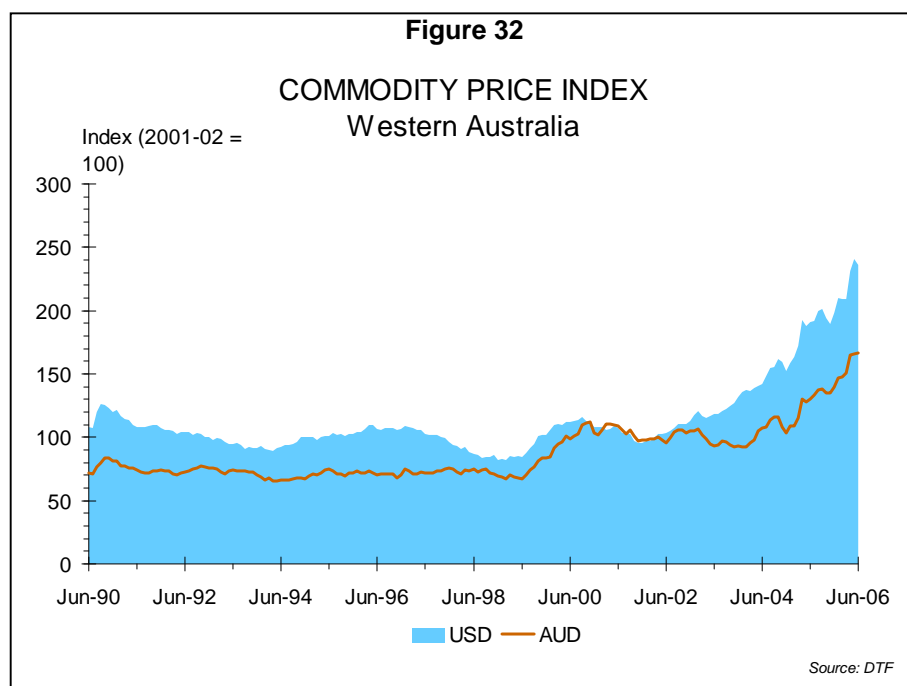
Commodity Prices

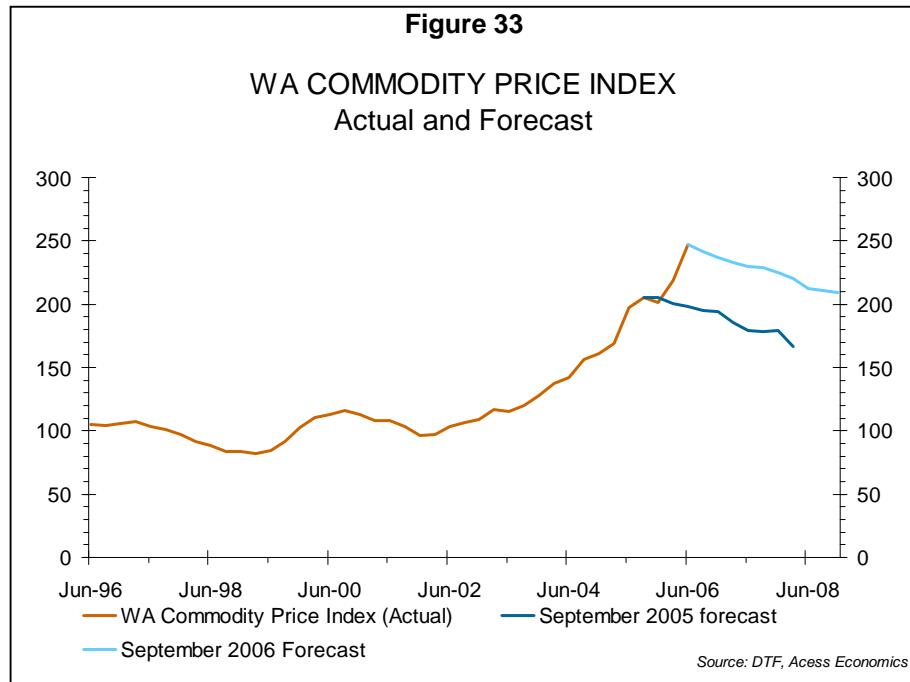
Strong demand for Western Australia's key mineral and energy resource products, and the resulting global commodities price boom, have underpinned the State's strong economic growth in recent years.

In the three years to June 2006, the Western Australian Commodity Price Index has risen by 80%, and it is at historically high levels in both Australian and US dollar terms (see following chart).

Global resources demand is being driven by strong growth in developing economies (particularly China). As a result, prices for many of Western Australia's key mineral commodities are at, or close to, record highs. In \$US terms, the Western Australian Commodity Price Index rose by 25.9% in 2005-06, after an increase of 26.6% in 2004-05.

This has in turn spurred a large number of new or expanded resource projects in the State, with the construction phases of these projects stimulating additional employment and other economic activity (see Business Investment).





The extended rise in prices for most of the State's main resource commodities have led to concerns about an end to the commodities boom now being imminent. Access Economics consensus forecasts¹ show that many forecasters believe that the peak of the commodities price cycle has already been reached, with global prices expected to moderate for most of Western Australia's key resource commodities over the next few years.

However, this survey has been anticipating an imminent peak in prices for several quarters, with each successive survey pushing out the expected arrival of the peak in prices. The chart above shows what Access' published consensus commodity price forecasts implied for the Western Australian Commodity Price Index a year ago (September quarter 2005 publication), as well as what the forecasts are currently suggesting (September quarter 2006 publication).

Furthermore, Access also notes that the extent of the price moderation for most base metals now expected is not as severe as forecasters had been predicting in previous quarters. The forecast price declines for Western Australia's main commodities by the September quarter 2008 would still leave prices relatively high by historical standards (as also shown by the chart above).

Current and future trends in commodity prices, and their implications for the productive capacity of Western Australia's economy, are discussed in the feature article on page 54.

¹ Access Economics September quarter 2006 *Minerals Monitor* (the Monitor provides an outline of the views and consensus forecasts of 11 resource commodities forecasters).

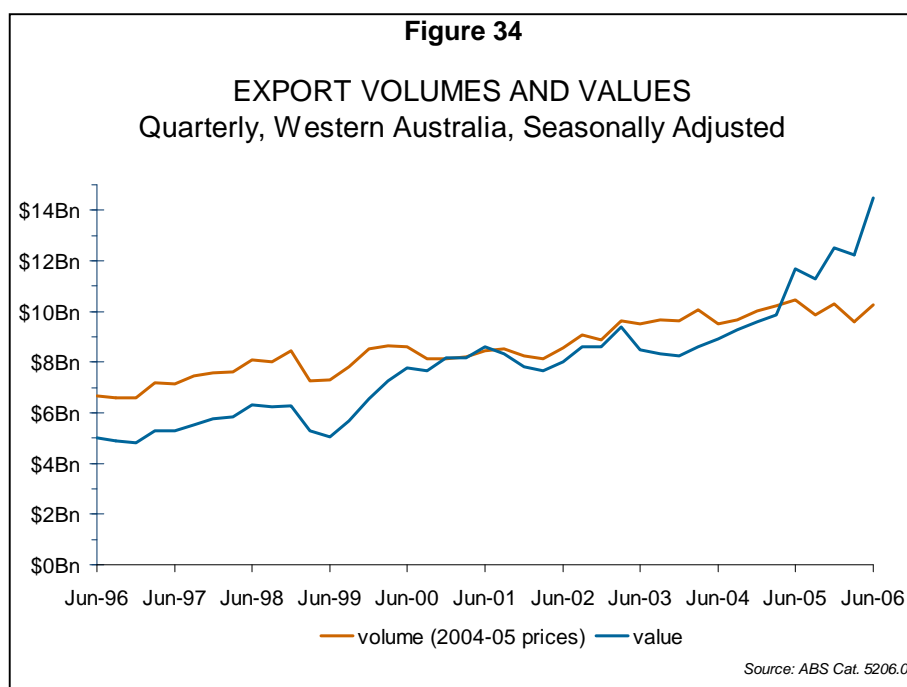
Trade

Strong growth in commodity prices has led to a large investment response in the State over recent years, with numerous major resource developments boosting business investment by 73.8% over the past three years.

However, this investment has yet to translate into a commensurate rise in export volumes. ABS data¹ show that merchandise export volumes fell slightly in 2005-06 (down 0.9%), following growth of 4.7% and 3.9% in 2003-04 and 2004-05 respectively. In conjunction with strong import growth, this resulted in a fall in Western Australia's trade balance (as measured in volume terms) in both 2004-05 and 2005-06.

In part, a main reason for this weak volume response are the long lead times between investment projects being approved and then coming on line after their construction phases. Delays in the completion of construction on some projects (due to very tight capacity conditions in the State, especially for labour availability) are also partly responsible (see Business Investment for further information on delays to major projects).

Another reason for weak export growth over 2005-06 was the disruption to production caused as a result of cyclones in the north west² of Western Australia at the beginning of 2006. While data for the June quarter of 2006 show that merchandise export volumes increased by 6.8% over the quarter, this followed a fall of 6.8% in the March quarter.



¹ Source: ABS catalogue number 5220.0 (the latest available data are for 2005-06)

² Important for the State in the context of the large volumes of production (and export) of both iron ore and LNG from the region.

Table 11**MERCHANDISE EXPORTS**
Growth (%), June Quarter
2006

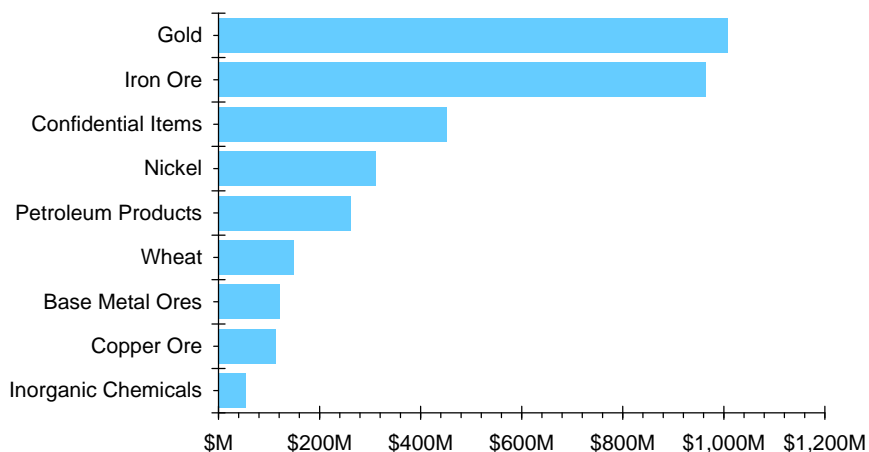
	% Change Over:	
	Change: Quarter	Change Year*
NSW	-4.2	3.1
Vic	0.3	-0.7
Qld	-4.3	-3.7
WA	6.8	-2.2
SA	17.2	14.6
Tas	-3.9	-13.0
Aust	1.6	1.4

*Past quarter on same quarter a
year earlier
Source: ABS Cat. 5206.0

While export volumes are weak, the high prices of most of the State's key resource commodities have resulted in the nominal value of exports growing strongly – up 32.5% in the September quarter 2006 when compared to the corresponding period a year earlier. The value of Western Australia's exports reached \$51.5 billion over the year to September 2006, up 26.1% on the 12 month ending September 2005 (also see chart above). In the year to September 2006 the State accounted for 32.3% of the value of national exports, with Western Australia's overseas trade surplus of \$31.3 billion contrasting to Australia's trade deficit of \$12.3 billion.

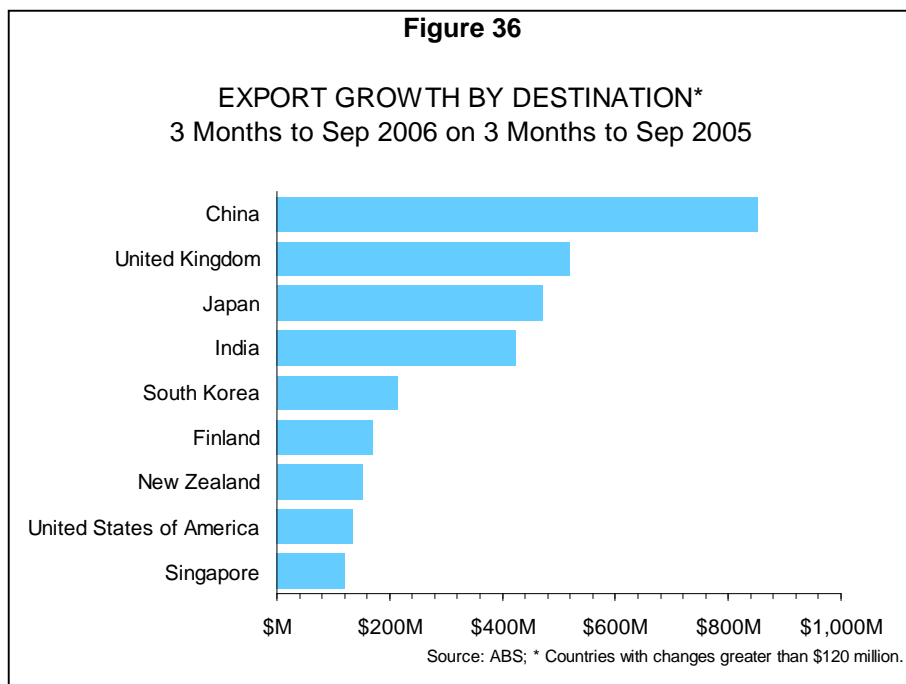
The value of gold exported recorded the largest increase over the three months to September 2006, up \$1,007.6 million (or 68.8%) when compared to the same period a year earlier. In volume terms, gold exports also increased (by 18.8%) in the quarter. After accounting for the increased import of gold into the State (for refining and re-export¹), the net value of gold exported increased by \$609.2 million (or 74.1%) over the period.

Iron ore exports are rising in both value and volume terms as a result of higher prices and numerous capacity expansions and mine developments under way or recently completed. The value of iron ore exports increased by \$965.3 million (or 32.4%) over the September quarter 2006 compared to the same period a year earlier, and the volume of iron ore exported over the period was 8.8% higher than the September quarter 2005.

Figure 35**GROWTH IN EXPORTS***
3 Months to Sep 2006 on 3 Months to Sep 2005

Source: ABS: * Commodities with changes greater than \$53 million.

¹ As a result of a restructuring of Australia's gold refining industry in 2002, gold from other Australian states and territories is now refined in Western Australia, before being exported. Similarly, gold is also imported into Western Australia from other (predominantly South East Asian) countries for refining, before being re-exported. As such, export figures for gold for Western Australia can often be larger than the State's own level of gold production (due to re-exports of gold products).



Looking forward, further increases in the volume of iron ore exported are expected to be coupled with another increase in the iron ore contract price for 2007, with some analysts¹ tipping a 7.5% increase in the negotiated contract price for 2007. The consensus forecasts presented in the September Quarter 2006 Access Economics *Minerals Monitor* is that contract prices for iron ore will be higher in April 2007 before falling in April 2008.

The industrial expansion currently under way in China has driven a much of the growth Western Australia's exports. In the September quarter 2006, exports to China were \$853 million (or 38.7%) higher than the corresponding period a year earlier.

As a result, China now imports 20.6% of the State's total exports, only 1.6 percentage points behind Western Australia's largest export destination of Japan. Iron ore exports to China rose by \$485.6 million and accounted for most of the increase, while confidential items² also contributed to the increase, up \$210.3 million over the September quarter 2006.

¹ "Iron Ore Prices May Rise to Record on Chinese Demand"

<http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aN8e5Bee7pbw>

"France's Vallourec sees rising iron ore prices."

<http://asia.news.yahoo.com/060928/3/2qke0.html>,

² The ABS puts confidentiality restrictions on some of the commodity-specific data it produces. Confidential items are thought to consist primarily of alumina, nickel and LNG.

The United Kingdom has also emerged as a major destination for the State's exports. Exports to the United Kingdom increased by \$518.9 million over the period and now accounts for 7.6% of the Western Australia's total exports. Most of the rise in exports to the United Kingdom has been driven by gold exports¹. Over the September quarter 2006, gold exports to the United Kingdom rose by \$516.6 million.

Imports

Merchandise imports into Western Australia grew by 28.8% (or \$1.1 billion) over the September quarter 2006, when compared to the same period a year earlier. Imports of gold (mainly for refining and re-export – see footnote 1 on previous page) made the largest contribution to growth over the period, increasing by 62.1% to contribute 10.6 percentage points to the 28.8% increase in overall import growth. Strong growth in business investment in the State resulted in plant and equipment imports also making a significant contribution to growth (6.8 percentage points) in Western Australia's imports, increasing by 25.6% (or \$257.2 million) over the same period.

Over the year to September 2006, the nominal value of merchandise imports in Western Australia grew by 38.2%. Nationally, the value of merchandise imports grew by a more moderate 12.7% over the same period.

International Economic Trends

The International Monetary Fund (IMF) reports buoyant global economic conditions in its September 2006 *World Economic Outlook*. The report forecasts global economic growth in 2006 and 2007 above the long-term trend, at 5.1% and 4.9% respectively².

The IMF identifies the main risks to these forecasts as a further tightening of monetary policy by central banks in response to increasing inflationary pressures, rises in the price of oil and a slowing housing market leading to weaker economic growth in the USA.

Interest rates in the United States, United Kingdom and Japan have risen in 2006 and are forecast to rise further in coming quarters, even though inflationary pressures have eased slightly (with oil prices falling from peaks of US\$75 per barrel in July to below US\$60 recently). Economic growth in the United States has weakened since the beginning of 2006, but the present global economic expansion is probably sufficiently broadly-based to be fairly resilient to the effects of a United States slowdown². Growth in Europe has picked up, China continues to grow rapidly, and growth in emerging economies has been solid.

¹ The United Kingdom (and in particular, the London Bullion Market Association) is a particularly large market for gold, and often acts as a 'sink' for the State's gold exports, when world demand from other countries is low (even though it may not necessarily be a final destination for gold exports).

² <http://www.imf.org/external/pubs/ft/weo/2006/02/index.htm>, "World Economic Outlook September 2006."

Furthermore, while conditions in the housing market are detracting from growth in the United States, business conditions are robust. The recent fall in petrol prices and tight labour market appear to be supporting growth in spending and reducing the effect of the housing downturn.

A risk to the Western Australian economy is that any slowing in economic growth in the United States could reduce its demand for Chinese exports (and hence Chinese demand for Western Australian resources exports). For the time being, however, China's growth is very strong. Growth in real Gross Domestic Product was reported at 10.4% between the September quarters of 2005 and 2006, down slightly from the 11.3% recorded in the four quarters to June 2006. China's structural problems still pose significant risks over the medium term (for more information on the nature of these risks see feature article "China: An Economic and Structural Outlook" in the Department of Treasury and Finance's Summer-Autumn 2006 Economic Summary).

In Western Australia's other main trading partner, Japan, GDP increased by 2.5% over the year to the June quarter 2006. While this may seem low in the context of growth rates for other countries, this is 1.2 percentage points higher than Japan's average growth rate of 1.3% over the past ten years. Private final domestic demand is growing at a solid pace, while private fixed investment is buoyant, underpinned by profits and a turnaround in bank credit. The IMF predicts growth in Japan to be 2.7% for the 2006 calendar year.

Western Australia's Productivity Paradox

**By Kurt Sibma and Nicky Cusworth
Department of Treasury and Finance**

This article draws on presentations in September 2006 by Kurt Sibma at the 2006 Computable General Equilibrium modellers' Conference, and by Nicky Cusworth at the Curtin Business Symposium.

