THE RESOURCES BOOM AND MACROECONOMIC POLICY IN AUSTRALIA

Australian Economic Report: Number 1

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The Australian Economic Report is an occasional series of research-based analyses of important issues facing the Australian economy, produced by researchers from the Centre for Strategic Economic Studies, Victoria University, Melbourne.

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Executive Summary

The puzzle

Australia is in the midst of the most remarkable resources boom in its history: both mining investment and the terms of trade are at record levels and investment is continuing to increase further. But the domestic economy is slowing: real GDP rose by only 1.4% over the past year, while employment has been virtually flat in the first nine months of 2011, with unemployment rising a little. How can both of these things be happening at the same time? The answer to this question is of real importance for monetary and fiscal policy, which are both set to offset the expansionary effects of the resources boom. The continuing uncertainty about the world economy further clouds the issue.

This report seeks to throw light on this puzzle, by examining in detail the various ways in which the resources boom affects the national economy. Our central argument is that the net impact of resources boom – which operates through several channels, both positive and negative – has been strongly positive but has now peaked. With no additional net positive impact from the boom, both monetary policy and fiscal policy need to become more expansionary. This implies a reduction in interest rates and changes to fiscal policy to support the domestic economy in the light of the other domestic and international forces that are producing slower growth.

The resources boom

Traditionally Australia has been said to be experiencing a resources boom if *either* the level of resource investment as a share of GDP *or* the terms of trade (the ratio of export prices to import prices) were at high levels. In the current boom *both* variables are at record levels at the same time, for the first time in Australia's history. This means that the analysis of this unique episode is complex, with interweaving price and volume effects at work.

We analyse the net impact of the resources boom as the overall effect of four key factors: (i) the impact of lower import prices on the real value of domestic incomes; (ii) the impact of higher $A export prices on the incomes and financial assets of Australian owners of resource companies; (iii) the impact on domestic economic activity and employment of the Australian content of resource investment; and (iv) the negative impact of the higher real exchange rate on trade exposed sectors – such as manufacturing, tourism and educational services. While most focus has been on mining investment, the first of these has probably been the most important in macroeconomic terms.

In analysing the overall impact of the boom, we distinguish between level and change effects. The positive impact of the boom has been building over eight years, with an increasing impact each year except for the period of the global financial crisis. But the incremental effect – the change in the impact from year to year – is more important for policy formulation, and it is widely assumed the boom will have a continuing positive incremental impact on the economy in the years ahead. By contrast, our assessment is that the net incremental effect has now peaked – the level effect, while still positive, is no longer increasing. Both monetary and fiscal policy need to adjust to this fact.

The changing incremental effect of the resources boom

During the resources boom, Australia's export prices have increased by 170% in foreign currency terms, with the increase heavily concentrated on the resources sector. This has led to a rise in the exchange rate and an increase in export prices in $A, each of about 65%. The rise in the exchange rate has led to falling relative import prices, and hence to an increase in the real value of domestic incomes (point (i) below). The rise of nearly two-thirds in $A export prices has contributed greatly to the incomes in $A of resource companies and of their domestic and foreign owners (point (ii) below).

(i)   Higher real incomes from lower import prices. As a result of the rise of 65% in the real trade weighted $A exchange rate between the December quarter of 2002 and the June quarter of 2011, import prices fell by 35.5% relative to the price of domestic supplies to final demand over this period. Allowing only for direct effects, lower import prices reduced the growth in the implicit price deflator for domestic final demand by 9.7% relative to the case of no fall in relative import prices. These lower import prices increased the real value of most classes of domestic incomes, with higher effects where a higher proportion of income is spent on imports.

For example, real compensation per employee hour grew by 2.1% per annum over this period, by comparison with 1.3% over 1979-2002, and by mid 2011 was 10.5% above the previous trend. Real per capita household disposable income grew by 2.8% per annum over 2002-11, in comparison with 1.0% over 1979-2002, to be 17.6% above the earlier trend level by mid 2011. This rapid growth in the real value of household incomes was substantially due to the import price effects but other factors, also in part arising from the resources boom, are relevant. For example, total hours worked grew by 2.0% per annum over 2002-11 by comparison with 1.5% per annum over 1979-2002.

During the September quarter 2011, the nominal exchange rate fell by 6.3%, although it has shown signs of recovery subsequently. This analysis is undertaken on the basis of fixed exchange rates going forward at their June quarter 2011 levels, an assumption which seems reasonable at the present time. On this assumption the exchange rate boost to (non-export) domestic incomes – arguably the most powerful effect of all - has come to an end, even if the terms of trade rise further.

(ii)   Incomes and financial assets. As most mining companies pay only modest dividends and stock markets anticipate the future benefits accruing from current investments, the main benefit to resource owners is through the appreciation of asset values, mainly share prices. From early 2003 to October 2007, before the financial crisis had its impact, the resources index of the ASX increased fourfold. This was dominant reason for the rise of 144% in the ASX All Ordinaries Index and of 151% or $1014 billion in the market capitalisation of domestic equities over that time. Much of this increase in asset values accrued to foreign rather than domestic partners, as the resources sector is about 80% foreign owned (Connolly and Orsmond 2011). Even so, rising share prices stimulated the rise in housing and other asset values; between 2002 and 2007 Australian households saw an increase of 8% per annum in real per capita assets, about three times the long-run rate of growth.

This increase in real asset prices driven by the resources boom has also come to an end. The resources component of the ASX index recovered after the GFC fall, but remains below its 2007 peak. The overall ASX index is well below that peak, in part reflecting the impact of the higher $A on

the profitability of non-resource companies. More generally, the level of real per capita household assets is lower now than in 2007, and probably still falling. The period of rising asset values driven by the resources boom has well and truly passed.

(iii) Mining investment. One area in which the boom remains strongly evident is in mining investment, which rose as a share of GDP from 1.6% in 2002-03 to 4.8% in 2010-11, and could reach 7% by 2013-14. The impact of this investment needs to be considered in terms of its local content and of trends in other forms of investment. Very limited information is available about the local content of resource investment in Australia. The Reserve Bank concluded, on the basis of its industry liaison work, that 'around half – give or take – of the demand generated by these projects is typically filled locally, though, of course, this amount varies with the nature and details of any specific project' (Stevens 2011a), and both of these points are broadly confirmed by the *Local Content Report* published by the Western Australian Government (DSD and DC 2011).

There is evidence that the local content of mining investment is falling over time, as a result of the changing nature of mining projects and of the impact of the higher $A on the position of Australian suppliers. The pattern of resource investment is shifting sharply to LNG projects, especially large, offshore projects such as the Gorgon ($43 billion), Wheatstone ($29 billion) and Prelude ($12 billion), with much lower local content ratios. In such projects, major components of the offshore platform are fabricated overseas, for example in Korea or China, and then brought to the drill location, often by sea. Other information supports this conclusion of lower local content ratios in recent and prospective mining investment. For example, employment in manufacturing in Western Australia rose steadily (by 2.1% per annum) from August 2002 to August 2008, but in the three years to August 2011 it has fallen by 22.4%, or 8.1% per annum. Thus while the Reserve Bank's 50/50 estimate may be appropriate over the boom as a whole, it is likely we are seeing a shift from well above 50% local content in the early boom years to well below 50% in the future. This will temper the impact of rising resources investment on the domestic economy.

Over the course of the boom, resource investment has not displaced other private investment – non-resource private investment stood at 16.9% of GDP in 2002-03 and at 17.0% in 2010-11. But the periods before and after the GFC have been quite different: between 2002-03 and 2007-08 the non-resource investment share rose by about two percentage points of GDP (to 19.0%), but since then it has fallen by the same amount. The outlook for each of the three non-mining components of total investment – dwellings, other private investment and public investment – seem to be subdued at best. Both because of this fact and the falling local content of resource investment, it is likely that the effective contribution of investment to local activity has peaked in this cycle as a share of GDP, and may fall over the next two years even as resources investment increases further.

(iv) Competitive impact of the higher $A. The lift in the $A exchange rate since 2003, taken together with the rise of China and other low cost countries and periods of weakness in the global economy, has placed trade-exposed non-resource firms in Australia under continuing competitive pressure. Reflecting these and other factors, the real trade balance on goods and services as a share of total domestic demand has fallen by 15 percentage points over the decade to the June quarter of 2011 – from +11.9% in the June quarter of 2001 to -3.1% in the same quarter of 2011. Nevertheless, it has been the second round of the exchange rise after the GFC that has intensified pressure on manufacturing and service industries, perhaps because it has been combined with weak economic

conditions in the USA and the EU and because longer term decisions are being taken as the $A becomes entrenched.

In manufacturing, for example, real gross value added rose by 1.5% per annum between the second quarters of 2003 and 2008, but has fallen by 4.6% or 1.6% per annum over the three years to the June quarter of 2011. As a result, while manufacturing employment grew marginally in the earlier period it has fallen by 10.2% (or 3.9% per annum) in the three years to August 2011. Similarly, real service exports rose up to early 2008, but have fallen steadily since then, and imports of services have grown rapidly in recent years. As a result the real trade position in services, positive before 2005 and balanced after the GFC, has moved to a deficit of about 2% of domestic final demand by the June quarter of 2011. This reflects, inter alia, a decline in the number of foreign students coming to Australia and a dramatic change in net short-term population movements, as residents departing now far outnumber visitors arriving.

Implications for policy

Economic outcomes are shaped by the interactive effect of many factors, and the data on critical parameters are limited. But in our assessment, it is clear that the incremental effect of the ongoing resources boom, strongly positive for so long, has now peaked. Unless the exchange rate rises further, the terms of trade boost to non-resource incomes has come to an end; real household per capita assets are now falling, after a strong period of rapid growth; resource investment is continuing to rise as a share of GDP, but its net impact is being eroded by the changing nature of resource projects and the high $A, which is also contributing to weaker investment in other industries; in the context of weak demand in the USA and the EU, the competitive pressure from the high $A is mounting on Australian trade exposed goods and service industries.

Monetary policy has been 'mildly restrictive', in the words of the Reserve Bank, being directed to offset the presumed net (incremental) expansionary impact of the resources boom and by concern about inflation running above the target band. In our view both of these concerns are no longer relevant, the first for the reasons outlined above and the second because it is clear that there is now no inflationary problem in Australia that needs to be addressed by a restrictive monetary policy.

Over the three years to the June quarter of 2011 five sub-groups, out of a total of 90 in the CPI and accounting for about 12% of the index, have provided 40% the growth in the CPI, and 44% of the growth over the past year. The five groups are lamb and mutton, fruit, vegetables, utilities and tobacco. These five groups in total have risen by 11.9% per annum over the past three years, while the rest of the CPI rose by 1.8%; over the past year the five groups rose by 16.7% and the rest of the index by 2.2%. Thus excluding these items inflation has been well within the Reserve Bank's target range of 2-3% on average over the cycle.

There is no reason for thinking that the rapid growth in prices for these items can be significantly influenced by monetary policy. Prices for food items reflect seasonal conditions affecting supply, while increases in tobacco prices are driven by regular increases in tax rates. The reasons for the rapid growth of utility charges (11.5% per annum over three years) are far from clear, but it is unlikely that price changes for this group would be greatly affected by a restrictive monetary policy. On 1 November 2011 the Bank recognised that the economy was slowing and the threat of inflation was easing, and cut interest rates accordingly, moving to a more neutral stance.

Fiscal policy is currently severely rather than mildly restrictive, with the Australian Government overseeing the most rapid process of fiscal consolidation for over 40 years. In the context of a perceived powerful continuing stimulus from the resources boom and in pursuit of a balanced budget by 2012-13, the Government proposes to take $50 billion or 3.6% of GDP out of the economy (on an underlying cash basis) over 2011-12 and 2012-13. Again neither of these concerns is currently relevant to Australia's economic situation. Partly reflecting the considerations outlined above and ongoing issues in the EU and USA, the outlook for the Australian economy is now much weaker than that presented in May in the 2011-12 Budget Papers, in spite of the continuing resources boom. Real GDP has grown by 1.9% per annum over the last three years, and GDP growth for 2011-12 in now likely to be closer to that figure than to the 4% forecast in the Budget Papers, while employment growth will fall well short of the 1.75% forecast.

It should be noted that Australia's fiscal position is very strong, with Australian Government net debt at only 6.1% of GDP at the end of 2010-11. It will be strengthened further over the next decade, even under the current taxation regime, as tax revenue from higher resource prices and from projects currently under construction begins to be received. Such revenue is currently being delayed by capital losses incurred in the global financial crisis and by depreciation allowances being generated by high levels of capital investment. The scale of both the investment and of the depreciation allowances being generated is massive, but tax revenues from the resources sector will rise strongly when these allowances are used up.

It is no longer appropriate in current circumstances for the Australian Government to pursue a budget surplus in 2012-13. It should move away from this target and adopt a much less restrictive fiscal policy, more supportive of economic growth.

1   The Issues

The key features of the resources boom

Mining or resources booms have been a key feature of Australian development since European settlement, from the gold rushes of the 1850s to the massive exploitation of liquefied natural gas (LNG) that will extend over the next decade. The description 'resources boom' is commonly applied when either (or both) the terms of trade (the ratio of export to import prices) or the level of resource investment as a share of GDP are well above their long-term trend. As a result, different authors often mean quite different things by the use of this term, depending on which aspect they have in mind.

As is evident from Figure 1, which shows the terms of trade back to 1870 both in annual terms and as a five-year moving average, Australia has had six terms of trade 'booms' over the past 140 years (in the 1880s, in the first decade of the 20th century, in the 1920s, in the early 1950s period of the Korean War and at the present time). Figure 2 shows that there have been five identifiable 'booms' in resources investment over that period, with the peak levels of investment occurring in 1902, 1971, 1983, 1998 and probably 2012 or 2013.

Figure 1 Terms of trade, Australia

Terms of trade, 2007/08 = 100, annual 5-year centred rolling average ——Average ——Annual
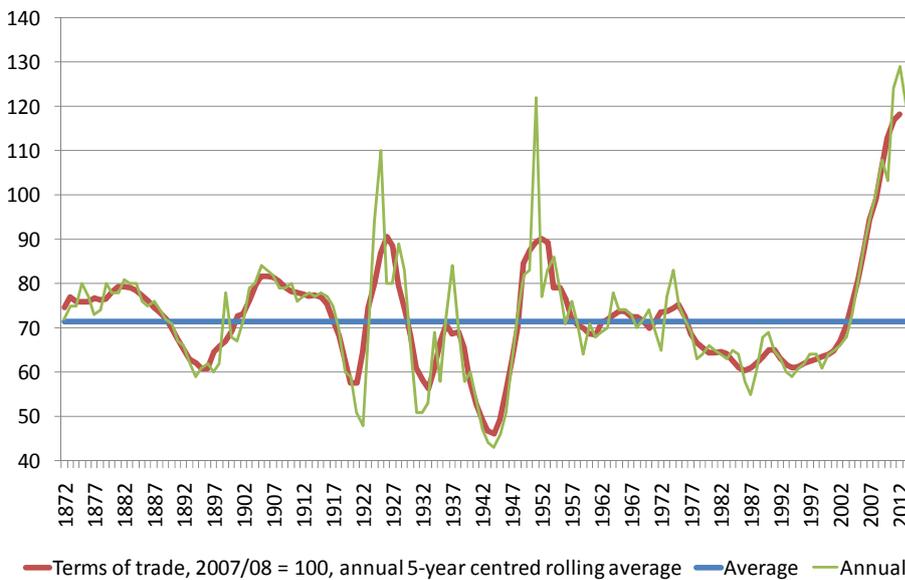
Source: Reserve Bank Australia; data from 2011 on are CSES estimates.

