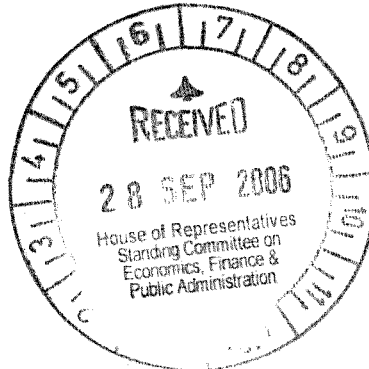




Premier of Victoria

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D06/2609

**Committee Secretary
Standing Committee on Economics, Finance and Public Administration
House of Representatives
PO Box 6021
Parliament House
CANBERRA ACT 2600**

Dear Sir/Madam

VICTORIAN GOVERNMENT SUBMISSION TO THE HOUSE OF REPRESENTATIVES INQUIRY INTO THE FUTURE OF MANUFACTURING

Thank you for inviting the Victorian Government to contribute to the House of Representatives Standing Committee on Economics, Finance and Public Administration inquiry into the state and future directions of Australia's manufactured export and import competing base. Please find enclosed the Victorian Government submission to the inquiry.

Should you have any questions about the Victorian Government submission, please do not hesitate to contact Mr John Dalton, Director, Industry & Trade Policy, at the Department of Innovation, Industry and Regional Development. Mr Dalton can be contacted on 03 9651 9135, or by e-mail at john.dalton@iird.vic.gov.au

Yours sincerely



**HON STEVE BRACKS MP
Premier of Victoria**

House of Representatives Standing Committee on Economics, Finance and Public Administration Inquiry into the current and future directions of Australia's manufacturing industry

Victorian Government Submission, July 2006

1. Introduction

The House of Representatives Standing Committee on Economics, Finance and Public Administration is inquiring into the state and future directions of Australia's manufactured export and import competing base, focusing on, but not limited to:

- Australia's dominance in commodities exports and the impacts of this on the economy following the resources boom;
- the state of the country's manufacturing sector (and the goods and associated services) including opportunities and challenges from the expansion in global trade (in particular by China); and
- policies for realising these opportunities.

The Victorian Government welcomes the opportunity to contribute to this important Inquiry, in view of the prominence of manufacturing within the State's economy and this Government's strong focus on the development of manufacturing. The Inquiry and the more recent announcement by the Minister for Industry, Tourism and Resources of the Federal Government's intention to develop an Industry Statement in early 2007, signal a welcome recognition on the part of the Commonwealth of the need for urgent attention to issues of industry policy. It is hoped that these actions will result in the development of appropriate policy responses to the substantial challenges confronting Australia's manufacturing industry.

The submission addresses the key issues covered by the Inquiry – the impacts of the resources boom and the global factors influencing Australia's manufacturing performance. It also highlights the extensive work currently being undertaken by the Victorian Government, both at a state and national level, to support the future development of the manufacturing sector.

2. The impact of the resources boom

The Victorian Department of Treasury and Finance has modelled the regional impacts of the resources boom.¹ It found that rising commodity prices have already generated a substantial increase in Australia's terms of trade. While prices of rural (agricultural) commodities are currently lower than at the end of 2002, the Australian dollar price of base metals has doubled over the same period. The net result is that the terms of trade has increased by about 30% over the past three years, boosting national income by about 5.5%.

¹ *A tale of two economies: the regional impact of Australia's resources boom*, Department of Treasury and Finance Discussion Paper, May 2006. (Copy attached to this submission)

Although the income gains from the higher terms of trade accrue nationally, different resource endowments across the States imply that there are also region-specific effects on economic activity. Stronger world demand for Australian mining exports has put upward pressure on the exchange rate, making imports relatively cheaper and Australian non-mining exports less competitive. Therefore, the States with a larger share of agricultural, manufacturing and tourism exports are likely to be adversely affected. At the same time, labour and capital are being absorbed by the resource industries, so non-resource industries are faced with higher labour and capital costs. Economic activity is likely to be lower than it would have otherwise been in those States without a large mining sector. The modelling results show that the boom in commodity prices has reduced annual Victorian and NSW GSP growth by up to half of one percentage in the short term.

The modelling suggests that while the mining industries have expanded, most other industries are likely to be smaller than they would otherwise have been. As the table below shows, trade-exposed industries outside the resources sector, such as manufacturing, are most vulnerable to these pressures. All manufacturing industries except for aluminium decline. Petroleum refining declines the most, which reflects large increases in the price of oil.

Table 1. Impact of commodity price increases from 2003-04 to 2004-05 on industry activity in the manufacturing sector by region (per cent change relative to baseline)²

	Aust	NSW	VIC	QLD	SA	WA	TAS	NT	ACT
Food, Other	-1.4	-1.3	-1.1	-2.0	-0.9	-1.4	-1.5	-3.7	-1.2
Drink	-0.5	-0.6	-0.4	-0.5	-0.3	-0.8	-0.3	0.0	0.0
TCF	-3.4	-3.4	-3.4	-3.5	-2.5	-4.8	-3.4	-7.3	-4.7
Wood Products	-1.5	-1.4	-1.4	-1.4	-1.3	-2.2	-1.5	-4.1	-1.7
Paper Products	-1.0	-1.0	-0.9	-0.9	-0.9	-0.9	-1.1	-1.6	-1.4
Manufacturing, Other	-1.0	-0.6	-1.2	-1.1	-1.2	-1.5	-0.7	-3.8	-0.5
Petrol Refining	-6.6	-7.2	-7.1	-4.6	0.0	-8.6	0.0	0.0	0.0
Chemical Products	-1.9	-2.2	-1.5	-1.4	-1.9	-3.0	-1.3	0.0	0.0
Plastic and Rubber Products	-1.3	-1.3	-1.3	-1.4	-1.3	-1.2	-1.3	0.0	0.0
Non-metal Mineral Products	-1.0	-1.1	-0.9	-1.0	-0.8	-1.3	-0.9	-2.4	-1.7
Cement	-0.1	-0.1	0.0	-0.2	-0.1	-0.1	-0.3	-0.2	-0.2
Iron and Steel	-1.3	-1.9	0.1	-1.4	-0.1	-0.8	-3.0	-3.3	0.0
Aluminium	0.5	0.6	0.5	0.2	0.0	0.2	0.4	2.3	0.0
Metal Products	-4.7	-5.7	-2.0	-7.3	-5.1	-4.1	-7.3	-21.9	-1.9
Transport Equipment	-3.2	-4.1	-2.6	-4.0	-2.2	-5.4	-4.3	-12.7	-4.2
Other Equipment	-3.1	-3.5	-2.6	-3.3	-2.7	-2.8	-3.9	-3.0	-1.9

The manufacture of metal products, transport equipment (includes cars) and TCF also fare badly. By comparison, the cement industry records just a small decline as it sells its product to the non-trade exposed construction industry.

² Unpublished notes from *A tale of two economies: the regional impact of Australia's resources boom*, Department of Treasury and Finance Discussion Paper, May 2006.

