Maximising growth in a mining boom

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**Contents**

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive summary</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Section 1</td>
<td>Investment boom follows price boom</td>
<td>11</td>
</tr>
<tr>
<td>Section 2</td>
<td>Mining and related sectors are bigger than you think</td>
<td>21</td>
</tr>
<tr>
<td>Section 3</td>
<td>The structural implications of a mining boom</td>
<td>27</td>
</tr>
<tr>
<td>Section 4</td>
<td>We need to talk about growth</td>
<td>33</td>
</tr>
<tr>
<td>Section 5</td>
<td><strong>Demand side policies to boost growth</strong></td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Monetary policy</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>Budgetary policy</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>Sovereign wealth fund</td>
<td>45</td>
</tr>
<tr>
<td>Section 6</td>
<td><strong>Supply side policies to boost growth</strong></td>
<td>51</td>
</tr>
<tr>
<td>Section 7</td>
<td><strong>Conclusion</strong></td>
<td>59</td>
</tr>
</tbody>
</table>

**Appendices**

| Appendix 1               | How big are the mining and related sectors?                  | 65   |
| Appendix 2               | Listed mining service company revenue                        | 71   |

**References**

|                                                      |                                                      | 77   |

**Endnotes**

|                                                      |                                                      | 81   |

**Charts**

| Chart 1                   | Terms of trade boom                                  | 11   |
| Chart 2                   | Mining prices jump, but output lags                  | 12   |
| Chart 3                   | Australia’s terms of trade rose more than others     | 13   |
| Chart 4                   | Mining investment is still rising                    | 13   |
| Chart 5                   | Australia’s known mineral reserves are large         | 15   |
| Chart 6                   | Emerging Asia can boost Australia’s growth           | 16   |
| Chart 7                   | Mining and mining services output growing rapidly    | 22   |
| Chart 8                   | Business capital stock annual growth surges          | 34   |
| Chart 9                   | Mining sector has high productivity                  | 41   |
Focusing mainly on distribution issues risks choosing policy options that reduce the potential gains for the nation as a whole. We need policy reforms that lift Australia’s overall growth rate by encouraging resources to move into the things we are best at doing, rather than subsidising uncompetitive firms.

Structural change occurs constantly in a growing economy, because as income rises resources move out of lower value added uses into higher value added uses. Dynamic economies have high jobs turnover, as rapidly growing higher wage jobs replace those that are lower paid. The challenge is to maximise the opportunities such change offers. We should position ourselves for the future, not try to preserve the past. If we do it right, not only mining benefits from rapid Asian growth, but agriculture, education, tourism and health can do so as well.

Policy should focus on facilitating resources moving into expanding sectors to meet rising Asian demand. If we do not expand our mining capacity while export demand is rising, our competitors in Brazil, South Africa, Indonesia and elsewhere will.

The non-mining sector must be able to adjust costs and innovate to survive. The Australian dollar could remain relatively high for an extended period and we need to increase the economy’s flexibility and productivity. Mining and mining services show that Australian firms can be successful internationally.

This paper is structured in seven sections.

Section 1 shows that rapid growth in Asia has lifted Australia’s commodity export prices to record levels and is now stimulating mining investment and output. This boom will be long lasting, driven by the surge in emerging Asian living standards. Export prices will fluctuate, but Asian demand is likely to keep growing for decades.

Section 2 and Appendix 1 show that the mining and mining-related sectors now make up around 20% of the economy and are much larger than many people think. The mining services sector is growing rapidly at 15 to 20% a year and is now exporting successfully and expanding offshore.
Appendix 2 shows that this success has been driven by mining sector demand for competitive inputs, often using cutting edge technology. Most of the growth in the economy is occurring in mining-related sectors and the near 80% of the economy in the non-mining sectors is growing at only 1% a year.

Section 3 shows structural change is always occurring and is necessary if resources are to move from lower to higher productivity uses. The rapid growth in mining has lifted the Australian dollar, so some firms in the non-mining tradeables sector are being squeezed. The structural tensions created by the rapid expansion of high productivity mining can be eased by policies designed to lift the speed at which Australia’s total economy can grow. Low end manufacturing in Australia will struggle but, as mining services firms show, high end manufacturing can succeed.

Section 4 argues we can successfully lift Australia’s growth rate by both demand and supply side policies. As Asian incomes rise, firms must be flexible enough to take advantage of opportunities outside mining. This is not a temporary boom and it will cause major structural changes in the economy that will raise Australian incomes substantially. Australia has high underemployment, can import capital and skilled labour and can adopt productivity-boosting supply side reforms that allow faster economic growth, without inflation rising. This reduces the need to switch resources from existing sectors to allow expansion in mining and related sectors.

Section 5 argues that the Reserve Bank of Australia can cut interest rates further to boost demand in the short run, without increasing inflation pressures. High interest rates have restricted growth in the non-tradeable services sector which generates the most jobs. As a result, employment has been flat over the last year and underlying inflation is declining. The Reserve Bank fears that above trend output growth necessarily means higher inflation. Rapid growth in the high productivity mining sector will boost national productivity. We can sustain above trend output growth without rising inflation, as long as wages outside mining do not accelerate faster than productivity.

If demand is held below potential, rising unemployment invites political responses that protect declining firms and lower our sustainable long-run growth rate. The Federal Budget needs to be moved into structural balance which means a larger surplus in future years as a cushion against volatile mineral prices. A sovereign wealth fund that invests only offshore is unnecessary. We should focus on the best ways to increase our own growth.
Section 6 argues that supply side reforms are needed to boost growth in the medium term and that the Productivity Commission should be used more to analyse policy options. We need to increase the flexibility with which resources move between sectors and make it easier to improve productivity within firms. Policies that subsidise declining firms will lower Australia’s growth speed limit. Assistance should instead be provided to help people move to where jobs are available and to retrain. We need to encourage resources to shift from lower productivity uses – where we are no longer competitive – into higher productivity uses.

The concluding section argues that we need the right environment so firms can adapt to the new opportunities and pressures that rapid Asian growth creates. Policy must focus on maximising the benefits of the boom, which are much wider than just minerals exports. That requires adjustment to demand and supply side policies. The floating of the dollar in the 1980s forced supply side changes in product and labour markets that improved the way the economy operated. Current rapid mining growth is also forcing supply side changes and means more reforms are needed both to maximise the benefits of the boom and minimise the pain for other sectors. Such reforms would be easier to sell in a high growth economy.

“

We need to increase the flexibility with which resources move between sectors and make it easier to improve productivity within firms.

”
Investment boom follows price boom
SECTION 1

Investment boom follows price boom

Asia’s rapid development has transformed Australia’s economic outlook over the last decade.

Chart 1 shows Australia’s terms of trade to be at its highest sustained level in 140 years. The Reserve Bank’s non-rural commodity price index has risen 315% since 2003 in SDR terms, while the rural index has risen 65%. It is not only the size of the price rise that is unusual, but also that even given recent falls, prices seem likely to continue above historical norms for much longer than in previous booms. This price surge did not result immediately in sharply higher Australian mining output, which rose by 3% a year from 2000 to 2010, broadly in line with overall output growth, partly because of falling oil output.