One thing that is striking about the historical record is that the periods in which these two measures peaked have generally been quite distinct: temporary surges in resource prices and the terms of trade have normally not been closely associated with a major upswing in resource investment. Peaks in the terms of trade have typically emerged from global booms of a temporary nature, such as in the 1920s and the early 1950s, and have not been sustained for long enough to generate a major supply response. Surges in resource investment have often been associated with exploitation of new resource supplies in the context of a new long-term market, such as with coal and iron ore for the

Japanese market in the two decades after the mid 1960s and with natural gas for the Japanese and Korean markets in the 1990s.

Figure 2 Resources investment as a share of GDP
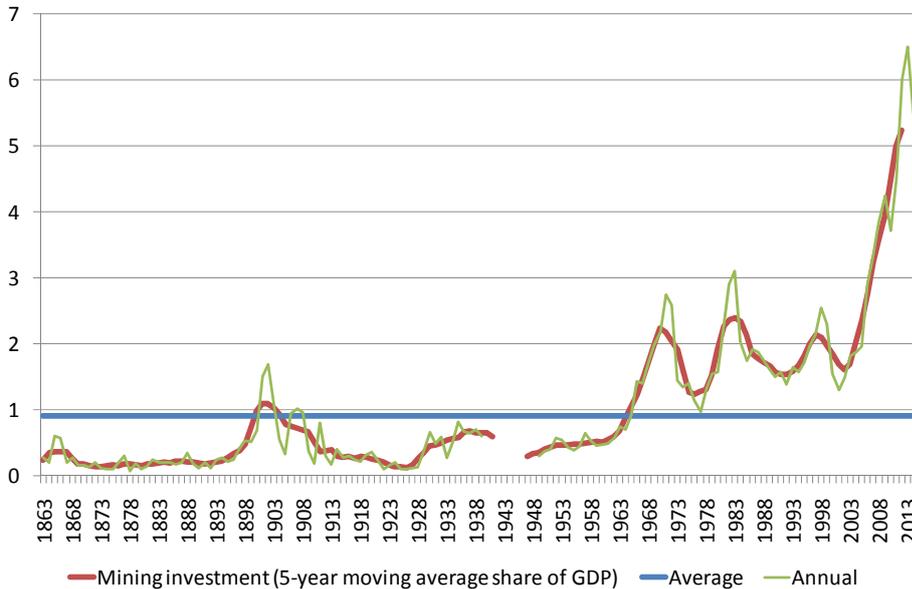
Source: Reserve Bank Australia; data from 2010 on are CSES estimates.

As is evident from the figures, the current boom is unique in that both the terms of trade and the level of resources investment are at historically unprecedented levels and that these peaks are concurrent. These characteristics are most clearly evident in the five-year moving average data. On this basis, the terms of trade reached a peak about 25% above the long-term average in the 1920s and the 1950s, while in the current episode the peak is likely to be about 70% above that average. The previous peak levels of investment as a share of GDP were at about 2.5%, whereas it is likely to exceed 5% of GDP on a five-year moving average basis this time. The height of these peaks, and their concurrent nature, mean that the forces currently shaping the Australian economy are of a nature and scale that we have not seen before.

The present resources boom started in 2003, when both the terms of trade and the level of resource investment began to increase, and both increased strongly through to 2008. This is sometimes referred to as the first stage of the boom. It was characterised by high levels of investment (up by over 150% from 2003 to 2008) and a sharp increase in the terms of trade (up by over 50%), with only a limited increase in production and value added (up by less than 20%). There was then a brief pause associated with the global financial crisis – the terms of trade fell by 17% between the September quarters of 2008 and 2009, and the mining investment share of GDP fell in 2009 – before rapid growth in both variables resumed. This current second stage of the resources boom has so far still been associated with only modest growth in mining value added – more rapid growth in output is likely over the next decade as the new projects are completed and come on stream.

The underlying causes of this major resources boom – sustained rapid resource intensive growth in China and in a range of other developing countries – are well known, and will not be discussed further in this report. These are widely seen as very long-run, structural changes in the world economy, with growth in demand continuing to run ahead of increasing capacity in many resource

industries. This structural character of the underlying demand factors is held to explain the unprecedented longevity of both the rise in the terms of trade and in the level of investment.

The new context of the resources boom

Mining is very different from what it used to be thirty years ago, when Australia experienced its last resources boom. It is now a global and highly capital-intensive industry, with many of the resources needed sourced through migration and trade, and the profits widely distributed. It is heavily foreign owned, with the Reserve Bank estimating the level of foreign ownership of the Australian resources sector at about 80% (Connolly and Orsmond 2011). The Australian economy has also changed fundamentally over the period: trade-exposed manufacturing has declined sharply as a share of GDP, and the economy is now heavily service-oriented.

These changes have important implications for any analysis of the impact of the resources boom on the domestic economy. With mining companies readily able to source capital from global markets, the financing of the investment boom will have a more limited impact on the Australian capital market; to a lesser degree their ability to bring in skilled labour from overseas, for example by 457 visas, will modify the impact on Australian labour markets. More generally, an important issue will be the extent to which resource investments of different types draw on Australian local content, and in assessing the benefits to Australia of the boom a relevant consideration will be the extent of foreign ownership.

This change in the nature of industries and industrial structure also implies important measurement issues, with the output of the goods industries measured by the value of physical products, but with that of many service industries still measured on a labour input basis. As the output of the resources industries expands, this will support a significant increase in GDP in the state in which production takes place, even if little of the income associated with the increased output is captured in that state.

The changing character of the boom

One feature of the resources boom that will be important in the subsequent analysis is that it is changing its character over time, in terms of the nature of the projects that are being constructed. In the first stage, investment activity was widely distributed across the various components of the resources industry, but in the second stage it has become heavily focussed on energy projects and particularly on LNG projects. Figure 3 shows a distribution by type of those projects listed as advanced (under construction or firmly committed) in the annual ABARES listing of major resource projects, for the April listing from 1995 to 2011. The data show the value of advanced projects in constant 2010-11 dollars. By April 2011 the total value of these projects had reached $173.5 billion. In 2006, for example, energy projects accounted for about 35% by value of all advanced projects, but by 2011 they accounted for two-thirds of such projects. Over this five-year period the real value of energy projects has increased about eightfold, while that of other projects has broadly doubled.

Thus the resources boom is rapidly becoming an energy boom, and more specifically an LNG boom. In the April 2011 listing, oil and gas projects accounted for 92% of all advanced energy projects and 62% of all advanced projects, and the vast majority of these were LNG projects. There are also many

other LNG projects in earlier stages of consideration. As discussed later in Section 6, there are 15 major LNG projects on the ABARES April 2011 listing, with their status ranging from under construction to being in the pre-feasibility study stage. In total they involve investment of over $200 billion, and if all were completed would increase Australia's current LNG capability sixfold, allowing Australia to surpass Qatar as the world's leading exporter of natural gas.

Figure 3 Value of advanced projects, minerals and energy, 2010-11 dollars, $ billion
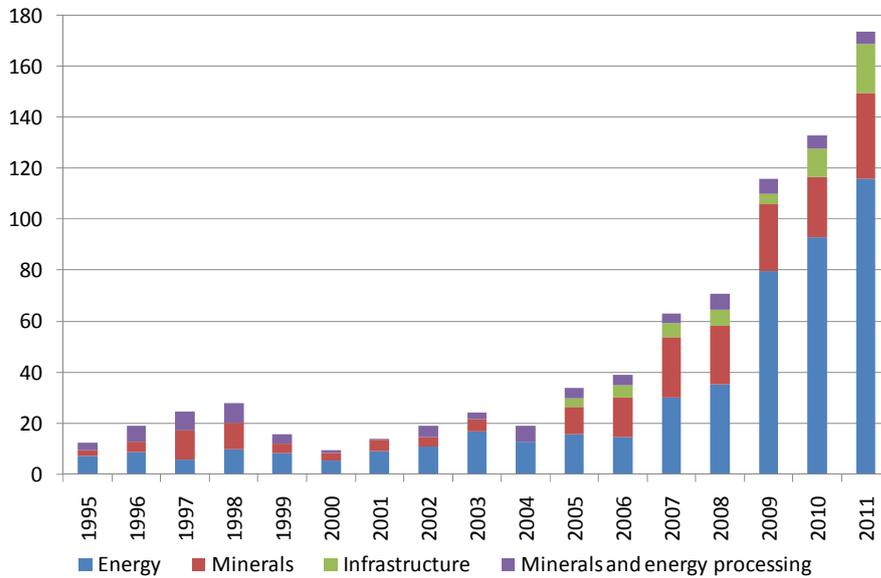
Source: ABARES 2011, Minerals and Energy: Major Development Projects, April 2011 Listing, Canberra, p. 15.

There are several different types of LNG projects, and each of these may have a different impact on the domestic economy than other resource projects. All LNG projects involve a gas extraction process and a gas liquefaction plant, in which the gas is cooled to about −160°C to reduce its volume substantially for shipping. While many projects are based on drilling natural gas reservoirs, either onshore or offshore, we are also seeing a major development of coal bed methane projects, mainly in Queensland, in which methane is extracted from large coal beds. In all recent projects, the liquefaction plant is onshore, so that the gas obtained offshore needs to be piped from the gas field to the plant. Some new projects now involve massive floating extraction and liquefaction facilities, which can be towed to the site of the gas offshore and which allow all processes, including liquefaction and shipping, to take place from this facility. Shell has begun construction of a $12 billion, 488 metre long facility for use with its Prelude field off Western Australia, and GDF Suez have a similar approach under consideration for its Bonaparte field offshore of the Northern Territory.

2   Interpreting the Terms of Trade Effects

As previously noted, Australia has experienced three resources booms prior to the present one over the past 50 years, but they have all been cases in which investment as a share of GDP was well above the long-term average, rather than cases in which the terms of trade have been high. As a result, most attention has been given to the economics of resource investment booms rather than to terms of trade and relative price effects. In this section we consider some of the economic and

measurement issues involved in terms of trade increases, before outlining the overall framework of the analysis.

The importance of export price and terms of trade increases

In the Australian international trade model, pioneered by Wilson (1931) and Swan (1960) and developed further by Salter (1959), Corden (1960) and Gregory (1976), there are three goods: exports, imports and non-internationally traded home goods. This three-good model becomes analytically powerful when the terms of trade are fixed and the model can be reduced to two goods and two prices, non-traded goods and traded goods (exports and imports can be aggregated together using their fixed price relativity, the terms of trade). The price ratio of traded to non-traded goods is referred to as the real exchange rate.

The well-known paper by Gregory (1976) was firmly within this tradition and assumed fixed terms of trade. But the data reviewed above indicate that a fixed terms of trade model is not sufficient today. The large price increases that we have seen for a wide range of minerals and other exports, which comprise a high share of Australia's exports, have converted into large terms of trade changes, as shown in Figure 1. It is noticeable from Figure 1 that the terms of trade normally improve during world economic booms, but the increases have been relatively short lived and last less than three years. But as has already been demonstrated, this resources boom is quite different, in terms of both the scale and longevity of increases in Australia's terms of trade.

Such large and sudden shifts in the terms of trade and such persistence at high levels suggests that the analytical emphasis should be placed on export price changes and not increases in export volumes. To emphasize this point, it is worth noting that Australian export volumes have been flat for a decade and a half, while there has been a big increase in the volume of imports.

Figure 4 Ratios of real exports and imports to GDP (indexes 1959 = 1, based on constant 2008-09 prices)
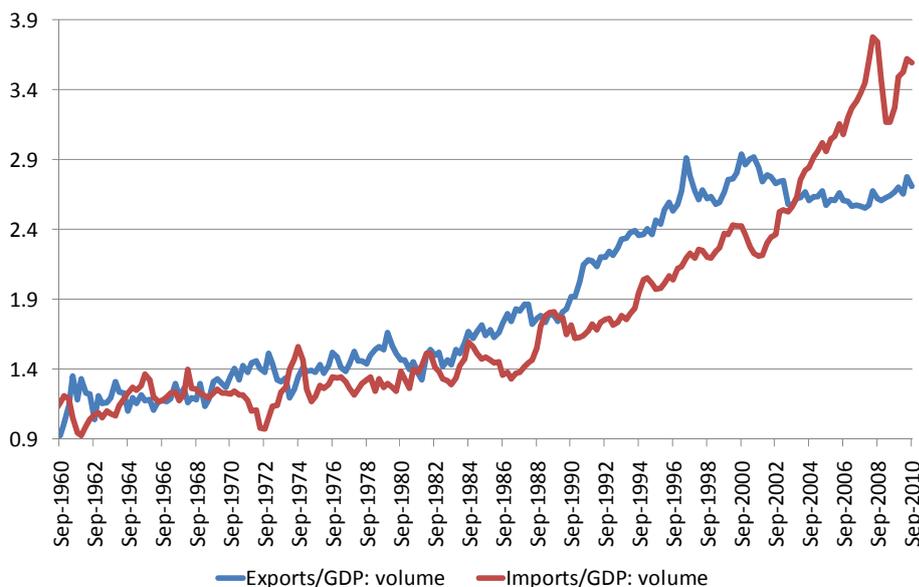
Source: ABS 2011, Australian National Accounts: National Income, Expenditure and Product, March 2011, Cat. No. 5206.0, Table 5.

Figure 4 plots the exports/GDP and imports/GDP volume ratios, both set at unity in 1959. These data show a constancy of the export share during the 1970s, a fairly strong increase during the 1980s and the first half of the 1990s, and then somewhat surprisingly near constancy for the last decade and a half. The other noticeable feature of Figure 4 is the rapid rise in import volumes as a share of GDP. Since the terms of trade began to increase, the import/export volume ratio increased from 80 to 130 per cent, departing from the experiences of the last half century when import volumes were invariably less than export volumes in terms of the 1959 base. Currently, each unit of export volume is associated with 50 per cent more imports than in previous decades. These trends indicate that we need to focus on export price rather than export volume effects, and on the role of those higher prices in financing increased exports.

Measurement mechanics: The income effect of terms of trade increases

It has been well known among Australian policy analysts, at least since the Korean War boom, that large increases in the terms of trade can generate large real income gains.[1] What is not well known is how to measure the real income changes and how they relate to changes in real income from other sources. Indeed, these are not straightforward tasks and there is no universal agreement (see Silver and Mahdavy 1989; UN 1968) on measuring real income gains and on how real income gains from the terms of trade relate to other changes in income.

The key analytical issue arises as follows. Most macro growth analysis relies on real gross domestic product (RGDP) as a measure of real income. But RGDP is not a complete measure of real income gains when there are large increases in the terms of trade. RGDP attempts to measure *volume* increases in goods and services and, by construction, does *not* attempt to measure any real income changes that arise directly from the *price* of imports and exports. Hence, the usefulness of RGDP as a measure of income and living standards during a mineral boom will depend on whether additional income is being generated by an increase in export *volumes*, measured by RGDP, or an increase in export *prices,* not measured by RGDP.

The inadequacy of RGDP can be illustrated as follows. Suppose export prices double but all other prices and real outputs in the economy are unchanged. In this example, current price GDP increases *only* because export prices increase. To measure RGDP national account, statisticians deflate each component of current price GDP by its own price deflator to calculate the underlying volume. When the higher export value is deflated by the higher export price, this will indicate correctly that the export volume and RGDP have not changed. But, an export price increase, ceteris paribus, has increased real income.[2] A country must be better off when overseas sales double in price.

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[1] The very large, but temporary increases in the Australian terms of trade in response to the Korean War boom, and the associated large increase in national income, helped to provide impetus to the development of the Australian international trade model based on the traded/non-traded goods dichotomy (Salter 1959; Swan 1960; Gregory 1976). But surprisingly, these models invariably assume fixed terms of trade when the Korean War boom was an export price and terms of trade change phenomenon.