The long-term impact on Australia, and the non-commodity States such as Victoria, will depend on the future path of commodity prices and the future size of commodity exports from Australia's resource-intensive States. Although there is some evidence that continued rises in the terms of trade are coming to an end as supply eventually responds, as long as world demand remains strong, new capacity will see Australian commodity export volumes and GDP expand. The above average pricing for resources will most likely continue in the longer term because the source of demand is developing countries. For example, should China's demand for commodities slow, the other "BRIC" countries of Brazil, Russia and India will most likely continue the momentum with moderate consumption growth.

In the long run, labour mobility would result in patterns of net interstate migration shifting to favour the relatively resource-intensive States, reducing disparities in unemployment rates and wage rates between the States. The resource States would also attract investment from the rest of the country. In other words, permanently higher commodity prices are likely to have a net positive impact on the size of the Australian economy, but change both the industry composition and regional distribution of economic activity.

While an eventual decline in commodity prices and a subsequent fall in the Australian Dollar would benefit trade-exposed industries outside the resources sector, the effects of high commodity prices as described above could, if sustained over time, cause significant and permanent damage to the size, structure and competitiveness of these sectors.

It is this "hollowing out" effect on these industries that the Victorian Government regards as the greatest cause for concern from a long-term resources boom. Already, there is evidence of this process occurring. DFAT data indicates that of the 35 manufacturing product groups, only one experienced negative real annual growth during the 1985/6 to 1993/4 period, and 27 had real annual growth rates of more than 10%. However, since 2000/1, 17 product groups had negative real annual growth rates and only six had double digit growth.

Whilst the resources boom may in part be contributing to these alarming trends, there are other global factors that need to be considered as well. These are the focus of the next section of the submission.

3. Opportunities and Challenges for the Manufacturing sector (and the goods and associated services sectors) in the expansion in global trade (in particular by China)

Manufacturing continues to be vital for Australia's and particularly Victoria's economy. Although manufacturing's share of Victorian GSP has been declining over the medium to long term as in many jurisdictions around the world, manufacturing accounted for a significant 15% of Gross State Product in 2005-06, employed 334,300 people in Victoria contributing more to total factor income in Victoria than any other industry. This was the second largest industry employer, behind the retail trade industry. On an output per capita basis (\$ terms), manufacturing in Victoria leads all sectors and is higher than the manufacturing output per capita for Australia (by around 25%). Additionally, manufacturing is the

largest provider of full-time jobs of any industry; 287,600 or 16.5% of Victorian full-time total.

Beyond this, manufacturing plays a significant economy wide role through extensive multiplier impacts, and through its capacity to drive innovation, knowledge and new and improved work and organisation practices over many sectors. The design, form and functionality of products and services are increasingly becoming key drivers of manufacturing. Moreover, manufacturing is increasingly integrated with services to form complex product-service relationships either through the production process, at the point of final sale or in 'bundling' product/service packages.

The Victorian Government has extensively examined the current state of our manufacturing sector in recent months, as part of the development of the Victorian Manufacturing Strategy and for the National Manufacturing Summit. This analysis has particularly focussed on the range of global developments that are presenting challenges to and opportunities for the industry.

The Victorian Strategic Assessment of Manufacturing Discussion Paper (copy attached), prepared by the Victorian Government in late 2005, provides a comprehensive analysis of these issues. In essence the key issues explored in this paper are outlined below.

3.1 Global factors impacting the manufacturing sector

China

No discussion of global manufacturing can possibly ignore the rapid rise of a number of powerful global manufacturing players, and in particular, China. Combining large markets, increasingly skilled people with relatively low wages, China and a number of other emerging economies are challenging the established leaders for supply of goods and services. Other factors underpinning China's competitiveness include favourable exchange rates and adherence to lower standards (e.g. environmental, health and safety) than Australia and other western economies.

China's industrial sector's share of GDP has risen from 41.6% in 1990 to 52.3% in 2003-05, accounting for 54% of the cumulative increase in GDP over this period. Moreover, its manufacturing base is not just limited to low cost labour intensive sectors. There has been significant growth in output in sectors which have high value added per employee, such as machinery.

China alone accounts for close to 5% of global exports and over 4.5% of global imports. This is a rise from 1% and 1.25% respectively, 30 years ago, and 3% and 2.75% respectively, just 10 years ago. China has maintained its rating as the most attractive destination for FDI, according to the AT Kearney index of FDI attractiveness, and in 2003 surpassed the U.S in becoming the largest FDI recipient in the world. There is also growing outward investment from China, especially to other parts of Asia, as regionally based production value chains are emerging.

China's growing commitment to innovation as a basis for intensifying its move up the value chain is also impressive. Some examples will suffice:

- It has the third largest R&D (mainly public) spending in the world behind US and Japan, (but does lag below the OECD average share of R&D/GDP);
- It is a world leader in the education of engineers e.g. approximately 39% of China's degree holders (aged 24) were engineers, far above that of the U.S (5%) and other Asian countries (South Korea, Taiwan, Japan); and
- Industrial/technology parks have been dedicated to attract Chinese Students from abroad-there are some 60 such industrial parks where around 4000 businesses created by more than 10,000 returned Chinese students are located.

Recent survey work by the Ai Group (*Australian Industry Group: Australian Manufacturing and China, Opportunities and Challenges*) of around 850 manufacturing businesses indicates that firms considered the impact of China was negative in 2003-04, considering export sales to China, local input costs, revenue from China based investments, and export sales excluding China. There is a negative net impact of \$560m.

Among the other key findings are:

- Most respondents (54.8%) considered China a competitive threat in the domestic market mainly through import competition;
- On the positive side 43.9% of firms said China was having a favourable impact as an alternative source of low cost inputs; and
- While 20% of respondents were benefiting from greater exports to China, around 32% of respondents considered that China is a competitive threat in other export markets.

The Ai Group also indicates that the most frequently nominated strategy response to the challenge of China was accelerating the pursuit of production efficiencies, followed by importing more from Chinese suppliers and accelerating the adoption of new technologies. This is consistent with its other recent research suggesting that many manufacturers are focusing on cost containment rather than growth strategies. However, it is the case that a significant number of firms are accelerating the adoption of new technologies and differentiating their products and services through R&D, branding and distribution.

However, while there are difficulties associated with the rise of China for local manufacturers, it is also the case that China's rapid growth, modernisation initiatives, and issues/challenges that it currently faces, and is likely to continue to face, offers enormous opportunities, including:

- Demand for inputs as China continues to move "up market" (specialised equipment, niche componentry);
- China's emerging scientific base (collaborative scientific ventures in biotechnology);
- Demographic challenges, including population movements to urban centres and ageing of the Chinese population (construction and related industries, building materials, urban design services, aged care technologies);
- Environmental pressures in China such as congestion and energy usage (environmental technologies, pollution control equipment, renewable energy)

- Olympic Games associated technologies; and the
- Rising standard of living and growing household disposable income (processed food, leisure industries, and health care).

The Role of Technology

The nature of global manufacturing has been transformed by extraordinary developments in computing, communications and distribution. Each of these developments in isolation would have significantly influenced opportunities in trade, investment and global production in and of themselves. However, “...taken in combination, the rapid changes in all three influence many of the trends that have most impacted manufacturing from the shop floor to the loading dock to the final customer”(Manufacturing in America, 2004).