Table of Contents

Introduction	55
The Productivity Paradox.....	57
Mining Sector Productivity	59
Productivity and Prices by Sector.....	61
Is Output the Key?	64
Commodity Price Scenarios.....	67
Possible Trends	67
Modelling the Effects.....	69
Summary and Conclusions	72
References	73

Introduction

The resources boom of the past four years is unprecedented in post-war Australia. Commodity prices are at all-time highs¹, the terms of trade² are the strongest for 40 years, and the strength of global demand has underpinned a strong economic expansion³.

Western Australia has benefited more than other States from the global commodities boom, for three related reasons:

- It is more export focussed, with exports of goods and services representing 45% of Western Australia's Gross State Product (GSP) in 2005-06, more than any other State or Territory and more than double the national ratio of 20%.
- Its economy is much more resource reliant. In 2005-06 mining accounted for 27% of Western Australia's total factor income, compared to 8% Australia-wide.
- Its commodity price growth and in particular its terms of trade increase has been even stronger than nationally in the past three years. In the three years to June 2006 Western Australia's commodity prices rose by 79% while Australia's rose by 68%. Over the same period, the State's terms of trade⁴ rose by 59%, while Australia's rose by 40%.

Rising commodity prices and export values have induced substantial additional investment by business, particularly in the mining industry and related sectors. Real business investment has increased at an average rate of almost 17% a year for the past six years.

Yet there have also been some puzzling trends.

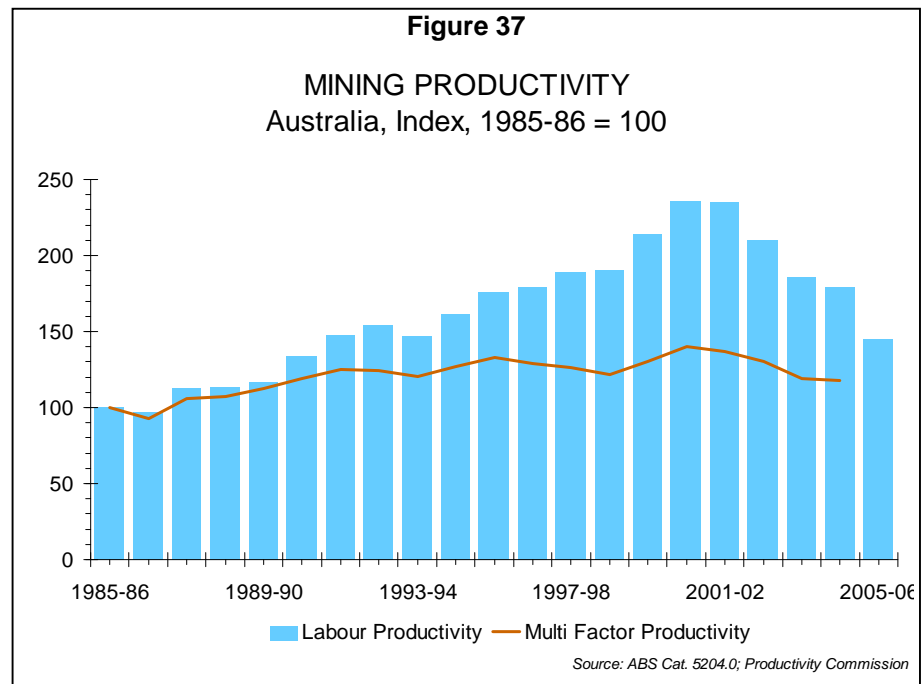
While Western Australia's export values have grown strongly in response to rising global commodity prices, the volume of exports has been slow to respond, despite six years of strong business investment growth.

¹ In nominal terms – 'real' commodity prices are not – see discussion on page 61

² The 'terms of trade' is the ratio of export prices to import prices.

³ The main section of this Economic Summary outlines Western Australia's recent economic trends in detail, and that analysis need not be repeated here. For further information on the key features of the State's recent economic relevant to this article, see page 3 for a discussion of growth in commodity prices and the terms of trade; page 41 for growth in business investment, especially in the mining industry; and page 49 for trends in the volume and value of exports and imports.

⁴ For consistency, the terms of trade cited here for both Western Australia and Australia are calculated from the implicit price deflators for imports and exports in ABS Cat. 5206.0. The rise in Australia's goods terms of trade published in ABS Cat. 5302.0 was virtually identical (39% over the three years to June 2006). These data only cover international trade - Western Australia's substantial interstate trade is not included.



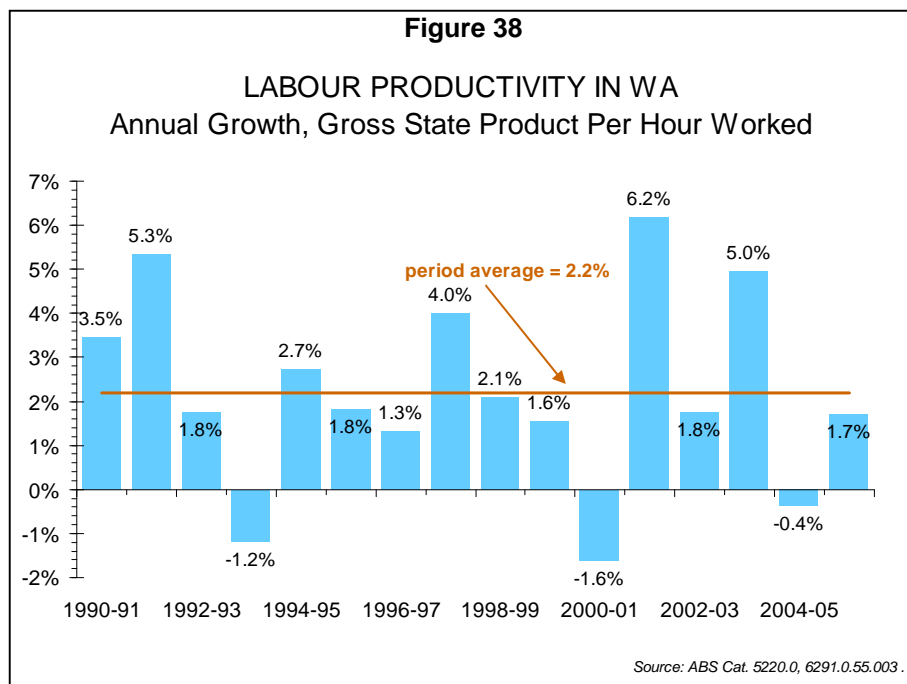
Imports, however, have grown strongly in both volume and value terms. As a result, net exports detracted significantly from Western Australia's real economic growth in 2005-06 (see page 2)¹ – again, an intuitively unlikely outcome in an economy in which strong growth is apparently being fuelled by export demand.

Across Australia, while the value of output from the mining sector has risen, it appears that the volume of output has not. Yet inputs into this sector have risen rapidly, with both employment and investment increasing in response to high commodity prices. As a result, the level of productivity in the national mining sector has dropped sharply (Figure 37).

Although state-based productivity estimates by industry are not published by the Australian Bureau of Statistics, it is highly likely that Western Australia's mining sector has shared in this trend, both because the State accounts for a large share (45%) of the national mining industry, and because Western Australia has also recorded strong growth in mining investment and employment, but only weak growth in the volume of mineral production.

As resources comprise the bulk of Western Australia's exports, this is likely to also explain the weakness of export volumes in recent quarters (see page 49).

¹ Note that the usual measure of 'real' economic growth, the chain volume estimate of Gross State Product, measures the quantity of output, not its value. As discussed below (see page 64) this may not be the best measure of the community's real economic purchasing power at a time when the terms of trade are increasing sharply.



This drop in mining productivity may well be responsible for the decrease in the overall level of labour productivity in Western Australia in 2004-05 and its weak growth in 2005-06. Such weak productivity growth is very unusual in conjunction with the State's strong economic growth.

This article explores the paradox of Western Australia's strong economic growth and weak productivity, and considers the implications of the resources boom for the present and future welfare of Western Australians.

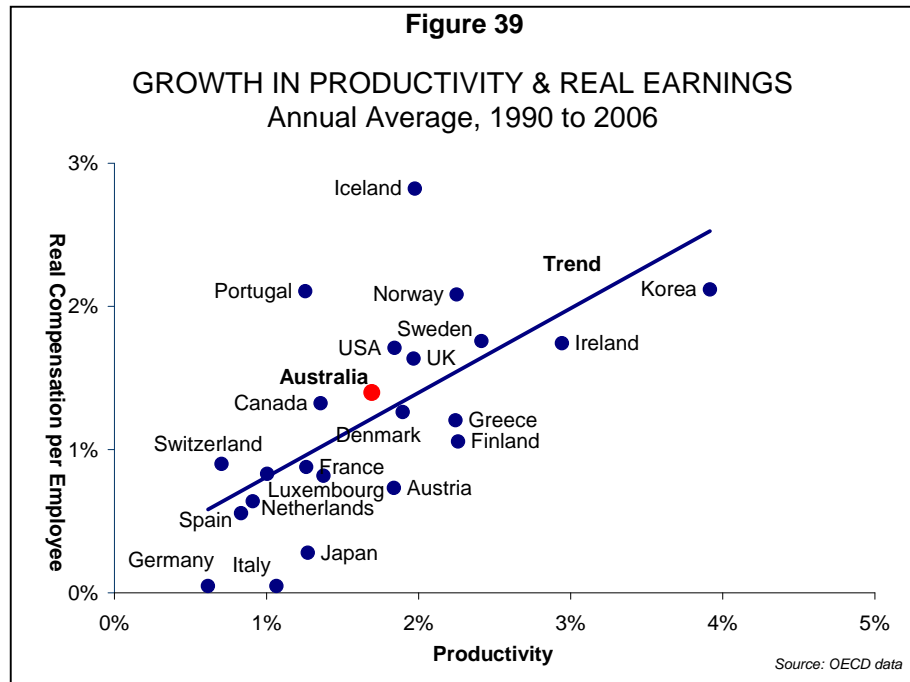
The Productivity Paradox

The close relationship between a country's or state's productivity growth and its economic welfare in the longer term is well established in economics. As US economist Paul Krugman has said (1990, p. 9):

Productivity isn't everything, but in the long run it is almost everything. A country's ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker.

The relationship is most direct in the link between real wages¹ and productivity. The correspondence between real wage growth and labour productivity growth may be fairly loose in the short term or even the medium term, if the share of national income devoted to wages compared to government or profits is shifting.

¹ Economic welfare is probably best evaluated as real consumption per capita, but real wages are a significant determinant of consumption possibilities. The relationship between productivity and real wages is also discussed here as it can be expressed directly through a simple formula (see next footnote).



But unless the wage share of GDP is changing, long-run growth in real wages will equal growth in real output per worker¹. And changing the profit or wage share of economic output is not sustainable indefinitely as a means of generating real wage growth above (or below) growth in output per worker.

There is evidence as well as theory behind this assumption. In the longer term, growth in labour productivity and growth in real earnings are closely correlated across countries (Figure 39).

It is hardly surprising, then, that any deceleration or reversal in productivity growth causes consternation. Australia's deceleration in labour productivity in recent years has puzzled the Reserve Bank of Australia, with the Bank's Governor Glen Stevens recently observing that Australia's labour productivity growth has slowed to "approximately zero" in the past three years (Stevens, 2006, p.15).

¹ If:

Real GDP	=	G
Employment	=	E
Average Real Wage	=	W
Aggregate Real Wages	=	Y = W x E
Labour Productivity	=	P = G ÷ E
Labour Share	=	S = Y ÷ G

$$\begin{aligned}
 P &= G \div E & \text{so} & & G &= P \times E \\
 W &= Y \div E & \text{so} & & Y &= W \times E \\
 S &= Y \div G & = & & S &= ((W \times E) \div (P \times E)) = W \div P \\
 \text{And } P &= W \div S
 \end{aligned}$$

If productivity (P) growth is running faster than real average wage (W) growth, the labour share of GDP (S) must be falling, and vice versa.

Australia's weak productivity growth in the past few years is due mainly to decelerating output growth. Western Australia's productivity turnaround - from strong growth in 2001-02 to 2003-04, to a dip in productivity in 2004-05 and a modest rise in 2005-06 - is more puzzling, given its generally strong output growth over the past few years.

As noted above, it seems highly likely that Western Australia's recent productivity record is linked to falling productivity in the mining sector, its largest industry. So to explore the paradox of Western Australia's weak productivity, it is necessary to explore why mining productivity should be falling so sharply in the middle of a resources boom.

Mining Sector Productivity

Figure 38 on page 57 shows productivity in the Australian mining industry. For multi-factor and particularly labour productivity, the recent trend has been markedly downwards. Although state-based estimates of productivity by sector are not produced by the ABS, it is plausible that Western Australia's mining productivity has followed a similar trend.

At least three factors could explain why a boom in commodity prices might lead to a fall in mining sector productivity, at least in the short term.

Firstly, the rise in prices makes it profitable for miners to exploit previously marginal or uneconomic resources that yield a lower volume of output for a given level of capital and labour inputs. Devoting substantial additional resources to achieving modest additional output may be highly profitable from the business's perspective, even if it means a fall in productivity as conventionally defined (the volume of output per unit of inputs).

The 75% increase in employment in Western Australia's mining sector between September 2003 and September 2006 suggest that businesses are seeking to produce more from their existing assets and resources.

Rising mining investment levels similarly indicate that the capital stock is likely to be expanding, although as the Australian Bureau of Statistics does not publish capital stock data by state there are no official data describing trends in Western Australia's capital stock¹.

The second and related factor is that the depletion of resources that are cheap and easy to exploit may necessitate the use of less productive resources to meet rising demand. This, too, could lead to rising costs and falling productivity as rising demand is met from resources that are more costly to produce.

¹ National data show that the mining sector's real net capital stock rose by 25.2% in the five years to 2005-06 (ABS Cat. 5204.0, Table 89).

Investment cannot necessarily be assumed to generate growth in the capital stock because of depreciation and because some investment risks may not pay off, resulting in capital expenditure exceeding the economic value of the asset purchased.

Third, investment in mining is lumpy and takes time, and there are considerable lags between a business's decision to invest in capacity expansion and the new facilities reaching full capacity. This is especially true in the current economic environment, as shortages of skilled labour and equipment are adding to the time and cost of capacity expansion, especially in the resource sector.

Furthermore, investment in long-term capacity expansion can actually reduce output in the short term, because the use of existing equipment and infrastructure is disrupted as these are upgraded.

This explanation appears to fit the evidence in Western Australia, where mining investment has risen at an average rate of 42% a year for the past three years without any evidence yet of a commensurate increase in output volumes.

If this third explanation accounts for the drop in mining productivity, it means that most of the loss of productivity will be temporary, with output volumes likely to increase rapidly as expanded capacity comes into production. This reasoning underpins the Department of Treasury and Finance's forecast of strong growth in export volumes in 2006-07 and beyond.

It is possible, however, that the industry may not be willing to invest in capacity expansion to the extent that current high commodity prices seem to warrant. There is considerable uncertainty about the future path of commodity prices, but few analysts expect prices to remain at current highs indefinitely (see discussion on page 67). Miners will not invest in capacity expansions if they do not expect current high prices to last, especially given the high costs and long lags between deciding to invest and achieving higher output. This sticky supply response would not itself directly cause a fall in productivity, but it could mean that the expansion in output in response to high prices is less than it would have been if those high prices were expected to persist.

Furthermore, it may be more profitable for miners to constrain output and keep prices high than to expand output to meet demand. In a perfectly competitive market such a tactic would make no sense, as a producer that did not expand output would lose sales to producers that did. But as the mining industry becomes increasingly concentrated and integrated worldwide, some businesses may have sufficient market power to make it both possible and profitable to achieve sustained higher prices by limiting production.

Productivity and Prices by Sector

The relationship between productivity and prices in the resources sector is central to understanding the causes and consequences of the resource boom and mining productivity trends in recent decades.

In principle, three groups could benefit if an industry is enjoying productivity growth ahead of other sectors – shareholders, in the form of higher profits; employees, in the form of higher real wages; or customers, in the form of lower relative prices. It may be possible for capital or labour to capture the benefits of higher productivity in the short term, but in a competitive environment such benefits are likely to be eroded by competition¹. In the longer term, customers are likely to be the main beneficiaries, and industries with relatively high productivity growth are likely to be those with relatively low growth in output prices.

This account fits the evidence in Australia fairly well. Figure 40a shows a clear relationship between long-run average productivity growth and output price growth by industry in Australia between 1989-90 and 2005-06².

Until the late 1990s, the mining industry typically enjoyed productivity growth somewhat ahead of the average for the rest of the economy, and its rate of output price growth was somewhat lower (Figure 40b).

This is consistent with the Prebisch-Singer hypothesis, which holds that the price of commodities relative to manufactured goods decreases over time. The reasons for this are low income-elasticity (as people's income increases, their consumption of basic commodities grows less quickly than consumption of manufactured goods or services), and the relatively strong growth of primary industries' productivity³.

In the long term, global commodity prices have shown a trend decline relative to other goods. Cashin and McDermott found that the real long-term decline in commodity prices is about 1.3% a year over almost 140 years (from 1862 to 1999), albeit with considerable short-term volatility and some fairly prolonged periods of marked deviation from that trend (Figure 41).

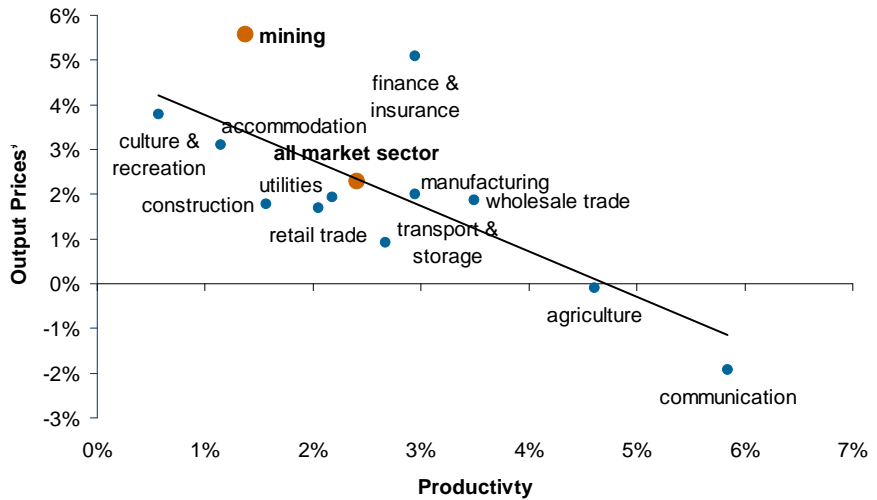
¹ Unless there is a scarce factor of production, e.g. a lack of skilled labour.

² This methodology was adapted from Philip Lowe's 1995 study of the relationship between productivity growth and relative wages. The start date for the chart data – 1989-90 – is the earliest for which both price and productivity data are available.

³ Analysis by the staff of the Commonwealth Treasury suggests that the Prebisch-Singer hypothesis does not hold for Australia, and that the prices of commodities in the long term show no declining trend compared to prices of manufactured goods (Grant *et al*, 2006). This mainly reflects the fact that the composition of Australia's commodities production has tended to shift towards relatively high-priced commodities over time – a fixed weight basket of commodities would show a downward trend. It should also be noted that the real long-run commodity price data in Figure 41 compare commodity prices to the general price level. Grant *et al* point out that, compared to manufactured goods prices (which tend to grow less quickly than services prices), commodity prices rose in the second half of the 20th century.