[2] Furthermore, when the terms of trade change, real GDP calculated by the income or expenditure path will no longer equal real GDP calculated from the production path.

How should this increase in real income, generated by an export price increase, be measured? The usual response can be illustrated as follows.[3] Expenditure estimates of current price GDP can be written as:

$$GDP = D - M + X$$
(1)

where *D* is current price total domestic final expenditure, *M* is the current price value of imports and *X* the current price value of exports. To produce an estimate of RGDP, each item on the right-hand side of equation (1) is divided by its own price deflator.

To account for the income effect flowing from a terms of trade change, the usual response is to deflate *X* and *M* not by their own price deflators, but by a common price deflator that will reflect the extra expenditure opportunities (the income increase) brought about by the export price increase. Hence, a new concept real gross domestic income (RGDI) is defined as:

$$RGDI = RGDP - (X/P_x - M/P_m) + (X - M)/P^*$$
(2)

The RGDI calculation therefore involves removing from RGDP the volume of exports and imports, deflated by their own price deflators – the second term on the right-hand side of equation (2) – and replacing them in the RGDP calculation by volume measures of exports and imports calculated by the application of a different deflator.

The difference between these two volume measures, the second and third term of equation (2), is referred to as a "trading gain" which can be written as:

$$x(P_x/P^* - 1) - m(P_m/P^* - 1)$$
(3)

where *x* and *m* are export and import volumes, calculated by application of their own deflators. Trading gains arise therefore from relative price changes among exports, imports, the price deflator *P** and the weights provided by export and import volumes calculated from their own deflators. If there is no change in any of these price relativities between one period and the next, there is no price-generated trading gain in that period. Under these circumstances, the change in RGDI is equal to the change in RGDP.

What deflator *P** should be chosen to measure the trading gain? There is no universally accepted answer to this question, although it has been posed for almost a century (Taussig 1927; Dorrance 1948-1949; Nicholson 1960; Silver and Mahdavy 1989; Diewert and Morrison 1986; UN 1968). Perhaps the reason for the lack of an accepted answer is that there is no correct response? While it seems straightforward that the extra export revenue generated by higher export prices should be deflated by the price index of the use to which the extra revenue will be put, there is no way of knowing exactly what this use might be or when it might occur. So the only thing to do is to make a

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[3] The precise definition applied by the ABS can be found at ABS (2004).

reasonable assumption and proceed on this basis. There are two potential price deflators with wide support.[4]

Academics are increasingly recommending that *P** be measured by the final domestic expenditure deflator. They argue that domestic expenditure (consumption) is the purpose of economic activity and the right living standard measure. They also argue that this deflator better captures all relative price shifts that are occurring in the economy (Diewert and Morrison 1986; Kohli 2004; Macdonald 2010). This deflator opens up many avenues for analysis – the role of each price and the role of the export and import weights. But with this analytical richness comes complexity. For example, even if the terms of trade do not change, there may still be trading gains if the domestic expenditure deflator changes at a different rate than export and import prices. When this occurs the trading gain is labelled as a real exchange rate change – a gain from a change in the price of traded to non-traded goods. This concept is central to the fixed terms of trade models of Swan (1960), Salter (1959) and Gregory (1976).

However, official statistical agencies[5] usually adopt a simpler approach and choose the import price deflator which, upon substitution into equation (3), simplifies the trading gains to:

$$x(P_x\!\big/\!P_m - 1) \tag{4}$$

This calculation effectively adopts an import volume metric for the trading gains, and implies a narrower definition of trading gains which can now only arise from terms of trade changes. There is no role for the price of non-traded goods.

One argument underpinning the choice of P_m as a deflator is that from a nation's viewpoint the purpose of exports is to provide foreign currency to buy imports, hence the use of an import metric (Nicholson 1960). Furthermore, if the economy is operating at full capacity, additional imports is the only margin available for increased resources in the short run. Other advantages are that the terms of trade enter into the calculation in a simple way and the formula is easy to understand.

Here we use the import price deflator as *P** primarily because this is the deflator which underlies the official RGDI series published by the ABS. Also, over the period of interest, the estimated Australian trading gains do not differ significantly when calculated with either of the two main deflators. Further discussion of these and related issues can be found in Gregory (2011).

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[4] As might be expected, official statisticians have been very uncomfortable with a concept as amorphous as RGDI. But, even so, it is difficult to comprehend how controversial RGDI and the choice of deflator have been. The UN in their publication, *The System of National Accounts* (SNA) (UN 1968, 1978), recommended that the terms of trade adjustment not be included in official statistical publications (Silver and Mahdavy 1989). The UN has been slowly changing its position and the 2008 SNA publication (UN 2008) suggests that the official statistical bureaus should account for terms of trade changes, but offers no single recommendation as to how this should be done (see Kohli 2004; UN-SNA 2008; Silver and Mahdavy 1989).

[5] The UK, US, Canada and Australia adopt the import price deflator when calculating RGDI.

Terms of trade and gross domestic income growth

How much has Australian income increased in response to the exceptional lift in the terms of trade? There are two important short-run gains.

First, there is the direct trading gain which is measured by the income gap between RGDP and RGDI. Apart from issues surrounding the choice of deflator, measuring this effect is quite straightforward. Figure 5 shows the ABS measures of these variables as shown in the Australian quarterly national accounts, expressed as an index of seasonally adjusted quarterly data based on the March quarter of 2003 set equal to 100. From the start of the resources boom at about that time, the gap between RGDI and RGDP has grown to be 15.0% in the March quarter of 2011. That is, by that time, RGDI was 15% higher than RGDP relative to the March quarter 2011 base. This is a massive effect, and examining the ways in which this gain has shaped the Australian economy is an important part of this study.

Figure 5 Real GDP and real GDI, Australia, 1985-2011 (index December quarter 2002 = 100, based on seasonally adjusted data)
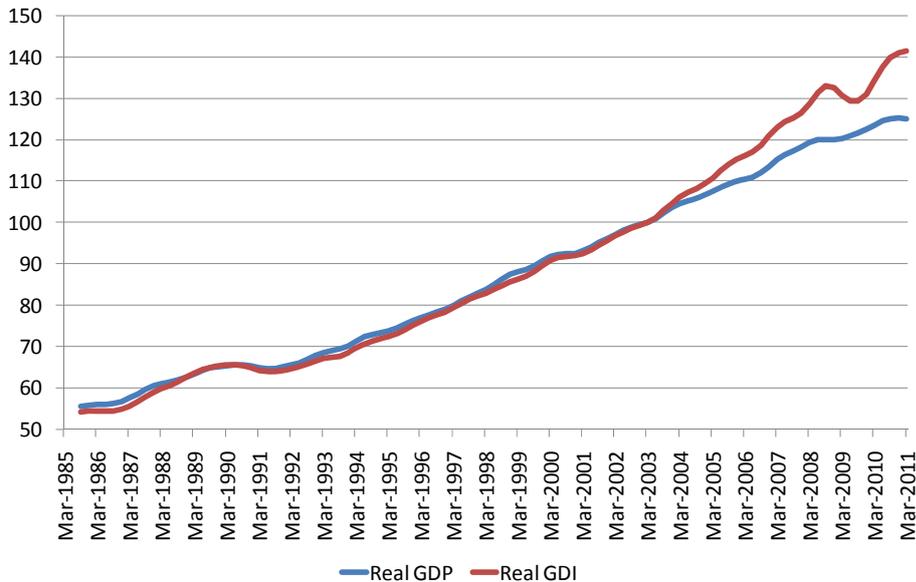
Source: ABS 2011, Australian National Accounts: National Income, Expenditure and Product, Cat. No. 5206.0, Table 1: Key National Accounts Aggregates.

Second, in addition to direct income flows through the economy, the trading gains will produce an indirect income effect as increased optimism about future mineral prices will usually generate an investment boom that adds to RGDP. Of course, this indirect income effect is only one contributor to RGDP and, because of this, there can be no universal agreement as to its exact contribution relative to other factors.[6] Nevertheless, it seems clear that both the direct and indirect effects have been important in Australia. In response to the global financial crisis, almost all developed economies are experiencing depressed RGDP growth rates and record high unemployment. Australia, in contrast,

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[6] There has been some dispute in Australia as to the relative contribution of the stimulus package, the mining boom and general stability of the banking system to the stronger performance of the Australian economy since 2008.

has avoided any significant falls in RGDP and, until recently, had been experiencing falling unemployment rates to levels that are considerably lower than average over the last forty years.

An empirical estimate of the indirect effect involves a comparison between actual RGDP and a counterfactual, an estimate of what RGDP would have been without the trading gain. To estimate a counterfactual is a large and complex task which we do not attempt.

Since we are interested in the contribution to the living standards of all Australians, RGDI can be expressed in per capita terms and related to direct and indirect trading gain effects by the following identity:

$$RGDI per cap ita = \frac{RGDP}{Pop} \times \frac{RGDI}{RGDP} \tag{5}$$

The first term on the right-hand side of equation (5) is *RGDP* divided by the population. This measures living standards without adjustment for direct trading gain effects. The second term, *RGDI/RGDP*, measures the direct income effect of the trading gain at the aggregate level. Figure 6 plots the change of living standards and the accounting contribution of the first and second term over the last fifty years. We divide the period into two, the long period 1960 to 2003 and the recent period beginning in 2003.

Over the long period, RGDP per capita has increased fairly steadily, although there are noticeable downturns during the recessions of the early 1980s and 1990s, but only a short pause in the growth rate during the 2001 recession. Living standards as so measured have approximately doubled over the past forty years.

Figure 6 RGDP and RGDI per capita, 1971-2010 (indexes 1971 = 100, based on seasonally adjusted quarterly data)
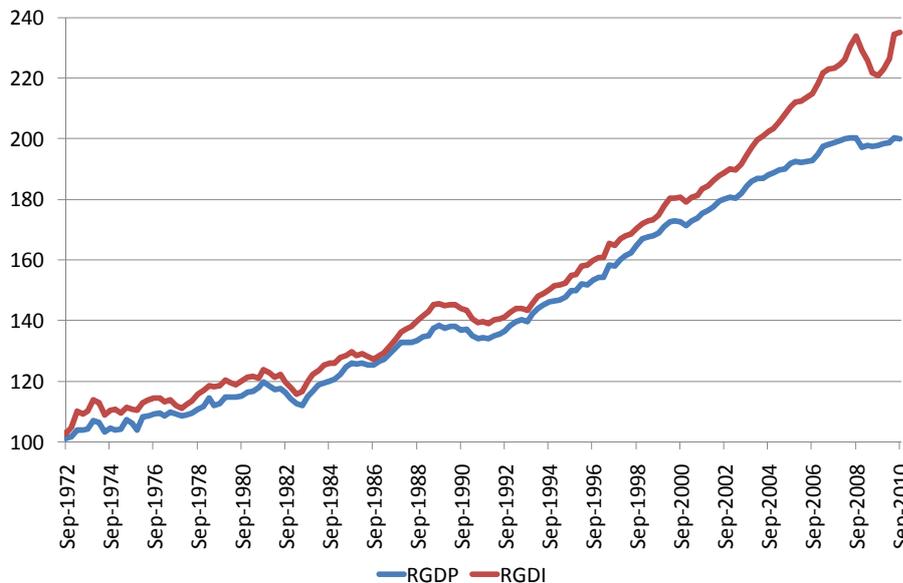
Source: ABS 2011, Australian National Accounts: National Income, Expenditure and Product, March 2011, Cat. No. 5206.0, Table 1: Key National Accounts Aggregates; and ABS 2011, Australian Demographic Statistics, Dec 2010, Cat. No. 3101.0, Table 9.

The direct income effect of the trading gains, the RGDI-RGDP ratio, has also contributed positively to the level of RGDI per capita over the long period. There is a trading gain contribution in the early 1970s, which has more or less stayed in place and widened a little in the late 1980s. But the most striking feature of the long period to 2003, is that the direct income effect of trading gains is of little practical significance. Over the long period, trading gains have lifted RGDI relative to RGDP by about ten per cent of the total increase. One reason for this relatively insignificant contribution is that the terms of trade have not changed a great deal over these forty years, and when they do move to higher levels, these outcomes are not maintained for very long. Another reason for their insignificant contribution is that trading gains are calculated by weighting the terms of trade changes by export volumes, which typically account for around one fifth of GDP. Small weights dampen terms of trade effects.

Since trading gains have not been very important over the long period to 2003, it follows that virtually all living standards growth can be attributed to increased per capita inputs and their efficiency in use to produce RGDP. It also follows that, over the long period to 2003, RGDP per capita is, from this point of view, an adequate national accounts measure of changing living standards although, on average, there is a small understatement reflecting the small positive effect of the trading gains.

Recent history since 2003, however, is quite different in two important ways. First, over this short period, the direct income effects from trading gains have been large and persistent (see Figure 5). As previously noted, RGDI has moved to be 15.0% above RGDP in the March quarter of 2011. This is an exceptionally large increase in income over eight years and amounts to more than 60 per cent of the growth in per capita income. This substantial amount is equivalent to over $7500 per person per year (2011 prices). It should be noted, however, that this calculation takes no account of what part of this income accrues to foreign interests as opposed to Australian citizens, nor of how the net Australian component is distributed within the Australian community. Further discussion of these and related issues can be found in Gregory (2011).

While these issues of the ownership, timing and distribution of the trading gains are important, there is little doubt that the direct and indirect trading gain effects have enabled Australia to avoid the world recession among developed economies following the global financial crisis. Australian recessions usually occur at the same time as recessions in developed economies, reflecting a global economic cycle. This time is different, undoubtedly in substantial part due to the trading gains effects arising from the boom in the terms of trade. Nevertheless, the issues of ownership, timing and distribution are central to attempting to trace through the impact of the resources boom on the Australian economy, and need to be considered in developing an analytical framework.