The growth in computing power and its application to an ever widening array of activities in the business arena is undoubtedly the single most powerful technological change affecting manufacturing today. Computing power affects every part of the manufacturing process, for example:

- revolutionising product design;
- giving rise to a new generation of multiple axis machine tools;
- permitting revolutions in business processes, such as “just in time” production and “demand pull” manufacturing.

Numerous economic growth studies suggest that ICT was also responsible for a large share of productivity improvements in the economy, including manufacturing, in industrialised countries in recent years, for example, in enabling:

- just in time inventories;
- the rise of the global supply chain and the meta-national. ICT has enabled the capacity to source parts from around the world and allows real-time product development discussions around the globe;
- the transformation of the way goods flow through the transport distribution and logistics system to the final customer.

Looking ahead, it is evident that other new technologies – biotechnology, nanotechnology and advanced manufacturing technologies will have similarly dramatic impacts on products and processes, with production likely to shift to those locations that develop these technologies or are early adapters.

Free Trade Agreements

Australia has recently signed Free Trade Agreements (FTAs) with the US, Singapore and Thailand and is in various stages of negotiation with the United Arab Emirates, Malaysia, China, Japan and ASEAN/New Zealand. While FTAs present significant opportunities to gain better access to overseas markets (particularly given that multilateral negotiations are slow to proceed), FTAs have resulted in increased competition in the domestic market. For example, the FTA with the US requires that all Australian and US tariffs on manufactured goods will be zero by 2015. Econometric studies have shown that on balance, the Australia-US FTA will be negative for the Victorian automotive, chemicals and plastics industries, slightly positive for electronics and neutral for other sectors, including pharmaceuticals, shipbuilding and TCFL.

Negotiations for an FTA with China are expected to take some years to complete and, if concluded, will present both challenges and opportunities. The impact on Victoria's TCFL industry is likely to be significant, as China will push for increased access to Australia's markets for manufactured goods. The Victorian Government has commissioned research to analyse the expected impacts of a China FTA on Victorian industry.

We note that, as well as negotiating FTAs with China, ASEAN, Malaysia and the UAE, the Federal Government has recently also sought comment on possible commencement of negotiations towards an FTA with Mexico. We are concerned that negotiating so many FTAs concurrently may stretch resources to a point where thoroughness and diligence could be compromised. We are also concerned that these FTAs may undermine existing industry support plans like ACIS where transition support is predicated on a predetermined, long term timetable for tariff reduction. Finally, it is critical that negotiation of FTAs takes appropriate account of the manufacturing sector. The Victorian Government is concerned that the interests of Australian manufacturing not be sacrificed in the face of pressure from the primary sector to conclude such negotiations as quickly as possible.

Participation in Supply Chains

The key impact on global manufacturers in industrialised countries of the above trends has been to increase the availability of new sources of low-cost labour and manufacturing capacity. Indeed, today's manufacturers are increasingly compelled by competitive forces to move towards sourcing parts and components globally.

Integration into supply chains, both local and global, is important in driving efficiencies, product and process innovation, and for market access.

Whilst supply chain management has been an important aspect of industrial output for several decades, it has increased in complexity and sophistication in recent years. The current and future wave of supply chain management is about "a holistic, fully integrated approach incorporating the dynamic flow and management of products, information, cash and even ideas". Among the key driving forces are:

- shortening product lifecycles placing a premium on speed to market;
- growing customisation of products and global scale markets;
- rapid advances (and declining) costs of communications, including e-commerce
- new production technologies around rapid prototyping, lean and agile manufacturing, point to point manufacturing; and
- increased product recognition, both from the view of global branding and the need to track products globally for environmental and product liability concerns.

Successful supply chain integration hinges on a number of factors:

- importance of concurrent engineering when speed to market is important;
- design and development practices established with speed in mind;
- being close to customers in responding to changes in market needs;
- collaboration with partners on a global scale;
- maximising functional and procedural synergy between members;

- develop leading edge design capabilities in firms including adoption of rapid prototyping and increased scope of products and services;
- increasing creativity to develop and trial products;
- addressing delivery at the design stage in the context of greater speed to market; and
- providing cost competitive and efficient logistics infrastructure.

The key benefits of integrated supply chain management centre on:

- improved focus and quality of OEM manufacturers;
- lower production and inventory costs;
- diffusion of risk;
- joint product development and greater innovation in product and process;
- wider access to technologies (through wider supply chain membership);
- greater access to skilled labour; and
- wider access to markets.

3.2 Australia's Manufacturing Trade Performance

The substantial trends and forces affecting manufacturing globally, described above, are inevitably having impacts on Australia's recent trade performance in manufacturing.

Exports

As a small open economy, sustaining and enhancing living standards in Australia will depend on greater exports to ensure future growth. Between 2000 and 2005, world exports grew at 10% p.a. providing vast opportunities for growth in manufacturing exports.

In this context and in view of the well-recognised strategic significance of manufacturing as a driver of employment and productivity growth, Australia's widening manufacturing "trade deficit" is cited frequently by many economists as a concern. This deficit is particularly pronounced in the medium-high and high technology segments of manufacturing, in which Australia's growth has slowed considerably following a strong surge during the early 1990s.

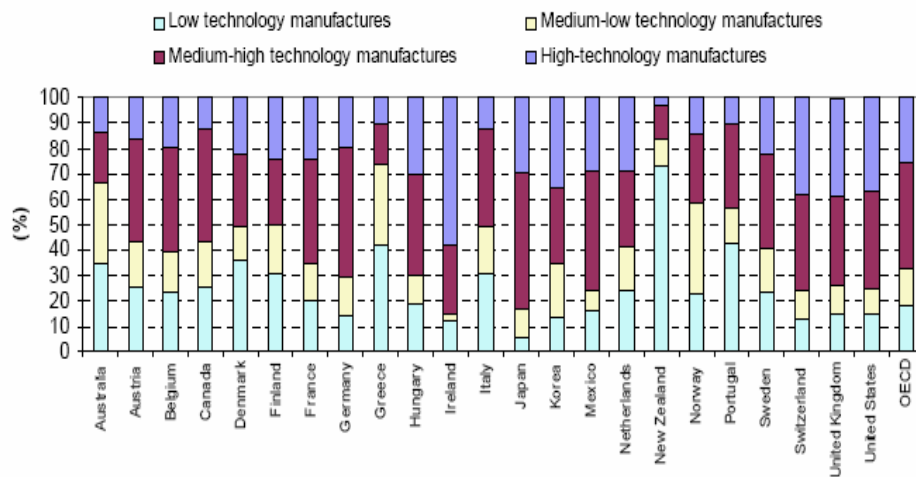
In the context of this discussion, it is important to understand the significance of Elaborately Transformed Manufactures (ETMs) to the long term stability of the economy and continued wealth generation. Relative to exports of commodities, ETMs:

- involve more 'value-adding' and can generate greater wealth;
- are characterised by non-price elements, and are less sensitive to exchange rate fluctuations and price competition than commodity products;
- are more knowledge intensive and tend to employ highly skilled people both in terms of their product development and manufacturing operations – the manufacturing sector itself accounts for almost 50 per cent of business expenditure on R&D and most ETM producing industries tend to have relatively high ratios of R&D to turnover; and
- can generate spill overs through deep knowledge linkages formed between firms producing ETMs, their suppliers, competitors, related research intuitions and leading-edge customers.