![Chart 1: Terms of trade boom (2000/01 = 100)](chart1)

Source: EconData and Vamplew
Chart 2 shows the gain to Australia in this period was from higher export prices, rather than much higher mining output. This jump in export unit values was reflected in rapid growth in real net national disposable income, which takes account of changes in the terms of trade to measure the purchasing power of national output. Because our exports were earning more, we could buy more imports with the same export volumes.

![Chart 2: Mining prices jump, but output lags](chart2)

In the last five years, net national disposable income has risen 24%, much faster than the rise in output of 14%. The mining boom helped to cushion Australia from the global recession in 2008-09, with output and income in many other developed countries still at or below previous peaks. Australia has had a massive rise in its terms of trade as export prices rose not only relative to history, but also compared with other developed countries (including resource exporters) as shown in Chart 3.1
Mining investment has also boomed in recent years, rising from 1% of nominal output 10 years ago to 4% at the end of the last decade. Using current data on firms’ plans, mining investment will reach 6% of output this year and 7% over the next two years as shown in Chart 4. This represents a doubling in investment in two years.
Mining investment in 2011-12 is expected to be $95 billion. This excludes mining-related investment recorded in other sectors by the Australian Bureau of Statistics and thus excludes investment in rail, roads, pipes and ports infrastructure used to transport mining output, as well as mineral processing investment. According to Deloitte Access Economics, the stock of mining investment underway and in prospect totals $406 billion of which $189 billion is under construction or committed. This investment will be spread out over many years and does not include related infrastructure and processing.

This surge in mining investment is now resulting in rapid growth in mining output. The Bureau of Resources and Energy Economics expects the volume of mine production to grow 10.6% in 2011-12, partly reflecting the recovery in coal output after the floods in early 2011. The first phase of the boom therefore boosted Australian income, rather than mining output. The current phase is boosting both mining investment and output, so there will be ongoing benefits in terms of output, even if prices fall back somewhat.

Strong Asian growth seems likely to continue for many years and despite inevitable fluctuations, Australian export prices should remain relatively high. Between 2007 and 2012, China’s economy grew 60% and emerging Asia as a whole by 50%. The output of high income developed countries grew by only 3% and contracted in a number of developed economies. Australian output and income growth was between these extremes, as Australia benefited from exporting resources at higher prices to rapidly growing emerging Asia. This rapid Asian growth reflects income convergence, as Asia urbanises and catches up with technology already available in developed countries. While these emerging economies are generating the bulk of world growth, their income per head remains low in comparison with high income countries and they have much further to grow before they close the income gap.

While we are currently in the resource-intensive phase of Asian development, Asian consumption will grow as income per head rises. Treasury has argued that:

‘As incomes in Asia rise and as more people are brought into the global middle class, consumption patterns will continue to shift towards higher order goods and services. The rise in the Asian middle class will drive global consumer markets and lead to broader economic opportunities for Australia.’
Australian sectors apart from mining that could benefit as Asian incomes rise include agriculture, tourism, health and education.7

This mining boom has much wider implications for the future of the Australian economy and its structure than the previous temporary surges in commodity prices. This is because it is driven by the major ongoing changes occurring in our Asian trading partners. There is an opportunity for some non-mining sectors to benefit in the future as Asian incomes rise, if they can adjust what they produce to meet surging Asian demand.8 This would provide an additional growth stimulus to the Australian economy by drawing resources into new higher productivity uses.

Chart 5 shows that Australia’s known reserves of most major non-renewable minerals are large, with over 50 years of supply at current output levels, with the exception of oil and gold. Australia can continue to increase mining output for many years as long as demand is growing rapidly and production in Australia is competitive. Port Jackson Partners has projected that a large increase in Australian commodity investment and exports is possible in coming decades, given the expected growth in Asian demand and assuming Australia maintains its existing market share.9

![Chart 5: Australia’s known mineral reserves are large](chart5.png)

**Source:** Reserve Bank of Australia
Chart 6 shows the potential impact of the Asian boom on Australia as quantified by the International Monetary Fund using its global economy model. Over the next 10 years, Australian output could grow 20% faster than otherwise if Asian real output rises 50% more than the baseline, driven by Asia’s resource-intensive tradeables productivity growth. More balanced Asian growth halves our gain, but it remains substantial. This shows the size of the prize available if Australia can shift resources into exports to take advantage of booming Asian demand.

**Emerging Asia can boost Australia’s growth**

*Percent deviation from baseline*

- Emerging Asia
- Australia: Asian tradable sector driven growth
- Australia: Asian tradable and non-tradable sector driven growth

**Source:** International Monetary Fund
Mining and related sectors are bigger than you think
The Reserve Bank estimate is clearly too low, as it excludes mining output for the domestic market and mining service exports and investment. I have corrected the Reserve Bank estimates in Appendix 1 and they are then similar to the higher Treasury estimates.

As Chart 7 shows, Treasury estimates that the mining sector, including metals manufacturing, will account for 12.3% of total Australian real output in 2011-12 and is similar in size to the decade to 2002-03. While iron ore and coal output rose strongly in the last decade, oil output declined.

The strongest growth has been in mining-related production, which covers manufacturing, construction and service firms that contribute to mining output and investment. Referred to here as mining services, this sector has doubled from 4% of output in the decade to 2002-03 to an expected 8.4% in 2011-12. Mining services output is growing rapidly at 15 to 20% a year and Treasury estimates that on the back of the mining investment boom it will expand from 6.7% of the economy in 2010-11 to 9.4% in 2012-13. Yet some commentators continue to think of the mining sector as relatively small.
On Budget forecasts, Treasury concludes that over the three years to 2012-13 the mining sector will grow annually at 5% and mining-related sectors at over 20% on the back of the investment boom. By contrast, the non-mining sectors comprise 75% of the economy, but are growing annually at only 1%.

Mining companies demand high quality competitive inputs. This has created many leading edge mining service firms that invest in research and development, enabling them to export and compete offshore. The rapid growth in mining services reflects the surge in mining investment, increased contracting out to specialist providers by mining firms and the growth of sizeable Australian mining service firms that are diversifying internationally by both exporting and producing offshore. Mining service industry growth has been customer-driven and public policy has not played an important role. The success of mining services reflects the demand of mining itself for competitive inputs if it is to compete in world markets.

While the construction side of mining services will decline when mining investment peaks, mining output will rise and boost mining service firms involved in contract mining and maintenance. There are 122 firms listed on the Australian Securities Exchange (ASX) with substantial mining service revenue.

Chart 7  **Mining and mining services output growing rapidly**

[Chart showing percentage of GDP for mining and mining services over different decades]

Source: Treasury
of $86 billion in 2010-11 and with expected revenue growth of 17% in 2011-12 based on sharebroker forecasts (see Appendix 2). These firms are growing rapidly and 20 of the top 150 ASX firms by market capitalisation have substantial mining service revenue. On one estimate, they generate export revenue of around $9 billion.16

“Mining service industry growth has been customer-driven and public policy has not played an important role.”