A framework for analysing the impact of the resources boom

As noted above, several factors can affect the trading gain, through impacting on either export or import prices. As we are concerned with a resources boom and with the rise in export prices for commodities to which it has given rise, we focus here on the case in which the rise in the terms of trade is entirely due to rising export prices. In considering who benefits from the increase, we also focus initially on the first round effects; if any party benefits from this rise in income there will be

complex second round effects, as the higher income affects spending, resource allocation and prices. But we focus initially on the first-round effects.
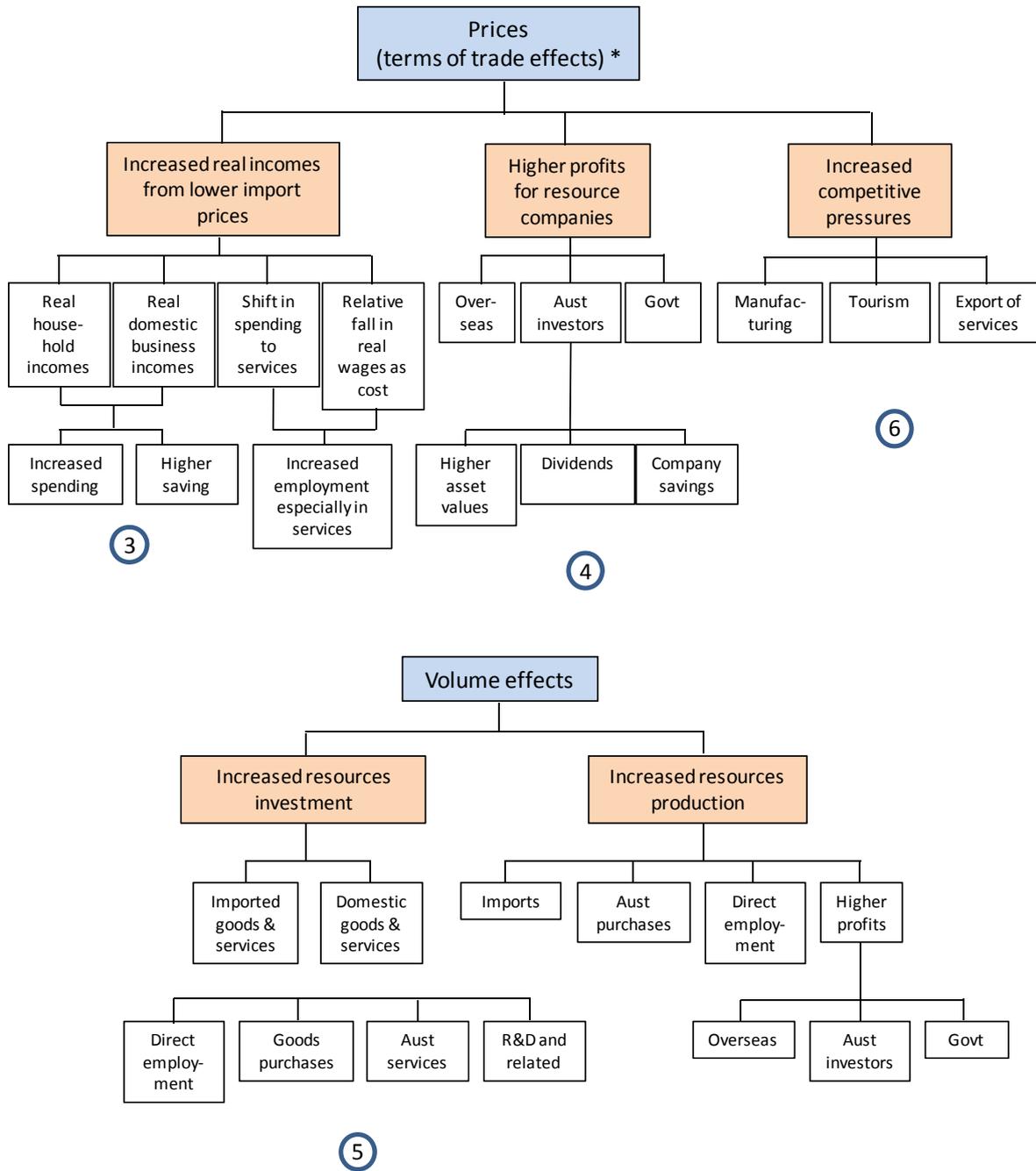
If export prices rise and there is no exchange rate adjustment, so that import prices are unchanged, all of the initial benefits of the rise in the terms of trade will accrue to the exporting companies and their owners. In this case the distribution of the initial benefits will depend on who owns the exporting companies, and we know that for the resource sector the extent of foreign ownership is high. At the other extreme, if export prices rise in foreign currency but the exchange rate falls to fully offset that rise, so that export prices are steady in $A but import prices fall, all of the initial benefits of the terms of trade flow through lower import prices. In this case, the benefits will accrue in the first instance to those in Australia using imported goods and services – for example individuals, households, companies and governments, both Australian and foreign. The extent of the gain to any individual or enterprise will depend on the extent to which they use imported goods and services.

In the current boom the actual experience is between these two extreme cases. Export prices in foreign currency terms have risen by 170%, but (after allowing for compounding) this increase has been about equally divided between a rise in the trade-weighted exchange rate of 65% and a rise in export prices in $A of about 65%. While the rise in $A export prices will lead to an increase in the profits of export companies and to a rise in resources investment, the rise in the exchange rate will have two main effects. First, it will lead to increased real incomes for those using imports, both households and businesses, and hence to higher spending and/or saving from those incomes. The relative fall in import prices will also lead to a fall in the price of traded goods and services relative to non-traded ones, and more generally to a decline in real wages as a cost to employers (the product wage) relative to real wages as an income to employees, with possible effects on employment. Secondly, the rise in the exchange rate will lead to increased competitive pressures for trade exposed industries, notably manufacturing, tourism and educational services.

The framework we use to analyse this impact is summarised in Figure 7, which contains two components, terms of trade or price effects and volume effects, in terms of increased resource investment and production. There are clearly interactions between price and volume effects throughout the economic system, but these are two separate channels through which the boom impacts on the economy. In terms of volume effects, the increased level of resource investment and the subsequent higher level of production will increase the demand for goods, services and labour within Australia. For any given level of investment and/or production, both the degree of local content and the capital intensity of investment and production will influence the level and structure of purchases from Australian suppliers. The degree of local content will also be a function of the exchange rate, and hence of the competitiveness of local suppliers.

The numbers in Figure 7 refer to the subsequent section of the report in which the effect in question is discussed. No attempt is made here to analyse explicitly the many complex inter-relationships between the different effects that will emerge, but their potential importance is acknowledged.