The figure below shows a breakdown of OECD manufacturing exports by country. The OECD scoreboard (2005) provides the following observations:

- Firstly, the differences among countries are substantial; the share of high- and medium-high-technology industries ranges from over 80% in Japan and Ireland to less than 10% in Iceland. With almost 17% of total OECD technology exports, Germany had the largest share of the technology market in 2003, closely followed by the United States.
- The data shows significant variation in the nature of Australia's exports relative to other OECD countries. In 2002, approximately 32% of Australia's exports were medium-high and high technology products. Only Greece and New Zealand had a lower percentage. For all other countries, except Norway and Portugal, **at least 50% of their exports are medium-high and high technology products.**

Table 2. Exports by technology intensity for OECD countries in 2002



Source: Invetech derived from OECD data

Australia's share of world exports in medium-high and high technology products is also falling. While Australian exports of medium-high and high technology products increased over the five year period 1997-2002, it was at a slower rate than the rest of the OECD. Also noteworthy is that in recent years the growth of high technology exports has declined in Australia as measured by exports of Elaborately Transformed Manufactures (ETMs).

An interesting contrast in the above analysis is Germany, which, in overall economic terms is suffering from the slowest growth rates in the EU, a consequence of its lack of natural competitive advantages in mineral and energy resources and the dislocation and financial stringency it has experienced due to the reunification of country in the 1980s. Moreover, Germany has traditionally been weak in services and has high labour costs. Notwithstanding these disadvantages, Germany remains the EU's largest exporter in absolute terms, and this has been driven overwhelmingly by exports of ETMs to sophisticated markets. This example highlights for Australia the critical role of ETM exports when and if mineral and energy exports (the resources boom) decline.

Recent exchange rate appreciations and high relative costs (relative to China) have contributed in part to Australia's ETM export decline. However, according to a recent report on Victorian ETM exports by Allen Consulting³ commissioned by the Victorian Government (copy attached), other more pressing causes include:

- lack of access to capital to support business R&D and commercialise innovation;
- lack of adequate local supply chains and gaps in industry collaboration to support manufacturing;
- lack of sales and export marketing skills; and
- more generally the competition from China as an emerging manufacturing powerhouse.

This decline in ETM export performance is also illustrated in the following table describing Victoria's recent export performance in the three areas of manufacturing: Elaborately Transformed Manufactures (ETMs); Simply Transformed Manufactures (STMs); and Processed Food.

Table 3. Average Annual Growth in Victoria's trade in manufactured goods

	1990 - 1997	1997- 2005	1999- 2001	2001- 2003	2003- 2005	1990- 2005
Processed Food Exports	9.6	6.3	16.7	-4.6	3.5	7.8
STM	0.7	4.8	18.6	-0.08	-4.5	2.9
ETM	17.1	1.9	13.7	-3.7	1.98	8.8

Source: DFAT

ETM exports are worth more to the Victorian economy than STMs, and Victoria "punches above its weight" (as compared with the State's share of GSP at 25%) in terms of the share of national ETM exports. However, Victoria's share of national ETM exports has fallen since 2000 and has basically remained unchanged between 1990 and 2005.

Imports

Imports of manufactured goods continue to be of considerable significance within the Australian economy and have experienced strong growth in recent years, especially in the ETM sector, reflecting both the liberalisation of the economy and, arguably, greater specialisation.

As an illustration of this significance, recent analysis by the Victorian Government indicates that manufactured imports to Victoria grew by an average of 6.1% per annum over the ten years from 1994/5 to 2004/5, with ETM import growth (6.4%) significantly exceeding STM growth (2.4%). Moreover, ETM imports to Victoria now account for 89% of all manufactured imports, with motor vehicles, machinery and equipment and pharmaceuticals the dominant items. With the exception of electrical machinery and some telecommunications equipment, China does not yet figure prominently in these ETM import figures, a trend that one assumes will change in the near future.

³ *Growing Global Niches: Positioning Victorian Elaborately Transformed Manufactures for Future Growth 2005*, Allen Consulting Group report for the Victorian Government

Similar trends apply at the national level, with Australia's trade deficit in manufacturing widening by 162% over the past ten years, with motor vehicles, electronic and industrial machinery and equipment being the major areas in which imports substantially outweigh exports.

3.3 Other Trends and Features in Australian Manufacturing

Off Shoring

Lower labour costs, access to larger markets and new technologies which enable global distribution, have led to increased off shoring, particularly to China and India. At an economy wide level there can be gains to off shoring, as firms can generate cost savings and focus more on core competencies. The downside to off shoring can be in relation to the potential adjustment costs for employees, and the loss of parts of supply chains. While off shoring is not new per se, there are many striking features of the "current wave". Firstly, its pace and extent is intensifying. Through their large markets, cost advantages and growing skills bases, China and India are magnets for off shoring. Further, other locations including the Philippines are emerging as next tier locations.

Many Australian manufacturing companies, particularly in the automotive sector, have outsourced some or all of their production processes to lower cost countries. Others have moved towards new global purchasing arrangements, which have also resulted in job losses in Australia. Survey work undertaken by the Ai Group in 2004 found that 40% of all Victorian automotive component manufacturers expected to have outsourced some or all their production processes to lower cost countries by 2006. Further, 80% of component manufacturers expected to have switched to lower cost suppliers of basic or semi processed inputs by 2006.⁴ Although the actual incidence of such changes has not been quantified, there have been frequent and substantial examples to demonstrate the accuracy of the trends predicted by the Ai Group's survey. However, some companies are responding to these developments by investing in design, new technologies and moving up the value chain.

Structural Adjustment

Manufacturing has experienced significant structural change as measured by shifts in employment shares. The causes of structural change include technological change, rising incomes and changing tastes. People losing their jobs in manufacturing have had lower re-employment prospects than in other industries – particularly in the TCFL sector due to factors of age, location and education levels. Sectors such as TCFL, rubber products, photographic and scientific equipment, fruit and vegetable processing and structural metal products have experienced significant declines in employment over the last five years. In contrast, employment has grown in petroleum refining, motor vehicles and parts, basic metals products and processed foods sectors.

⁴ AiGroup *The Victorian Automotive Components Manufacturing Industry October 2004*

Skill Shortages

One in two manufacturing companies experience difficulties in obtaining skilled labour, and there are particular skill shortages in the sectors of machinery and equipment, chemicals and plastics, transport equipment and petroleum and coal products. They cover a range of occupations including electricians, engineers, mechanics, welders, plant managers and sheet metals workers. There are several ways to address skills shortages, such as improved links between training providers and industry; increased labour mobility; and improved coordination among stakeholders of skills needs.