Because these firms are not identified as a sector by the Australian Bureau of Statistics or the ASX, their importance and rapid growth is often overlooked. They represent a cluster of internationally competitive Australian firms in construction, engineering, drilling, manufacturing, logistics and services that produce often high technology products and high value added services.

As discussed in the next section, in conventional treatment the expanding mining sector is associated with a contraction in existing tradeable industries like manufacturing and agriculture, while the non-tradeable services sector also expands. Yet the rapid growth in mining services currently underway generates increased demand in several manufacturing sub-sectors. Explosives is recorded in chemicals; rail wagons in transport equipment; high technology mining equipment for drilling and excavation in machinery and equipment manufacturing; fabrication in metal manufacturing; and off-site homes in prefabricated building manufacturing. Just the listed firms in these industries have revenue of $15.5 billion (see Appendix 2), though not all is produced in Australia.

So some manufacturers benefit from the mining boom, even if others are squeezed by the higher Australian dollar. Substantial parts of construction, transport and power are also mining-related and some firms do better than the sector average by tapping into the mining boom. Irrespective of the ownership of mining companies, nearly two thirds of mining revenue is spent on labour, goods and service inputs, tax and royalties, while mining profits are being used at present to finance additional investment.17
The structural implications of a mining boom
The structural implications of a mining boom

Structural change is always occurring in a growing economy. Some sectors expand and others contract – at least in relative terms – as demand and supply conditions change.

Higher mining prices and output raise Australian real incomes and, to the extent that wages in other sectors rise, the least competitive existing tradeables firms are squeezed if they cannot adjust.

This is part of an ongoing process in all countries where rising real wages means that the structure of the tradeables sector changes from lower valued activities towards higher valued added activities. As real incomes rise in developing countries they move from producing goods using cheap labour like clothing, footwear and textiles, towards bulk consumer goods and then into more sophisticated investment goods and eventually, as economies mature, into value adding service industries. Which firms and sectors contract depends on their ability to adjust so they remain competitive despite paying higher real wages. Firms can remain competitive by investing in higher valued products, research and development, or marketing. To be competitive they need flexibility to adjust productivity, work practices and production to offset higher costs. Many new jobs are created every year in a dynamic economy as some firms contract while others grow.

A conventional model of adjustment to a mining boom in a fully employed economy suggests that expansion in mining means that other sectors must contract. On this view, the expansion of mining has similarities to the tariff cuts of earlier decades. Lower tariffs led to a contraction in lower productivity industries, in the expectation that resources would be redeployed into higher value uses that were not identified beforehand. The expansion in high productivity mining attracts resources from lower productivity uses, with market...
price signals determining which lower productivity sectors are most affected. The economy expands by the extent to which the same labour and capital inputs can produce more highly valued output.

This analysis ignores the ability of the economy in the short term to use unemployed and underemployed resources and to import additional labour and capital. For example, a large mining expansion, as occurred in Australia’s gold rush in the 19th century, raised factor prices and imported labour and capital led eventually to an expanded and more diversified economy.

Australia currently has considerable underutilisation of labour, which the Australian Bureau of Statistics estimated to be 12.6% at November 2011, made up of unemployment of 5.3% and underemployment of 7.5%. Australia can also import finance, capital goods and skilled labour. So rapid growth in the mining sector can lead to a larger economy overall with higher incomes, as well as structural changes that switch resources into higher productivity uses.

In analysing a mining boom, it is useful to think of the economy as three sectors:

- the rapidly expanding mining and mining-related sectors
- the existing non-mining tradeables sector consisting of parts of manufacturing, agriculture, tourism, education and other services that export or compete with imports
- the large non-traded sector, consisting mainly of services that neither export nor face import competition.

There is potentially a three-speed economy when mining booms, rather than a two-speed economy. As national income rises, new jobs are created in the non-traded sector, even though mining creates few direct jobs and the non-mining tradeables sector is squeezed.

Higher mining revenue stimulates national income and spending, while labour and capital are drawn from other sectors as mining output rises.

The first stage of this mining boom saw income rise from higher mineral prices, but mining output did not expand as a proportion of total output. The Australian dollar rose due to higher export income and capital inflows reduced the competitiveness of the existing export sector. The non-traded sector expanded as income was spent on services, drawing resources from the non-mining tradeables sector.

The current rise in mining investment and output draws additional resources from other sectors and if subsidies or regulation prevent resources moving into higher value uses then national income will be
lower. Structural change is therefore necessary to maximise the growth in Australian income.

Some worry about a ‘Dutch disease’ if higher export prices are temporary. They argue that when mineral prices decline again some of the non-mining tradeables firms may have been driven out of existence and may not be easily replaced, even if the exchange rate drops back.

However, Australia has had a sustained rise in mineral prices. Australia is therefore experiencing rapid growth in mining investment and output that draws resources from other sectors and overseas into higher value added uses. Even if mineral prices fall eventually, total output would be higher and the structure of the economy would have changed. The Australian dollar would also fall with mineral prices and in a flexible economy, this would stimulate resources to shift into new industries, as occurred in Holland when its gas output declined.

The industries that will be competitive in 10 years time will be different from those that were competitive 10 years ago. We should not try to preserve the past. Rather than try to preserve the existing economic structure before the mining boom, we are better off allowing market prices to stimulate output in whatever industries are competitive at the time.

At present, Australia benefits from both higher mineral prices and mining output. The non-traded sector expands as incomes rise. The non-mining tradeables sector is a smaller proportion of the larger economy, due both to the higher Australian dollar and the shift of resources into higher productivity uses.

Australia has a diversified economy with a large service sector. A wide range of resource commodities, including iron ore, coal and liquefied natural gas, are expanding output. Mining services output is also rising rapidly. Rising Asian incomes in future could stimulate Australian agriculture, tourism and education. This is not a narrowly-based boom limited to one mineral with limited reserves. While mineral prices will fluctuate, rising Asian demand is likely to continue for decades.

A diversified economy is one protection against the ‘Dutch disease’ and problems arising in the future from commodity price volatility. A flexible economy, efficient factor markets and a stable macroeconomic environment allow the economy to adjust in the event of adverse shocks.
We need to talk about growth
We need to talk about growth

Good policy should focus on maximising Australia’s total economic growth and overall living standards. Australia faces a choice of three policy options for dealing with a booming mining sector.

Option 1 – Avoiding harm
The government does not protect declining firms, but does nothing to accelerate the economy’s growth rate through active supply side measures to remove impediments or encourage resources to move into higher productivity uses.

Option 2 – Accelerating change
The government can increase the economy’s speed limit by encouraging the importation of factors of production, encouraging underemployed domestic resources into use and increasing the productivity with which existing factors of production are used. This means an even larger economy than in option 1 and less pressure on existing non-mining tradeables industries, though they may be a relatively smaller share of a larger economy. The government can also encourage resources to move to high productivity uses rather than subsidise declining firms.