Figure 7 Analytical framework: Impact of resources boom

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                          ┌────────────────────────┐
                          │         Prices         │
                          │ (terms of trade effects) * │
                          └────────────────────────┘
```

Prices (terms of trade effects) *

- Increased real incomes from lower import prices
  - Real household incomes
  - Real domestic business incomes
  - Shift in spending to services
  - Relative fall in real wages as cost
  - Increased spending ③
  - Higher saving
  - Increased employment especially in services
- Higher profits for resource companies
  - Over-seas
  - Aust investors
    - Higher asset values
    - Dividends
    - Company savings
  - Govt
  ④
- Increased competitive pressures
  - Manufac-turing
  - Tourism
  - Export of services
  ⑥

Volume effects

- Increased resources investment
  - Imported goods & services
  - Domestic goods & services
    - Direct employ-ment
    - Goods purchases
    - Aust services
    - R&D and related
  ⑤
- Increased resources production
  - Imports
  - Aust purchases
  - Direct employ-ment
  - Higher profits
    - Overseas
    - Aust investors
    - Govt

Notes: *Distribution between real incomes for the non-resource sector and resource company profits is determined by rise in exchange rate, as is the extent of increased competitive pressure.

Numbers circled refer to the sections in the body of the report in which the relevant issues are discussed.

3   Exchange Rate Changes and Real Domestic Incomes

In this section we explore the impact of the increase in the terms of trade, in so far as they have led to an increase in the exchange rate, on the real value of domestic incomes. Here we implicitly adopt the first of the two approaches for valuing the increase in incomes distinguished in Section 2 above, in that the increased real value of domestic incomes is considered in terms of the appropriate price deflator for that income class, which incorporates the impact of the rise in the terms of trade through the exchange rate. As a result of the rise of 65% in the real trade weighted $A exchange rate between the December quarter of 2002 and the June quarter of 2011, import prices fell by 35.5% relative to the price of domestic supplies to final demand over this period. Allowing only for direct effects, lower import prices reduced the growth in the implicit price deflator for domestic final demand by 9.7% relative to the case of no fall in relative import prices. These lower import prices increased the real value of most classes of domestic incomes, with higher effects where a higher proportion of income is spent on imports. While the real gain accrues to business and government incomes also, we focus here on wage and household incomes. That component of the increase in income through higher export prices in $A terms that accrues to resource companies and their shareholders is considered in Section 4 below.

Real hourly compensation: The real consumption wage

In the first stage of the resources boom, between the March quarters of 2003 and 2008, the real trade-weighted exchange rate rose by 36.5% and the consequent fall in the relative price of imports strongly boosted domestic incomes (see Figure 8). Real employee compensation per hour worked, using the implicit deflator for household consumption, rose by 3.5% per annum over this period, by comparison with 1.3% over 1979-2003. This strong boost to the economy was interrupted during the global financial crisis (GFC), which brought with it a sharp decline and then a rapid recovery in the exchange rate. Real compensation per hour was flat between the March quarters of 2008 and 2010, but growth has resumed in the year to the June quarter of 2011 (by 4.1% per annum), as the real exchange recovered strongly.

Figure 8 Real hourly compensation and real exchange rate, Australia
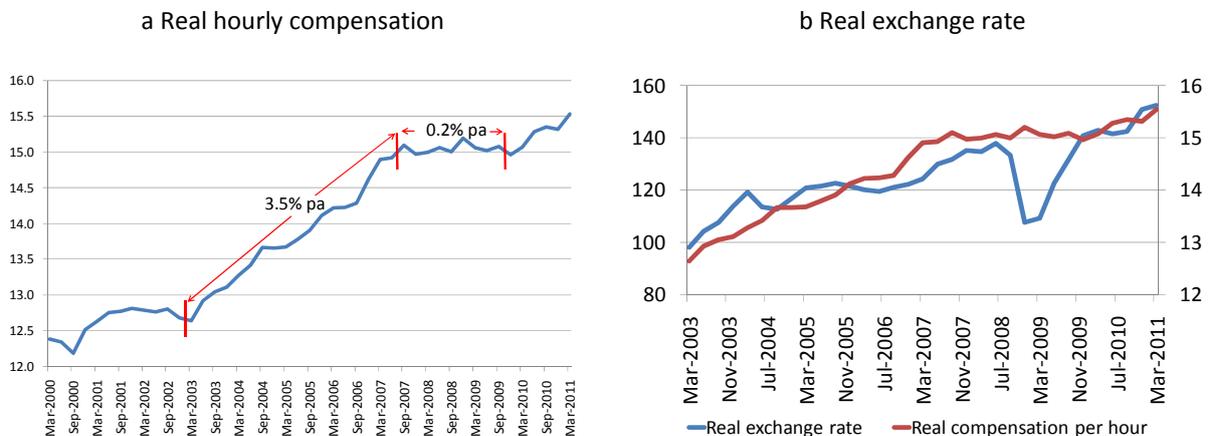
a Real hourly compensation

b Real exchange rate

Source: ABS 2011, Australian National Accounts: National Income, Expenditure and Product, March 2011, Cat. No. 5206.0, Table 14: Household Income Account, Current Prices; and Reserve Bank Australia statistics for real exchange rate.

The growth in the real consumption wage of 3.5% per annum for five years between 2003 and 2008 provided a very strong boost to household incomes and spending. As noted, between 1979 and 2003 the average growth in this variable was only 1.3% per annum. If we take this as the underlying trend rate, the above trend growth in the real consumption wage, driven by exchange rate appreciation and other factors, from the end of 2002 to the June quarter of 2011 was 10.5%. This is a very powerful boost to household incomes and hence to economic activity.

Hourly compensation deflated by the value added deflator: The real product wage

Wages are not only an income to employees but also a cost to employers, but falling import prices increase real incomes at no cost to employers in terms of increased compensation. They thus drive a wedge between wages as an income (the real consumption wage above) and wages as a cost (the real product wage – hourly compensation deflated by the GDP or other value added deflator). Over the full eight years between the first quarters of 2003 and of 2011, the real product wage grew by only 5.9% or 0.7% per annum while the consumption wage rose by 22.9% or 2.6% per annum, implying differential growth of nearly 2% per annum in the consumption wage. Relative to the March 2003 base, the gap between the two wage measures had grown to 16.0%. Over the previous 24 years for which data are available (1979-2003), the real product wage had risen in line with the consumption wage (at 1.3% per annum). Thus in the resources boom, the low rate of growth of real wage costs at a time at which demand was growing strongly undoubtedly contributed to the rapid growth in employment.

Figure 9 Real product wage, ex-mining and total, and real consumption wage, Australia, 1989-90 to 2009-10 (indexes 2002-03 = 100)
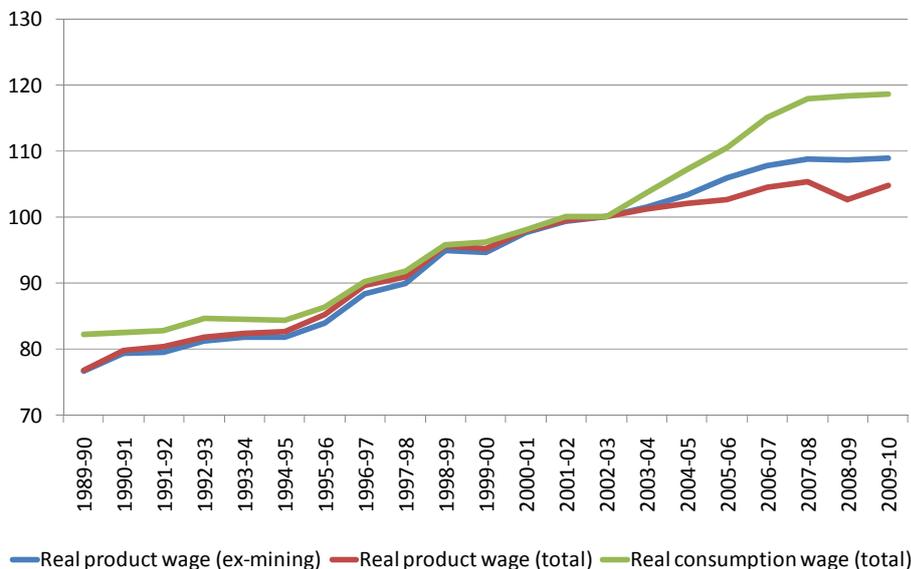
Source: ABS 2010, Australian National Accounts: State Accounts, Cat. No. 5220.0, Table 10: Expenditure, Income and Industry Components of Gross Domestic Product, Australia, Chain Volume Measures and Current Prices.

As the aggregate real product wage is calculated using the GDP deflator, its value will be strongly influenced by the high level of resource prices captured in that deflator. Figure 9 shows, for both the

total economy and the total excluding mining and using annual data for 1989-90 to 2009-10, the real product wage (defined as hourly compensation per employee deflated by the relevant GDP deflator). The data are indexes with 2002-03 = 100. It also shows the real consumption wage, for which the deflator in the household consumption deflator. There is no substantial variation across the two sectors for this variable.

Using the annual data for the total economy relative to a 2002-03 base, the gap between the consumption wage and the product wage by 2009-10 was 13.2%. But about one third of this gap is due to the impact of the mining sector on the real product wage – excluding this the gap in 2009-10 was about 9%. Thus while the growth of resource prices is responsible for the gap, most of it remains in the ex-resource economy and reflects exchange rate factors. On the basis of the quarterly data, it is likely that the real consumption wage increased further in 2010-11, with little or no growth in the real product wage, implying a further widening of the gap. This stability in real hourly earnings as deflated by value added prices has undoubtedly contributed to the strong growth in employment, and to the slower growth in productivity, in Australia after the global financial crisis.

It is also of interest to compare the recent trends shown in Figure 9 with those in the previous decade, from 1992-93 to 2002-03, which was a period of strong productivity growth in Australia. Over this decade for the non-resource sector, the real product wage rose more rapidly than the real consumption wage (by 2.1% per annum as compared to 1.7% per annum). This contrasts sharply with the more recent period, where the real product grew by only 1.2% per annum by comparison with 2.5% for the real consumption wage. However, this boost to both demand and employment is highly dependent on a rising exchange rate, and cannot be presumed to continue under a fixed exchange rate assumption.

Real household disposable incomes

The most comprehensive measure of household incomes – real household disposable income – is influenced by many other factors in addition to employee compensation, such as employment growth, movements in tax and benefit rates and in interest rates, and the impact of falling relative import prices on the value of other components of household income. Thus it summarises the net effect of the various channels of impact of the resources boom on household incomes, as well as that of other factors.

Over the period from the December quarter of 2002 and the June quarter of 2011, real household disposable income grew by 49.4% or 4.8% per annum, nearly twice the long-term trend rate of growth of 2.6% per annum over 1979-2002. Growth in real disposable income per capita more than doubled over this period, from 1.0% in the earlier period to 2.8% in the later period. Thus by the June quarter of 2011 real household disposable was 17.6% above the long-term trend, and this provides another striking indicator of the impact of the boom. In terms of the annual data, the growth in real household disposable income nationally was 4.8% per annum over the seven years from 2002-03 to 2009-10, by comparison with 2.6% over 1989-90 to 2002-03.

While the growth in hours worked was somewhat above trend – total hours worked grew by 2.0% per annum over 2002-11 by comparison with 1.5% per annum over 1979-2002 – the main reason for this extraordinary growth in household income was the price factors associated with the resources

boom. The real value of other domestic incomes, such as those of businesses and governments, was also enhanced by the relative fall in imports, but these are not considered further here.

4   Higher Profits and Asset Prices

Even though some of the value of rising foreign currency commodity prices has been transferred from resource companies to domestic incomes by the rise in the $A, commodity prices have still risen strongly in $A terms and this is being translated into higher actual and potential earnings for resource companies. To the extent to which the shares in these companies are owned by Australian residents, these higher profits will accrue to them, initially in the form of higher share prices, as the market anticipates higher future earnings, and in due course in higher dividend receipts. Similarly, the anticipated returns from new investment projects will be factored into share prices, long before those projects are completed and start to earn income. While it is clear that the majority of such increased returns will accrue to foreign shareholders, the benefits flowing to Australians are likely to be considerable.

Thus one major channel for the impact of the resources boom is its effect on the value of financial assets held by Australian residents, and on their future income flows from these forms of capital. Rising asset values resulting from the resources boom are likely, especially in the context of strong income growth from other sources, to flow onto the value of other assets, such as housing, as they provide both rising confidence and stronger collateral against which to borrow for the purchase and construction of housing and other assets.

The resources boom and share prices

From a low point in February 2003 before the resources boom got underway, the All Ordinaries price index of the Australian Stock Exchange (ASX) rose by 144% to its pre-GFC peak in October 2007, and the market capitalisation of domestic equities rose by 151% or by $1013.6 billion over this time. While the resource, financial and industrial components of the index all rose over this time (Figure 10), the dominant factor was resources. Over this period the resources component of the share index rose more than fourfold, driving the rise in the overall index.

As shown in Figure 10, all three components fell during the GFC, with the falls in the financial sector most acute and those in the resources sector more moderate, and each has subsequently recovered. By the March quarter of 2011 the resources index had recovered to be close to its pre-GFC peak, and hence to be nearly four times its level in the first quarter of 2003, but falling again subsequently as global conditions became more uncertain. By comparison, by mid 2011 the financial index was lower than 2003 level, while the industrial index was only marginally above its 2003 level. Thus the vast bulk of the increase in the ASX All Ordinaries index over the period was due to the growth of the resources sector.

Figure 10   Australian share price indices (log scale, end December 1994 = 10)
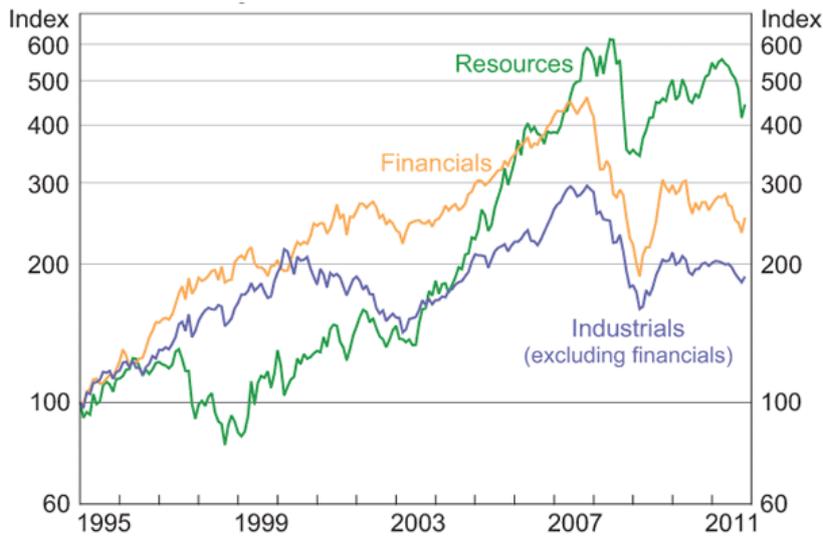

Source: Reserv Bank Australia 2011, 'Chart Pack: Graphs on the Australian Economy and Financial Markets – Share Markets, at: http://www.rba.gov.au/chart-pack/share-markets.html

Over the eight-year period between the first quarters of 2003 and 2011, the market capitalisation of domestic equities listed on the ASX rose by about $800 billion, from $630 billion to about $1430 billion. Taking account of the inflation rate as measured by the domestic demand deflator and some contribution from the other sectors, the increase in market capitalisation over the period due to the resources sector is about $600 billion in 2011 prices. While the resources boom has a number of contrasting effects on share values in the non-resource sectors, being studied in part in this report, this figure can be taken as a broad indication of the impact of the resources boom on share market capitalisation in Australia. Such increases in asset values underpin economic activity in a wide range of ways, from providing a foundation for increased consumption and investment spending to facilitating higher borrowing against these assets by households and businesses.

Trends in real house prices and overall household assets

Higher financial asset values arising from the resources boom might be expected to stimulate higher demand for housing, especially for established houses in attractive neighbourhoods, and hence lead to increasing prices for such houses. Figure 11 shows the ABS index of established house prices in Australia's five largest cities, with the index deflated by the domestic final demand deflator and expressed as an index with the March quarter 2003 equal to 100. Real house prices so measured have increased by about 60% over the eight-year period in three cities (Melbourne, Brisbane and Adelaide) and by 95% in Perth, but by only 7% in Sydney. Clearly these trends reflect a range of factors, including monetary policy and city-specific factors (such as the pre-2003 level of prices in Sydney or the special impact of the resources boom on Perth), but the overall rise in household incomes and share prices associated with the resources boom must be important contributing factors.