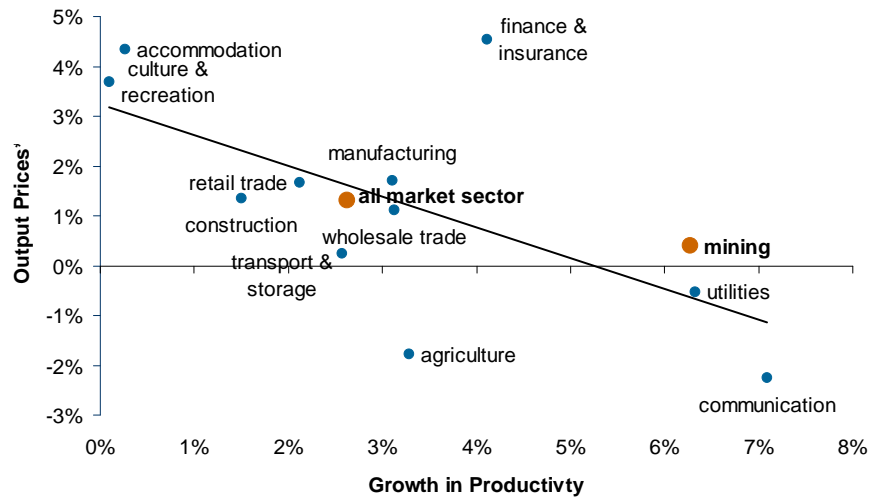
Figure 40

a) LABOUR PRODUCTIVITY AND OUTPUT PRICES
Australia, Annual Average Growth, 1989-90 to 2005-06



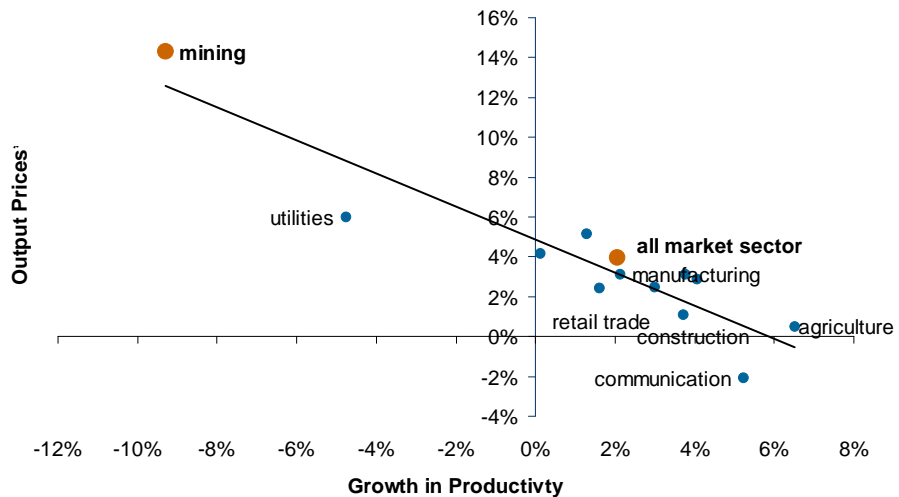
*deflator for gross value added at basic prices; Source: DTF estimates from ABS Cat. 5220.0

b) LABOUR PRODUCTIVITY AND OUTPUT PRICES
Australia, Annual Average Growth, 1989-90 to 1999-00

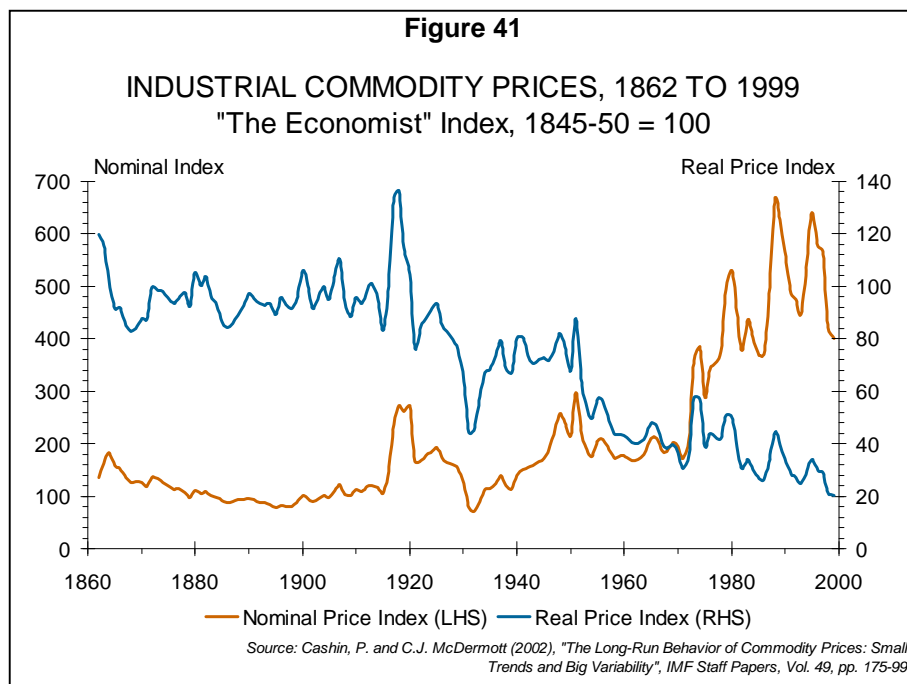


*deflator for gross value added at basic prices; Source: DTF estimates from ABS Cat. 5220.0

c) LABOUR PRODUCTIVITY AND OUTPUT PRICES
Australia, Annual Average Growth, 2000-01 to 2005-06



*deflator for gross value added at basic prices; Source: DTF estimates from ABS Cat. 5220.0



The long-term decline in commodity prices relative to other goods and services is sometimes presented as a reason for governments to try to reduce their economies' reliance on primary industries. Primary production is presented as an accelerating treadmill, on which ever-increasing volumes of output are needed to secure a static standard of living.

However, this representation is misleading if relatively high productivity growth is the cause of falling relative price growth. Far from being a source of ever-increasing economic pressure, falling relative prices could be better interpreted as evidence of relative economic success.

The long-term decline in relative mining output prices has reversed spectacularly with the growth in commodity prices since 1999-00. The mining industry's output price and productivity trends have also shifted sharply relative to other sectors. From being a high productivity low price growth sector up to the late 1990s (Figure 40b), in recent years mining has recorded a significant decline in productivity, and output price growth that is well above average (Figure 40c)¹.

These recent trends raise two key questions - what do the recent changes in relative prices mean for the economic well-being of Western Australians, and how is the current cycle of commodity prices, output and productivity changes likely to unfold in future?

¹ It is notable that the utilities (electricity, gas and water) have also moved from high-productivity low-price growth to the opposite in the same period. There may be a link here – for example, in the effect of higher coal, oil and gas prices on electricity and retail gas prices.

Is Output the Key?

The close connection that economics generally assumes between productivity and economic welfare is based on the expectation that the capacity of an economy to produce is closely linked to the capacity of its citizens to consume.

For an economy in economic isolation, this is necessarily true, as the only goods and services available for consumption are those produced locally. Price movements do not affect overall economic welfare, as a price change that benefits one group (e.g. producers) disadvantages another (e.g. consumers).

However, when economies trade, this is not necessarily the case. The goods and services available for domestic consumption comprise not only local produce, but also the things that can be exchanged for local produce¹. Changes in a country's export prices relative to its import prices (the "terms of trade") can therefore have significant effects on its capacity to consume, largely independent of its capacity to produce.

In practice, for most economies over the longer term, these terms of trade effects on potential consumption are fairly small relative to the influence of domestic production. This is because exports typically represent a relatively small share of total production, and because terms of trade swings are seldom sufficiently pronounced to have a large effect, and anyway tend to balance out over time.

For example, Productivity Commission commissioned Meyrick and Associates to undertake a quantitative study of the effect of changes in the terms of trade on living standards in Australia.

The main conclusion from this study is that, taken over long time period of several decades, changes in the terms of trade have relatively little impact on welfare².

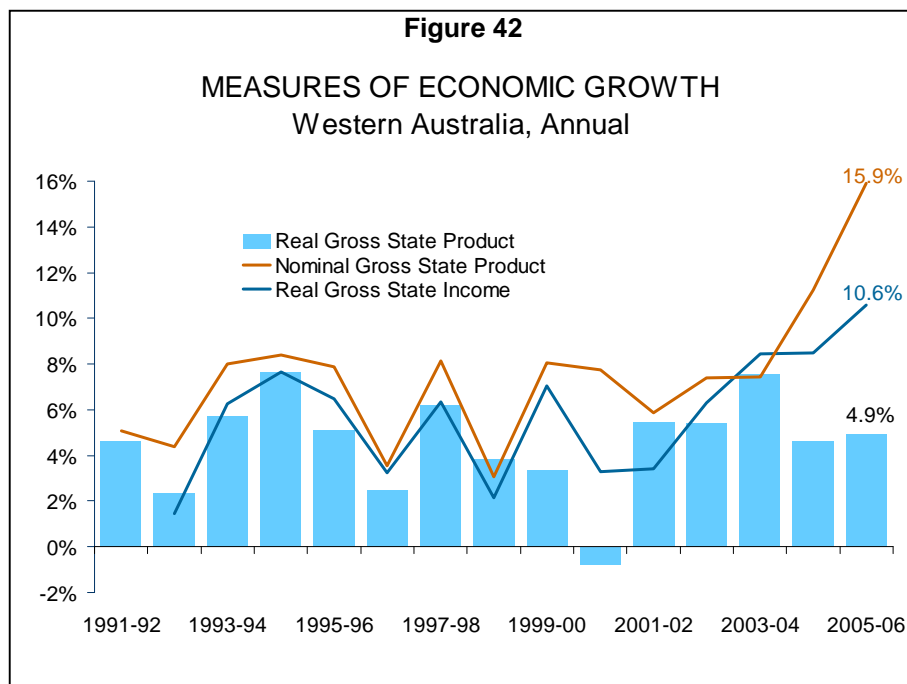
This is because welfare benefits from improvements in the terms of trade in one period have been offset by losses from subsequent deteriorations in the terms of trade.

However, because the study covers the period 1960 to 2004, it omits the continued upswing in the terms of trade since the survey period and thus arguably understates the importance of the terms of trade on welfare³.

¹ An open economy might also consume more than it produces by running a trade deficit, but that is not relevant to this article.

² Over the past four and a half decades, changes in terms of trade have increased real income by less than 5% in aggregate.

³ Since 2004 the terms of trade have risen by more than 15%.



Even if terms of trade effects have relatively little influence on Australian economic welfare, they are likely to be more important for Western Australia. This is both because it has the most export-reliant economy of the States and Territories, and also because its exports comprise mainly commodities, whose prices are more volatile than other goods and services.

The Australian Bureau of Statistics produces estimates of real Gross State Income¹ that capture some of these terms of trade effects on the States' real purchasing power.

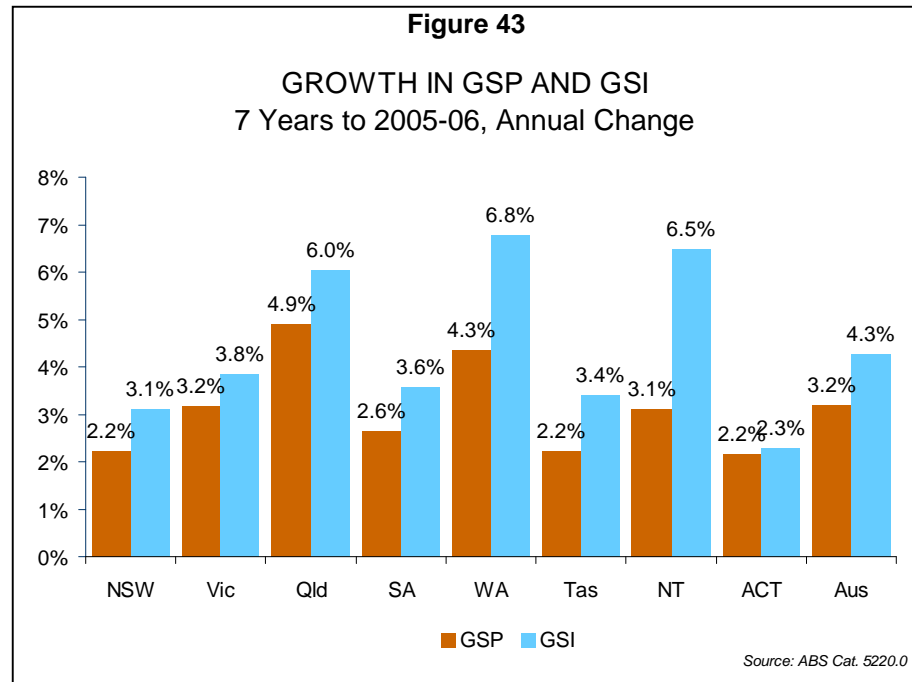
This is calculated in the same way as real GSP except that the value of the State's exports is adjusted by its terms of trade, to reflect the volume of imports that it can obtain in exchange for its exports².

Figure 42 shows that, in recent years, growth in Western Australia's real Gross State Income has exceeded growth in its real GSP by a significant margin. In 2005-06 real Gross State Income increased by 10.6%, the strongest growth since this data series began in the early 1990s. Nominal GSP growth was even higher, also reflecting the effect of the rise in the state's export prices on its GSP deflator.

The extent to which Western Australia's Gross State Income growth has exceeded its GSP growth in the past seven years is greater than any other State, although in the Northern Territory the gap is even larger (Figure 43).

¹ Or Gross Domestic Income, at a national level.

² For a more detailed discussion of the Gross State Income measure see pages 56-62 of the Spring 2005 *Western Australian Economic Summary*.



Western Australia's real Gross State Income increased by 6.8% a year on average between 1998-99 and 2005-06, compared to growth in real GSP of 4.3% a year. Nationally, the gap was less than a percentage point, with growth in Gross Domestic Income of 4.3% a year and growth in Gross Domestic Product of 3.2% a year.

This has some important implications for output and productivity growth and their relationship to consumers' welfare in Western Australia. Other things being equal, weak productivity growth indicates that the community's potential disposable income is also growing weakly. But if productivity growth is weak in part because the export sector is using more marginal resources or increasing employment more rapidly than output, but a rise in export prices means that the sector's exported output can be exchanged for a much larger volume of imported goods and services, then productivity growth will significantly understate the true growth in the State's potential purchasing power.

And if weak productivity now is necessary for higher output in future – for example, because the export sector is spending heavily on investment, but is not yet reaping the returns in higher output volumes – then there is the potential for productivity to catch up most of its lost ground fairly rapidly once the new capacity under construction comes fully into production.

The increase in Western Australia's terms of trade in recent years has boosted the State's purchasing power substantially, but it is unlikely to last indefinitely. Sooner or later export prices will stop rising faster than import prices, and at that point productivity and output growth will again be the key determinants of growth in living standards.

The key question for the short to medium term future of the Western Australian economy is whether, when and by how much commodity prices fall once the current price cycle peaks.

Commodity Price Scenarios

Commodity prices are notoriously hard to predict. Rather than trying to pick the likely path of commodity prices in future, this section outlines four scenarios for possible future trends in commodity prices. Three of these – a super cycle, a return to business as usual (with relative prices declining) and a gradual decline in prices, but not to pre-boom levels – are based on recent IMF analysis of the commodity price outlook globally and of its implications for Australia (IMF, 2006b, pp.26-27). The fourth is based on Grant *et al.*

Possible Trends

Super cycle

The “super cycle” scenario predicts that the current commodity boom will be stronger and more durable than previous cycles. This is based mainly on the strength and breadth of commodity demand underpinning current high prices. The industrialisation of China and India is adding to world commodity demand at an unprecedented rate, and demand growth is likely to intensify as these countries move through stages of development that are particularly resource intensive because they focus on the creation of infrastructure, capital equipment and consumer goods.

Supply may also play a role in the “super cycle” scenario. Resource depletion may have brought resource production to the stage where productivity improvements will not be sufficient to ensure declining relative prices over time. If the most readily and cheaply accessed resources have been exhausted, average costs may have to rise in future to meet growing demand.

This scenario would imply that the Prebisch-Singer hypothesis (see page 61) may no longer apply in future.

Gradual decline

A more moderate version of this scenario predicts that mineral commodity prices will peak and then decline, as production expands to meet demand and some exceptional factors driving current demand fade away. However, because of the demand, supply and cost trends outlined above, the rate of decline will be modest, and will not take prices back to levels prevailing before the boom. This is the view that the IMF believes most probable:

Over the medium term ... metals prices are expected to retreat from recent highs as new capacity comes on stream, although probably not falling back to earlier levels – in part because higher energy prices have increased production costs. That said, the timing and the speed of the price reversal is uncertain, because with current high capacity utilization rates and low inventories, markets are very sensitive to even small changes in supply and demand.

(IMF 2006a, p.157)

A similar conclusion on the outlook for metals prices was reached by the World Bank Group’s Oil, Gas, Mining and Chemicals Department in papers prepared for the G20 meeting in November 2006.

It concluded that:

It is expected that prices will start to come down the next year or so and eventually settle at levels that are closer to the average of the period 1990-2004. However, prices are likely to be somewhat above previous lows as a portion of the increase in costs remains permanent.

(Word Bank Group, 2006, p.ii)

Hyper volatility

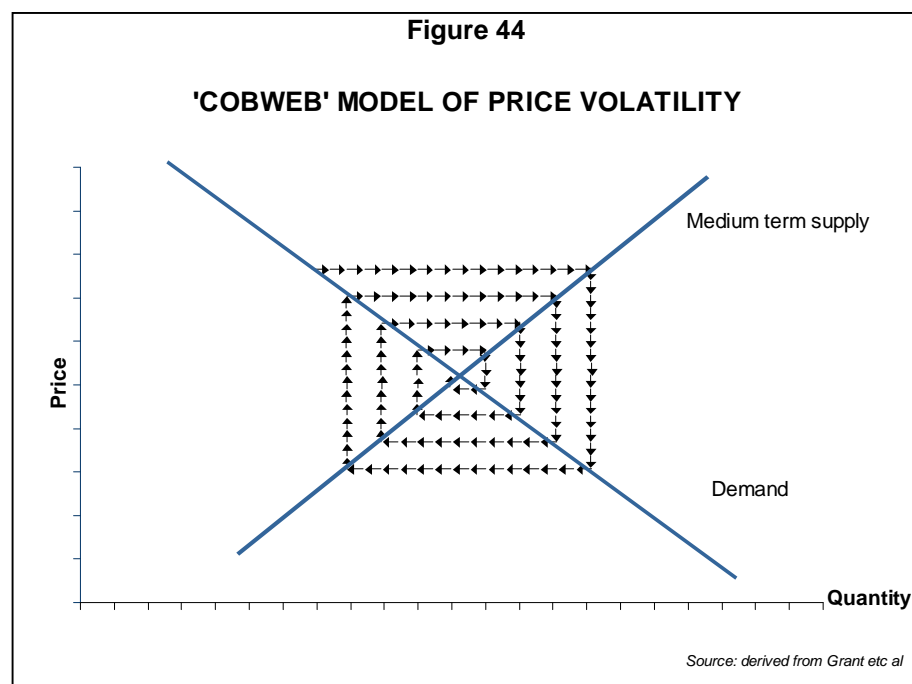
A scenario of hyper volatility in commodity prices is not discussed by the IMF but has been considered as at least a theoretical possibility by staff at the Australian Treasury (Grant *et al*, 2006). There are two reasons why this might be a possible model of commodity prices at present.

Firstly, historical evidence suggests that strong volatility has characterised commodity prices in the long term, as both Grant *et al* and Cashin and McDermott found.