Research and Development

R&D allows new and improved products to be developed and applications of technology to be undertaken. Business expenditure on R&D enables ideas to be transformed into commercial applications, and this is relatively high in Victoria compared with the rest of Australia. However, compared with other developed countries, it is low. The manufacturing industry is the major driver of business expenditure on R&D – the automotive industry alone contributes 44% in Victoria.

Sustainable Manufacturing

Sustainable development in a carbon constrained world is increasingly driving economic growth agendas around the world. This has significant implications for the manufacturing industry, as it needs to develop and improve products, processes and services, and make more efficient use of existing resources. In Victoria, manufacturing is the main user of electricity and gas, which significantly contributes to the emission of greenhouse gases. Manufacturing companies are now incorporating cleaner production methods, adopting alternative energy sources, and developing new environmentally friendly technologies. As well as meeting local standards and regulations, it also provides opportunities for the design of innovative products and services, and for generating appeal to ‘green’ consumer sentiment.

In its Sustainability Action Statement, *Our Environment, Our Future*, released in July 2006, the Victorian Government has signalled the growing significance of sustainable development in the context of its industry development agenda. Within the new investment of over \$200 million announced in the Statement, there are significant industry support initiatives focussing on assisting businesses avoid waste, save water and invest in sustainable technology and equipment. The fact that the Department of Innovation, Industry and Regional Development is playing a key role in implementing these business-focussed sustainability initiatives highlights the increasing convergence of industry and environmental policy.

Access to Capital

Manufacturing firms need to access capital to start-up, expand or commercialise a new technology. For high-risk ventures, companies normally access capital via a venture capital fund. The venture capital industry is likely to grow significantly, largely because the Federal Government has introduced tax incentives, but there are still barriers for manufacturers in accessing venture capital, including a perception that manufacturing is a low skill, low technology, low return industry. It is important for manufacturers to develop skills to be able to sell the opportunities for strong returns from investment in manufacturing.

As a nation, across all industries, we are below leading practice abroad on the measure of venture capital/GDP. In Australia, manufacturing accounts for a small proportion of venture capital investments across all industries.

Infrastructure

Efficient, accessible and high quality infrastructure is a key enabler for industry. Infrastructure also embodies new technology and know-how, further enhancing productivity. According to a range of surveys and work by Industry Associations and others, Australia faces a number of infrastructure issues and challenges including: addressing road congestion; more effective national energy markets; enhancing port capacity; and more integrated and co-ordinated multimodal transport arrangements. These require a national approach. Governments at both Commonwealth and State level are addressing infrastructure issues in a variety of ways. The Victorian Government recently put forward proposals for a national agenda on infrastructure to the Council of Australian Governments (COAG), while a major piece of work on Australia's export infrastructure needs and issues was recently concluded for the Commonwealth Government.

In addition to its contributions to the national agenda, the Victorian Government is investing heavily in infrastructure as a key means of fostering industry development and delivering services and jobs. In its 2006/07 Budget, handed down in May 2006, the Government announced the largest capital works program in Victoria's history, with a record high investment of \$4.9 billion.

Image of Manufacturing

While the character of manufacturing may be changing, there is continuing concern that the perception of manufacturing remains outdated and unfortunately unattractive. The resultant effects of the poor image include difficulties in recruiting fresh talent, in obtaining finance for growth and in carrying weight in national policy development. While the industry itself would claim that manufacturing is now much more high technology, cleaner and safer than ever before, this is not necessarily a common perception. A co-ordinated and consistent approach to marketing and promoting manufacturing at both National and State level is required. Many initiatives to this end are underway.

3.4 The Future of Australian Manufacturing

To be successful and sustainable in the future, Australia's manufacturing industry in the future is likely to have to become more specialised and more globally integrated. Design, R&D and engineering excellence, as well as strong links with services, will be key components of manufacturing. In the context of heightened global competition and opportunities, companies will need to develop strategic alliances, undertake offshore production and participate in global supply chains and clusters. The main locations for investment will depend on market access, global commodities and technology sourcing zones. Positioning ourselves as a technology zone to attract and retain strategic and value adding investments will be an increasingly important element of new manufacturing.

Central to future competitiveness will be the development and adoption of ‘platform’ technologies, such as nanotechnology, biotechnology and ICT, which are generic, cost cutting and enabling.

Nanotechnology applications (which create and use materials, devices and systems that exploit nanometric sized properties) are expected to revolutionise manufacturing, through the development of new and advanced materials and customised production possibilities. The other major enabling technology is ICT which has facilitated the shift from manual, mechanical and electrical applications to the automatic, electronic and digital processes.

Another important success factor for the manufacturing industry is lean production – not just doing things more efficiently but also deciding whether certain operations should be done at all. Linked with this are lean consumption and the ability to meet customer needs through highly customised products while minimising customer’s time, effort and resources.

A scenario exercise conducted by National Institute of Economic and Industry Research⁵ compared a business as usual case (incorporating for example continued rapid import penetration, continued narrow export base, stagnant innovation) with an alternative which is based on significant additions to R&D, investment in plant and equipment and a manufacturing industry structure that is moving up the value added chain and linked more into global supply chains. The results of the scenarios revealed some important insights:

- a marked increase in both output and exports in the alternative case compared with business as usual;
- the key sectors behind the enhanced output and export performance in the alternative scenario are processed food, motor vehicles, and parts of engineering (aircraft, other industrial equipment, scientific and electronic equipment). These sectors benefit from increased foreign direct investment and R&D; and
- while employment declined slightly in the alternative case between 2010-2015, the employment decline is more than double in the business as usual case over the same period and consistently fell over the whole period. By 2015, manufacturing employment was forecast to be 27,000 more than at the same time in the business as usual case.

4. Policies for realising these opportunities.

Globally, many jurisdictions (see for example, UK, Scotland, Singapore, Ohio, Pennsylvania, and the EU) are developing manufacturing policy responses to the global trends described above, typically including:

- ongoing reforms to improve the business environment by reducing red tape and regulation;
- skills enhancement, including improved links between training and industry;

⁵ (National Institute of Economic and Industry Research, *Growth or Stagnation: Constructing an alternative scenario for Victorian manufacturing in the new millennium*, A report for the Manufacturing Industry Consultative Council of Victoria, 2001)

- innovation programs, including significant R&D tax credits. R&D tax credits need to be sufficient to encourage local manufacturers to see an immediate financial advantage in investing in R&D as well as encouraging more footloose international investment in R&D;
- manufacturing advisory services;
- export assistance, including information provision, trade fairs and missions; and
- global supply chain programs.

Australia needs to develop an integrated suite of strategic initiatives designed to enable Australian manufacturing industry to reposition itself. Such initiatives need to include the approaches identified above, as well as taking into account the impact of factors like FTAs (not just those involving Australia, but those involving Australia's trading partners which may affect our relative positioning such as a US-UAE FTA), significant currency rate fluctuations, commodity prices, and technological sea change.

In particular, Government policies need to assist industries to reposition themselves up the value added scale - to differentiate their product on innovation (product and process innovation), quality, service, design, branding and strategic niche marketing.

Metaphorically speaking, Australia's place is in the premium stores, not in the bargain basement, as the assumption behind the "work choices" legislation seems to suggest.