Figure 11   Real prices of established houses, selected states (deflated by the final domestic demand deflator, indexes March quarter 2003 = 100)
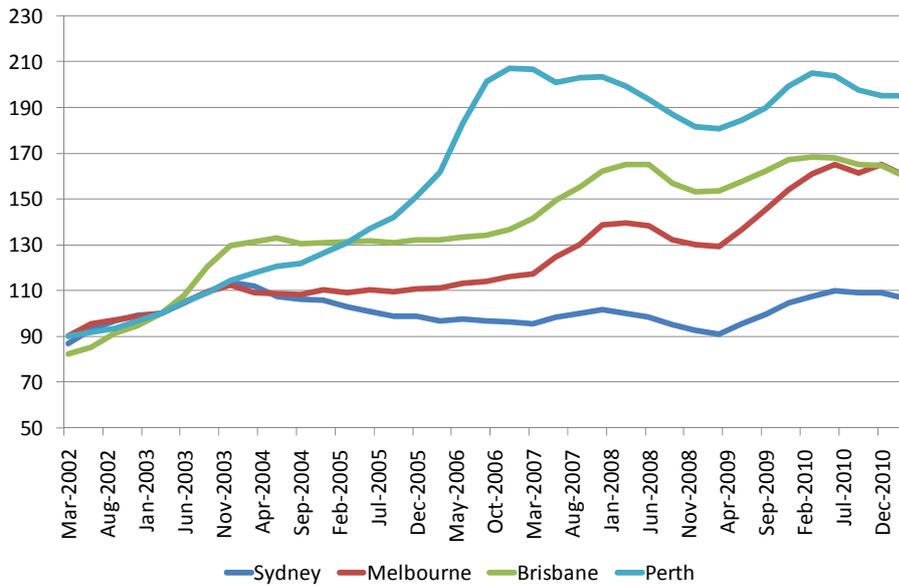
Source: ABS 2011, House Price Indexes: Eight Capital Cities, March 2011, Cat. No. 6416.0, Tables 1, 2, 3, 4, 5 and 6: House Price and Selected Housing Indexes, Index Numbers and Percentage Changes.

It is noticeable that both share values and house prices have fallen back in recent months. By June 2011, the real value of the main ASX share indexes was about 10% below the peak levels attained after the GFC. Real house values in the five cities shown in Figure 11 were by the June quarter of 2011 2-6% lower than their peak levels, typically reached around mid 2010. Overall, the era of rapid growth in asset prices driven at least partly by the resources boom also seems to have passed, although those asset prices remain at high levels.

Figure 12   Per capita real asset holdings by Australian households, financial and non-financial assets, 1988 to 2010 (deflated by the household consumption deflator, $'000s per capita, 2008-09 prices)
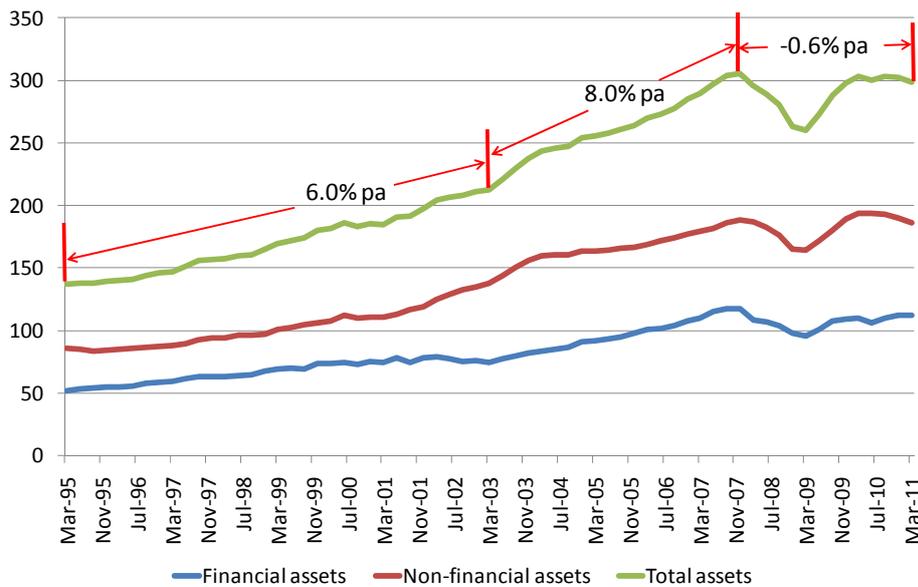
Source: Unpublished data provided by the Reserve Bank of Australia, based on ABS data.

Figure 12 and Table 1 summarise data provided by the Reserve Bank on the real per capita assets of Australian households, divided into financial and non-financial assets. Stevens (2011b) puts the data shown here into context, by noting that according to the total wealth data of the Australian Treasury, real per capita wealth in Australia grew by 2.6% per annum over 1960-1995. The growth shown since 1995 is therefore striking in historical terms, especially so in the first stage of the resources boom. Over the five years from the end of 2002 to the end of 2007, the real value of per capita household assets grew by 43.8% or $93,000 per capita, a growth rate of 8.0% per annum. This rapid growth was driven in good part by rapid growth in real financial assets, which grew by 9.9% per annum, in turn reflecting the increased value of resources shares described above. The value of non-financial assets, and particularly dwellings, also increased rapidly during this period.

Table 1 Per capita real asset holdings by Australian households, financial and non-financial assets, 1995 to 2010 (deflated by the household consumption deflator)

	Financial assets	Non-financial assets	Total assets
	($'000s, 2008-09 prices)		
Mar-95	51.9	85.4	137.2
Mar-03	74.7	137.5	212.2
Dec-07	117.2	188.1	305.2
Mar-11	112.5	186.5	299.0
Percentage change:	(% per annum)		
Mar-95 to Mar-03	4.7	6.1	5.6
Mar-03 to Dec-07	9.9	6.8	8.0
Dec-07 to Mar-11	-1.2	-0.3	-0.6

Source: Unpublished data provided by the Reserve Bank of Australia, based on ABS data.

This remarkable period of increase in the value of both financial and non-financial assets relative to general price levels, which saw real per capita assets increase by 112% or $168,000 per capita (in 2008-09 prices) in less than 13 years, came to an end with the GFC. According to the Reserve Bank figures, real per capita household assets were 2% lower in the March quarter of 2011 than in the final quarter of 2007, with a larger decline in financial assets. It seems likely that both components have continued to fall beyond the March quarter.

5   Resource Investment and Production Effects

To date we have been considering the terms of trade and financial effects of the resources boom. But, whatever else it is, the current resources boom is also a large scale investment boom, with mining investment as a share of GDP rising from 1.3% in 2001-02 to 4.8% in 20010-11-09 and may reach 7% of GDP by 2013-14. This has undoubtedly provided a major stimulatory boost to the domestic economy, although the extent of that impact nationally will depend on the extent to which it displaces or substitutes for other investment and on the extent of spending on local content by the resource companies undertaking the investment. For a given region such as Victoria, the size of the stimulatory effect will depend on these factors as well as the degree to which investment spending spills over to the region of interest.

On the first issue – the extent to which increased resource investment has displaced or crowded out other investment in Australia as a whole – the answer is clear: at least up to 2010-11 higher resource

investment has added to the total level of capital investment in Australia, with no signs of substitution or displacement. Rather, there are signs that the resource investment may have for some time stimulated complementary or supporting investment, by both the public and private sectors. Figure 13 shows three components of real fixed capital formation – private business investment, other private investment and public investment – together with total investment, all expressed as a share of GDP and shown for the twenty-year period from 1989-90 to 2009-10, and further detail is provided in Table 2.

Figure 13   Real gross fixed capital formation, Australia, by components (share of GDP, %)
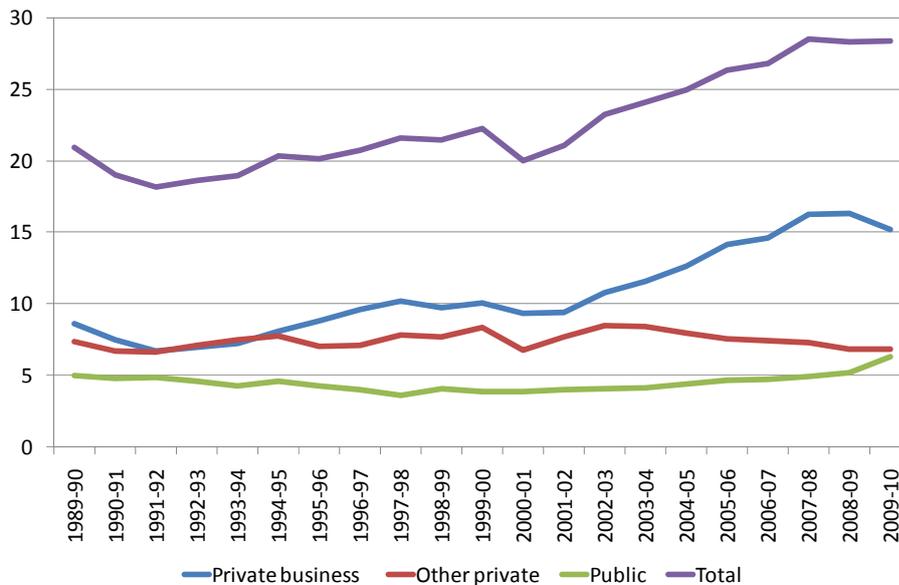
Source: ABS 2010, Australian National Accounts: State Accounts, Cat. No. 5220.0 Table 10. Expenditure, Income and Industry Components of Gross Domestic Product, Australia, Chain Volume Measures and Current Prices.

Total investment has risen steadily from its pre-boom level of 22.4% of GDP in 2002-03, apart from a flattening in the wake of the GFC, to reach 28.1% of GDP in 2010-11, an increase of 5.7 percentage points of GDP. Investment in dwellings has fallen, but non-dwelling private investment has risen by 4.2 percentage points over that time. Of this increase 3.2 percentage points of GDP has been in mining investment, while another 1.0 points has been in other industries. This indicates two things: that there has been some net additional business investment brought forth by the resources boom, and that the globalised nature of the industry and of the capital market has enabled the resource investment to be financed without crowding out other private investment. However, private investment excluding mining has fallen by about 2 percentage points from 2007-08 to 2010-11, and the forward indicators suggest that continued weakness is likely into 2011-12. Again this seems to reflect the broader issues being discussed in this report rather than crowding out by resources investment.

There has also been a rise in public investment, which has increased from 3.9% of GDP in 2002-03 to 6.3% in 2010-11. While this rapid growth may have been in part to facilitate mining developments in the relevant states, it is also evident in non-resource states such as Victoria and partly reflects the ongoing implications of the Government's GFC stimulus package. Public investment may fall as this stimulus package is brought to an end, but infrastructure and related investments by both levels of government should remain fairly strong.

Table 2 Real gross fixed capital formation, as a share of GDP, by industry (%)

	Dwellings	Mining	Other private	Total non-dwelling private	Public	Total	Memorandum Items Private ex mining
2001-02	5.7	1.3	9.6	10.9	3.9	20.5	15.2
2002-03	6.3	1.6	10.6	12.2	3.9	22.4	16.9
2003-04	6.4	1.7	11.4	13.1	4.0	23.4	17.7
2004-05	6.2	1.8	12.0	13.8	4.3	24.3	18.2
2005-06	5.9	2.7	12.7	15.4	4.5	25.7	18.5
2006-07	5.7	3.1	12.8	15.8	4.6	26.1	18.4
2007-08	5.6	3.7	13.5	17.2	4.8	27.5	19.0
2008-09	5.4	4.2	13.0	17.1	5.1	27.5	18.3
2009-10	5.3	3.8	12.2	16.0	6.2	27.5	17.5
2010-11	5.4	4.8	11.6	16.4	6.3	28.1	17.0

Sources: ABS 2011, Australian National Accounts: National Income, Expenditure and Product, June 2011, Cat. No. 5206.0, Canberra; ABS 2010, Australian National Accounts: State Accounts, 2009-10, Cat. No. 5220.0, Canberra.

These facts illustrate the extent to which the new global economic context of the resources boom shifts attention away from the issues of competition for capital and labour resources that were central to earlier analyses of mining booms. This new context, with access to international supplies of capital and labour, is one of the factors which has allowed total investment in Australia to rise from 20% of GDP in 2000-01 to 28.1% in 2010-11, without severe inflationary pressures and without significant redistribution of resources from the non-resource states.

Indicators of local content

This new global context is also likely to influence the extent to which foreign rather than domestic suppliers provide goods and services for resource investment at the present time. Unfortunately there is very little information on the distribution of investment spending on Australian suppliers (local content) and on foreign goods and services. On 15 June 2011 the Governor of the Reserve Bank (Glenn Stevens) expressed the view that:

> Based on the industry liaison work that the Bank has done, around half – give or take – of the demand generated by these projects is typically filled locally, though, of course, this amount varies with the nature and details of any specific project. (Stevens 2011c)

If it is true that, on average, about 50% of the investment spending on recent resource projects goes to foreign suppliers, then the stimulatory impact of the rise in investment discussed above would be considerably muted. It is clear, as the Governor has noted, that the local content of investment will differ greatly from project to project, and also that the ability of Australian suppliers to compete for mining industry work will be significantly affected by the rise in the exchange rate. From 2003 to 2011 the real trade weighted exchange rate has risen by about 54%, and this must greatly inhibit the ability of Australian manufacturers and other firms to compete with suppliers from China, Korea and other countries.

To our knowledge the only direct source of data on the local content of resource investment projects is the *Local Content Report* published by the Government of Western Australia (DSD and DC 2011), for projects undertaken by companies operating in that state under state agreements. Some other indications can be gleaned from the project details provided on the ABARES project listing cited above in relation to Figure 3. Table 23 provides the local content report data for nine projects as

published by the Western Australian government. For the nine projects as a whole, the overall local content level is 59%, with 41% of spending directed to overseas suppliers. Of the local content nearly 90% is captured by Western Australian suppliers, with about 12% of the local content (or about 7% of the total contract expenditure) going to suppliers in the eastern states. These figures are, as expected, highly variable across projects, with the local content on the Gorgon project to date being only 41%, but on several smaller projects being over 95%.

Table 3   Companies operating under State agreements, local content reports, cumulative outcomes, 2010

| New projects (including expansions)	Percentage of contract		
	Western Australia	Eastern States	Overseas
BHP Billiton Iron Ore			
RGP4	62%	21%	17%
RGP5	85%	2%	13%
Iluka Resources Ltd (expansion projects – mineral sands)	93%	4%	4%
CP Mining (Sino project – iron ore)	71%	13%	15%
Rio Tinto Iron Ore (Pilbara projects)	73%	10%	16%
Simcoa (silicon)	50%	5%	45%
Tiwest Joint Venture (expansion projects - titanium)	99%	0%	1%
Worsley Alumina Pty Ltd (E&G project)	65%	32%	3%
Chevron (Gorgon)	38%	3%	59%
TOTAL NEW PROJECTS	53%	7%	41%

Source: Department of State Development and Department of Commerce 2011, Local Content Report, Government of Western Australia, May.

The ABARES project listing records data, provided by the company managing the project, on total capital expenditure and on employment during both the construction and operations stages of the project. There is likely to be some correlation between local content and the level of local employment in the construction phase: if components or structures are fabricated and assembled offshore then the level of employment in the construction stage is likely to be lower. Thus we use capital expenditure per unit of construction employment as a broader indicator of local content also. But this indicator must be used with caution, both because the correlation will be only partial and because the precise meaning of the employment data provided by the companies is not known. In particular, the data seem to relate to total employee numbers and not to the length of employment or hours worked, so that if more hours are worked per employee on longer projects the measure could be biased towards a higher figure for such projects.

Figure 14 summarises an analysis by product type of all 51 distinct projects listed in the advanced project section of the ABARES listing for April 2009, April 2010 and April 2011, for which both a capital expenditure and an employment during construction estimate is available. It shows that for most projects, capital expenditure per construction employee is in the $1-2 million range, with three project types having figures above $3 million per employees: LNG projects with onshore gas ($3.3 million per employee), diamonds ($6.3 million) and LNG projects with offshore gas ($8.9 million). Within the limited comparability that is possible, these data are strongly consistent with the local content figures in Table 1 above. Alumina and mineral sands projects have high local content (greater than 95%) and capex per employee at close to or below $1 million; the iron ore projects have relatively high local content (about 85%) and capex per employee of about $1.5 million; the

only offshore LNG project covered by Table 3 (the Gorgon project) has low local content (41%) while such projects have a high capex per employee figure of $8.9 million. Thus this analysis confirms the expectation of sharp differences across project types and also provides support for the use of capex per construction employee as a broad proxy for local content levels. It also confirms the expectation of sharp project-by-project variation around the 50/50 estimate cited above.

Figure 14   Capital expenditure per construction employee, by product, advanced projects on the ABARES project listing, April 2009 to April 2011, $m per employee
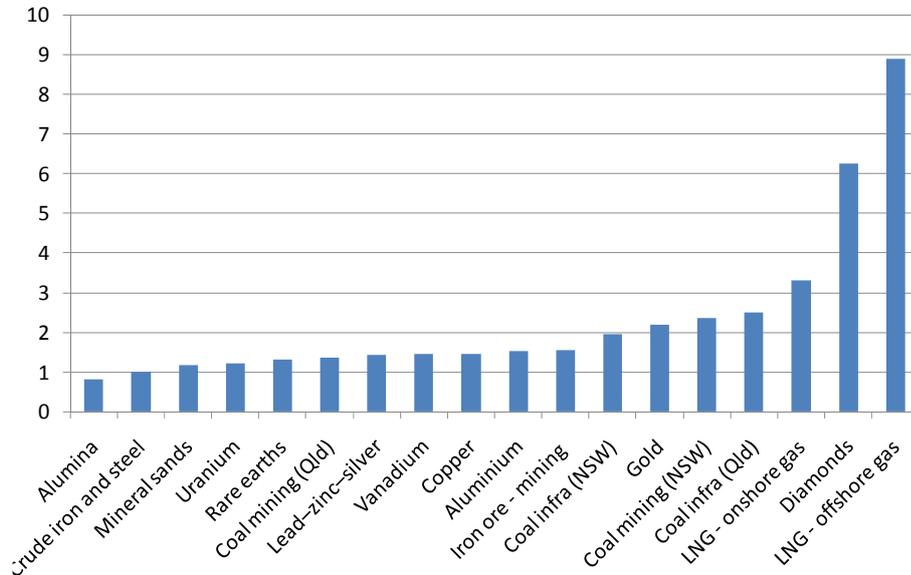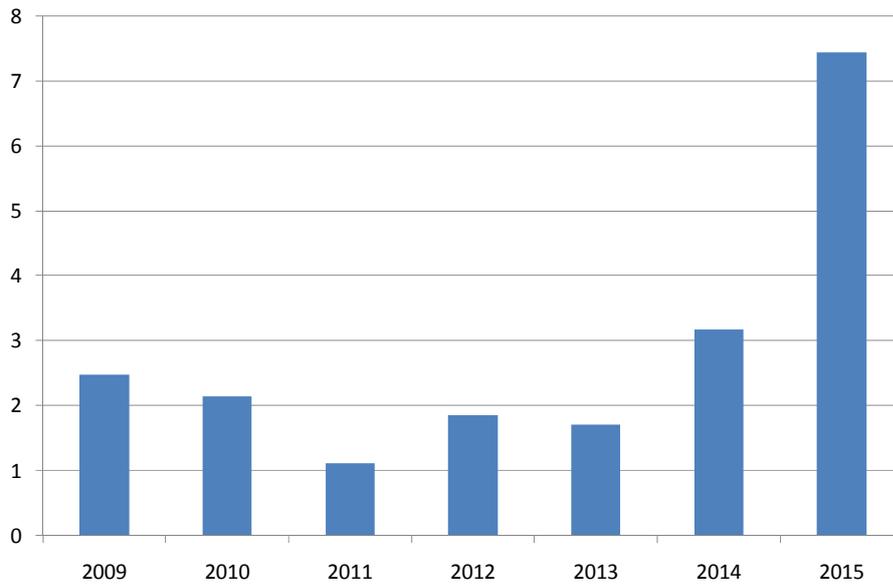

Source: ABARES 2011, Minerals and Energy: Major Development Projects, April 2011 Listing, Canberra.

The changing nature of the resources boom