Option 3 – Doing harm
The government can try to limit mining sector growth by raising taxes and slowing project approvals, or by protecting existing non-mining tradeables firms with subsidies. This will result in a smaller economy than in option 1 and a less efficient economy, particularly if protection is provided through the government arbitrarily choosing which firms to subsidise. Resources that could be better employed elsewhere will remain in lower value added uses. Real growth and income will be lower than in option 1.

The optimal strategy is option 2 and this paper focuses on the policies needed under option 2 to maximise Australian growth as a result of the mining boom. There are both short-term demand and medium-term supply side measures that can lift growth.
Above trend growth is possible without inflation rising

Australia’s trend rate of output growth has been 3.3% a year and is expected to decline in the medium term as a result of the ageing population. The Reserve Bank fears that output growth above trend reduces spare capacity and will eventually lead to higher inflation. With 20% of the economy that is mining or mining-related growing at 15% a year, this means that the non-mining sectors can hardly grow without pushing Australia’s growth above trend. However, to the extent growth is concentrated in the high productivity mining-related sectors, national productivity should improve from the recent disappointing performance.

Chart 8 suggests that the mining investment boom is lifting the growth rate of the business capital stock to 6% a year, even after allowing for high depreciation rates. This is similar to previous peaks in business capital stock growth. However, Australia may be able to sustain above trend output growth without creating inflation pressures, given the concentration of the capital stock and output growth in high productivity mining-related sectors. The extent of current spare capacity is uncertain. While unemployment is relatively low, underemployment remains high, with many people who work part-time wanting to work longer hours. The ability of the economy to grow rapidly can also be lifted by skilled migration and reforms that lift labour
mobility, labour market participation, training and productivity generally across all sectors.

The speed limit the economy can sustain is a key policy issue. If interest rates restrain output growth too much, then inflation will fall and unemployment will rise. There may be perverse political reactions that protect firms under pressure and reduce the ability to lift supply side capacity in the medium term. On the other hand, if output growth is so fast that there are wage and inflation pressures, interest rates need to rise to squeeze down on demand and the bulk of growth will occur in the expanding mining-related sectors with little employment growth.

Rapid growth in mining output can expand the total size of the economy in a number of ways:

• mining output growth draws resources into higher productivity uses so higher output can be produced using the same inputs
• resources that would otherwise have remained unemployed or underemployed can be used in the booming sector
• given the high returns available in mining, factors of production can be attracted from overseas that would otherwise not come to Australia, including capital and skilled labour
• the revenue generated by the expanding mining sector at current tax rates can be used to expand the supply potential of the economy by improving infrastructure and training, or financing welfare and tax reforms that encourage participation
• the size of this mining boom means Australia is developing a network of infrastructure (for example, gas pipelines and liquefied natural gas plant) that makes it cheaper to develop new discoveries by linking them with existing projects. This allows development of smaller or lower grade reserves
• mining investment will remain high for an extended period and the size of the mining sector means there will be ongoing maintenance spending. This encourages the growth of mining service firms to meet ongoing demand, with specialist firms emerging and expanding offshore. This would not occur with a single mine development in Australia, but depends on a cluster of mining service firms being stimulated by ongoing mining sector demand, which in turn encourages mining firms to outsource more to specialist local suppliers. The result is the development of high productivity, dynamic, internationally competitive new mining service firms, attracting resources away from lower productivity uses

WE NEED TO TALK ABOUT GROWTH
• the cause of the sustained rise in mineral prices is rapid growth in Asia that is boosting resource-intensive output. As Asian incomes rise, this will boost Asian consumption and increase demand for Australian rural output, tourism, education and services more generally (for example, medical tourism). The transformation of Asia therefore will provide a demand boost not only to mining, but also to other sectors if they are flexible enough to take advantage of emerging opportunities. Resources can again shift into higher value added uses, boosting potential output growth.

The challenge is to maximise the growth of Australia’s income and wealth by embracing the structural changes needed to move resources into higher value added activities. The structural tensions created can be eased by policies designed to lift Australia’s overall growth rate while maintaining low inflation. In the short term, demand policies can help and in the longer term supply side policies are vital.
Demand side policies to boost growth
Demand side policies to boost growth

Treasury has estimated that the large increase in Australian mining investment could see total output rise by around 3% a year, or near trend, for several years just as a result of higher mining and related sector output.\textsuperscript{27}

These sectors make up over 20% of the economy and have higher than average productivity as shown in Chart 9.

\textit{Chart 9  Mining sector has high productivity}

Source: Deloitte Access Economics
The near 80% of the economy in non-mining-related sectors is being restrained by high interest rates and is currently growing at 1% a year at best. The result is little growth in total employment and near trend total output growth. National productivity growth is therefore likely to improve due to sectoral shifts as the high productivity mining sector expands as a proportion of total output.

“The Reserve Bank believes that the economy cannot sustain above trend annual output growth beyond 3 to 3.5% without inflation pressures rising. This is far too pessimistic.”

Monetary policy

The Reserve Bank believes that the economy cannot sustain above trend annual output growth beyond 3 to 3.5% without inflation pressures rising. This is far too pessimistic. Reserve Bank Governor Glenn Stevens argued in June 2011 that:

the degree of slack in the economy overall does not seem large in comparison with the apparent size of the expansion in resources sector income and investment now under way. With that general outlook, it follows that macroeconomic policies must be configured in the expectation that there will need to be some degree of restraint. Monetary policy has already been exerting some restraint for a while.... And further tightening of monetary policy is likely to be required at some point for inflation to remain consistent with the 2-3 per cent medium-term target.\textsuperscript{28}

The Reserve Bank now suggests that output growth will remain around trend at 3 to 3.5% a year, with inflation around the mid-point of the target band.\textsuperscript{29} It believes that interest rates are appropriate after two cuts reduced rates to around neutral (or near their long run average).
Yet over the last year underlying inflation has fallen and employment stagnated, as the jobs created in the mining and related sectors have not been sufficient to absorb new entrants to the workforce and job shedding in some non-mining sectors. In the year to January 2012 there was little creation of jobs or hours worked nationally. Employment rose in Western Australia and Queensland, but fell in New South Wales and Victoria. Unemployment has not risen by more, because the participation rate fell.

Despite the economy growing at near trend, there is increasing spare capacity in the labour market, as well as a rapid rise in the capital stock due to the mining investment boom. There is rising spare capacity in the economy given employment is flat, population is rising over 1% a year and wage pressures remain subdued. This is consistent with a view that interest rates can be lower to allow above trend output growth without inflation rising.

The sectoral shift occurring into the high productivity mining sector means that labour productivity growth is starting to rise faster than previously. Output is rising around trend, but employment and hours worked have hardly risen over the last year. The concentration of output growth in mining means that the economy should be able to sustain faster than trend growth for a period, without rising inflation pressures, as it will take longer to reach full capacity utilisation of labour.

The Reserve Bank has underestimated the size of the mining and related sectors at only 15% of the economy and therefore their contribution to growth and productivity. Treasury estimates and corrected Reserve Bank estimates suggest mining and related sectors are over 20% of the economy (see Appendix 1). Treasury estimate that the 75 to 80% of the economy in non-mining-related sectors may be growing at only 1%. That is not fast enough to generate sufficient employment growth, given the high productivity of the rapidly growing mining-related sectors.