Second, Grant *et al* point out that the recent pattern of the commodity boom in Australia may be consistent with a longstanding theory of price volatility known as the cobweb model. Cobweb price paths may occur in markets where short-term supply is highly inelastic, but in the medium term supply can expand to meet demand.

Under such conditions, a sharp and unexpected rise in demand will lead to a large increase in price in the short term, because supply cannot rise to meet demand at the prevailing prices. Producers expand capacity in response to these high prices, and in the medium term supply overshoots, causing a rapid drop in prices that in turn causes production to be scaled back.

Demand and supply thus spiral towards balance, but with substantial overshooting of prices both above and below equilibrium, creating a cobweb effect (Figure 44).



Western Australia's recent experience, of rapidly rising commodity prices inducing strong growth in resource investment but as yet no commensurate increase in output volumes, seems consistent with such a model.

For a cobweb to eventuate, however, at least two other conditions would need to be satisfied: other producers around the world would similarly need to be increasing supply, and producers would need to be unaware of this supply response and thus fail to anticipate lower prices in future. While the first of these conditions is plausible, the second is less so.

Business as usual

The final scenario is business as usual, meaning a resumption of the prevailing trend before the recent commodity price rises, not a continuation of current trends. For global commodity markets this would mean that the current round of prices is no more than an exceptionally strong example of the normal volatility of commodity prices. Once supply has adjusted and demand perhaps eases a little, the prices of commodities would drop back.

In the longer term, commodity prices would resume their trend decline compared to prices of other goods and services.

This scenario assumes that recent price rise is no more than a temporary phenomenon as supply adjusts to new demand levels. It reflects suspicion that the "super cycle" theory ignores the economic reality of supply responses, and is reminiscent of the hype of the "new economy" and other past property, share and other price bubbles, which have almost always been attended by optimistic speculation that this time the boom will not end in a bust.

Modelling the Effects

If the IMF and World Bank are right in their expectations that prices will decline, but not to pre-boom levels, then the effects of the recent demand shock will not fade completely once prices peak in the current cycle.

The DTF¹ has attempted to model the economic implications of the resources boom for Western Australia using the MMRF-Green computable general equilibrium model². The aim was to determine whether a permanent increase in global demand for the State's key commodity exports could improve welfare, notwithstanding an assumed decline in mining sector productivity. The simulation was carried out in two parts.

¹ This analysis was presented by Kurt Sibma at the 2006 CGE Modellers' Conference in Perth. A paper describing the results and methodology in more detail will be published later in 2006-07.

² The MMRF-Green model is a multi-regional, dynamic model developed by the Monash University Centre of Policy Studies, with Australia separated into different regions. MMFR-Green is documented in detail in Adams, Horridge and Wittwer (2003).

Firstly, a shock in demand for Australia's resource sector commodities was modelled as an upward (price) shift in the export demand curve for these goods by 10% to 20%¹.

Second, a similar demand shock is implemented but the increase in demand for resources sector commodities was accompanied by a reduction in total factor productivity in the resources sector. The aim was to test whether welfare improves as a consequence of the resources boom, notwithstanding a reduction in mining sector productivity.

The headline results for the first simulation are presented in Table 12. Real GSP in Western Australia expands by a cumulative 3.4% relative to the base case over the period to 2024-25, with exports and real household consumption increasing by a roughly similar amount². In Australia, which is not as resource-oriented as Western Australia, GDP and consumption also expand, but by smaller amounts.

The rise in demand for resource commodities, and the attendant rise in prices for these goods, improves rates of return to capital. This in turn elicits a sizeable investment response. This expansion in resource investment increases the productive capacity of the State's economy. Production of iron ore rises by around 15% relative to the base case by 2024-25, and production of other metal ores increases by a similar magnitude. With mineral and energy products accounting for around 60% of the State's exports (in the model database), higher production of these commodities explains much of the increase in Western Australia's GSP.

Table 12

ECONOMIC EFFECT OF A SUSTAINED INCREASE IN DEMAND FOR RESOURCES				
Cumulative deviation from base case, 2000-01 to 2024-25 (%)				
	Real GDP / GSP	Exports (volume)	Real household consumption	Employment (hours worked)
NSW	-0.1	-2.2	0.1	-0.5
Vic	-1.1	-3.6	-0.9	-1.3
Qld	1.8	2.1	2.1	1.1
SA	-1	-3.4	-0.8	-1.2
WA	3.4	4	3.8	2.7
Tas	-0.6	-2	-0.4	-0.9
NT	4	6	5	3.4
ACT	0	-4.7	0.5	-0.1
Aus	0.5	-0.5	0.7	0

Source: WA DTF based on MMRF-Green simulation

¹ Note that the default in MMRF Green is constant returns to scale, so production can expand indefinitely at base case productivity levels.

² The results presented in this paper reflect the percentage change in variables compared to the what would have happened without the shock. Thus, the Western Australian economy is 3.4% higher than it would have been without the resources boom. Even without this shock, the economy is projected to expand in the base case scenario.

Table 13

MACROECONOMIC IMPACT OF A RESOURCES DEMAND AND PRODUCTIVITY SHOCK		
Cumulative deviation from base case, 2000-01 to 2024-25 (%)		
	Real GDP / GSP	Real household consumption
NSW	-0.4	-0.2
Vic	-1.0	-0.7
Qld	1.0	1.4
SA	-0.9	-0.7
WA	2.6	3.2
Tas	-0.5	-0.2
NT	3.3	4.5
ACT	0.3	0.6
Aus	0.1	0.4

Source: WA DTF based on MMRF-Green simulation.

Aside from this growth in exports and production, a second key feature of the improvement in economic welfare in Western Australia is a favourable shift in relative prices. An increase in the terms of trade drives incomes growth higher, resulting in stronger growth in real household consumption.

In this second simulation, the shock in demand to Australia's mineral and energy exports is combined with an assumed decline in mining sector productivity, perhaps because the sector is using less productive resources. This shock is to test whether an increase in demand for resources generate a welfare gain in Western Australia's community even if mining sector productivity falls.

The effect of lower productivity in simulation 2 reduces GSP by approximately 1% in 2024-25 compared to simulation one, but GSP still increases significantly over the base case¹. This is because the resources sector now requires more inputs – i.e. more labour and capital – to produce the same level of output. This in turn increases the price of the State's resource commodities and reduces Western Australia's export competitiveness, partly offsetting the initial upward shift in export demand. However, it is important to note that the overall deviation from the base case is still positive.

Growth in private household consumption in Western Australia is significantly higher than growth in GSP (Table 13). This reflects the effect of favourable movements in the terms of trade raising purchasing power.

Thus, even with an economy-wide reduction in productivity, overall welfare in Western Australia is enhanced by a sustained shift in global demand for resource commodities.

¹ Productivity in 2024-25 is still higher than in 2004-05, but the rate of growth is slower in this simulation.

Australia's other mining States and Territories also fare well, but even with a favourable shift in the terms of trade, consumption in less resource-oriented economies – particularly Victoria and South Australia – falls relative to the base case. For Australia as a whole, GDP increases marginally under this modelling scenario (by 0.1% in 2024-25). However, the increase in household consumption and welfare is noticeably higher, again reflecting terms of trade effects.

Summary and Conclusions

The main purpose of this paper is to explore the apparent paradox of strong economic growth but weak productivity growth in Western Australia in the context of the resources boom, and in particular what these trends might mean for the economic welfare of the Western Australian community.

Its key findings are that weak overall productivity growth in Western Australia is almost certainly linked to the decline in mining sector productivity in recent years. Much of that decline is probably a temporary effect, as lags and long lead-times in capacity expansion mean that strong growth in mining investment has yet to result in strong growth in the volume of outputs. At least some of the drop in productivity may be permanent, however, as high prices have also made it profitable to exploit more marginal and costly resources, so the average level of outputs relative to inputs has fallen.

However, from the point of view of the community's capacity to consume, productivity and output growth are currently telling only part of the story. The same phenomenon that had induced the mining sector's apparent loss of productivity – namely strong commodity prices – has also induced a sharp increase in the terms of trade. This means that Western Australia's traded outputs can be exchanged for a larger volume of goods and services, so consumption possibilities are greatly enhanced.

The question of whether Western Australia's productivity paradox is a temporary oddity or a long-term phenomenon will depend on the longer-term path of commodity prices. Several possible price paths are discussed, but if the IMF and World Bank are right, prices will drop from recent highs, but not revert to pre-boom lows. Abstracting from technological progress, such a sustained increase demand could induce a permanent one-off reduction in mining sector productivity, with higher prices and demand encouraging producers to exploit more remote and less productive deposits.

However, a permanent shift in relative prices due to a sustained increase in demand could nonetheless generate significant welfare gains in Western Australia. The DTF's modelling suggests that an increase in resource prices could improve welfare in resource export-oriented economies even if mining sector productivity falls, if the fall in productivity is demand driven (and universal). In other words, there can be a counter-intuitive situation where an economy-wide reduction in productivity is associated with positive welfare outcomes.

References

Adams, P.D., Horridge, M. and Wittwer, G. *MMRF-Green: A Dynamic Multi-Regional Applied General Equilibrium Model of the Australian Economy, Based on the MMR and MONASH Models*. 2003. Monash University Centre of Policy Studies General Working Paper No. G-140 October 2003, Melbourne. <http://www.monash.edu.au/policy/ftp/workpapr/g-140.pdf>.

Australian Bureau of Statistics (ABS):

- Cat. 5204.0 ABS National Accounts (Annual)
- Cat. 5206.0 National Accounts: National Income, Expenditure
- Cat. 5220.0 National Accounts: State Accounts (Annual)
- Cat. 5302.0 Balance of Payments and International Investment
- Cat. 5368.0 International Trade in Goods and Services
- Cat. 5422.0 International Merchandise Trade
- Cat. 5439.0 International Merchandise Imports
- Cat. 5625.0 Private New Capital Expenditure and Expected Expenditure
- Cat. 6203.0 Labour Force, Australia
- Cat. 6291.0.55.003 Labour Force, Australia, Quarterly

Cashin, Paul and C. John McDermott, *the Long-Run Behavior of Commodity Prices: Small Trends and Big Variability*. IMF Staff Working Papers Vol. 49 No. 2, July 2002
<http://www.imf.org/external/pubs/ft/staffp/2002/02/pdf/cashin.pdf>

Department of Treasury and Finance. *Western Australian Economic Summary*, Spring 2005.

Diewert, E. and Lawrence, D. (Meyrick and Associates). *Measuring the Contributions of Productivity and Terms of Trade to Australia's Economic Welfare*. Report to the Productivity Commission, March 2006.
<http://www.pc.gov.au/research/consultancy/economicwelfare/economicwelfare.pdf>

Grant, Angelia, John Hawkins and Lachlan Shaw (Macroeconomic Division, the Australian Treasury). *Mining and commodities exports*. 2006. Australian Treasury.
http://www.treasury.gov.au/documents/1042/PDF/02_Resource_commodities.pdf

International Monetary Fund:

- *World Economic Outlook: Financial Systems and Economic Cycles* September 2006. IMF.
<http://www.imf.org/Pubs/FT/weo/2006/02/pdf/weo0906.pdf>
- *Australia: Selected Issues*. IMF Country Report No. 06/373, October 2006.
<http://www.imf.org/external/pubs/ft/scr/2006/cr06373.pdf>

Krugman, Paul. *The Age of Diminished Expectations*, 1990. Cambridge MA. MIT Press.

Lowe, Philip, *Labour-Productivity Growth and Relative Wages: 1978-1994*, Reserve Bank of Australia Research Discussion Paper 9505, September 1995.

Sibma, Kurt. *The Resources Boom: Productivity and welfare implications for Western Australia*. Forthcoming.

Stevens, Glen. *Economic Conditions and Prospects*, Address by Mr GR Stevens, Governor, to the Australian Business Economists and the Economic Society of Australia (NSW Branch) Annual Forecasting Conference Dinner, Sydney, 11 October 2006.

http://www.rba.gov.au/PublicationsAndResearch/Bulletin/bu_oct06/Pdf/bu_1006_3.pdf

World Bank Group. Oil, Gas, Mining and Chemicals Department . 2006. *Background Paper : The Outlook for Metals Markets; Prepared for G20 Deputies Meeting Sydney 2006*. World Bank. Washington.

http://www.treasury.gov.au/documents/1192/PDF/Session_2_WB_The_Outlook_for_Metals_Markets.pdf

Issues For Major Project Assistance Analysis Using Computable General Equilibrium Models

By Bruce Layman
Department of Treasury and Finance

Table of Contents

Introduction.....	76
Computable General Equilibrium or Cost-Benefit Analysis?	77
Modelling Issues.....	78
Justify a Market Failure	78
Justify the Assumptions Used	78
Present a Measure of Economic Welfare.....	79
Include the Total Cost of Any Subsidy.....	81
Include the Impact of the Commonwealth Grants Commission.....	83
Account for Foreign Ownership	85
Labour Market and Interstate Migration Assumptions.....	86
Make Sure Intermediate Input Responses are Truly Marginal.....	87
Account for Risk.....	87
Conclusion.....	88
References	89

Introduction

Computable General Equilibrium (CGE) models are commonly used in Australia to evaluate the merits of proposals from companies or projects for government support. Project proponents will often submit a CGE analysis supporting their request for assistance, while governments will often conduct their own analyses to gauge the merit of proposals.

However, unlike Cost-Benefit Analysis (CBA), a standard set of assumptions and outputs have never been formalised by the CGE modelling community. Partly as a result of this, governments across Australia have not specified what they require in an analysis to make judgments on the merits of proposals.

This has meant that a variety of assumptions have been used and outputs presented. Additionally, past analyses have tended not to be very transparent with their assumptions. There seems to be a perception that a CGE modelling analysis is the truth no matter what. In reality, however, the assumptions used will often determine the result of a modelling run even before any buttons are pressed on a computer.

Finally, the outputs presented have rarely been the types required for governments to make an informed decision on whether the project would make their citizens better off. That is, will assisting a project increase economic welfare? Instead, the economic impact of particular proposals is the most common output, but this should have no place in the decision-making process.

This paper discusses many of these issues in the context of requests for assistance to the Western Australian Government. It does not aim to be overly prescriptive, as the flexibility of CGE models to adapt to many situations is one of their major strengths. Instead it suggests some 'standard' methods, assumptions and outputs, and notes that shifting away from these assumptions is acceptable, but the alternative assumptions used must be justified by sound logic or empirical evidence.

This paper is designed as a less technical version of Layman (2006), and is also slightly less comprehensive than the technical paper. It is recommended that modellers should read the more technical paper for exact implementation of the issues contained below.

The paper will make many comments such as "in CGE analyses to date" or "usually" without references. This is because most of the analyses that motivated this paper have been confidential submissions to the Western Australian Government, and so cannot be directly quoted here. The generalities presented are from the author's direct experience of many such proposals.

At this stage, this paper is structured as a discussion of issues rather than a list of requirements for submitting modelling to the Department of Treasury and Finance (DTF). However, the issues discussed in this paper will probably form the basis for a publication of such requirements some time in the future.

Computable General Equilibrium or Cost-Benefit Analysis?

Before proceeding to a discussion of CGE modelling assumptions and techniques, it is worth considering whether a CGE model should be used to evaluate a project, or whether a 'traditional' CBA (Sugden and Williams, 1978, p. 89) is more appropriate.

No matter what technique is used, the CBA discipline of considering all of the costs versus all of the benefits should still be imposed. A project is only worth assisting if the welfare effect is still positive after inputting all of the costs and benefits into a CGE model or a CBA.

While CBA is appropriate for many forms of government decisions¹, CGE models are the appropriate tools for analysing direct subsidies to major resource projects (Layman, 2006, p. 5). This is because the benefits of this type of project on the domestic economy are largely the flow-on benefits from the project, particularly if the project is 100% foreign owned. Some form of general equilibrium model, such as a CGE model, is needed to calculate these flow-on benefits.

A grey area in the choice of models is in the provision of government-owned multi-user infrastructure at below cost (or more correctly at below required rates of return). An example is the Western Australian Government's decision in 2003 to provide approximately \$160 million of multi-user infrastructure on the Burrup Peninsula for potential gas-processing projects.

While there is no definitive rule the distinction can be made by considering what type of market failure government is trying to correct (Layman, 2006, p. 30). For example, if a road is provided from which users cannot be excluded, then the market failure is the inability of the road builder to capture returns from their asset. In such a case, a CBA to value the consumers' surplus (Sugden and Williams, 1978, pp. 113-118) from use of the road is clearly the appropriate methodology for analysis.

In the case of multi-user infrastructure in a contained industrial precinct, however, there is no real market failure with the provision of infrastructure², but there could be some market failure with the projects that will use the infrastructure.

To put it another way, while in practice the Government is subsidising the infrastructure, it is really subsidising the projects that will use it. The infrastructure is just the means to provide that subsidy. Here, CGE models become the appropriate analysis tool.

¹ See MJA (p. 3) and BTRE (p. 106).

² There could be some market failure, like bargaining problems between the proponents. However, this would only require the Government to organise the infrastructure access, and not subsidise it.

This distinction becomes difficult for a piece of infrastructure (e.g. a water pipeline) that could potentially service both social interests and achieve economic development objectives. There may be scope for a combined approach, but the costs and benefits from each approach may not be comparable for purposes of analysis. This is a key area of future research.

Modelling Issues

Justify a Market Failure

Many past proposals to the Western Australian Government for project assistance supported by CGE analyses have stated that a project will “increase Gross State Product by \$XX million a year” or “add \$YY million a year to economic activity”.

However, before generating any figures from a model, the modeller must ask why they need to add this project to the economy, rather than it occurring with no government interference. That is, why is it not in our modelling ‘base case’?

Some form of market failure must be demonstrated before a project is modelled in the context of an assistance proposal. Government support for a project cannot increase economic welfare unless there is some form of market failure that causes the project not to proceed. Unless market failure can be found, the failure of a particular project to locate in Western Australia is a case of market reality, and government intervention cannot reverse this without a subsidy so large that it will reduce economic welfare.

The identification of market failure is probably the single biggest improvement that could be generally applied across the CGE analyses that have supported project assistance requests presented to the Western Australian Government over the past few years.

Justify the Assumptions Used

These rival assumptions are not right or wrong, but they illustrate how far the results of CGE models flow from the presuppositions of their authors. Most empirical exercises confront theory with numbers – they test theories against the data; sometimes they even reject them. CGE models, by contrast, put numbers to theory. If the modeller believes that trade raises productivity and growth, for example, then the model's results will mechanically confirm this. They cannot do otherwise. In another context, Robert Solow, a Nobel prize-winner, has noted the tendency of economists to congratulate themselves for retrieving juicy plums that they themselves planted in the pudding.

The Economist, 2006, p. 61

The above comment by *The Economist* magazine exposes a common fallacy in CGE modelling – that the act of modelling itself justifies the assumptions used in the model. Too often CGE modelling results are presented without discussion of the critical assumptions that drive the results – policy makers are expected to believe that a project is worthwhile just because a CGE model says so. This treats a CGE model as an all-knowing ‘black box’.

However, it is well known that any problem inputted into the model would have a response consistent with the shock applied to the economic theory and assumptions on which such models are based. For example, basic microeconomic analysis proves that imposing a tariff on imported goods imposes welfare losses on consumers. A CGE model based on neoclassical economic theory can only quantify this, never prove or disprove it¹.

If a proposed project is modelled by placing a large lump of new capital in a regional economy without modelling the true cost of that project to government, allowing free labour market migration, there should be no surprise that the size of the regional economy expands. In such cases a modeller is, as Solow said, just finding the juicy plums that they planted in the pudding.