Given the differences in local content levels across projects of different types, it is of interest to explore possible changes in the local content of resource investment across time, especially given the increasing centrality of large LNG projects to the ongoing level of investment. We provide below two pieces of information relevant to this issue: Figure 15 provides an analysis of the 51 projects covered by Figure 14 by year of project completion, and Table 4 summarises the information on all the LNG projects contained in the April 2011 listing, whether as advanced or less advanced projects.

With no data available on project spending by year, the data on project completion is taken as a broad measure of spending over time, but is not an indicator of spending in any year. Figure 16 does show a marked increase in the capex per construction employee for projects with later completion dates. Whereas for projects due for completion in 2011-13, the average capex per employee figure is $1.6 million, for those due for completion in 2014 the average is twice that figure at $3.2 million and for 2015 projects the figure is $7.4 million. This reflects, of course, the increasing dominance of large LNG projects in resources investment.

Figure 15   Capital expenditure per construction employee, by year of completion, advanced projects on the ABARES project listing, April 2009 to April 2011, $m per employee

Source: ABARES 2011, Minerals and Energy: Major Development Projects, April 2011 Listing, Canberra.

Table 4 moves to a broader base, covering all 15 LNG projects in the ABARES April 2011 listing, with their status ranging from under construction to being in the pre-feasibility study stage. In total they involve investment of $230 billion, and if all were completed would increase Australia's current LNG capability sixfold. As discussed earlier, there are several different types of LNG projects, and the projects in Table 3 are classified by type. All LNG projects involve a gas extraction process and a gas liquefaction plant, in which the gas is cooled to about –160°C to reduce its volume substantially for shipping. While many projects are based on drilling natural gas reservoirs, either onshore or offshore, we are also seeing a major development of coal bed methane projects, mainly in Queensland, in which methane is extracted from large coal beds. In all recent projects the liquefaction plant is onshore, so that the gas obtained either offshore or onshore needs to be piped from the gas field to the plant. New projects are emerging which involve massive floating extraction and liquefaction facilities, which can be towed to the site of the gas offshore and which allow all processes, including liquefaction and shipping, to take place from this facility.

The 15 projects shown have a total capacity of 108.8 million tons per annum, which would increase Australia's LNG capacity sixfold from its present level of about 20 million tons per annum. While capital expenditure estimates are not available for all of them, if all were to proceed, total capital investment would be $250 billion in a period of about 5 years, amounting to some 4% of GDP each year. While some of these may not proceed, six are already under construction, with total capital investment of $130 billion, and more seem likely to proceed unless circumstances change sharply.

Table 4 Planned Australian LNG-export projects

Project	Operator	Location	Construction employees	Type	Status (July 2011)	Start-up	Capital expenditure	Capacity (million t/y)
Pluto-1	Woodside Energy	WA	2000	Offshore gas/Onshore LNG	Under construction	2012	14	4.3
Gorgon LNG	Chevron, Shell, ExxonMobil	WA	3000	offshore gas/Onshore LNG	Under construction	2015	43	15
Queensland Curtis LNG	BG	QLD	5000	CBM	Under construction	2014	15.5	8.5
Australia Pacific LNG	ConocoPhillips, Origin Energy	QLD	6000	CBM	FID taken on Phase 1 (S14 b.) Awaiting FID on Phase 2.	2015	35	9
Gladstone LNG	Santos, Petronas, Total, Kogas	QLD	5000	CBM	Under construction	2015	16.5	7.8
Wheatstone	Chevron, Apache, KUFPEK, Tokyo Electric	WA	5000	Offshore gas/Onshore LNG	Under construction	2016	29	8.6
Browse LNG Development	Woodside, BP,BHP Billiton, Chevron, Shell	WA	6000	Offshore gas/Onshore LNG	FEED underway	2017	35	15
Ichthys	Inpex	WA	3000	Offshore gas/Onshore LNG	FEED underway	2017	20.6	8.4
Prelude	Shell	WA		Offshore gas/Offshore LNG	Under construction	2016/17	12	3.6
Bonaparte LNG	GDF Suez	NT	1000	Offshore gas/Offshore LNG	Pre-FEED	2018		2
Scarborough/Thebe	ExxonMobil	WA		Offshore gas/Onshore LNG	Pre-FEED	2018		8
Greater Sunrise	Woodside	NT		Offshore gas/Offshore LNG	FEED underway	2017		4
Pluto-2&3	Woodside	WA		Offshore gas/Onshore LNG	FEED finished	2014	6-11	8.6
Fisherman's Landing (train1&2)	LNG Ltd	QLD		CBM	FEED underway	2014	1.2	3
Timor Sea LNG project	MEO Australia	NT	500	Offshore gas/Offshore LNG	Pre-feasibility study		2.2	3
Potential new capacity			36500				230.0-235.0	108.8

Note: FEED: Front end engineering design. FID: Final investment decision Source: ABARES 2011, Minerals and Energy: Major Development Projects, April 2011 Listing, Canberra, update by the authors where additional information is available (three projects only).

The economics of a resources boom largely based on LNG projects, and especially offshore LNG projects, are likely to be quite different from that applicable to the boom up to say 2010. The figures in tables 3 and 4 indicate that the local content of offshore LNG projects will be considerably lower than for many other projects, and this is confirmed by reports of large scale platforms or rigs being assembled overseas and towed to the drill site. This will be accentuated as projects with offshore liquefaction and shipping facilities, such as Prelude and Greater Sunrise, are developed, as these will involve construction of a single giant mobile facility offshore, with very low local content. It is also notable from Table 4 that the level of Australian ownership of these projects is very low.

This changing pattern of local content in resource investment will significantly affect the impact of that investment on the domestic economy. If investment accounts for 4% of GDP with 70% local content, one can define an 'effective spending' measure as the product of the two, here 2.8% of GDP. If investment increases from 4% to 6% of GDP, but the average local content falls to 45%, the effective spending measure falls to 2.7% of GDP. This notional calculation illustrates the way in which sharp changes in the local content proportion can reduce the stimulatory impact of resource investment. While precise effects cannot be calculated it is evident that the stimulatory effects of further increases in mining investment will be significantly diminished by a falling local content ratio.

Another potential indicator of a decline in the local content ratio is the trend in manufacturing and construction in Western Australia, the epicentre of the resources boom. Over the five years from 2002-03 to 2007-08, real gross value added in manufacturing in Western Australia rose by 23.3% and in construction by 65.6%, but in the next two years (2007-08 to 2009-10) manufacturing value added fell by 9.7% and construction value added rose by only 7.6%. While these two years were heavily affected by the GFC, data on employment available to August suggest that this is something of a continuing trend. Employment in manufacturing in Western Australia rose steadily (by 2.1% per annum) from August 2002 to August 2008, but in the three years to August 2011 it has fallen by 22.4%, or 8.1% per annum. These figures again suggest that the combination of the high exchange rate and the changing pattern of resource investment are eroding the local content of that investment.

6   Increased Competitive Pressures and Related Impacts

The final channel of the impact of the resources boom to be considered is the effect of the higher real exchange rate on the competitive position of trade-exposed goods and services industries. As previously noted, between the December quarter of 2002 and the June quarter of 2011 the real trade-weighted Australian dollar exchange rate rose by 65%. This sustained appreciation must be expected to damage substantially the competitive position of industries engaged in international competition. Assessing the impact of such an appreciation is a complex task, having regard to the many price and non-price factors interacting to produce the final outcomes shown in the data. Here we concentrate on trade indicators, especially those concerned with goods trade in states not greatly affected by a higher volume of resource exports and on those related to Australia's services trade, but first provide an aggregate indicator in Figure 16.

Figure 16   Trade balance as a share of domestic final demand, current and constant prices, 1959 to 2011 (centred moving three quarterly average of seasonally adjusted data)
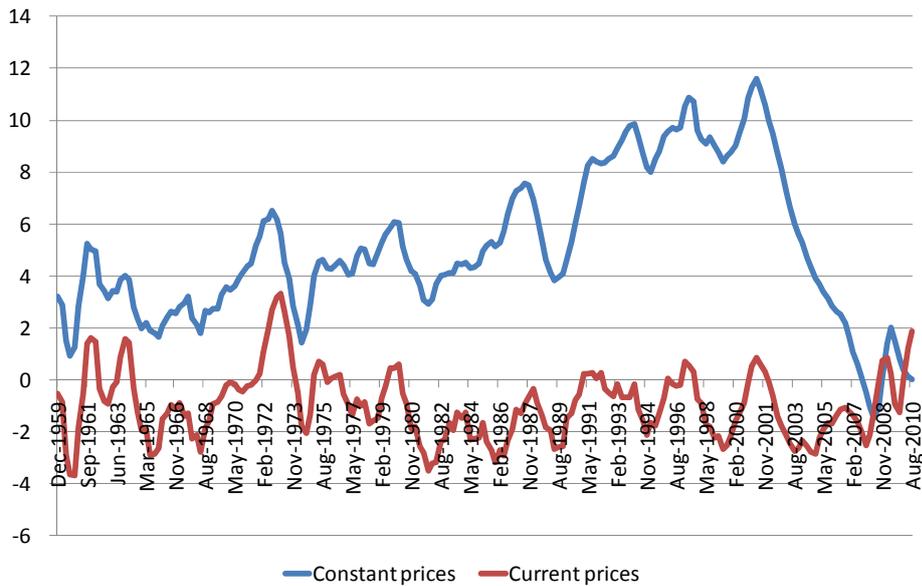
Source: ABS 2011, Australian National Accounts: National Income, Expenditure and Product, Cat. No. 5206.0, Table 2: Expenditure on Gross Domestic Product (GDP), Chain Volume Measures.

Figure 16 shows the net trade balance of goods and services, in both current and constant prices and expressed as a share of domestic final demand. It shows that, while the balance expressed in current prices is relatively stable, being between +2% and –4% in virtually all years, the balance in real terms has shown more dramatic movements. The underlying real trade balance rose steadily over three decades, to exceed 10% of final demand in 2001-02, as a greater volume of real net exports was needed to achieve a reasonable outcome in current price terms when the terms of trade were weak.

However, when China and other low-cost countries became much more vigorous competitors in world trade after 2001 and the $A appreciated against the currencies of those and other countries, the real trade balance dropped sharply. Between mid 2001 and mid 2008, the real trade balance on Australian goods and services expressed as a share of domestic final demand fell by 13 percentage points. This is by far the biggest fall in the period for which data are available, and was made possible by the rise in the terms of trade cushioning the fall in the real trade balance on the nominal balance, and allowing the exchange rate to continue to rise. While potentially influenced by many factors, this is a striking indicator of the extent of the deflationary impact of the rising $A in the current global trading environment.

Goods trade and competitive position

In a resources boom, the net trade balance in goods can be affected by many factors related to that boom – the appreciation of the exchange rate, the impact of resource investment on imports, the general buoyancy of the economy, and in due course the expansion of resource exports – as well as many other independent factors. To isolate the impact of the higher exchange rate, we concentrate here on the net goods trade balance for three states for which the resources boom factors are less important: New South Wales, Victoria and Queensland. While Queensland has recently been a

recipient of substantial resource investment, since 2003 the overall level of private investment in Queensland has grown in line with overall final demand.

Figure 17 shows the change in the real trade balance in goods from the September quarter of 1985, expressed as a percentage of state final demand, for New South Wales, Victoria and Queensland. Given that the exchange rate was effectively exogenous for these states from 2003 – being determined by developments and expectations surrounding resources development and monetary factors – this change can be thought of as reflecting three factors: the exchange rate, global trading conditions and domestic demand conditions. For all three states the net trade balance was fairly stable at its 1985 level for the next fifteen or sixteen years. But after 2001 the trade balance began to deteriorate in all three states, and fell sharply until the advent of the GFC in 2008: between the March quarters of 2001 and 2008 the trade balance fell by 10.2 percentage points in New South Wales, by 9.4 points in Victoria and by 13.9 points in Queensland.[7] Given the limited sensitivity of the exports of these states to developed country markets, the net trade balance improved during the GFC as domestic demand retreated, but has subsequently deteriorated again as the domestic economy recovered.

Figure 17   Change in real net goods trade position from September 1985 base, share of state final demand (%)
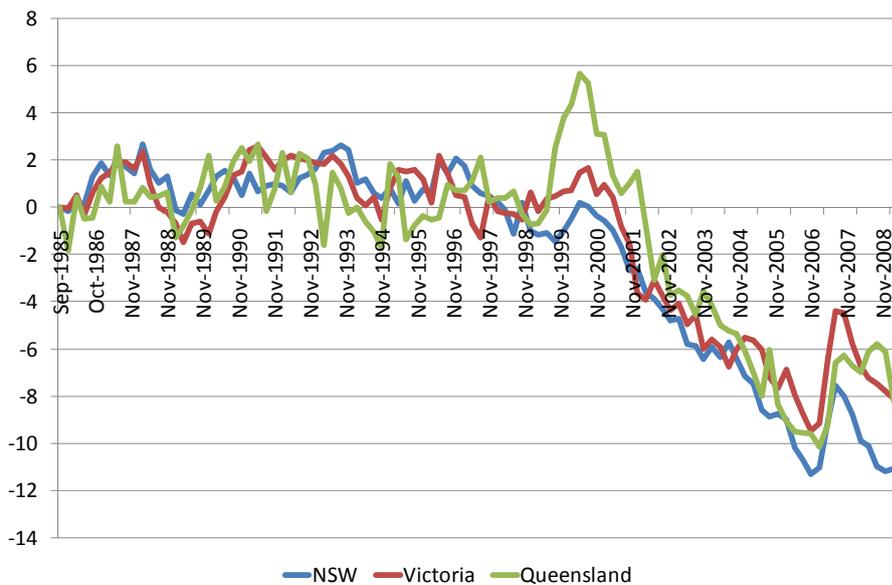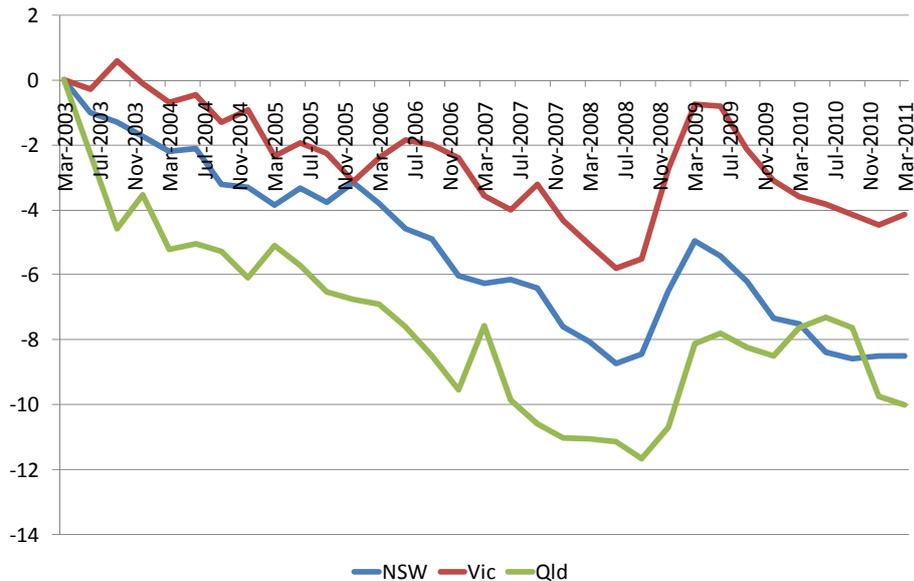

Source: ABS 2011, Australian National Accounts: National Income, Expenditure and Product, Cat. No. 5206.0, Table 21.

To help isolate the effects of the resources boom, Figure 18 expresses these data relative to March 2003, showing the change in the goods trade balance relative to that time, again as a percentage of final demand. It is evident from figures 17 and 18 that the deterioration in the trade balance began in 2002 and continued steadily through to 2008, whereas the first stage of the exchange rate appreciation was in 2003 – between the March quarters of 2003 and 2004 the real exchange rate rose by 21.3%. Figure 18 brings out two points: that, especially for Victoria, the deterioration from

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[7] It is worth noting that the corresponding falls in South Australia and Western Australia were 4.2 and 26.2 points respectively. The sharp fall in Western Australia was presumably influenced by very strong final demand conditions, including a high level of imports related to mining investment.

the March 2003 base was considerably lower than from the 2001 base, and that there has been no further fall in the trade balance from 2008 to 2011. For Victoria the net goods trade balance as a share of final demand was only 4 percentage points lower in the March quarter of 2011 than in the same quarter of 2003. Thus while the combined effect of the increased trading power of China and other developing countries and of the appreciation of the exchange rate has had a strongly moderating effect on the economy over the period since 2001, this effect is less evident over the past three years.

Figure 18   Change in real net goods trade position, three states, March 2003 to March 2011, share of state final demand (%)

Source: ABS 2011, Australian National Accounts: National Income, Expenditure and Product, Cat. No. 5206.0, Table 21: State Final Demand, Summary Components by State: Chain Volume Measures.

The two panels of Figure 19 show the change in real exports and imports of goods, as a share of final demand, since the March quarter of 2003. For Victoria in particular, the scale of the effects is fairly modest, especially given the magnitude of the forces at work. Real goods imports are only 2 percentage points higher, as a share of final demand, over the eight-year period, and real goods exports are only down by 2 percentage points. This suggests a real resilience of the Victorian economy in the face of such powerful forces. The reasons for this resilience are beyond the scope of this report, but are a matter requiring further serious investigation.