The major source of new jobs in a mining boom should be in the non-traded service sector and high interest rates have meant demand in this sector has not been growing rapidly enough to generate employment growth. This underlines the dangers of restraining demand excessively during a mining boom so that the economy fails to create enough jobs to prevent unemployment from rising. A number of these sectors are particularly sensitive to interest rates. Australian interest rates are not high in historical terms, but are high relative to developed countries overseas that have very low rates.
as they struggle to emerge from recession. This interest rate gap has added to the upward pressure on the exchange rate and the squeeze on the non-mining tradeables sector. If interest rates remain too high, unemployment will rise and political pressures could lead to subsidies to uncompetitive industries that reduce the supply side changes that boost productivity and our long run sustainable growth rate. Whether the Reserve Bank is correct that output cannot grow faster than trend without inflation rising will be determined by how the economy performs. Continued trend output growth, little employment growth and subdued underlying inflation would confirm that there is room to cut rates further.

Budgetary policy
The higher terms of trade did not generate an immediate rise in mining investment and output. There was a surge in mining profits and tax payments at current tax rates that boosted government tax revenue and financed income tax cuts that spread the benefits of the boom more widely.\textsuperscript{31} At present, the Australian Government is using higher revenue to reduce its budget deficit rather than to cut taxes. Tax revenue growth is also more subdued as high mining investment generates high initial depreciation deductions that reduce company tax collections in the short run. Consumers still benefit from the mining boom through a stronger Australian dollar reducing import prices and the lower budget deficit reducing pressure on interest rates. However, with a contractionary budget, interest rates need to be low enough to stimulate adequate demand growth in the private sector to generate employment growth outside the resource-rich states.

The Australian Government has been reducing its budget deficit, which is predicted to fall by around 2% of output this year and next year. The 2011-12 Budget Papers observed that:

‘Critically, the Government’s strict fiscal strategy built on a return to budget surplus in 2012-13 will ensure that it does not compound price pressures that are likely to re-emerge as the investment boom gathers pace. The Government’s fiscal strategy will also support the strengthening of the Government’s finances over time. A strong government balance sheet affords the necessary ongoing flexibility for the budget position to vary in line with economic conditions and to respond to unforeseen events – promoting macroeconomic stability.’\textsuperscript{32}

Max Corden, Ken Henry, Glenn Stevens and the International Monetary Fund have all canvassed the need for increased saving given the mining boom and volatile mineral
prices. There is less agreement on how this should be achieved. The Government does not plan to move into substantial surplus rapidly after 2012-13, as is necessary to achieve a structural budget balance near the top of the economic cycle. The Government has also locked in spending from the volatile proceeds of the new mining tax. As Deloitte Access Economics points out, this runs the risk that if the terms of trade fall sharply the budget will automatically swing rapidly into large deficit again, just when the government may want to boost spending by discretionary decisions.

Sovereign wealth fund

One popular suggestion is that rather than simply build up budget surpluses, Australia should have a sovereign wealth fund invested wholly abroad. Supporters of such a fund include former Reserve Bank Deputy Governor Stephen Grenville, Professor Warwick McKibbin and the Federal Opposition’s Malcolm Turnbull. Such a fund, it is suggested, could collect mining tax revenue or invest budget surpluses however generated.

Max Corden argues that exporting capital would partly offset the rising exchange rate caused by a mining boom and reduce the squeeze on the non-mining tradeable sector. He argues it would also provide an internationally diversified investment portfolio that could be used if mining turned down. While Corden sees this as preferable to ‘piecemeal protectionism’, it is hardly optimal. It has been claimed a sovereign wealth fund could:

• limit exchange rate appreciation
• provide a source of saving to smooth consumption
• reduce tax revenue volatility
• discipline government spending.

“Australia’s problem is not that mining output is short lived, but that mineral prices are volatile.”

In Norway, which has a very large oil and gas sector with limited reserves, the aim of the sovereign wealth fund is to provide income for when mining output declines and to help to preserve existing industries. Australia’s position, however, is quite different. In contrast, Australia has extensive known mineral reserves and will be able to produce minerals for many decades. Australia’s problem is not that mining output is likely to be short lived, but that mineral prices are volatile. Australia is therefore more concerned with cyclical volatility.
of mineral prices and revenue. This is similar to Chile, which has a legislative requirement to keep the budget in structural balance. All cyclical budget surpluses are invested in a pension reserve and stabilisation fund. This means public saving moves counter-cyclically to smooth out the volatile income swings created by Chile’s dependence on copper.

There is a case for Australia achieving a structural budget balance while commodity prices are high and building up cyclical budget surpluses in the good times, that can be run down when needed. As Glenn Stevens suggests, high exposure to emerging Asian economies may lead to faster, but more volatile, Australian output growth. Some increase in precautionary saving should occur through public finances, rather than relying on private saving.

However, doing so through a sovereign wealth fund raises governance issues and administrative costs. Normal budget policy can use surpluses to retire debt or purchase domestic assets to reduce demand for offshore capital and has much the same effect on the exchange rate as investing abroad. Australia is an attractive destination for funds at present because returns here are high. A higher budget surplus would allow lower interest rates and faster private sector growth in Australia. Ultimately, it is preferable to invest funds where returns are highest. It seems unlikely that a government-run fund investing wholly offshore will generate higher returns than investing in the Australian economy at present.

Nor is it clear that a sovereign wealth fund makes it easier politically to run budget surpluses compared with simply building up normal budget surpluses. In either case, governments can decide for political reasons to spend cyclical revenue in preference to building up surpluses. The priorities should be to return the budget to headline surplus, then to achieve a balanced structural budget and finally to pay off outstanding debt.
Supply side policies to boost growth
Supply side policies to boost growth

Supply side reforms that raise productivity boost the speed limit of the Australian economy and reduce pressure on the non-mining sectors.

The Australian Government can boost national productivity by supply side reforms that stimulate private sector productivity and participation, by providing better infrastructure and by ensuring its own spending is efficient. More use should be made of the Productivity Commission to provide public and independent advice on policy options to help win public acceptance of supply side reforms.

Productivity can be improved by making it easier for resources to switch into higher value added uses, or by making it easier to improve productivity within firms. The easier it is for resources to switch into new expanding sectors, the less prices need to change. It is therefore important to encourage flexibility in the labour market in terms of skills deployment, as well as sector and regional mobility. This both maximises growth in higher productivity sectors and reduces the cost pressures on existing sectors. Existing industries can respond more easily to competitive pressures if they have flexibility to lift productivity within the firm.

Attempts to subsidise existing firms slow the expansion of higher productivity industries, force more change onto sectors that miss out on subsidies, and create an unhealthy lobbying mentality in industry. This applies to both hand-outs to non-mining sectors and to forcing mining under Australian content policies to source supplies from higher cost domestic rather than imported sources. The latter policy raises mining costs, pushes the exchange rate higher and benefits some firms and workers at the expense of others.37 The best policy approach is to facilitate the movement of resources into higher productivity industries while providing assistance to workers to move, rather than trying to preserve
jobs in less competitive firms that require ongoing subsidies. Research and development is also important as firms will need to move up the value added chain to survive.