In terms of the practical modelling of a project, modellers must understand and justify the assumptions that they are making, both implicit and explicit. This is because they could be determining the outcome of a simulation before they even run the model. The justification for assumptions must be grounded in sound logic and/or empirical evidence.

Additionally, it is critical for modellers to detail their assumptions in the write up of their analysis, and highlight the ones that underpin the major results. CGE modelling is perhaps as close as an applied economist will ever get to undertake a controlled experiment and, as such, leaving a trail for future researchers to repeat an analysis is a critical part of a modeller's task.

Present a Measure of Economic Welfare

Welfare analysis, not economic impact analysis, is required to assess the merit of a proposal

The task of governments is to improve the lives of citizens in their respective jurisdictions. They can do this through a variety of means, from providing the rule of law, provision of public goods such as health and education services, or possibly through economic development activities such as assisting major projects².

Economists use the Pareto Improvement Criterion to decide whether a certain action is worth pursuing. A government action leads to a Pareto improvement if it makes at least one person better off and no one worse off (Sugden and Williams, 1978, p. 89). This form of analysis is called welfare analysis.

¹ CGE models are very good at valuing competing alternative, such as the rise in other taxes required to offset the loss in tariff revenue, such as in IC (1997, p. N23).

² Governments can also improve different types of welfare. They can increase economic welfare (e.g. increased incomes or consumption), social welfare (e.g. by constructing community infrastructure) or environmental welfare (e.g. by rehabilitating a sensitive area). This paper concentrates on economic welfare, not because other types of welfare are unimportant, but simply because there are issues with economic welfare that need to be resolved.

In contrast, economic impact analysis should not be used to assess the merit of a proposal. In a report prepared for the Western Australian Economic Regulation Authority (ERA), Marsden Jacob Associates (MJA) notes the role of economic impact analysis as:

The purpose of economic impact analysis is to quantify and describe the pertinent impacts (such as the number of jobs created during the construction period of a major piece of infrastructure or the amount of income generated). However, these aggregates describe economic impacts and do not themselves indicate the magnitude of the benefits and costs and whether the project is desirable from a social point of view.
MJA, 2006, p. 2

Economic impact analysis can reveal interesting things that will happen in response to a proposal, but it cannot tell policy makers whether that proposal will make Western Australians better off and is worth pursuing¹. However, many of the CGE analyses presented to the State Government to this point in time are in fact impact analyses, and do not inform on the potential welfare gain from assisting a project.

Welfare measures

If we are undertaking welfare analysis, then the final figure (or figures) that we pluck from the thousands of results produced in a CGE model must be a reasonable approximation of economic welfare. In this regard, the commonly used figures for Gross Domestic Product (GDP) at the national level and Gross State Product (GSP) at the State level are not good measures of economic welfare.

Changes in GDP and GSP can be offset by changes in an economy's terms of trade and, importantly for foreign-financed projects, by increased foreign ownership. There are also problems with the Divisia problem (Dixon and Rimmer, 2002, p. 25), where changing weights can lead to a change in GDP without a change in production for any specific commodity.

Dixon and Rimmer note that real consumption (private and public) is a better indicator, but still suffers from the Divisia index problem. Instead, they recommend Laspeyres or Paasch cost differences (pp. 210-211). Alternatively, Layman (2004, p. 21) argued that, while Laspeyres or Paasch cost differences were technically superior, consumption was a more practical and acceptable measure for explanation to policy makers.

At the State level in a regional CGE model, large population shifts relative to the base case are common when an economic shock (such as the advent of a major project) occurs in just one region (Wilson, 2004, p. 2). Such shifts mean just about any project can make the economy bigger, but this does not necessarily mean that the residents of the economy are better off.

¹ Impact analysis can be useful for analysing adjustment costs of a project or policy.

Per-capita consumption (private and public) is a useful measure to see if welfare has increased due to a change, particularly if the cost of any subsidy is incorporated into the analysis. However, it does not give any guidance for the total scale of the benefits relative to the total scale of the costs.

A suggested measure here is public and private¹ Population Adjusted Real Consumption (PARC). The formula for PARC in volumes in time t is:

$$PARC_{it} = \left(\frac{C_{itP}}{POP_{itP}} - \frac{C_{itB}}{POP_{itB}} \right) * POP_{itB} \quad (E1)$$

where:

$PARC_{itP}$ is population-adjusted real public and private consumption in region i in time t;

C_{itP} is real private and public consumption in region i in year t in the policy scenario;

POP_{itP} is population in region i in year t in the policy scenario;

C_{itB} is real private and public consumption in region i in year t in the base scenario; and

POP_{itB} is population in region i in year t in the base scenario.

PARC is essentially the increase in per-capita public and private consumption aggregated across the pre-policy shock State population. An increase in the Net Present Value (NPV) of PARC over the life of the project would indicate that it is, in economic terms, worth proceeding with the request for assistance.

While not perfect, PARC gives a reasonable approximation of the change in economic welfare at the State or Territory level from just about any policy change². It accounts for terms of trade effects, foreign ownership and accounts for population shifts.

Include the Total Cost of Any Subsidy

CGE models are commonly used to fully capture the flow-on benefits from a proposal, however, the flow-on effects of the budgetary impact of any subsidy must also be examined within the model³.

¹ Consumption of public goods, such as an increase in health expenditure afforded from an improvement in a Government's tax collections, improves economic welfare by just as much as private consumption.

² PARC makes intuitive sense with a rising population, but it is not clear whether policy-makers would be attracted to a policy that might increase average incomes but reduce population. This was illustrated in Layman (2006, pp. 29-36), where the project created work for a few highly paid workers, but the subsidy required to attract the project required a reduction in a large number of low-paid public servants.

³ It is not acceptable to compare model-generated benefits with costs not ever entered into the model. This is because this method examines the flow-on benefits from the project, but does not examine the flow-on costs.

Put simply, the job creation impact of a project seeking a subsidy is often presented, but the job destroying impact of commandeering money from other taxpayers to support the project is never included. This one sided presentation has been likened to 'single entry bookkeeping' (Hoover Institution, 2006).

Just as with input-output multipliers¹, accounting for the benefits of a project without the costs of attracting the project can only ever produce a positive result. It is effectively a one-sided analysis².

The need to examine the budgetary impacts has long been recognised by CGE modellers. For example, in some of the earliest examples of exogenously adding a project to the economy in a CGE model, the Centre for Regional Economic Analysis (CREA, 1990, p. 12) accounted cuts in other public³ consumption required to fund the Very Fast Train project in New South Wales and Victoria, while Dixon, Horridge and Johnson (1992, p. 273) did likewise for the Multi-Function Polis in South Australia. However, this technique seems to have become less common as the technique of adding projects to the economy in CGE models has become more popular.

Project proponents have often argued that the addition of a project will generate more than enough revenue to cover its additional cost to the budget. The CGE framework is perfect for testing this claim through a balanced budget closure.

The costs modelled should include both the direct costs, such as the subsidy required to attract the project, and the indirect costs, such as additional expenditure on the State Government health system required to support a higher population.

It could be argued that these are 'good' costs as they are associated with economic growth. They are, nevertheless, costs that must be accounted for. Worthwhile projects will generate more benefits (economic and fiscal) than the total costs generated by the project.

¹ Input-output multipliers are widely regarded as discredited and should not be used under any circumstance (DTF, 2002, pp. 49-50).

² This term can be attributed to Greg Watts of the Queensland Office of Economic and Statistical Research in a conversation with the author.

³ This analysis also imposed reduced private consumption in the short run as it was largely financed by the private sector.

The usual way to implement 'double entry bookkeeping' in a CGE model is to fix the cash budget balance or net cash-borrowing requirement of the model being used¹, and leave either a tax rate (e.g. payroll tax) or a particular type of government expenditure (e.g. transfers to households or government consumption²) free (endogenous) to adjust to the level required to produce the calculated budget outcome³.

The budget balance can then be shocked to the level required to pay for the subsidy in the years that repayments are needed. This can be an ongoing subsidy, but does not have to be the same year in which the expenditure occurs – for example the public debt created from capital expenditure can be paid off over a number of years.

Include the Impact of the Commonwealth Grants Commission

The Commonwealth Grants Commission (CGC) is tasked with distributing Goods and Services Tax (GST) revenues amongst the States and Territories according to the principle of fiscal equalisation⁴. According to the CGC, fiscal equalisation states that:

each State should be given the capacity to provide the average standard of State-type public services, assuming it does so at an average level of operational efficiency and makes an average effort to raise revenue from its own sources.
CGC, 2006

Broadly speaking, a State's share of GST grants will increase when its national population share increases⁵, but will fall when its own source revenue raising capacity rises⁶. Increases in expenditure needs (such as higher cost of service delivery to remote areas) will also lead to a higher share of GST grants⁷.

¹ This is different to fixing the total budget balance. See Layman (2006, p. 20) for further detail. All revenue, expenditure and budget variables are reported in cash accounting terms.

² Government expenditure is preferred, as this does not violate the savings/investment assumption of most CGE models (Layman, 2006, pp. 19-20).

³ Government administrative costs required to examine and implement the subsidy should also be included (Layman, 2006, p. 20).

⁴ Formally, the CGC advises the federal Treasurer who distributes the grants.

⁵ As compensation for an increase in expenses associated with a higher population share.

⁶ Based on an equal effort to raise taxes from its tax base.

⁷ This analysis ignores Specific Purpose Payments, which could grow with population.

If CGC effects are ignored in a CGE analysis, then a positive shock, such as the addition of a major project to the economy, will overestimate the economic impact to that region as the model will not distribute the benefits of that shock around the other regions in Australia as much as should be the case.

This is because, under the exogenous budget balance closure with no horizontal fiscal equalisation, an increase in economic activity leads to an increase in State revenue, which will, given a fixed net financing requirement assumption, be redistributed to local residents through an increase in expenditure or a reduction in taxes. This will further stimulate economic activity and revenue.

It is important to note that the CGC process is very complex, so modelling it perfectly is extremely unlikely. In the case of a new resource project, however, some relatively simple model code can account for the Commission's impact on revenues substantially better than the usual current solution, which is to ignore the impact of the project on CGC redistributions.

Normally, the major impact of the advent of a new project is to make a State economy bigger. This will have two major effects relevant to the CGC process. It will increase the revenue base of the region and, given standard labour market closures, will increase the population of the region. This will simultaneously increase the revenues and expenses in the region.

It will not change the level of operational efficiency of the Government sector in the region, nor will it change, at least in the first instance, the per-person level of service provided to residents in the region or the level of effort required to raise revenue (e.g. an increase in tax rates)¹.

A relatively simple CGC adjustment equation for a proposal to assist a project is outlined in Equation E2 below. The basic adjustment equation in levels terms is:

$$G_{it} = \left[\left(\frac{P_{it}}{\sum_{i=1}^8 P_{it}} \right) * (GST_t + \sum_{i=1}^8 R_{it}) - R_{it} \right] \quad (E2)$$

where:

G_{it} is GST grants to State/Territory i in time t ;
 P_{it} is population in State/Territory i in time t ;

¹ However, if tax rates or expenditures are used to keep the budget balance unchanged, there will be some impact on these areas. For the sake of simplicity, the second-round effects from expenditure and/or taxation changes have been ignored at this stage, as they would be very complex to include in model code. This, however, should not be the end of the matter as it is important to include these effects eventually, which would enable a wider application than just project assistance analysis.

GST_t is total national GST revenue in time t ; and
 R_{it} is own source revenue¹ in State/Territory i in time t .

$$GST_t + \sum_{i=1}^8 R_{it}$$

The term $GST_t + \sum_{i=1}^8 R_{it}$ is the total revenue pool raised through the GST and from the eight States and Territories own sources. Each State is entitled to its population share of this pool. A State's GST grants are equal to its population share of the pool minus its own source revenues.

If a region's share of national population rises, then it will receive proportionately more GST revenue. If its own-source revenues rise relative to the national average, then it will receive proportionally less GST grants.

Account for Foreign Ownership

Foreign corporations own many of the large resource projects in Western Australia. Even if a project is domestically owned², it is likely that many of its shareholders and creditors live outside of the region in which the project is located. It follows that much of the income generated by the project in its operational phase will be of no direct benefit to the State, as the income will flow outside of the region in the form of income (dividend and interest) repatriations³.

In the past, some (comparative static in particular) analyses have allowed the domestic capital stock to increase in the long run, but have not allowed for the financing of that capital (income repatriations overseas)⁴. This will artificially inflate the benefits of a project to the domestic economy.

For dynamic CGE models, it is critical that the foreign ownership structure of the project is included in the model data. For example, in the MMRF-Green model the appropriate coefficient is 'DOMS'. A value of one means that the project is entirely Australian owned⁵, a value of zero means that it is entirely foreign owned.

¹ This is effectively own-source revenue raising capacity, as tax rates are not being changed.

² There is also the issue of whether the project is owned by Western Australians or by the rest of Australia. This is discussed in Layman (2006, p. 24).

³ See Layman (2006, p. 5) for a brief explanation of Australia's balance of payments system.

⁴ Technically domestically financed projects should not be able to create capital out of thin air either. The construction of a domestically owned privately sector project must be financed by reduced private consumption in the short run (CREA, 1990, p. 12), or diversion of existing capital expenditure. Endogenising consumption and exogenising the trade balance, and shocking consumption downwards by the annual capital expenditure on the project, can achieve this.

⁵ In the State or Territory in which the activity occurred.

The foreign ownership variable should then flow through to subtract foreign-owned capital income from the income available to domestic consumers. Linking domestic private consumption to tax-adjusted Gross National Product (GNP) can do this.

In comparative static models, the trade balance should be made exogenous in the long-run closure, with consumption endogenous to the model. The trade balance should be shocked to a (positive) level equivalent to after-tax overseas income and debt repatriations (CREA, 1990, p. 17)).

Labour Market and Interstate Migration Assumptions

Labour market

The standard labour market assumption for most comparative static and dynamic CGE models is that national employment is variable in the short run with the national wage level fixed. In the long run, national employment is fixed with the national wage level endogenous (Dixon and Rimmer, p. 32)¹.

An additional assumption for regional (State-level) CGE models² is that the nominal wage differential between States is not affected by the project (i.e. it is exogenous), and migration adjusts to maintain this wage differential. This means that interstate migration will be large and instantaneous in response to any policy change³.

As noted in Section 3.2, these are simply assumptions and are not proven by their use in the model, but have a well-founded theoretical justification (Dixon and Rimmer, p. 32).

It is recommended that modellers use these assumptions as a default labour market closure⁴. However, there is no reason why a modeller cannot use different assumptions to the defaults if an external justification can be provided and substantiated.

¹ In dynamic models, the path between the short and long run is facilitated by a partial wages adjustment mechanism (Dixon and Rimmer, p. 205).

² With each region modelled as a separate economy.

³ This might be considered unrealistic, but is acceptable in the absence of a sound theory for interstate migration.

⁴ Although there is an argument for fixing the real wage differential (deflated by consumer prices) between States rather than the nominal differential (Layman, 2006, p. 23).

For example, a project might be planning to locate in a sub-State region that has persistently high unemployment¹, and the labour skills required by the project are already possessed by the regional labour market or can be easily obtained. In such a case then an increase in long run employment² can be justified.

Alternatively, in the current Western Australian (and Australian) labour market with a substantial skills shortage³, any short-run increase in employment might not be reasonable. Here, any increase in labour demand results in higher wages rather than an increase in employment.

Make Sure Intermediate Input Responses are Truly Marginal

Many resource-processing projects are often promoted on the basis that they add value to the State or nation's natural resources. If this is the case, they should be modelled as such and not include extra production of natural resources (from the linkage industry that produces the raw material) as an increase in intermediate demand from the project.

Recent examples of such projects include gas-processing projects that use gas that could be exported or sold into the domestic market, and processing of plantation timber that would have been sold as woodchips. The opportunity cost of exporting the resources in unprocessed form must be deducted from the net benefits of the project.

The preferred method to implement such restrictions is to fix investment (through a swap with a variable in the investment function) and production (through a swap between output and capital productivity) of the linkage industry. This method values the resource at its full opportunity cost⁴.

Account for Risk

When analysing a project or projects the analyst must allow for the risk of an outcome other than as specified in a project proposal (both less and, if necessary, more optimistic).

¹ And people will not shift to areas of higher employment potential.

² Through a reduction in the State's unemployment rate.

³ Western Australia's unemployment rate fell to 3.1% in July 2006, the lowest figure since monthly records were kept in 1978 (ABS, 2006).

⁴ This calculation becomes more complex if the resource-processing project brings forward the mining of the natural resource, but fixing production at various time intervals can accommodate this.

The types of projects (usually large resource-processing projects) that request assistance from the Western Australian Government are very complex, expensive and risky. While the initial financial analysis of a project might paint an optimistic picture, there are a multitude of things that can go wrong, especially price changes for construction and intermediate inputs in remote locations.

Risk in a public CBA is better explicitly identified rather than being incorporated into the discount rate (Sugden and Williams, 1978, p. 62), and this line of reasoning is also justifiable for a CGE analysis. This is because, in a public CBA, the public discount rate is the Marginal Rate of Time Preference (MRTP) for money. The MRTP for money simply represents society's valuation of a dollar today versus a dollar tomorrow, and not the opportunity cost of capital or the risk associated with the project, as would be evaluated by a financial analysis of a company.

This means that the modeller must run several scenarios based on potential outcomes for the project. A probability of each outcome must be assigned to each scenario and a net result calculated.

Assigning probabilities is a subjective exercise, but a long enough history exists to show that, contrary to many project assistance submissions, the most optimistic scenario for multiple project starts almost never occurs.

Conclusion

This paper outlines several issues relevant to the modelling of a request for assistance to the Western Australian Government from a potential major resource project. It canvasses the theoretical basis for modelling the project, the steps involved in an analysis and the assumptions that should be included.

Following the recommendations in this paper should allow project proponents and their CGE modelling consultants to produce results that will enable the Western Australian Government to make a reasonable assessment of whether assisting the particular project will enhance the net economic welfare of Western Australians.

While only a discussion of issues at this stage, it is anticipated that in the near future the Department of Treasury and Finance will draw up a set of guidelines based on these issues that project proponents must follow for their proposal to be considered.

Comments and suggestions can be forwarded to the author, Bruce Layman, at the contact address and phone number given at the beginning of this publication.

References

ABS (Australian Bureau of Statistics) (2006) Labour Force: Australia, Cat. No. 6202, ABS, Canberra.

BTRE (Bureau of Transport and Regional Economics) (1999) Facts and Furphies in Benefit-cost Analyses: Transport, BTRE Research Report 100, <http://www.btre.gov.au/docs/reports/r100/r100.aspx>.

CREA (Centre for Regional Economic Analysis) (1990) The Economic Impact of the Very Fast Train, Report Prepared for the VFT Joint Venture Partners, October 1990.

CGC (Commonwealth Grants Commission) (2006) The Commission and Its History, <http://www.cgc.gov.au/>.

Dixon, P.B., Horridge, M. and Johnson, D.T. (1992) "A General Equilibrium Analysis of a Major Project: The Multi-Function Polis", Australian Economic Papers, 31(59), pp. 272-290.

Dixon, P.B. and Rimmer, M.T. (2002) Dynamic General Equilibrium Modelling for Forecasting and Policy Analysis, North-Holland Publishing Company, Amsterdam.

DTF (Department of Treasury and Finance) (2002) "The Use and Abuse of Input-Output Multipliers", Economic Research Articles, Perth, <http://www.dtf.wa.gov.au/cms/uploadedFiles/ecoresearchart2002.pdf>.