Figure 19   Change in real goods imports and exports, three states, March 2003 to March 2011, share of state final demand (%)
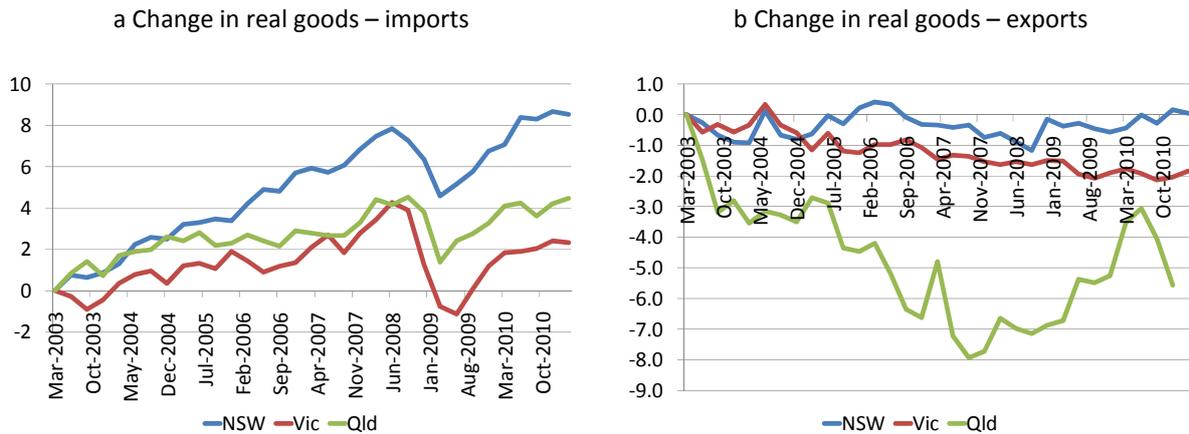
a Change in real goods – imports

b Change in real goods – exports

Source: ABS 2011, Australian National Accounts: National Income, Expenditure and Product, Cat. No. 5206.0, Table 21: State Final Demand, Summary Components by State: Chain Volume Measures.

Trade in services and competitive position

We now turn to consider briefly trade in services, both for Australia and Victoria, and the impact of the rising exchange rate on services trade. In view of the importance of tourism and education on Australia's services trade, we also examine some key indicators in these areas.

The impact of the rising exchange rate on services trade has been quite different. Up to 2007 the impact was quite limited – services exports continued to rise quite strongly, and while service imports also rose, the increase in the deficit on services as a share of domestic final demand was modest (Figure 20). The GFC had a positive impact on Australia's balance of services trade, as imports of services fell. But as the economy recovered from the GFC and the exchange rate recovered to its pre-GFC peak and then appreciated further, service exports fell and imports began to increase sharply. From effective balance in the March quarter of 2009, the deficit on services trade has risen to 1.6% of final domestic demand by the March quarter of 2011, and appears to be rising strongly. Again, Victoria's position was much stronger than the national average, with service exports continuing to increase out to 2009-10 and only a small increase in the deficit over the seven years to 2009-10.

Figure 20   Total real exports and imports of services

a Total real exports of services ($m, 2008-09 prices)
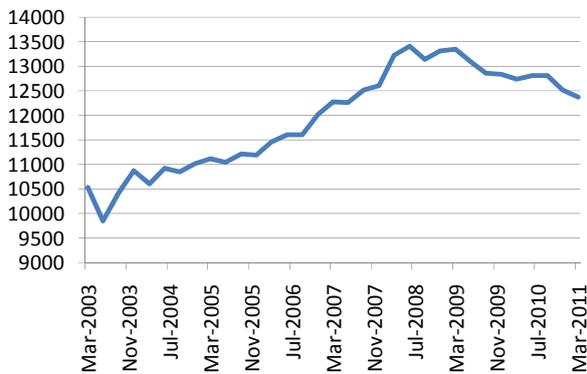
b Real exports and imports of services as a share of domestic final demand (%, based on 2008-09 prices)
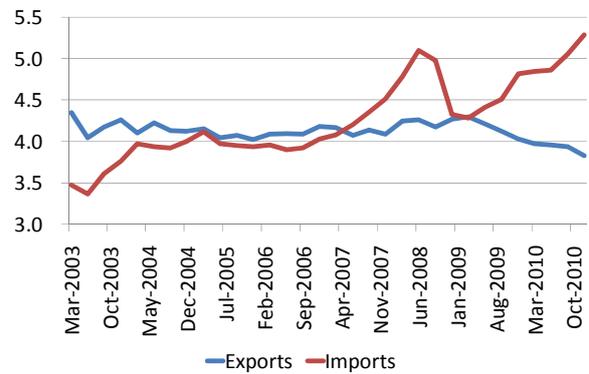

Source: ABS 2011, Balance of Payments and International Investment Position, Australia, Cat. No. 5302.0, Table 18: Services Credits, Chain Volume Measures and Indexes: Original and Seasonally Adjusted, Quarter.

Two of the key areas of services trade for Australia are tourism and education. The rise in the $A has led to a major change in short-term population movements into and out of Australia. Net short-term departures by Australian residents have more than doubled from 3.3 million in 2002-03 to 7.3 million in 2010-11 (Figure 21).[8] The implied growth rate of 10.5% per annum is to be compared with the 3.4% growth rate over 1989-90 to 2002-03. By contrast, short-term arrivals by non-residents have grown by only 3.2% per annum over the recent period, nearly half the rate (6.0%) of the earlier period. As a result, there has been a change from net short-term movements into the country of 1.4 million in 2002-03 to a net outflow of 1.3 million in 2009-10.

This dramatic change in net short-term movements into Australia will have important implications for net services income from tourism, and is also now of a scale to have broader economic implications. For example, with short-term departures now averaging one in three per capita per annum, the growing incidence of overseas travel, and of expenditure while overseas, is of a scale to influence overall domestic consumption and savings behaviour.

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[8] The figure for 2009-10 includes a CSES estimate of population movements for the final quarter of the financial year.

Figure 21   Short-term population movements: residents departing, visitors arriving and net movement, 1989-90 to 2010-11
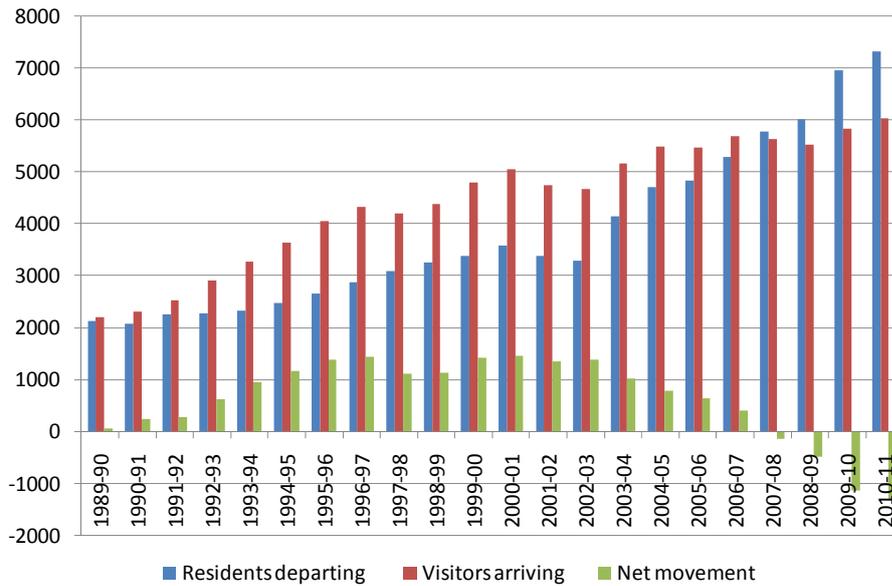
Source: ABS 2011, Overseas Arrivals and Departures, Australia, Cat. No. 3401.0, Table 2: Total Movement, Departures: Category of Movement.

Figure 22   International student commencements, by type of education, five months to May, 2002-2011, number
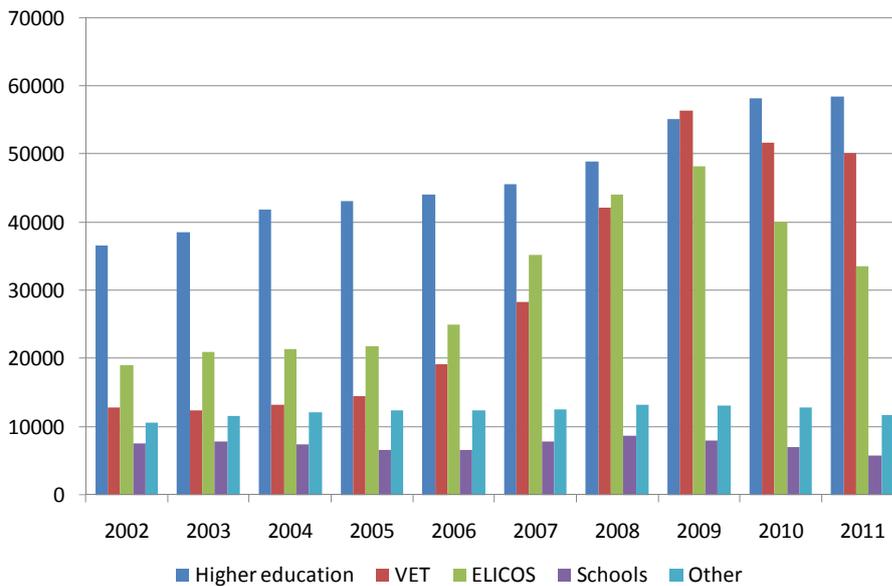
Source: Australian Education International 2011, International Student Data, DEEWR.

Exports of educational services have been one sector that has gone against the trend for much of the period since 2003. To enable the latest data to be incorporated, we here report on enrolments for each year for the five months to May (Figure 22). Between 2003 and 2010 total enrolments for the first five months in Australian institutions grew by 10.7% per annum, with higher education enrolments growing by 7.8% and vocational and educational training (VET) enrolments growing by 23.6%. This was achieved in spite of the rising value of the $A. But in 2010 and, increasingly in 2011, Australia's eroding competitive position has started to tell, as competition from other countries such as the USA and Canada has intensified. While higher education enrolments continued to increase in

2011, VET enrolments fell by 18.8% in 2011, and ELICOS and schools enrolments fell by 29.6% and 21.6% respectively in the two years to 2011. Total enrolments fell by 9.1% in 2011 and falling enrolments seem likely to continue, perhaps outside the higher education sector.

7 The Dynamics of the Resources Boom: Some Policy Implications

For the reasons outlined above, the resources boom has had a major stimulatory impact on the Australian economy, as a result of the net impact of four factors which are all of major significance in their own right:

- *Higher domestic real incomes*. For example, real compensation per employee hour grew by 2.1% per annum over this period, by comparison with 1.3% over 1979-2002, and by mid 2011 was 10.5% above the previous trend. Real per capita household disposable income grew by 2.8% per annum over 2002-11, by comparison with 1.0% over 1979-2002, to be 17.6% above the earlier trend level by mid 2011.

- *Higher asset values.* Strong growth in the value *o*f resource shares and other assets, driving a 44% growth or an increase of $93,000 per capita in the real value of financial and housing assets held by Australian households over the five years from the first quarter of 2003 to the end of 2007.

- *The local content of rising resource investment*. A continued rise in both resources investment and other investment as a share of GDP, from 21% in 2001-02 to nearly 28.1% in 2010-11, with a reasonably high local content of resource investment on most projects, provided a major stimulus to activity.

- *Competitive pressure on trade-exposed industries*. Intense competitive pressure on trade-exposed non-resource companies from a combination of appreciation of the $A and enhanced competitive from China and other developing countries, resulting in an sharp reduction in the net trade balance on goods and services of 13 percentage points of domestic final demand between mid 2001 and mid 2008.

While the net impact of these factors has undoubtedly been strongly positive for most of the period since 2003, there are good reasons, on the assumption of fixed exchange rates going forward, for thinking that the net stimulatory impact of the resources boom has come to an end. These reasons relate to the changing time path of each of the four impacts noted above.

- While the further path of commodity prices is uncertain, unless the exchange rate rises further the impetus to growth in real domestic incomes from this source will not continue. Since peaking in late July at 79, the trade-weighted $A index has traded broadly in a 72-76 band over the last three months. Assuming that the exchange rate is fixed at broadly currently 2011 levels, further real income growth from this source will not continue after the lagged effects have passed through.

- The remarkable growth in real per capita household assets prices over 1995 to 2007, which was boosted to 8% per annum growth in the first five years of the resources boom, seems to have ended. Real per capita assets have trended downward a little over the year to the June quarter 2011, and this seems likely to have continued for the next two quarters at least.

- Resources investment is likely to continue to increase as a share of GDP for up to two years yet, because of a dramatic increase in large LNG projects. But the combination of the high $A and of the shift to large, offshore and heavily foreign-owned LNG projects means that the local content of resources investment will fall sharply, and this will substantially offset the impact of rising investment on the domestic economy.

- With the exchange rate assumed to stay high, the competitive pressure on Australian trade exposed firms will continue, and indeed accentuate in key sectors such as manufacturing, tourism and education, as both producers and suppliers adjust to expectations of high exchange rates for the medium term.

In short, on the assumption of fixed exchange rates, the stimulus from the three expansionary factors has or will shortly come to an end, while the pressure on trade-exposed firms remains and in some respects is intensifying.

This conclusion has important implications for macroeconomic policy in Australia. The settings of such policy have been restrictive for some time, mildly so for monetary policy, as acknowledged by the Reserve Bank, and severely so for fiscal policy, as outlined by the Australian Treasury. The Australian Government is overseeing the most rapid process of fiscal consolidation for over 40 years. In the context of a perceived powerful continuing stimulus from the resources boom and in pursuit of a balanced budget by 2012-13, the Government proposes to take $50 billion or 3.6% of GDP out of the economy (on an underlying cash basis) over 2011-12 and 2012-13 (see Table 5). Neither of these concerns is currently relevant to Australia's economic situation. Partly reflecting the considerations outlined above and ongoing issues in the EU and USA, the outlook for the Australian economy is now much weaker than that presented in May in the 2011-12 Budget Papers, in spite of the continuing resources boom. Real GDP has grown by 1.9% per annum over the last three years, and GDP growth for 2011-12 in now likely to be closer to that figure than to the 4% forecast in the Budget Papers, while employment growth will fall well short of the 1.75% forecast.

It should be noted that Australia's fiscal position is very strong, with Australian Government net debt at only 6.1% of GDP at the end of 2010-11. It will be strengthened further over the next decade, even under the current taxation regime, as tax revenue from higher resource prices and from projects currently under construction begins to be received. Such revenue is currently being delayed by capital losses incurred in the global financial crisis and by depreciation allowances being generated by high levels of capital investment. The scale of both the investment and of the depreciation allowances being generated is massive, but tax revenues from the resources sector will rise strongly when these allowances are used up.

It is no longer appropriate in current circumstances for the Australian Government to pursue a budget surplus in 2012-13. It should move away from this target and adopt a much less restrictive fiscal policy, more supportive of economic growth.

Table 5   Australian Government budget aggregates, 2009-10 to 2014-15

	Actual		Estimates		Projections	
	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Receipts ($b) (a)	**284.7**	**302.0**	**342.4**	**378.5**	**395.9**	**415.5**
Per cent of GDP	22.2	21.7	23.2	24.3	24.1	24.0
Payments ($b) (b)	**336.9**	**346.1**	**362.1**	**372.1**	**389.2**	**406.5**
Per cent of GDP	26.2	24.9	24.5	23.9	23.7	23.5
Future Fund earnings	2.5	3.7	2.9	2.9	3.0	3.2
Underlying cash balance (c)	**-54.8**	**-47.7**	**-22.6**	**3.5**	**3.7**	**5.8**
Per cent of GDP	-4.3	-3.4	-1.5	0.2	0.2	0.3

Notes: (a) Includes expected Future Fund earnings.

(b) Equivalent to cash payments for operating activities, purchases of non-financial assets and net acquisition of assets under finance leases.

(c) Excludes expected Future Fund earnings.

Source: http://www.budget.gov.au/2010-11/content/fbo/html/index.htm

Monetary policy has been 'mildly restrictive', in the words of the Reserve Bank, being directed to offset the presumed net (incremental) expansionary impact of the resources boom and by concern about inflation running above the target band. In our view both of these concerns are no longer relevant, the first for the reasons outlined above and the second because it is clear that there is now no inflationary problem in Australia that needs to be addressed by a restrictive monetary policy. On 1 November 2011 the Bank recognised that the economy was slowing and the threat of inflation was easing, and cut interest rates accordingly, moving to a more neutral stance.

Over the three years to the June quarter of 2011, five sub-groups, out of a total of 90 in the CPI and accounting for about 12% of the index, have provided 40% the growth in the CPI and 44% of the growth over the past year. The five groups are lamb and mutton, fruit, vegetables, utilities and tobacco. These five groups in total rose have risen by 11.9% per annum over the past three years, while the rest of the CPI rose by 1.8%; over the past year the five groups rose by 16.7% and the rest of the index by 2.2% (see Table 6). Thus excluding these items, inflation has been well within the Reserve Bank's target range of 2-3% on average over the cycle. It is difficult to extend this analysis to the September quarter data, as a new CPI series was introduced in that quarter and the full data have not yet been released. But these trends appear to have broadly continued – utility charges rose by 7.2% for the month and tobacco prices by 1.8%, but the food items fell back a little.

Table 6   CPI analysis, to June quarter 2011

	Annual percentage increase to the June quarter 2011 (% pa)		
Classes with >5% increase over one and three years (5 classes)	One year	Three years	Five years
Lamb and mutton	12.5	8.7	5.7
Fruit	66.5	20.9	4.8
Vegetables	9.7	5.3	3.7
Tobacco	12.1	11.9	8.6
Utilities	9.8	11.5	9.4
Total	**16.7**	**11.9**	**7.5**
All other classes (85 classes)	**2.2**	**1.8**	**2.5**
Overall CPI	**3.6**	**2.7**	**2.9**

Source: ABS 2011, Consumer Price Index, Australia, Cat. No. 6401.0, Table 16 CPI: Group, Sub-group and Expenditure Class, Points Contribution, by Capital City.

There is no reason for thinking that the rapid growth in prices for these items can be significantly influenced by monetary policy. Prices for the food items reflect seasonal conditions affecting supply, while increases in tobacco prices are driven by regular increases in tax rates. The reasons for the rapid growth of utility charges (11.5% per annum over three years) are far from clear, but it is unlikely that price changes for this group would be greatly affected by a restrictive monetary policy. The move on 1 November 2011 to a more neutral stance may prove to be the first in a series of adjustments of monetary policy.

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