“Sensible supply side policies are similar with or without a mining boom.”

Sensible supply side policies are similar with or without a mining boom. However, a mining boom underlines the importance of flexibility so that labour and capital can be reallocated to the firms where they are most efficiently used. It is also desirable to reduce impediments to adjustment in industries and firms that are most under pressure. A high priority needs to be given to measures that accelerate growth. The list of supply side reforms outlined in this section is not exhaustive. Rather it is designed to illustrate the wide range of measures that have been canvassed in more detail elsewhere to improve flexibility and productivity.

These reforms are easier to implement in a strong economy than in a weak one. The mining boom provides an opportunity to adopt growth-enhancing supply side reforms that would be politically difficult in a contracting economy. A flexible economy will also be better positioned to move resources into other sectors that benefit from rising Asian incomes such as tourism, education and agriculture.

Industry policy
We should avoid policies that prevent uncompetitive industries and firms adjusting, but instead help individuals to retrain and move to new employment in expanding industries and regions. Helping uncompetitive firms lowers living standards and forces more adjustment onto non-subsidised industries. All firms benefit from increasing economic flexibility, as declining firms also benefit from flexible work practices and lower costs.

The rapid growth of mining services shows there are many competitive firms that can grow rapidly, without mandating Australian content and raising mining costs. Mining expansion may be constrained in coming years by rising construction and operation costs. Many firms in engineering consulting, construction and contracting are struggling to find appropriate skilled labour and managers. If Australia restricts mining growth then competitors overseas are likely to expand...
capacity instead. Australia has an incentive to expand capacity as fast and as cheaply as possible while demand is growing and before competitors can do so.

Rapid growth in mining services and its expansion offshore is being stimulated by demand and the dynamics of a cluster of internationally competitive firms that feed off mining. These firms will establish production facilities where they are competitive and the benefit to Australia is the development of larger Australian mining service firms that are internationally competitive (see Appendix 2). The creation of larger Australian multinational mining service companies with substantial offshore operations reduces risk and develops markets, but may raise tax and migration policy issues.

**Infrastructure and investment policies**

A high priority should be given to economic infrastructure that meets strict independent cost benefit analysis and also to social infrastructure in expanding regions. Other industries are not starved of funds because capital is flowing into resources. Given open capital markets, other industries that are competitive should be able to raise funds domestically or internationally, either directly or via Australian banks.

**Regional policy**

Both Treasury and the Reserve Bank have argued that domestic regional disparities in growth have declined since the mining boom got underway. However, we are seeing employment rising in the resource-rich states and declining in New South Wales and Victoria. The role of regional policy is therefore very important in facilitating the necessary sectoral shifts. Policy should focus on improving labour mobility as this increases the economy’s speed limit by allowing resources to move more easily into higher productivity uses. It also reduces the price changes needed to encourage resources to move and therefore makes adjustment less costly. Labour mobility can be improved by investing in social infrastructure in expanding regions, providing relocation assistance to help labour move from declining to expanding regions, encouraging skilled migration to fill labour shortages in remote regions, and reforming conveyancing stamp duties to lower domestic moving costs.

The location of many mineral projects in remote areas creates opportunities for local Indigenous employment. The mining boom could be a powerful force in improving the welfare of Indigenous Australians and underlines the importance of improving both...
Indigenous training and education so as many new people can enter the workforce as possible. The use of fly-in fly-out workforces has been controversial, but has an important role to play given temporary workforce surges in the construction phase of the boom and the need to provide a rapid build-up in workforces in remote areas where families find it unattractive to live. Providing suitable infrastructure and land use policies in regional centres is still vital and will be particularly important in existing towns like Gladstone and Darwin.

**Labour market policies**

Increasing labour market flexibility, and allowing expanding firms to attract staff, boosts the economy’s speed limit. Pressure on other industries’ costs and inflation is reduced if across-the-board wage rises can be limited. It is important to ensure expanding industries like mining have flexibility in remuneration arrangements to attract new workers, but it is also important for firms under pressure to have flexible work practices so they can respond more easily to competitive pressures. It is possible that the Australian dollar will remain high for an extended period and the reality is that firms under pressure need to be able to adjust costs to survive. Increased workforce participation could also be encouraged by tax and welfare reforms.

**Education, training policy and migration policies**

While general immigration may add as much to demand as to supply, an emphasis on skilled immigration can boost net labour supply and increase the economy’s speed limit and the ability to shift labour quickly into needed regions and jobs. Faster skills development and increased workforce participation is also needed and will be helped by more intensive training courses and national recognition of qualifications. In the longer run, taking advantage of rapid growth in Asia suggests Australia should increase numbers learning Asian languages and encourage appropriate immigration so there is ready access to language skills for businesses selling to Asia, such as mining and tourism.

**Competition and regulation policy**

Opening up more sectors to competition can help improve efficiency and lower price pressures, and so boost the economy’s speed limit. Reducing government regulation can reduce costs and improve the ability of the economy to create new firms and jobs.
Public sector efficiency

Improved public sector efficiency helps improve the budget bottom line and productivity. Both federal and state capital spending must be subject to independent cost benefit analysis.

Environmental policies

Climate change policies would be better taxing consumption of carbon as this avoids the competitive disadvantages of proposed policies that tax production. Removal of subsidies to renewables would reduce the cost of achieving targeted carbon savings and free up resources for higher productivity uses.
Conclusion
Conclusion

Australia has the opportunity to expand mining supply capacity rapidly to meet booming Asian demand. If we do not do so others will.

Many sectors can benefit from rapid Asian income growth in a flexible economy if firms are innovative enough to take advantage of the opportunities on offer.

In the short term, Australia can grow faster by cutting interest rates to expand demand and by using existing spare capacity. Given employment has been flat and inflation declining, this is consistent with the current inflation target. There is still underemployment and the participation rate is likely to rise if employment growth resumes. Additional employment growth from faster demand growth is likely to be concentrated in the non-tradeables sectors in the non-resource states, as these tend to be more interest rate sensitive.

Some supply side measures can also have quick impacts in boosting the ability of the economy to grow faster, including higher skilled migration, reforms to improve labour market flexibility and labour mobility and tax/welfare changes to boost labour market participation. Governments should avoid supporting declining firms, as this ties up resources in lower productivity uses that are better deployed elsewhere and encourages industry lobbying. Assistance should be provided to individuals to encourage retraining and mobility, rather than to subsidise jobs that are not competitive in the long run. Treasury, the Reserve Bank and the Productivity Commission have all pointed out that there is a long run decline in manufacturing employment, which is unrelated to mining, with employment growth concentrated in services.49

Governments can also implement supply side measures that will take longer to generate benefits, such as reform to training, education, regulation and competition policies. Measures that boost productivity...
growth and increase flexibility make it easier for firms under pressure to remain competitive and they also lift the speed limit the economy can sustain without inflationary pressures. Australia needs to focus on ways to lift the economy’s speed limit by boosting productivity generally and improving flexibility, so that resources can move easily into the highest productivity uses.