"Economic Models: Big Questions and Big Numbers" (2006) The Economist, July 15-21 2006, Volume 380 Number 8486, London.

Hoover Institution (2006) Welfare for the Well-Off: How Business Subsidies Fleece Taxpayers, (<http://www.hoover.org/publications/epp/2846211.html?show=essay>).

IC (Industry Commission) (1997) The Textiles, Clothing and Footwear Industries: Volume 2: Appendices, Report Number 59, September 1997, <http://www.pc.gov.au/ic/inquiry/59tcf/finalreport/59tcf2.pdf>.

Layman, B.D.

- (2004) CGE Modelling as a Tool for Analysing Major Project Assistance: A View from the Trenches, Paper present to the 4th Biennial Regional Modelling Workshop, Melbourne, <http://www.monash.edu.au/policy/regional/laypap.pdf>.
- (2006) Lessons in analysing proposals for major project assistance using MMRF-Green, Paper present to the 5th Biennial Regional Modelling Workshop, Perth.

MJA (Marsden Jacob Associates) (2005) Frameworks for Economic Impact Analysis and Cost-Benefit Analysis, Report Prepared by Marsden Jacob Associates for the Economic Regulation Authority, WA, 22 July 2005, http://www.era.wa.gov.au/water/library/Frameworks_for_economic_analysis_and_benefit_cost_analysis.pdf.

Solow, R.M. (1997) "It Ain't the Things You Don't Know That Hurt You, It's the Things You Know Ain't So", *The American Economic Review*, May 1997; 87, 2.

Sugden, R. and Williams, A. (1978) *The Principles of Practical Cost-benefit Analysis*, Oxford University Press, Oxford.

Wilson, E.M. (2004) Labour Market Closures and their Impact on the CGE Modelling Results for a New Resource Project, Paper present to the 4th Biennial Regional Modelling Workshop, Melbourne, <http://www.monash.edu.au/policy/regional/wilpap.pdf>.

Statistical Appendix

International Trends

REAL GROWTH IN WORLD OUTPUT AND TRADE IMF Estimates and Forecasts

	2007	2006	2005
Trade	7.6%	8.9%	7.4%
Output	4.9%	5.1%	4.9%

Source: IMF WEO Database, September 2006

CURRENT ACCOUNT BALANCES IMF Estimates, Countries, % GDP

	2005	2006	2007
Australia	-6.0%	-5.6%	-5.3%
China	7.2%	7.2%	7.2%
France	-1.6%	-1.7%	-1.7%
Germany	4.1%	4.2%	4.0%
HK	11.4%	8.7%	7.8%
Indonesia	0.3%	0.2%	0.6%
Italy	-1.6%	-1.4%	-1.0%
Japan	3.6%	3.7%	3.5%
Malaysia	15.2%	15.6%	15.7%
Mexico	-0.6%	-0.1%	-0.2%
NZ	-8.9%	-9.6%	-9.1%
Russia	10.9%	12.3%	10.7%
Singapore	28.5%	28.5%	27.3%
Taiwan	4.7%	5.8%	5.9%
UK	-2.2%	-2.4%	-2.3%
USA	-6.4%	-6.6%	-6.9%

Source: IMF WEO Database, September 2006

GENERAL GOVERNMENT BALANCES IMF Estimates, Countries, % GDP

	2005	2006	2007
Australia	2.3%	2.2%	2.0%
France	-2.9%	-2.7%	-2.6%
Germany	-3.3%	-2.9%	-2.4%
HK	1.0%	0.5%	0.7%
Italy	-4.1%	-4.0%	-4.1%
Japan	-5.6%	-5.2%	-4.9%
NZ	4.8%	4.4%	3.0%
Singapore	6.0%	4.3%	4.5%
Taiwan	-2.4%	-1.7%	-1.7%
UK	-3.3%	-3.2%	-2.8%
USA	-3.7%	-3.1%	-3.2%

Source: IMF WEO Database, September 2006

GENERAL GOVERNMENT STRUCTURAL BALANCE
IMF Estimates, Countries, % GDP

	2005	2006	2007
Australia	2.3%	2.2%	2.0%
France	-2.2%	-1.8%	-1.8%
Germany	-3.0%	-2.6%	-2.1%
Italy	-3.4%	-3.3%	-3.4%
Japan	-5.2%	-5.1%	-5.0%
NZ	4.8%	4.0%	3.3%
UK	-3.2%	-3.1%	-2.8%
USA	-3.6%	-3.1%	-3.2%

Source: IMF WEO Database, September 2006

GDP AT PPP SHARE OF WORLD TOTAL
IMF Estimates, Countries, % World Output

	2005	2006	2007
Australia	1.0%	1.0%	1.0%
China	15.4%	16.1%	16.8%
France	3.0%	2.9%	2.9%
Germany	4.1%	4.0%	3.9%
HK	0.4%	0.4%	0.4%
Indonesia	1.6%	1.6%	1.6%
Italy	2.7%	2.7%	2.6%
Japan	6.4%	6.2%	6.1%
Malaysia	0.5%	0.5%	0.5%
Mexico	1.8%	1.7%	1.7%
NZ	0.2%	0.2%	0.2%
Russia	2.6%	2.6%	2.6%
Singapore	0.2%	0.2%	0.2%
Taiwan	1.0%	1.0%	1.0%
UK	3.0%	2.9%	2.9%
USA	20.1%	19.9%	19.7%

Source: IMF WEO Database, September 2006

GDP GROWTH, CONSTANT PRICES
IMF Estimates, Countries, Annual % Change

	2005	2006	2007
Australia	2.5%	3.1%	3.5%
China	10.2%	10.0%	10.0%
France	1.2%	2.4%	2.3%
Germany	0.9%	2.0%	1.3%
HK	7.3%	6.0%	5.5%
Indonesia	5.6%	5.2%	6.0%
Italy	0.0%	1.5%	1.3%
Japan	2.6%	2.7%	2.1%
Malaysia	5.2%	5.5%	5.8%
Mexico	3.0%	4.0%	3.5%
NZ	2.3%	1.3%	1.7%
Russia	6.4%	6.5%	6.5%
Singapore	6.4%	6.9%	4.5%
Taiwan	4.1%	4.0%	4.2%
UK	1.9%	2.7%	2.7%
USA	3.2%	3.4%	2.9%

Source: IMF WEO Database, September 2006

GROWTH IN CONSUMER PRICES
IMF Estimates, Countries, Annual % Change

	2005	2006	2007
Australia	2.7%	3.5%	2.9%
China	1.8%	1.5%	2.2%
France	1.9%	2.0%	1.9%
Germany	2.0%	2.0%	2.6%
HK	0.9%	2.3%	2.5%
Indonesia	10.5%	13.0%	5.9%
Italy	2.3%	2.4%	2.1%
Japan	-0.6%	0.3%	0.7%
Malaysia	3.0%	3.8%	2.7%
Mexico	4.0%	3.5%	3.3%
NZ	3.0%	3.8%	3.4%
Russia	12.6%	9.7%	8.5%
Singapore	0.5%	1.8%	1.7%
Taiwan	2.3%	1.7%	1.5%
UK	2.0%	2.3%	2.4%
USA	3.4%	3.6%	2.9%

Source: IMF WEO Database, September 2006

UNEMPLOYMENT RATES
IMF Estimates, Countries, % Labour Force

	2005	2006	2007
Australia	5.1%	5.0%	5.0%
France	9.5%	9.0%	8.5%
Germany	9.1%	8.0%	7.8%
HK	5.7%	4.6%	4.0%
Italy	7.7%	7.6%	7.5%
Japan	4.4%	4.1%	4.0%
NZ	3.7%	3.9%	4.5%
Singapore	3.1%	2.7%	2.7%
Taiwan	4.1%	3.9%	3.7%
UK	4.8%	5.3%	5.1%
USA	5.1%	4.8%	4.9%

Source: IMF WEO Database, September 2006

GDP AT PPP SHARE OF WORLD TOTAL
IMF Estimates, Regions, % World Output

	2005	2006	2007
Africa	3.3%	3.4%	3.4%
Central and eastern Europe	3.3%	3.3%	3.3%
CIS and Mongolia	3.8%	3.8%	3.9%
Developing Asia	27.1%	28.0%	28.8%
Euro area	14.8%	14.4%	14.1%
Middle East	2.8%	2.8%	2.8%
Western Hemisphere	7.4%	7.4%	7.3%

Source: IMF WEO Database, September 2006

GDP GROWTH, CONSTANT PRICES
IMF Estimates, Regions, Annual % Change

	2005	2006	2007
Advanced economies	2.6%	3.1%	2.7%
Africa	5.4%	5.4%	5.9%
Africa: Sub-Saharan	5.8%	5.2%	6.3%
ASEAN-4	5.1%	5.0%	5.6%
Central and eastern Europe	5.4%	5.3%	5.0%
CIS and Mongolia	6.5%	6.8%	6.5%
Developing Asia	9.0%	8.7%	8.6%
Euro area	1.3%	2.4%	2.0%
European Union	1.8%	2.8%	2.4%
Major advanced economies (G7)	2.4%	2.9%	2.5%
Middle East	5.7%	5.8%	5.4%
Asian NIEs	4.5%	4.9%	4.4%
Other advanced economies	3.7%	4.1%	3.7%
Other emerging countries	7.4%	7.3%	7.2%
Western Hemisphere	4.3%	4.8%	4.2%
World	4.9%	5.1%	4.9%

Source: IMF WEO Database, September 2006

CONSUMER PRICE INDEX GROWTH
IMF Estimates, Regions, Annual % Change

	2005	2006	2007
Advanced economies	2.3%	2.6%	2.3%
Africa	8.5%	9.9%	10.6%
Africa: Sub-Saharan	10.7%	11.7%	12.6%
ASEAN-4	7.5%	8.6%	4.5%
Central and eastern Europe	4.8%	5.3%	4.6%
CIS and Mongolia	12.3%	9.6%	9.2%
Developing Asia	3.5%	3.8%	3.6%
Euro area	2.2%	2.3%	2.4%
European Union	2.2%	2.3%	2.4%
Major advanced economies (G7)	2.3%	2.6%	2.3%
Middle East	7.7%	7.1%	7.9%
Asian NIEs	2.2%	2.2%	2.2%
Other advanced economies	2.1%	2.3%	2.3%
Other emerging countries	5.3%	5.2%	5.0%
Western Hemisphere	6.3%	5.6%	5.2%
World	3.7%	3.8%	3.7%

Source: IMF WEO Database, September 2006

CHINA'S REAL GDP GROWTH
Annual % Change, Not Seasonally Adjusted

	Sep-06	Jun-06	Sep-05
GDP Growth	10.7%	10.9%	9.9%

Source: China Statistical Information Service

Markets and Commodity Prices

Commodity Prices

WA COMMODITY PRICE INDEX All Commodities, Index (2001-02 = 100)					
	Jun-06	<u>Level In:</u> May-06	Jun-05	<u>% Change Over:</u> Month Year	
In \$US	235.7	241.2	190.7	-2.3%	23.6%
In \$A	166.7	165.5	130.2	0.7%	28.0%
In SDRs	202.2	205.7	164.9	-1.7%	22.6%

Source: Department of Treasury and Finance

WA COMMODITY PRICE INDEX Non-Rural Commodities, Index (2001-02 = 100)					
	Jun-06	<u>Level In:</u> May-06	Jun-05	<u>% Change Over:</u> Month Year	
In \$US	246.2	252.0	197.4	-2.3%	24.7%
In \$A	174.1	172.9	134.8	0.7%	29.1%
In SDRs	211.1	215.0	170.6	-1.8%	23.7%

Source: Department of Treasury and Finance

WA COMMODITY PRICE INDEX Rural Commodities, Index (2001-02 = 100)					
	Jun-06	<u>Level In:</u> May-06	Jun-05	<u>% Change Over:</u> Month Year	
In \$US	136.8	138.4	127.2	-1.2%	7.5%
In \$A	96.7	94.9	86.9	1.9%	11.3%
In SDRs	117.3	118.0	110.0	-0.6%	6.7%

Source: Department of Treasury and Finance

WA COMMODITY PRICE INDEX In Australian Dollars, Index (2001-02 = 100)					
	Jun-06	<u>Level In:</u> May-06	Jun-05	<u>% Change Over:</u> Month Year	
Non-Rural Commodities	174.1	172.9	134.8	0.7%	29.1%
Rural Commodities	96.7	94.9	86.9	1.9%	11.3%
All Commodities	166.7	165.5	130.2	0.7%	28.0%

Source: Department of Treasury and Finance

COMMODITY PRICE INDEX In Australian Dollars, Index (Period Average = 100)					
	Jun-06	<u>Level In:</u> Aug-06	Sep-05	<u>% Change Over:</u> Month Year	
Western Australia	200.2	198.7	156.4	0.7%	28.0%
Australia	163.8	163.7	136.3	0.1%	20.2%

Source: Department of Treasury and Finance

RBA COMMODITY PRICE INDEXES All Commodities, Various Currencies, 2000-01 = 100					
	Sep-06	<u>Level In:</u> Aug-06	Sep-05	<u>% Change Over:</u> Month Year	
In \$A	143.4	143.3	119.3	0.1%	20.2%
In SDRs	180.9	179.0	159.4	1.1%	13.5%
In US\$	212.5	208.3	179.7	2.0%	18.3%

Source: RBA, Datastream

RBA COMMODITY PRICE INDEXES
By Group, 2000-01 = 100, Australian Dollars

	Sep-06	Level In:		% Change Over:	
		Aug-06	Sep-05	Month	Year
Non-Rural Commodities	161.2	162.6	142.5	-0.9%	13.1%
Rural Commodities	102.2	100.6	92.0	1.6%	11.1%
All Commodities	143.4	143.3	119.3	0.1%	20.2%

Source: RBA, Datastream

RBA COMMODITY PRICE INDEXES
Commodity Groups, 2000-01 = 100, in SDRs*

	Sep-06	Level In:		% Change Over:	
		Aug-06	Sep-05	Month	Year
Non-Rural Commodities	202.5	201.3	177.7	0.6%	14.0%
Rural Commodities	128.4	124.5	114.7	3.1%	11.9%
All Commodities	180.9	179.0	159.4	1.1%	13.5%

Source: RBA, Datastream; *SDRs - Special Drawing Rights (a basket of 4 major currencies)

RBA COMMODITY PRICE INDEXES
Commodity Groups, 2000-01 = 100, in US Dollars

	Sep-06	Level In:		% Change Over:	
		Aug-06	Sep-05	Month	Year
Non-Rural Commodities	237.8	234.2	200.3	1.5%	18.7%
Rural Commodities	150.9	144.9	129.3	4.1%	16.7%
All Commodities	212.5	208.3	179.7	2.0%	18.3%

Source: RBA, Datastream

ECONOMIST COMMODITY PRICE INDEXES
Commodity Groups, Year 2000 = 100, in US Dollars

	Dec-06	Level In:		% Change Over:	
		Nov-06	Dec-05	Month	Year
All Items	185.5	184.3	137.0	0.7%	35.4%
All Industrials	226.0	232.5	157.4	-2.8%	43.6%
Industrials: Metals	275.6	284.6	170.7	-3.2%	61.5%
Industrials: Non-Food	135.0	137.0	133.0	-1.5%	1.5%
Food	154.3	147.0	121.3	5.0%	27.2%

Source: 'The Economist' via Datastream

CRUDE OIL PRICE
West Texas Intermediate, Spot, Cushing

	Dec-06	Level In:		% Change Over:	
		Nov-06	Dec-05	Month	Year
\$US per barrel	\$63.14	\$58.72	\$58.48	7.5%	8.0%

Source: Datastream

GOLD
Perth Mint (\$A) And International (\$US) Prices

	Dec-06	Level In:		% Change Over:	
		Nov-06	Dec-05	Month	Year
Bullion US\$/Troy Ounce	\$647.60	\$615.30	\$501.60	5.2%	29.1%
Perth Mint Sell A\$/Oz	\$823.88	\$786.90	\$667.08	4.7%	23.5%

Source: Datastream

ALUMINA					
London Metals Exchange Spot Price					
		<u>Level In:</u>		<u>% Change Over:</u>	
	Dec-06	Nov-06	Dec-05	Month	Year
Alumina	\$225.00	\$265.00	\$560.00	-15.1%	-59.8%
<i>Source: Datastream</i>					

NICKEL					
London Metals Exchange Cash Price					
		<u>Level In:</u>		<u>% Change Over:</u>	
	Dec-06	Nov-06	Dec-05	Month	Year
Nickel	\$34,550	\$32,603	\$12,675	6.0%	172.6%
<i>Source: Datastream</i>					

COPPER					
London Metals Exchange Grade A Cash Price					
		<u>Level In:</u>		<u>% Change Over:</u>	
	Dec-06	Nov-06	Dec-05	Month	Year
Copper	\$6,948	\$7,295	\$4,465	-4.8%	55.6%
<i>Source: Datastream</i>					

LEAD					
London Metals Exchange Cash Price					
		<u>Level In:</u>		<u>% Change Over:</u>	
	Dec-06	Nov-06	Dec-05	Month	Year
Lead	\$1,705	\$1,675	\$1,065	1.8%	60.1%
<i>Source: Datastream</i>					

TIN					
London Metals Exchange Cash Price (99.85%)					
		<u>Level In:</u>		<u>% Change Over:</u>	
	Dec-06	Nov-06	Dec-05	Month	Year
Tin	\$10,725	\$10,163	\$6,348	5.5%	69.0%
<i>Source: Datastream</i>					

ZINC					
London Metals Exchange Cash Price (99.995%)					
		<u>Level In:</u>		<u>% Change Over:</u>	
	Dec-06	Nov-06	Dec-05	Month	Year
Zinc	\$4,531	\$4,280	\$1,732	5.9%	161.6%
<i>Source: Datastream</i>					

TITANIUM RUTILE					
Concentrate 95%					
		<u>Level In:</u>		<u>% Change Over:</u>	
	Dec-06	Nov-06	Dec-05	Month	Year
Titanium Rutile	\$635.00	\$635.00	\$600.00	0.0%	5.8%
<i>Source: Datastream</i>					

IRON ORE PRICE					
		<u>Level In:</u>		<u>% Change Over:</u>	
	Jul-06	Jun-06	Jul-05	Month	Year
In \$A	\$57.61	\$58.46	\$48.36	-1.5%	19.1%
In \$US	\$43.29	\$43.29	\$36.38	0.0%	19.0%
<i>Source: Department of Treasury and Finance</i>					

TITANIUM BEARING ORES

	Jun-06	Level In:		% Change Over:	
		May-06	Jun-05	Month	Year
Ilmenite	\$108.35	\$133.50	\$89.98	-18.8%	20.4%
Upgraded ilmenite	\$545.79	\$672.48	\$536.00	-18.8%	1.8%
Rutile	\$902.07	\$932.34	\$859.94	-3.2%	4.9%

Source: Department of Treasury and Finance

WOOL**AWC Eastern Indicator**

	Dec-06	Level In:		% Change Over:	
		Nov-06	Dec-05	Month	Year
Wool	\$8.25	\$8.37	\$6.48	-1.4%	27.3%

Source: Datastream

WHEAT**US Indicator Prices**

	Dec-06	Level In:		% Change Over:	
		Nov-06	Dec-05	Month	Year
No.2 Hard (Kansas)	\$5.71	\$5.52	\$4.50	3.5%	27.1%
No.2 Soft Red (Chicago)	\$4.90	\$4.68	\$3.22	4.7%	52.3%