Our place is also in occupying strategic niches that our relative size; our flexibility and agility; our creativity and our ingenuity give us a competitive edge in, rather than competing in high volume, low value added areas where low labour costs and the economies of scale in larger economies will swamp Australian manufacturers into oblivion.

4.1 The Need for a National Policy Approach

Mindful of the speed and scale of the emerging global challenges to our manufacturing sector, the Victorian Government has urged a strong and nationally agreed policy response. In this regard, we welcome this Inquiry and the recent announcement by the Minister for Industry, Tourism and Resources of the development of a Federal Industry Statement in early 2007. Whilst these developments indicate acknowledgment by the Commonwealth Government of the need for urgent and decisive industry policy action, we note that State and Territory Governments have been encouraging this for some time.

This was recently affirmed when in December 2005, the Victorian Government hosted on behalf of all State and Territory Governments the National Manufacturing Summit, which was attended by 230 delegates representing Governments, industry bodies, unions and individual manufacturing companies. The Summit explored the opportunities and challenges facing manufacturing now and into the future and measures to ensure a prosperous future. Workshop papers in the areas of Skills, Innovation, Investment and Globalisation were produced at the Summit by participants and form an attachment to this submission.

A key outcome of the National Manufacturing Summit was the commitment to establish a National Manufacturing Forum to develop a strategic action plan around the issues raised at the Summit. The Forum, sponsored by State and Territory Governments and comprising representatives from industry, employer groups, unions and the research sector, is focussing on the key themes of globalisation, innovation, investment and skills. The Forum will present its Strategic Action Plan for Manufacturing to State and Territory Ministers in September this year. The Plan will represent a proposed national approach to supporting the manufacturing sector, endorsed by all stakeholder groups represented at the Forum.

In view of the highly representative nature of the Forum and its endeavours to develop a shared vision for future manufacturing support, we strongly recommend that the Commonwealth considers the Plan as part of its future policy considerations.

4.2 Victorian Manufacturing Strategy

The Victorian Government is currently working on a new Victorian Manufacturing Strategy. This work is timely as the environment for manufacturing has changed significantly over the last four years (since the announcement of the Government's current manufacturing strategy, *Agenda for New Manufacturing*), making it essential that a new strategy is developed to address these changes.

There have been a number of changes in the global and domestic environment affecting manufacturing industry in Victoria. Some changes reflect new developments, while others are an acceleration of existing trends. Among the key shifts are:

- the rapid growth and modernisation in China and India, which present both challenges and opportunities;
- Australia's signature to a number of Free Trade Agreements (FTAs), or negotiation of proposed FTAs in recent years, including with the U.S, Thailand and Malaysia, UAE, China and ASEAN/NZ, which have altered the trading environment for manufacturing;
- a changed global environment for Foreign Direct Investment with larger scale projects flowing to developing countries, especially India and China while developed jurisdictions are competing for smaller, smarter and high value projects;
- intensification of technological change, including especially the growth in nanotechnology, and convergences between manufacturing and services;
- heightened structural adjustment pressures associated with import penetration, tariff cuts and technological change affecting a number of sectors, particularly labour intensive ones such as TCFL;
- a range of current and emerging constraints which impact on the productive capacity of manufacturing, such as skill shortages and infrastructure bottlenecks;
- environmental pressures in the context of policies towards greenhouse gas emissions and other issues relating to the need for sustainable production and consumption.

This work will complement related Victorian Government initiatives in the areas of Nanotechnology, Innovation and Life Sciences Strategies.

In conclusion, the Victorian Government believes that Australian manufacturing faces a crucial period in the next few years that will significantly influence the future size, structure and economic contribution of the sector. As indicated above, the Government is undertaking and contributing to a range of State and national-level policy initiatives to address the key challenges facing the sector, which we would be pleased to share with the Inquiry when they are completed.

**A tale of two
economies:
the regional impact of
Australia's resources
boom**

**Department of Treasury and
Finance Discussion Paper**

May 2006

Table of Contents

Introduction	1
Developments in commodity prices.....	1
Impacts on the Australian economy	3
Regional distribution of commodities	5
Economic impact	8
Methodology	10
The model.....	10
Commodity price shocks	11
Caveats	11
Results	13
National results.....	13
State results.....	15
Long run implications	16
References	17

Introduction

Strong world demand for mining commodities, and associated increases in commodity prices and incomes, has been a major driver of economic growth for the past two years in the resource-rich States – particularly Western Australia and the Northern Territory. However, for the remainder of Australia, and particularly Victoria, these developments are a mixed blessing. Although Victorians are sharing in the income gains of the resources boom, rising commodity prices have driven up the exchange rate, with adverse consequences for Victorian exporting and import-competing firms. At the same time, labour and capital are being absorbed by the resource-intensive States.

This paper uses a computable general equilibrium (CGE) model to examine the regional impacts of the resources boom. This section discusses some of the features of the Australian and State economies since the boom began, and the channels through which commodity prices influence these characteristics. To be robust, modelling should be able to explain some of these stylised facts. The remainder of this paper sets out the modelling approach and results, and discusses some of the longer-term implications of stronger world demand for mining commodities.

Developments in commodity prices

The recent strength in resource commodity prices reflects strong demand growth in the world economy, particularly from the rapid industrialisation of the Chinese economy, and constrained supply capacity in most resource-producing countries. The supply-side response has been limited by under-investment in mining in the late 1990s and early in the current decade. This is in contrast to previous episodes of rising commodity prices, which were the result of supply shocks, often associated with military conflict. As such, the current upswing in commodity prices has been more gradual and sustained. Rising commodity prices have already generated a substantial increase in Australia's terms of trade. Overall the current commodity price boom represents the largest cumulative rise in Australia's terms of trade since the early 1970s.

Prices for Australia's major resource commodities since 2002-03 are presented in Table 1. This shows that the price boom became broadly-based from 2003-04. For some commodities, particularly non-ferrous metals, there were significant price increases in the previous year. However, prices for iron ore and energy commodities, which account for about half of all resources exports, did not take off until 2004-05.