Rapid Asian growth is providing Australia with a rare opportunity to boost our incomes. It is up to us to make sure we take full advantage by encouraging resources to move into the sectors that will benefit the most.

Australian debate has tended to focus on the sector winners and losers. This is not a zero sum game.

The mining boom raises national income and wealth. Concentrating on protecting losers reduces the potential gains, as resources do not move into their most productive uses. Australia risks missing out on the benefits a more flexible economy would provide. Just as floating the dollar in the 1980s required reforms to the labour market, competition policy and public enterprises, rapid growth in mining requires policy reforms to maximise the benefits and make it easier for existing sectors to adjust by raising productivity.

“The mining boom is providing Australia with a rare opportunity to boost our incomes. It is up to us to make sure we take full advantage by encouraging resources to move into the sectors that will benefit the most.”
How big are the mining and related sectors?
Various methods can be used to estimate the size of the mining and mining-related sectors.

Treasury uses relationships from the latest available input-output tables for 2007-08.\(^50\) Mining includes metals manufacturing, while mining-related sectors cover those parts of domestic manufacturing, construction and services that directly contribute to mining output and investment.

The mining and related sectors on this basis rise from 18.3% of gross domestic product (GDP) in 2010-11 to 20.3% in 2011-12. This calculation appears to ignore mining service exports and mining service investment as these are not inputs into mining. They could add another 1 to 2% of GDP to the share of the mining and mining-related sectors.

The Reserve Bank of Australia estimates the mining and mining-related sectors by adding resource exports, plus mining investment, less an estimate of related imports.\(^51\) This suggests the sector was only 14.75% of GDP in 2010-11 – made up of mining exports of 12.5% of GDP (effectively incorporating mining services in the price of mining exports) and net mining investment of 2.25% of GDP, after deducting an estimate of imports.

This methodology underestimates the size of the mining and mining-related sectors as it ignores domestic consumption of mining output (for example, oil, gas and coal) and related mining services, mining service exports and mining service investment. Mining exports were 80% of mining production in 2006-07 and exports and domestic output have grown broadly in line until recently. Assuming mining services add as much to the domestic value of mining output as they do to exports, the value of total mining output (for export and domestic use) rises to 15.6% of GDP.\(^52\)
To this we need to add mining service exports of $9 billion (0.6% of GDP) and mining service investment less imports, which can be assume arbitrarily to be 1% of GDP. Given the rapid growth in mining services (including capital intensive transport, ports and power) this could be an underestimate of mining service investment.\textsuperscript{53} This gives a total share of 19.5% of GDP in 2010-11 for the mining and mining-related sectors. With mining output rising 10.6% in 2011-12, mining investment rising to about 6% of GDP and assuming half is imported, the adjusted Reserve Bank methodology suggests mining and mining-related output in 2011-12 will be near 22% of GDP.\textsuperscript{54}

In broad terms, both methodologies when corrected suggest mining and related sectors are around 20% of GDP in 2010-11 and could be around 22% of GDP in 2011-12. However, it would be useful for the Australian Statistician to undertake further work to get a better handle on the size of these sectors. ■
Listed mining service company revenue
Listed mining service company revenue

This Appendix lists the most recently available annual Australian dollar revenue for 122 listed companies with substantial mining service revenue.

Revenue of these firms was $86 billion in 2010-11, including both Australian and offshore revenue. On broker forecasts, where available, mining service firm revenue in the current year will grow 17%.

Sectors are listed in order by revenue. Within sectors, firms are listed by the size of their mining service revenue. Where readily available, non-mining service revenue is deducted, but revenue shown still includes substantial non-mining service revenue for many firms as a breakup is not always available. Revenue earned offshore and from exports is included. Where possible, revenue is allocated to a particular activity and some firms appear twice, with revenue split between their different activities.

The list does not include firms whose mining service revenue is a minor part of their revenue and cannot be separately identified. For example, the major banks earn substantial revenue from mining, as does Qantas on its fly-in fly-out operations, but this is not easily identified. The list does not include major participants in mining services such as unlisted private companies and overseas-listed companies.

Diversifying into mining services

Firms in many sectors can diversify into servicing the booming mining sector. Engineering and construction firms can switch from non-residential commercial work into mining-related work. For example, Hella Australia, a lighting company specialising in supplying the automobile industry, is diversifying into mining lighting. Firms providing accommodation can specialise in remote area...
housing for mining projects, or even build apartments in mining towns as Finbar Group has done in the Pilbara. Legal, accounting and financial firms can move resources into servicing the rapidly growing mining sector. Airlines move equipment into fly-in fly-out operations. OneSteel has taken advantage of rapid mining growth to diversify out of steel production into producing iron ore and taken over a large international grinding media mining service company.

It is possible therefore for a wide variety of firms to tap into rapid mining sector growth even though this may only be a small (rapidly growing) part of much larger businesses. This provides flexibility for firms to react to mining industry cycles by switching between activities when mining slows.

**Mining service firms going national and international**

Mining service firms are becoming national as Perth-based firms diversify to the east coast in search of markets and to reduce costs, and east coast firms establish Perth offices to tap into the mining boom in Western Australia. This often involves diversifying commodities, as east coast firms often started servicing coal focused firms and Perth firms servicing metal mining.

Many mining service firms have followed Australian mining companies into Africa and Latin America seeking markets and others have opened offices offshore to reduce costs and diversify market risk. Some are diversifying out of mining services to spread risk such as Campbell Brothers into food testing and UGL into property management. Several listed ASX firms operate mainly offshore, including Incitec Pivot, Boart Longyear and Zicom. Many smaller mining service firms earn 50% of revenue through exports or offshore offices, as they need overseas sales to reach a viable size in specialist areas.\(^5\)

Some of the revenue included is produced offshore or involves imports. For example, UGL and Bradken have opened rail wagon facilities offshore to lower costs, but still have manufacturing facilities in Australia. This allows firms to be competitive in supplying rolling stock and local maintenance facilities. The freight operations are part of larger operations that supply passenger rail equipment in the case of UGL and Downer.

Firms like Orica, Incitec Pivot, Worley Parsons, Boart Longyear, Bradken and Campbell Brothers are major players internationally in their areas of specialisation.

**High technology mining services and manufacturing**

There are many high technology
manufacturing mining service firms. The underlying forces driving the need for high technology in mining include the need to stay competitive in a high wage paying country, more difficult deposits, shortages of skilled workers and environmental and health regulation. For example, Imdex provides drilling mud, but has expanded into remote directional drilling equipment manufactured in Australia. This was achieved by taking over offshore operators with intellectual capital. Imdex is now an international operator with revenue well over $200 million. It is diversifying from mining into oil and gas and has high research and development expenditure.

Mining service high technology firms have developed through close links to customers and an entrepreneurial culture that owes little to public policy, with many entrepreneurs coming out of the mining sector itself. Developing better research links could help develop a competitive edge for small mining service firms, which have high research and development spending, a focus on IT and are clustered in Western Australia, Queensland and New South Wales.