Source: Datastream

Financial and Share Markets**OFFICIAL INTEREST RATES****Monetary Policy Targets, National Definitions**

	01-Dec-06	08-Nov-06	14-Jul-06
Australia	6.25%	6.25%	5.75%
USA	5.25%	5.25%	5.25%
Euro area	3.25%	3.25%	2.75%
UK	5.00%	4.75%	4.50%
Japan	0.40%	0.40%	0.40%
New Zealand	7.25%	7.25%	7.25%

Source: Central Banks (via Datastream)

AUSTRALIAN DOLLAR EXCHANGE RATES**Trade Weighted Index, and Key Currencies**

	Dec-06	Level In:		% Change Over:	
		Nov-06	Dec-05	Month	Year
TWI	64.6	64.2	63.6	0.6%	1.6%
US \$	0.79	0.78	0.74	2.1%	6.8%
Japanese ¥	91.4	90.7	88.6	0.8%	3.1%
European €	0.60	0.61	0.63	-1.7%	-5.2%

Source: RBA, Datastream

AUSTRALIAN ALL ORDINARIES INDEX**Weekly, Index, 29 May 1992 = 100**

	Dec-06	Level In:		% Change Over:	
		Nov-06	Sep-06	Month	Year
All Ordinaries	5,415	5,431	5,063	-0.3%	7.0%

Source: RBA, Datastream

S&P 200 INDEX					
Weekly, Index, 31 March 2000 = 100					
		<u>Level In:</u>		<u>% Change Over:</u>	
	Dec-06	Nov-06	Sep-06	Month	Year
S&P 200	5,428	5,454	5,098	-0.5%	6.5%

Source: RBA, Datastream

Australian and Western Australian Indicators

Demography

COMPONENTS OF POPULATION GROWTH					
Western Australia, 4-Quarter Rolling Sum					
		<u>Level In:</u>		<u>% Change Over:</u>	
	Mar-06	Dec-05	Mar-05	Quarter	Year
Natural increase	15,010	15,217	14,071	-1.4%	6.7%
Net overseas migration	20,995	20,263	16,115	3.6%	30.3%
Net interstate migration	2,621	1,996	1,577	31.3%	66.2%
Total	38,626	37,476	31,763	3.1%	21.6%

Source: ABS Cat. 3101.0

ANNUAL GROWTH IN POPULATION			
Western Australia and Australia, Quarterly			
	Mar-06	Dec-05	Mar-05
Western Australia	1.9%	1.9%	1.6%
Australia	1.3%	1.3%	1.2%

Source: ABS Cat. 3101.0

National and State Accounts

REAL GDP GROWTH			
Australia, % Change, Seasonally Adjusted			
	Jun-06	Mar-06	Jun-05
Annual	1.9%	2.9%	2.9%
Quarterly	0.3%	0.7%	1.3%

Source: ABS Cat. 5206.0

REAL ANNUAL GROWTH IN DOMESTIC DEMAND			
Western Australia & Australia, Seasonally Adjusted			
	Jun-06	Mar-06	Jun-05
Western Australia	14.0%	8.6%	6.4%
Australia	3.8%	4.6%	4.5%

Source: ABS Cat. 5206.0

REAL GROWTH IN PRIVATE CONSUMPTION			
Annual, WA & Australia, Seasonally Adjusted			
	Jun-06	Mar-06	Jun-05
Western Australia	3.9%	4.1%	5.2%
Australia	2.6%	2.6%	3.5%

Source: ABS Cat. 5206.0

REAL GROWTH IN BUSINESS INVESTMENT
Annual, WA & Australia, Seasonally Adjusted

	Jun-06	Mar-06	Jun-05
Western Australia	51.2%	25.6%	7.1%
Australia	11.5%	18.6%	14.6%

Source: ABS Cat. 5206.0

REAL GROWTH IN DWELLING INVESTMENT
Annual, WA & Australia, Seasonally Adjusted

	Jun-06	Mar-06	Jun-05
Western Australia	13.8%	4.2%	2.0%
Australia	-4.0%	-3.6%	-1.5%

Source: ABS Cat. 5206.0

REAL GROWTH IN HOUSEHOLD CONSUMPTION
Western Australia, Seasonally Adjusted

	Jun-06	Mar-06	Jun-05
Annual	3.9%	4.1%	5.2%
Quarterly	1.2%	0.9%	1.4%

Source: ABS Cat. 5206.0

WA BUSINESSES' REAL CAPITAL EXPENDITURE
2004-05 Prices, Seasonally Adjusted

	Jun-06	Level In: Mar-06	Jun-05	% Change Over:	
				Quarter	Year
Quarterly	\$6.4Bn	\$5.7Bn	\$4.2Bn	11.7%	51.2%

Source: ABS Cat. 5206.0

REAL GROWTH IN DWELLING INVESTMENT
Western Australia, Seasonally Adjusted

	Jun-06	Mar-06	Jun-05
Annual	13.8%	4.2%	2.0%
Quarterly	4.8%	-0.9%	-4.1%

Source: ABS Cat. 5206.0

REAL ANNUAL GROWTH IN DOMESTIC DEMAND
Western Australia & Australia, Trend

	Jun-06	Mar-06	Jun-05
Western Australia	11.7%	10.9%	7.7%
Australia	3.9%	4.3%	4.1%

Source: ABS Cat. 5206.0

REAL GROWTH IN PRIVATE CONSUMPTION
Annual, Western Australia & Australia, Trend

	Jun-06	Mar-06	Jun-05
Western Australia	4.0%	4.0%	4.8%
Australia	2.6%	2.5%	3.3%

Source: ABS Cat. 5206.0

REAL GROWTH IN BUSINESS INVESTMENT
Annual, Western Australia & Australia, Trend

	Jun-06	Mar-06	Jun-05
Western Australia	35.9%	37.3%	17.8%
Australia	12.4%	15.8%	15.3%

Source: ABS Cat. 5206.0

REAL GROWTH IN DWELLING INVESTMENT
 Annual, Western Australia & Australia, Trend

	Jun-06	Mar-06	Jun-05
Western Australia	10.4%	8.5%	3.0%
Australia	-4.6%	-3.4%	-3.6%

Source: ABS Cat. 5206.0

REAL GROWTH IN HOUSEHOLD CONSUMPTION
 Western Australia, Trend

	Jun-06	Mar-06	Jun-05
Annual	4.0%	4.0%	4.8%
Quarterly	0.9%	1.0%	1.0%

Source: ABS Cat. 5206.0

REAL BUSINESS INVESTMENT
 Western Australia, 2004-05 Prices, Trend

	Jun-06	Level In: Mar-06	Jun-05	% Change Over:	
				Quarter	Year
Quarterly	\$6.2Bn	\$5.9Bn	\$4.6Bn	5.3%	35.9%

Source: ABS Cat. 5206.0

REAL GROWTH IN BUSINESS INVESTMENT
 Western Australia, Trend

	Jun-06	Mar-06	Jun-05
Annual	35.9%	37.3%	17.8%
Quarterly	5.3%	8.8%	6.3%

Source: ABS Cat. 5206.0

REAL GROWTH IN DWELLING INVESTMENT
 Western Australia, Trend

	Jun-06	Mar-06	Jun-05
Annual	10.4%	8.5%	3.0%
Quarterly	2.1%	3.2%	0.3%

Source: ABS Cat. 5206.0

WA'S REAL EXPORTS & IMPORTS
 Seasonally Adjusted

	Jun-06	Level In: Mar-06	Jun-05	% Change Over:	
				Quarter	Year
Exports	\$10.2Bn	\$9.6Bn	\$10.5Bn	6.8%	-2.2%
Imports	\$5.4Bn	\$4.0Bn	\$3.9Bn	34.9%	39.1%
Balance	\$4.8Bn	\$5.6Bn	\$6.6Bn	-13.5%	-26.7%

Source: ABS Cat. 5206.0

REAL EXPORTS AND IMPORTS
 Western Australia, 2004-05 Prices, Trend

	Jun-06	Level In: Mar-06	Jun-05	% Change Over:	
				Quarter	Year
Exports	\$10.0Bn	\$10.0Bn	\$10.3Bn	0.7%	-2.5%
Imports	\$4.9Bn	\$4.3Bn	\$3.7Bn	13.4%	33.2%
Balance	\$5.2Bn	\$5.7Bn	\$6.6Bn	-9.0%	-22.2%

Source: ABS Cat. 5206.0

EXPORT VOLUMES AND VALUES
Quarterly, Western Australia, Seasonally Adjusted

	Jun-06	Level In:		% Change Over:	
		Mar-06	Jun-05	Quarter	Year
Volume (2004-05 prices)	\$10.2Bn	\$9.6Bn	\$10.5Bn	6.8%	-2.2%
Value	\$14.5Bn	\$12.2Bn	\$11.7Bn	18.3%	23.9%

Source: ABS Cat. 5206.0

EXPORT AND IMPORT PRICES
Western Australia, Quarterly, 2004-05 = 100

	Jun-06	Level In:		% Change Over:	
		Mar-06	Jun-05	Quarter	Year
Terms of trade	114.8	110.3	108.0	4.1%	6.3%
Import price deflator	123.0	115.6	103.3	6.4%	19.2%
Export price deflator	141.3	127.5	111.5	10.8%	26.7%

Source: ABS Cat. 5206.0 (and derived data)

TERMS OF TRADE
Western Australia, & Australia, 2004-05 = 100

	Jun-06	Level In:		% Change Over:	
		Mar-06	Jun-05	Quarter	Year
Australia	125.0	122.6	117.1	2.0%	6.7%
Western Australia	114.8	110.3	108.0	4.1%	6.3%

Source: ABS Cat. 5206.0 (and derived data)

GROSS DOMESTIC/STATE PRODUCT GROWTH
Western Australia and Australia, Annual

	2005-06	2004-05	2003-04
Western Australia	4.9%	4.7%	7.6%
Australia	2.8%	2.7%	4.1%

Source: ABS Cat. 5220.0

GROSS DOMESTIC/STATE PRODUCT GROWTH
States, 2005-06, Real Growth

NSW	1.4%
Vic	2.7%
Qld	4.9%
WA	4.9%
SA	2.2%
Tas	3.1%
NT	7.5%
ACT	3.4%
Aus	2.8%

Source: ABS Cat. 5220.0

GROSS DOMESTIC/STATE PRODUCT GROWTH
Five Years to 2005-06, Real Annual Average Growth

NSW	1.6%
Vic	3.4%
Qld	5.3%
WA	5.6%
SA	2.5%
Tas	3.7%
NT	3.1%
ACT	2.3%
Aus	3.3%

Source: ABS Cat. 5220.0

MEASURES OF ECONOMIC GROWTH
Western Australia, Annual

	2005-06	2004-05	2003-04
Real Gross State Income	10.6%	8.5%	8.4%
Nominal Gross State Product	15.9%	11.2%	7.4%
Real Gross State Product	4.9%	4.7%	7.6%

Source: ABS Cat. 5220.0

OUTPUT BY INDUSTRY
Share of Factor Income, 2005-06

	Western Australia	Australia
Mining	27.4%	7.7%
Manufacturing	7.8%	11.0%
Construction	8.0%	7.1%
Other production	6.0%	5.5%
Wholesale & retail	8.5%	11.0%
Transport	4.1%	4.2%
Finance	3.8%	7.7%
Property etc services	10.4%	12.6%
Health & community services	5.4%	6.6%
Other services	9.0%	12.7%
Other	9.6%	13.9%

Source: ABS Cat. 5220.0

EXPORTS AS % GDP/GSP
Current Prices, By State, 2005-06

	Goods	Services	Total
NSW	9.5%	5.4%	14.9%
Vic	8.7%	4.3%	13.1%
Qld	19.8%	3.9%	23.7%
SA	14.5%	2.7%	17.2%
WA	42.3%	3.0%	45.3%
Tas	16.7%	2.1%	18.8%
NT	22.2%	5.8%	27.9%
ACT	0.1%	4.6%	4.7%
Aus	15.7%	4.3%	20.1%

Source: ABS Cat. 5220.0

GROWTH IN GSP AND GSI
7 Years to 2005-06, Annual Change

	GSP	GSI
NSW	2.2%	3.1%
Vic	3.2%	3.8%
Qld	4.9%	6.0%
SA	2.6%	3.6%
WA	4.3%	6.8%
Tas	2.2%	3.4%
NT	3.1%	6.5%
ACT	2.2%	2.3%
Aus	3.2%	4.3%

Source: ABS Cat. 5220.0

Trade

CURRENT ACCOUNT BALANCE Seasonally Adjusted, Quarterly

	<u>Level In:</u>			<u>% Change Over:</u>	
	Jun-06	Mar-06	Jun-05	Quarter	Year
Goods and services balance	-\$4.1Bn	-\$4.5Bn	-\$4.2Bn	-8.2%	-0.9%
Current account balance	-\$13.2Bn	-\$13.6Bn	-\$12.3Bn	-2.9%	7.7%

Source: ABS Cat. 5302.0

EXPORTS, 12-MONTH ROLLING SUM States, % Australia

	Oct-06	Sep-06	Oct-05
WA	32.9%	32.4%	31.0%
Qld	22.6%	22.7%	21.8%
NSW	17.2%	17.4%	18.1%
Vic	12.2%	12.3%	13.7%
SA	5.6%	5.6%	5.9%
Tas	2.0%	2.0%	2.0%

Source: ABS Cat. 5432.0

WA'S EXPORTS, 12-MONTH ROLLING SUM By Destination, \$m

	<u>Level In:</u>			<u>% Change Over:</u>	
	Oct-06	Sep-06	Oct-05	Month	Year
China	\$11.1Bn	\$10.7Bn	\$7.9Bn	3.5%	40.9%
Japan	\$11.7Bn	\$11.5Bn	\$9.3Bn	1.6%	26.0%
Korea	\$4.4Bn	\$4.3Bn	\$3.4Bn	1.3%	27.9%
Singapore	\$1.9Bn	\$1.8Bn	\$1.7Bn	6.6%	10.3%
UK	\$3.8Bn	\$3.9Bn	\$1.1Bn	-1.5%	249.3%
USA	\$1.5Bn	\$1.4Bn	\$1.4Bn	5.9%	8.6%

Source: ABS Cat. 5432.0

WESTERN AUSTRALIA'S EXPORTS 12-Month Rolling Sum, Level and % Australia

	<u>Level In:</u>			<u>% Change Over:</u>	
	Oct-06	Sep-06	Oct-05	Quarter	Year
% Australia	32.9%	32.4%	31.0%		
\$ Bn	\$53.0Bn	\$51.5Bn	\$41.5Bn	2.9%	27.9%

Source: ABS Cat. 5432.0

WESTERN AUSTRALIA'S TRADE BALANCE Current Prices, 12-Month Rolling Sum

	<u>Level In:</u>			<u>% Change Over:</u>	
	Oct-06	Sep-06	Oct-05	Month	Year
Imports	\$21.2Bn	\$20.2Bn	\$14.7Bn	5.0%	44.3%
Balance	\$31.9Bn	\$31.4Bn	\$26.8Bn	1.6%	18.9%
Exports	\$53.0Bn	\$51.5Bn	\$41.5Bn	2.9%	27.9%

Source: ABS Cat. 5432.0

Business Indicators

VALUE OF WA MINERAL PRODUCTION Calendar Years

	<u>Level In:</u>		<u>% Change:</u>		
	2005	2004	2003	2004	2003
	\$38.9Bn	\$28.5Bn	\$26.7Bn	36.6%	45.8%

Source: DOIR

VALUE OF WA MINERAL PRODUCTION Financial Years

	<u>Level In:</u>		<u>% Change:</u>		
	2005-06	2004-05	2003-04	2004-05	2003-04
	\$43.2Bn	\$33.4Bn	\$26.4Bn	29.2%	63.4%

Source: DOIR

MAJOR PROJECTS BY STATE, SEPTEMBER 2006 Access Economics/Delta Electricity Investment Monitor

NSW	\$83.7Bn
Vic	\$66.0Bn
Qld	\$97.0Bn
WA	\$134B
SA	\$25.1Bn
Tas	\$6.8Bn
NT	\$4.9Bn
ACT	\$11.0Bn
Unallocated	\$39.1Bn

BUSINESS INVESTMENT BY TYPE Western Australia, Quarterly, Seasonally Adjusted

	<u>Level In:</u>			<u>% Change:</u>	
	Sep-06	Jun-06	Sep-05	Quarter	Year
Buildings & structures	\$2.9B	\$3.4B	\$1.8B	-15.6%	62.5%
Equipment etc	\$1.3B	\$1.6B	\$1.5B	-18.6%	-13.9%
Total	\$4.2B	\$5.1B	\$3.3B	-16.6%	27.3%

Source: ABS Cat. 5625.0

BUSINESS INVESTMENT BY TYPE Australia, Quarterly, Seasonally Adjusted

	<u>Level In:</u>			<u>% Change:</u>	
	Sep-06	Jun-06	Sep-05	Quarter	Year
Buildings & structures	\$7.6Bn	\$8.4Bn	\$6.2Bn	-10.0%	22.0%
Equipment etc	\$10.5Bn	\$10.7Bn	\$10.4Bn	-2.5%	1.0%
Total	\$18.0Bn	\$19.1Bn	\$16.5Bn	-5.8%	8.9%

Source: ABS Cat. 5625.0

BUSINESS INVESTMENT BY SECTOR Western Australia, Quarterly, Original

	<u>Level In:</u>			<u>% Change:</u>	
	Sep-06	Jun-06	Sep-05	Quarter	Year
Mining	\$2.8Bn	\$3.6Bn	\$1.9Bn	-22.3%	49.6%
Other industries	\$1.3Bn	\$1.6Bn	\$1.4Bn	-16.9%	-4.7%
Total	\$4.1Bn	\$5.2Bn	\$3.2Bn	-20.7%	27.0%

Source: ABS Cat. 5625.0

WESTERN AUSTRALIA'S INVESTMENT SHARE
 As % Australia, Quarterly, Original

	Sep-06	Jun-06	Sep-05
Mining	16.2%	18.4%	11.8%
Other	7.4%	7.8%	8.4%
Total	23.6%	26.2%	20.2%

Source: ABS Cat. 5625.0

BUSINESSES REPORTING LABOUR 'SCARCE'
 WA, % Respondents, CCI-BankWest Survey

	Sep-06	Jun-06	Sep-05
% Respondents	70.0%	71.0%	63.0%

Source: CCI/BankWest Survey of Business Expectations

Labour markets

FEDERAL ENTERPRISE AGREEMENTS
 Annual % Wage Increase

	Mar-06	Dec-05	Mar-05
Total	3.8%	4.5%	4.3%
Private	4.0%	4.2%	4.0%

Source: DEWR (in RBA Bulletin)

UNIT LABOUR COSTS
 Nominal, Annual % Increase

	Mar-06	Dec-05	Mar-05
Unit labour costs	3.2%	3.9%	4.2%

Source: DEWR (in RBA Bulletin)

WAGE SHARE OF GDP
 % GDP

	Jun-06	Mar-06	Jun-05
Wage share of GDP	54.4%	54.2%	54.3%

Source: RBA Bulletin

UNEMPLOYMENT RATES
 Western Australia and Australia, Seasonally Adjusted

	Oct-06	Sep-06	Oct-05
Australia	4.6%	4.8%	5.2%
Western Australia	3.7%	3.5%	4.0%

Source: ABS Cat. 6202.0

UNEMPLOYMENT RATES
 Western Australia and Australia, Trend

	Oct-06	Sep-06	Oct-05
Australia	4.7%	4.7%	5.1%
Western Australia	3.5%	3.5%	4.2%

Source: ABS Cat. 6202.0

PARTICIPATION RATES
 Western Australia and Australia, Seasonally Adjusted

	Oct-06	Sep-06	Oct-05
Australia	64.7%	65.1%	64.4%
Western Australia	67.2%	67.7%	67.7%