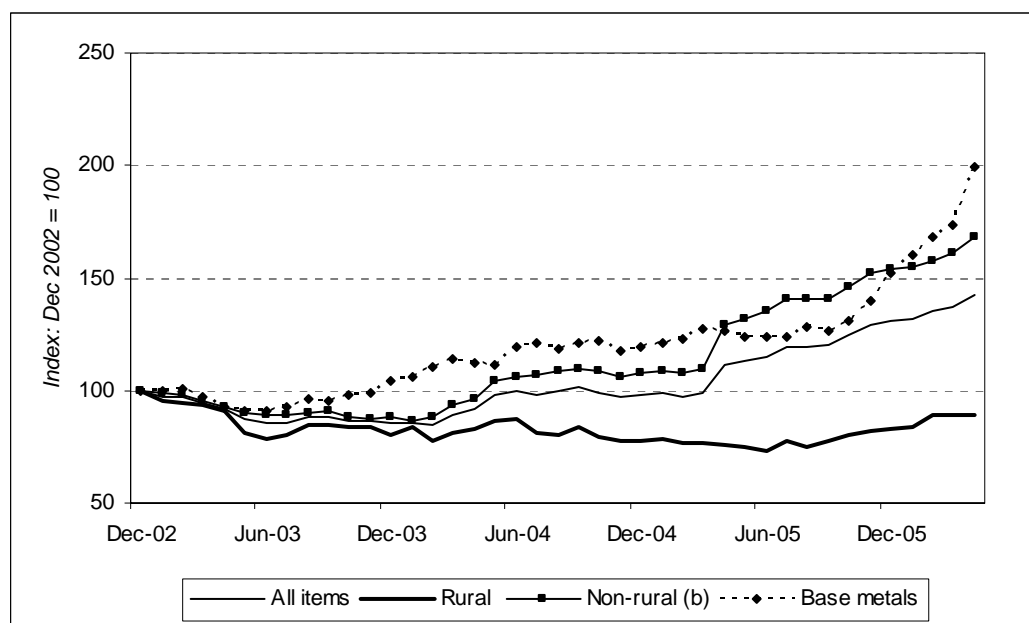
The RBA Index of Commodity Prices (see Chart 1) demonstrates the differential price changes for different commodity groups in the last three years. While prices of rural (agricultural) commodities are currently lower than at the end of 2002, the Australian dollar price of base metals has doubled over the same period.

Table 1: Resource commodity prices

Commodity	Units	2002-03 ^(a)	2003-04 ^(a)	2004-05 ^(a)	Dec-05	2002-03 to 2003-04	2003-04 to 2004-05	2002-03 to Dec 2005
						% change	% change	% change
Alumina	A\$/t	278.0	278.6	311.5	354.4	0.2	11.8	27.5
Aluminium	US\$/t	1360.7	1568.4	1806.9	2248.5	15.3	15.2	65.2
Gold	US\$/oz	334.2	389.3	422.5	509.4	16.5	8.5	52.4
Iron Ore	A\$/t	29.4	27.1	35.5	52.3	-8.0	31.0	77.5
Steaming Coal	A\$/t	44.5	41.0	59.6	67.3	-7.9	45.3	51.3
Coking Coal	A\$/t	69.1	58.3	86.1	146.0	-15.7	47.8	111.3
Crude Oil	US\$/t	26.3	29.3	41.2	51.7	11.7	40.4	96.8
Uranium	US\$/lb	10.2	14.9	22.2	36.3	45.8	49.0	254.7
Copper	US\$/t	1595.1	2333.3	3149.8	4577.5	46.3	35.0	187.0
Lead	US\$/t	445.0	700.1	964.1	1119.3	57.3	37.7	151.5
Zinc	US\$/t	774.8	962.0	1170.9	1822.1	24.2	21.7	135.2
Silver	USc/troy oz	461.0	579.9	694.9	865.3	25.8	19.8	87.7
Nickel	US\$/t	7673.2	12263.0	14971.0	13438.3	59.8	22.1	75.1
Gas	A\$/t	333.0	274.8	302.1	367.9	-17.5	9.9	10.5
Iron and Steel	A\$/t	516.9	630.6	867.9	719.0	22.0	37.6	39.1

Source: ABARE Australian mineral statistics, DTF calculations

Note: (a) Average price over the financial year

Chart 1: RBA Index of commodity prices^(a)

Source: Reserve bank of Australia

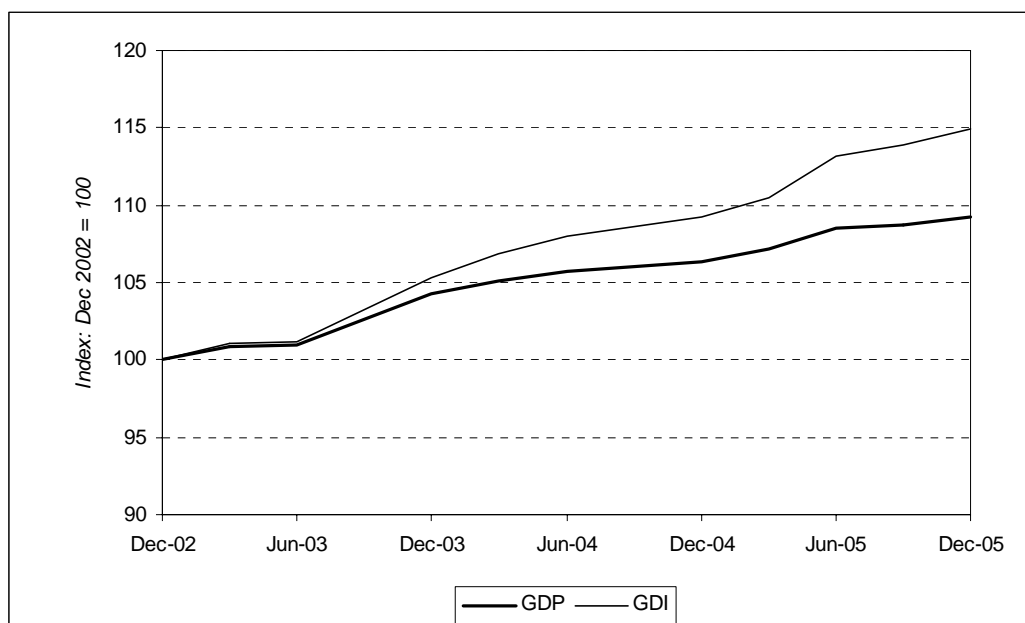
Note: (a) Australian dollar prices. All indices re-based to December 2002 = 100.0.

(b) Includes base metals.

Impacts on the Australian economy

Australian real gross domestic product (GDP) growth has been steady, but relatively subdued, averaging about 2.5 per cent in through-year terms since the end of 2004. However, gross domestic income (GDI), which measures the purchasing power of the total incomes generated by domestic production¹, has grown quite strongly over this period, averaging 4.4 per cent in through-year terms (see Chart 2).

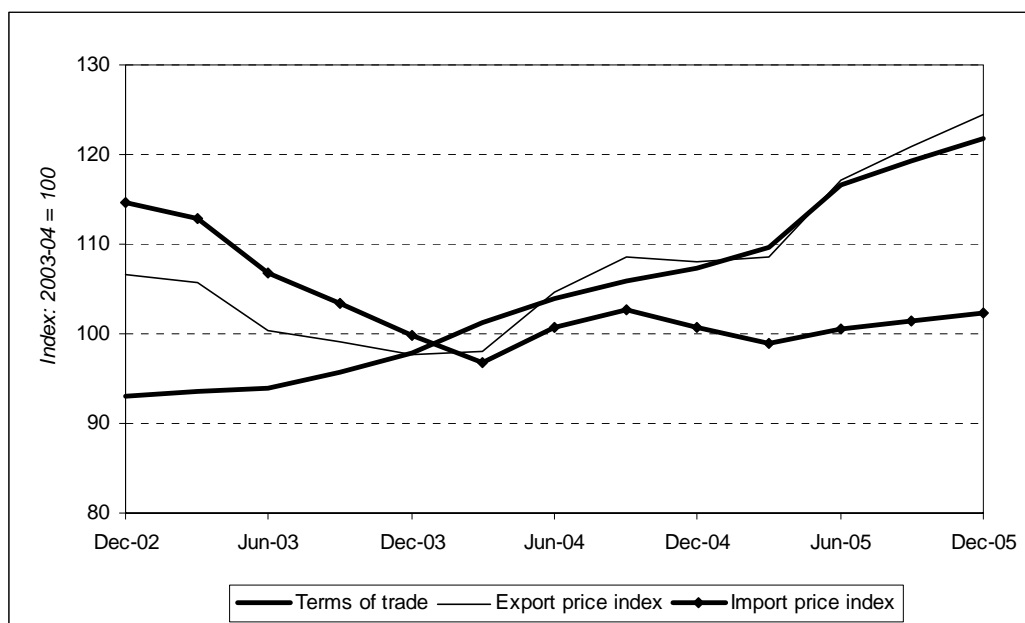
¹ Real gross domestic product (GDP) is a measure of the total volume of goods and services produced in an economy. Gross domestic income (GDI) is equal to real GDP plus the trading gain (or less the trading loss) resulting from changes in the terms of trade.