Construction: $21,543 million
Leighton (part), Lend Lease (part), Downer (part), UGL (part)
Monadelphous, Watpac, Clough, Forge, VDM Group, Seymour Whyte, Briety, Structural Systems, Saunders.

Mining contractors: $15,115 million
Leighton (part), Transfield Services, Downer (part), Macmahon, NRW, Mineral Resources, Sedgman, WDS, Thomas and Coffey, Maca, Industrea (part), Spotless (part), Mastermyne, Delta SBD.

Explosives: $9,505 million
Orica, Incitec Pivot (part), Wesfarmers (part).

Consulting and process engineering: $8,270 million
Worley Parsons, Cardno (part), Coffey (part), Ausenco, Sedgman, Lycopodium, GR Engineering, Logicamms, Emerson Stewart, Allmine, Resource Development.

Logistic suppliers: $5,450 million
QR National (part), Toll Holdings (part), Asciano (part), K and S, Mermaid Marine, Qube Logistics Regional Express, Skywest, Miclyn Express Offshore, Scott Corp, Aviation Services, Neptune Marine.

Consumables: $4,032 million
Westrac (Seven Group), Bradken (part), Transpacific Industries (commercial vehicles), Coventry (part), Alesco (part), Imdex (part), ADG Global Supply.
Labour hire/training: $3,489 million
Skilled Group, Chandler Macleod, Humanis, Programmed Group (part), Site Group.

Utilities: $3,318 million

Fabricators and manufacturers: $2,877 million
OneSteel (part), RCR, AusGroup (SGX listed), Austin Engineering, E and A, EVZ, Bisalloy, Korvest, Laserbond.

Electrical contractors: $2,866 million
Hastie Group, Norfolk, Southern Cross Electrical.

Drillers: $2,517 million
Boart Longyear (part), Ausdrill, AJ Lucas, Swick, Every Day Mining Services, Drill Torque, Cougar Metals.

Specialist mining, drilling, scientific and testing equipment: $1,333 million

Testing services: $1,114 million
Campbell Brothers.

Equipment hire: $996 million
Emeco, Boom Logistics, Global Construction Services.

Freight rail equipment and infrastructure: $959 million
UGL (part), Bradken (part), Downer (part), Engencor.

Remote housing: $884 million
Decmil, Fleetwood (part), Nomad, Titan Energy Services.

Mining software: $810 million
Data 3, Runge, ISS Group.

Recycling/waste management: $481 million
CMA Corp, Tox Free, Electrometals Technology.

Financial services: $264 million
Wilson HTM Financial Group, Bell Financial Group, Euroz, Austock Group (part), Investorfirst.

Other mining services: $148 million
Greencap (risk management), NewSat (satellite communications), Aspermont (publisher), Environmental Group (air and water quality), Clean TeQ (resource recovery), Site Group (training).

Sources: Company annual reports and sharebroker reports from Argonaut, Bell Potter, Patersons, RBS Morgans and Wilson HTM Group.
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See Connolly and Orsmond, Dec 2011, p. 31. In contrast, Gregory, Dec 2011 and Richardson and Denniss, Sept 2011, focus on foreign ownership of the mining sector and downplay the linkages to other sectors.

See, for example, Porter (p. 17) in Cook and Porter, 1984, which says if “all factors are assumed to be in fixed supply ... if one sector expands another must contract.”

Ergas, 2012, makes a similar point.

21 Australian Bureau of Statistics, Cat. No. 6202.0. Underemployment includes those working who want to work longer hours. It does not cover people who have dropped out of the labour market and are not looking for work, but might do so.

22 See Cook and Sieper in Cook and Porter, 1984, for a detailed discussion under various assumptions.


24 See Parkinson, Sept 2011, p. 17.

25 Bhattacharyya and Williamson, 2009, stress diversity as the key factor in Australia avoiding commodity price volatility causing volatility in output, unemployment, sector or regional performance.

26 Australian Government, Mid-year economic and fiscal outlook 2011-12, Table 1.2 assumes output growth of 3.25% this year and next and then 3% per year. This is described as around Australia’s trend growth rate.


28 Stevens, Reserve Bank of Australia Bulletin, Sept Quarter 2011, p. 84.

29 The Reserve Bank of Australia Statement on Monetary Policy of May 2011 had GDP growth of around 3.5% over the forecast period and underlying inflation running at 3%, but moving above the target band by December 2013. The February 2012 statement had annual GDP growth to June 2013 at 3% to 3.5%, with underlying inflation around the mid-point of the target band.

30 Gruen, Australian Treasury, Nov 2011, p. 16.

31 The appropriate taxation of mining is a large subject that has not been addressed here. Even if mining tax rates were not changed, mining booms generate more tax revenue over time through company tax and a larger economy.

32 Australian Government, Budget Paper No. 1 Statement No. 4, 2011-12, p. 4-29.


34 Business Council of Australia, Appendix 1, Feb 2011.


36 Banks, June 2011, Parkinson, Nov 2011 and Carling and Kirchner 2012 present some of the arguments against a sovereign wealth fund.


38 As argued by Banks, Productivity Commission, June 2011.

39 See Thompson, Murray and Jomani, Nov 2011, for estimates of the output
benefits of increased flexibility of migration, internal labour flows and capital to terms of trade shocks.

40 See Australian Government Budget Paper No. 1 Statement No. 4, 2011-12, pp. 4-32 to 4-36, Banks, Productivity Commission, June 2011.

41 See Scott-Kemmis, Nov 2011 and Jan 2012 for a detailed Australian analysis. Lederman and Maloney analyse the international literature and point to the importance of technology in resource development and the development of industry clusters.


46 Australian Education Foundation, Education Services Australia, 2010. James Packer, The Australian, 18-19 Feb 2012, suggests tourism needs more direct flights to Asia, faster visa processing, more Mandarin language teaching and investment in tourist attractions to exploit the “massive opportunity” offered by the rise of the Chinese middle class.

47 Productivity Commission, Dec 2011.

48 Carmody, 2009.


51 Reserve Bank of Australia, Statement on Monetary Policy, Aug 2011, Box B.

52 Department of Foreign Affairs and Trade Resources fact sheet, May 2008. Productivity Commission, 2008 Table 2.2 and p. 8 suggests only half mining output is exported.

53 See Carr and Ferguson, Aug 2011.


55 Scott-Kemmis, Nov 2011, p. 59 says 21 Australian mining technology service firms surveyed had 47% of turnover from exports or offshore operations.


57 See Scott-Kemmis, Nov 2011, Section 4 for a discussion.
Australia has a once in a generation opportunity to lift its wealth. Yet rather than focus on how to maximise the benefits of the mining boom, debate has been mainly about sectoral conflicts. Respected economist Ed Shann identifies the real challenge which is to lift the speed at which our economy can grow. From a perspective steeped in Australia’s ‘reform era’, he outlines the demand and supply side policies needed to maximise growth in a mining boom.

Maximising growth in a mining boom

DR ED SHANN