Source: ABS Cat. 6202.0

PARTICIPATION RATES
Western Australia and Australia, Trend

	Oct-06	Sep-06	Oct-05
Australia	65.0%	64.9%	64.5%
Western Australia	67.5%	67.5%	67.9%

Source: ABS Cat. 6202.0

EMPLOYMENT-POPULATION RATIO
Western Australia and Australia, Trend

	Oct-06	Sep-06	Oct-05
Western Australia	65.0%	65.1%	65.1%
Australia	61.9%	61.9%	61.2%

Source: ABS Cat. 6202.0

EMPLOYMENT GROWTH, WA AND AUSTRALIA
Seasonally Adjusted, Annual % Change

	Oct-06	Sep-06	Oct-05
Western Australia	1.4%	2.1%	4.6%
Australia	2.5%	2.7%	2.4%

Source: ABS Cat. 6202.0

EMPLOYMENT GROWTH, WA AND AUSTRALIA
Trend, Annual % Change

	Oct-06	Sep-06	Oct-05
Western Australia	1.9%	2.0%	5.7%
Australia	2.6%	2.4%	2.7%

Source: ABS Cat. 6202.0

TREND EMPLOYMENT GROWTH, WA
Annual and Three-Monthly % Change

	Oct-06	Sep-06	Oct-05
Annual	1.9%	2.0%	5.7%
Three-Monthly	0.7%	0.7%	1.9%

Source: ABS Cat. 6202.0

TREND EMPLOYMENT GROWTH, WA
By Employment Type, Annual % Change

	Oct-06	Sep-06	Oct-05
Part Time	-1.4%	-0.9%	5.7%
Full Time	3.3%	3.2%	5.7%
Total	1.9%	2.0%	5.7%

Source: ABS Cat. 6202.0

TREND EMPLOYMENT GROWTH, WA
By Gender, Annual % Change

	Oct-06	Sep-06	Oct-05
Females	1.2%	1.4%	5.6%
Males	2.4%	2.4%	5.8%
Total	1.9%	2.0%	5.7%

Source: ABS Cat. 6202.0

YOUTH UNEMPLOYMENT RATES, AGED 15-19
Western Australia, Original, 12-Month Moving Average

	Oct-06	Sep-06	Oct-05
Looking for full-time work	13.9%	14.8%	15.8%
Total	11.1%	11.6%	13.3%

Source: ABS Cat. 6202.0

YOUTH POPULATION RATIOS, AGED 15-19
Western Australia, Original, 12-Month Moving Average

	Oct-06	Sep-06	Oct-05
Employed	59.9%	59.8%	57.6%
Unemployed	7.5%	7.9%	8.9%

YOUTH PARTICIPATION RATE, AGED 15-19
Western Australia, Original, 12-Month Moving Average

	Oct-06	Sep-06	Oct-05
Participation rate	67.4%	67.6%	66.5%

YOUTH PARTICIPATION RATES, AGED 15-19
WA & Australia, Original, 12-Month Moving Average

	Oct-06	Sep-06	Oct-05
Australia	60.0%	60.0%	60.7%
Western Australia	67.4%	67.6%	66.5%

Source: ABS Cat. 6202.0

EMPLOYMENT GROWTH BY INDUSTRY
Rolling Annual Average, Year To August 2006

	Western Australia	Australia
Agriculture	0.4%	-3.4%
Mining	15.3%	16.3%
Manufacturing	3.6%	-0.5%
Utilities	-10.6%	10.8%
Construction	8.9%	3.6%
Wholesale trade	4.5%	1.8%
Retail trade	-1.7%	-1.1%
Accommodation etc	1.5%	-4.9%
Transport & storage	5.2%	2.0%
Communication	6.8%	-1.1%
Finance & insurance	10.1%	2.4%
Property etc services	3.5%	5.0%
Government admin & defence	7.7%	3.5%
Education	-5.6%	4.8%
Health/community services	1.3%	5.3%
Culture & recreation	4.7%	-0.2%
Personal/other services	-1.8%	2.3%
All sectors	2.8%	1.9%

Source: ABS Cat. 6203.0

WA EMPLOYMENT GROWTH BY INDUSTRY
000s, Rolling Annual Average, Year To August 2006

Agriculture	0.23
Mining	6.9
Manufacturing	3.5
Utilities	-1.15
Construction	8.6
Wholesale trade	2.0
Retail trade	-2.63
Accommodation etc	0.68
Transport & storage	2.2
Communication	1.0
Finance & insurance	2.6
Property etc services	4.2
Government admin & defence	3.4
Education	-4.10
Health/community services	1.3
Culture & recreation	1.2
Personal/other services	-0.80

Source: ABS Cat. 6203.0

AVERAGE WEEKLY EARNINGS GROWTH
Western Australia, Annual % Change

	Aug-06	May-06	Aug-05
Full time ordinary time	8.1%	4.0%	7.6%
Full-time total	8.1%	3.2%	7.8%
All employees total	7.2%	2.8%	7.0%

Source: ABS Cat. 6302.0

AVERAGE WEEKLY EARNINGS GROWTH
Australia, Annual % Change

	Aug-06	May-06	Aug-05
Full time ordinary time	2.9%	3.5%	6.3%
Full-time total	2.8%	2.8%	5.9%
All employees total	3.9%	4.7%	6.1%

Source: ABS Cat. 6302.0

FULL-TIME ORDINARY TIME EARNINGS GROWTH
Western Australia and Australia, Annual % Change

	Aug-06	May-06	Aug-05
Western Australia	8.1%	4.0%	7.6%
Australia	2.9%	3.5%	6.2%

Source: ABS Cat. 6302.0

WAGE PRICE INDEX GROWTH
States, Annual % Change

	Sep-06	Jun-06	Sep-05
NSW	3.8%	4.0%	4.2%
Vic	3.5%	3.8%	4.0%
Qld	4.5%	4.8%	4.1%
SA	3.7%	3.7%	3.8%
WA	4.3%	4.6%	4.9%
Tas	4.0%	4.0%	4.3%
Aus	3.8%	4.2%	4.2%

Source: ABS Cat. 6345.0

WAGE PRICE INDEX GROWTH			
Western Australia and Australia, Annual % Change			
	Sep-06	Jun-06	Sep-05
Western Australia	4.3%	4.6%	4.9%
Australia	3.8%	4.2%	4.2%

Source: ABS Cat. 6345.0

WAGE PRICE INDEX GROWTH, WA			
By Sector, Annual % Change			
	Sep-06	Jun-06	Sep-05
Public	3.3%	3.2%	4.6%
Private	4.6%	5.1%	5.0%
All employees	4.3%	4.6%	4.9%

Source: ABS Cat. 6345.0

Prices

GROWTH IN CONSUMER PRICE INDEX			
Perth and All 8 Capitals, Annual % Change			
	Sep-06	Jun-06	Sep-05
All 8 Capitals	3.9%	4.0%	3.0%
Perth	4.8%	4.7%	4.1%

Source: ABS Cat. 6401.0

GROWTH IN CONSUMER PRICE INDEX			
Perth, Quarterly & Annual % Change			
	Sep-06	Jun-06	Sep-05
Annual	4.8%	4.7%	4.1%
Quarterly	1.1%	1.8%	1.0%

Source: ABS Cat. 6401.0

ESTABLISHED HOUSE PRICE GROWTH			
Western Australia and Australia, Annual % Change			
	Sep-06	Jun-06	Sep-05
Perth	45.9%	38.1%	19.5%
All 8 Capitals	9.5%	7.0%	1.7%

Source: ABS Cat. 6416.0

HOUSE PRICE GROWTH, JUNE 2006		
Established Houses, Quarterly & Annual % Change		
	Quarterly	Annual
Sydney	0.2%	1.4%
Melbourne	1.7%	7.5%
Brisbane	0.9%	6.5%
Adelaide	0.6%	6.4%
Perth	10.1%	45.9%
Hobart	1.5%	9.4%
Darwin	3.1%	17.3%
Canberra	3.8%	10.5%
All 8 capitals	2.2%	9.5%

Source: ABS Cat. 6416.0

PRODUCER PRICE INDEXES			
By Stage of Production, Annual % Change			
	Sep-06	Jun-06	Sep-05
Intermediate Commodities	6.7%	8.0%	4.9%
Preliminary Commodities	7.7%	9.4%	6.5%
Final Commodities	4.0%	4.5%	3.4%

Source: ABS Cat. 6427.0

PRODUCER PRICES INDEXES			
Preliminary Commodities, Annual % Change			
	Sep-06	Jun-06	Sep-05
Domestic	7.2%	8.7%	6.0%
Imported	11.0%	13.8%	9.2%
Total	7.7%	9.4%	6.5%

Source: ABS Cat. 6427.0

PRODUCER PRICES INDEXES			
Final Commodities, Annual % Change			
	Sep-06	Jun-06	Sep-05
Domestic	4.8%	4.9%	4.6%
Imported	0.0%	2.3%	-3.0%
Total	4.0%	4.5%	3.4%

Source: ABS Cat. 6427.0

EXPORT AND IMPORT PRICES					
Australia, Quarterly, 1989-90=100					
	Level In:			% Change:	
	Sep-06	Jun-06	Sep-05	Quarter	Year
Import Prices	119.5	119.9	115.2	-0.3%	3.7%
Export Prices	146.4	143.7	129.3	1.9%	13.2%
Terms of trade	122.5	119.8	112.2	2.2%	9.2%

Source: ABS Cat. 6457.0

Private Finance and Consumption

CREDIT TO THE PRIVATE SECTOR			
Seasonally Adjusted Annual % Change			
	Oct-06	Sep-06	Oct-05
Housing	10.8%	11.4%	12.1%
Business	16.0%	16.0%	14.0%
Total	13.4%	13.7%	12.8%

Source: RBA

INDICATOR LENDING RATES			
Households and Small Business			
	Oct-06	Sep-06	Oct-05
Small business overdraft	10.1%	10.1%	9.6%
Banks' standard home loan	7.8%	7.8%	7.3%
Unsecured personal loan	12.8%	12.8%	12.1%
Credit card	17.3%	17.3%	16.8%

Source: RBA Bulletin

BANKRUPTCIES, WA & AUSTRALIA
 Quarterly, Not Seasonally Adjusted

	Sep-06	Level In:		% Change:	
		Jun-06	Sep-05	Quarter	Year
WA	383.0	350.0	316.0	9.4%	21.2%
Australia	6,076	5,705	5,522	6.5%	10.0%

Source: Insolvency and Trustees Service Australia

HOUSEHOLD DEBT AND INTEREST PAYMENTS
 Total, As % Household Disposable Income

	Jun-06	Mar-06	Jun-05
Debt	156.4%	153.2%	148.7%
Debt Interest	11.4%	11.0%	10.8%

Source: Reserve Bank of Australia

HOUSEHOLD DEBT
 As % Household Disposable Income

	Jun-06	Mar-06	Jun-05
Personal	21.6%	21.4%	21.0%
Owner-Occupied Housing	90.4%	88.4%	84.9%
Investor Housing	44.5%	43.4%	42.8%
Total	156.4%	153.2%	148.7%

Source: Reserve Bank of Australia

HOUSING-RELATED DEBT & INTEREST
 Housing Debt As % Household Disposable Income

	Jun-06	Mar-06	Jun-05
Housing Debt	134.8%	131.9%	127.7%
Mortgage Rate	7.6%	7.3%	7.3%
Housing Interest	9.1%	8.7%	8.6%

Source: Reserve Bank of Australia

ANNUAL RETAIL TURNOVER GROWTH BY STATE
 Seasonally Adjusted, Year To October 2006

NSW	4.8%
Vic	7.0%
Qld	6.1%
SA	8.6%
WA	12.3%
Tas	3.1%
NT	11.7%
ACT	9.5%
Aus	6.7%

Source: ABS Cat. 8501.0

ANNUAL RETAIL TURNOVER GROWTH
 Western Australia and Australia, Trend

	Oct-06	Sep-06	Oct-05
Western Australia	11.1%	10.3%	5.1%
Australia	6.4%	6.2%	3.1%

Source: ABS Cat. 8501.0

REAL RETAIL TURNOVER GROWTH BY STATE
 Seasonally Adjusted, September 2006

	Quarterly	Annual
NSW	0.3%	2.6%
Vic	-0.7%	2.3%
Qld	1.0%	3.7%
SA	0.6%	1.7%
WA	1.5%	7.0%
Tas	1.1%	3.7%
NT	0.9%	7.3%
ACT	1.7%	4.4%
Aus	0.4%	3.2%

Source: ABS Cat. 8501.0

REAL ANNUAL RETAIL TURNOVER GROWTH
 Western Australia and Australia, Trend

	Sep-06	Jun-06	Sep-05
Western Australia	7.3%	6.6%	3.1%
Australia	3.6%	3.4%	1.5%

Source: ABS Cat. 8501.0

REAL RETAIL TURNOVER GROWTH
 Western Australia, Seasonally Adjusted

	Sep-06	Jun-06	Sep-05
Annual	7.0%	6.8%	3.0%
Quarterly	1.5%	2.2%	1.4%

Source: ABS Cat. 8501.0

REAL RETAIL TURNOVER GROWTH
 Western Australia, Trend

	Sep-06	Jun-06	Sep-05
Annual	7.3%	6.6%	3.1%
Quarterly	1.8%	2.0%	1.1%

Source: ABS Cat. 8501.0

REAL PER CAPITA RETAIL SALES, QUARTERLY
 WA & Australia, Seasonally Adjusted, 2004-05 Prices

	Sep-06	Level In:		% Change:	
		Jun-06	Sep-05	Quarter	Year
Western Australia	\$2,693	\$2,666	\$2,566	1.0%	4.9%
Australia	\$2,539	\$2,538	\$2,492	0.1%	1.9%

Source: ABS Cat. 8501.0, 3101.0 & DTF estimates

Building and Construction

RESIDENTIAL BUILDING APPROVALS
 Western Australia & Australia, Seasonally Adjusted

	Oct-06	Level In:		% Change:	
		Sep-06	Oct-05	Month	Year
Western Australia	1,930	2,270	2,267	-15.0%	-14.9%
Australia	12,214	13,193	12,436	-7.4%	-1.8%

Source: ABS Cat. 8731.0

RESIDENTIAL BUILDING APPROVALS
Western Australia & Australia, Trend

	Oct-06	Level In:		% Change:	
		Sep-06	Oct-05	Month	Year
Western Australia	2,075	2,129	2,149	-2.5%	-3.4%
Australia	12,812	12,927	12,409	-0.9%	3.2%

Source: ABS Cat. 8731.0

NUMBER OF DWELLING UNITS COMMENCED
Western Australia & Australia, Seasonally Adjusted

	Jun-06	Level In:		% Change:	
		Mar-06	Jun-05	Quarter	Year
Western Australia	7,239	6,230	6,024	16.2%	20.2%
Australia	37,781	38,679	39,966	-2.3%	-5.5%

Source: ABS Cat. 8750.0

DWELLING UNITS COMMENCED
Western Australia & Australia, Trend, Number

	Jun-06	Level In:		% Change:	
		Mar-06	Jun-05	Quarter	Year
Western Australia	6,875	6,432	5,982	6.9%	14.9%
Australia	37,834	37,412	38,903	1.1%	-2.7%

Source: ABS Cat. 8750.0

RESIDENTIAL WORK DONE, WA & AUSTRALIA
Seasonally Adjusted, 2004-05 Prices

	Jun-06	Level In:		% Change:	
		Mar-06	Jun-05	Quarter	Year
Western Australia	\$1.1Bn	\$1.1Bn	\$1.0Bn	4.3%	12.1%
Australia	\$9.3Bn	\$8.9Bn	\$9.8Bn	4.1%	-5.4%

Source: ABS Cat. 8750.0

NON-RESIDENTIAL WORK DONE
WA & Australia, Seasonally Adjusted, 2004-05 Prices

	Jun-06	Level In:		% Change:	
		Mar-06	Jun-05	Quarter	Year
Western Australia	\$0.6Bn	\$0.4Bn	\$0.5Bn	34.3%	21.5%
Australia	\$5.8Bn	\$5.5Bn	\$5.3Bn	5.0%	9.1%

Source: ABS Cat. 8750.0

RESIDENTIAL WORK DONE, WA & AUSTRALIA
Seasonally Adjusted, 2004-05 Prices

	Jun-06	Level In:		% Change:	
		Mar-06	Jun-05	Quarter	Year
Western Australia	\$1.7Bn	\$1.5Bn	\$1.5Bn	12.6%	15.0%
Australia	\$15.0Bn	\$14.4Bn	\$15.1Bn	4.3%	-0.4%

Source: ABS Cat. 8750.0

TOTAL BUILDING WORK DONE, WA
Seasonally Adjusted, 2004-05 Prices

	Jun-06	Level In:		% Change:	
		Mar-06	Jun-05	Quarter	Year
Residential	\$1.1Bn	\$1.1Bn	\$1.0Bn	4.3%	12.1%
Non-Residential	\$0.6Bn	\$0.4Bn	\$0.5Bn	34.3%	21.5%

Source: ABS Cat. 8750.0

WA RESIDENTIAL BUILDING WORK DONE
By Stage of Production, Number, Quarterly

	<u>Level In:</u>			<u>% Change:</u>	
	Jun-06	Mar-06	Jun-05	Quarter	Year
Commenced (trend)	6,875	6,432	5,982	6.9%	14.9%
Completed (trend)	5,505	5,530	5,057	-0.5%	8.9%
Difference	1,370	902.0	925.0	51.9%	48.1%
Under construction (original)	21,791	20,703	17,960	5.3%	21.3%

Source: ABS Cat. 8750.0

ENGINEERING CONSTRUCTION WORK DONE
WA and Australia, Quarterly, 2004-05 Prices

	<u>Level In:</u>			<u>% Change:</u>	
	Jun-06	Mar-06	Jun-05	Quarter	Year
Western Australia	\$3.2Bn	\$2.7Bn	\$1.5Bn	18.1%	110.7%
Australia	\$10.8Bn	\$10.4Bn	\$8.8Bn	3.4%	22.4%

Source: ABS Cat. 8762.0

ENGINEERING CONST. WORK YET TO BE DONE
Western Australia, Quarterly Value, Current Prices

	<u>Level In:</u>			<u>% Change:</u>	
	Jun-06	Mar-06	Jun-05	Quarter	Year
Heavy Industry	\$6.7Bn	\$5.6Bn	\$4.0Bn	18.4%	67.3%
Total	\$11.2Bn	\$8.3Bn	\$6.5Bn	34.9%	72.8%

Source: ABS Cat. 8762.0

Vehicle Sales

MONTHLY SALES OF NEW MOTOR VEHICLES
Western Australia and Australia, Seasonally Adjusted

	<u>Level In:</u>			<u>% Change:</u>	
	Oct-06	Sep-06	Oct-05	Month	Year
Western Australia	9,684	9,698	8,536	-0.1%	13.4%
Australia	81,520	81,556	79,186	0.0%	2.9%

Source: ABS Cat. 9314.0

MONTHLY SALES OF NEW MOTOR VEHICLES
Western Australia and Australia, Trend

	<u>Level In:</u>			<u>% Change:</u>	
	Oct-06	Sep-06	Oct-05	Month	Year
Western Australia	9,714	9,635	8,734	0.8%	11.2%
Australia	81,145	80,795	81,743	0.4%	-0.7%

Source: ABS Cat. 9314.0