Chart 2: Gross Domestic Product (GDP) and Gross Domestic Income (GDI)^(a)

Source: Australian Bureau of Statistics

Note: (a) Indexed, chain volume measures.

The divergence between GDP and GDI is explained by an increase in the terms of trade – the ratio of the price of Australian exports to the price of imports. As Chart 3 shows, the terms of trade has increased by about 30 per cent over the past three years, boosting national income by about 5½ per cent (RBA, 2006, p.40). This was initially driven by a 13 per cent decline in import prices over the year to December 2003, due to the increased competitiveness of manufacturing in countries such as China and the appreciation of the Australian dollar. However, since the end of 2003, export prices have increased by 27 per cent, accounting for almost all of the gains in the terms of trade of the last two years.

Chart 3: Export and import prices^(a) and the terms of trade

Source: Australian Bureau of Statistics

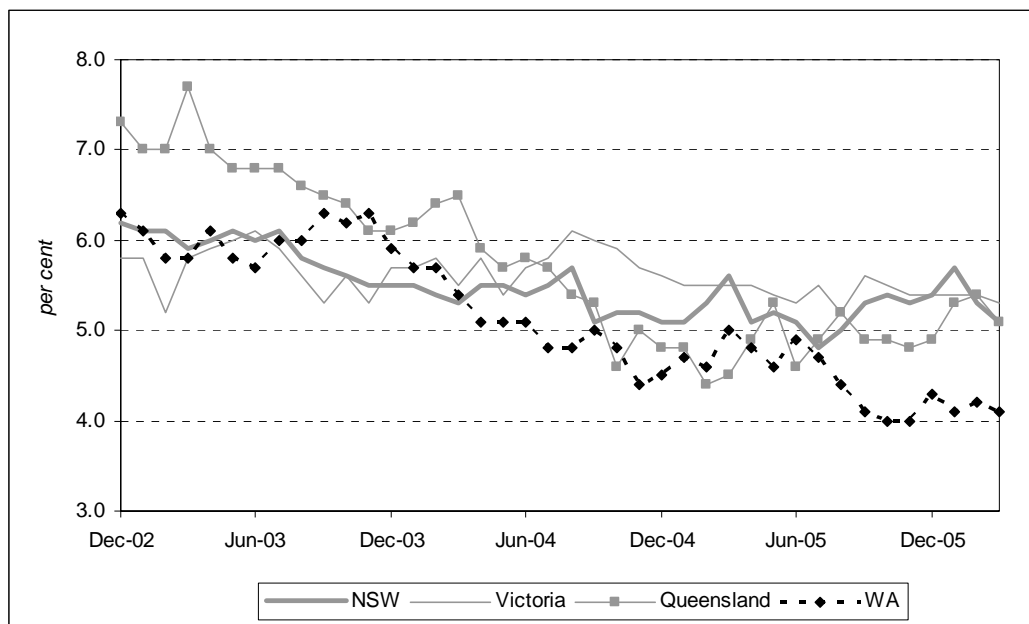
Note: (a) Indices derived from implicit price deflators for imports and exports of goods and services.

Although strong world demand has driven up the price of Australian exports, export volumes have been slow to respond. National export *volume* growth has averaged about 1.4 per cent in annual terms since December 2002. However, the *value* of exports has been growing at double-digit rates since mid 2004. As a result, the purchasing power delivered by a given volume of Australia's production has increased substantially over the past two years. This has facilitated increased demand, including for imports, and income payments to foreign investors (the resources sector has a high rate of foreign ownership), resulting in a relatively large current account deficit.

Although the income gains from the higher terms of trade accrue nationally, different resource endowments across the States imply that there are also some region-specific effects on economic activity.

Regional distribution of commodities

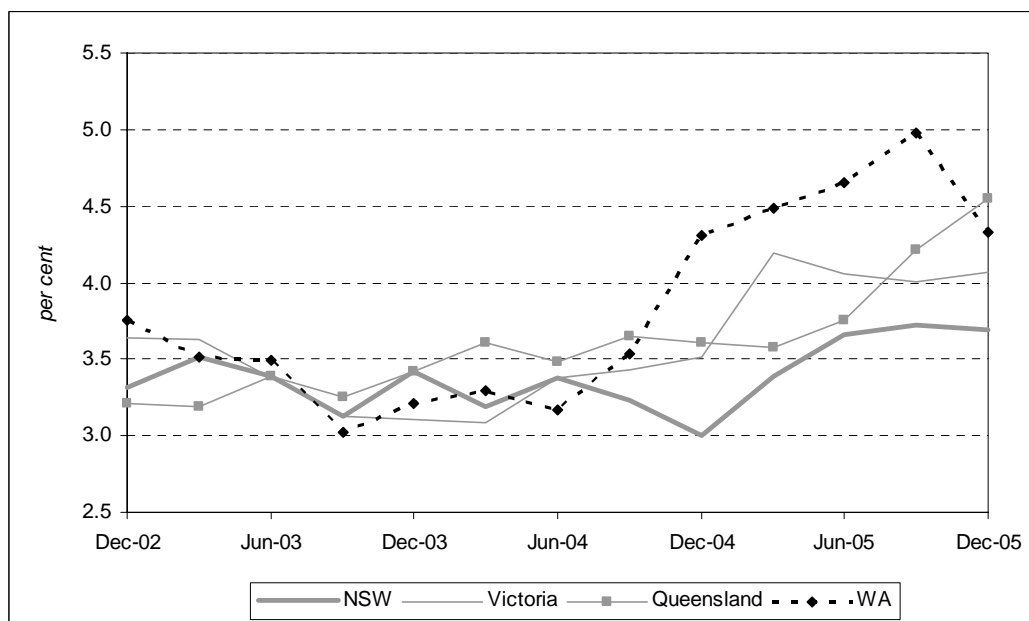
In particular, the past year has seen a significant divergence in economic conditions in Western Australia compared to the other major States. As Chart 4 shows, the unemployment rate has stabilised at between 5 and 5½ per cent for NSW, Victoria and Queensland, while Western Australia's unemployment rate fell below those of the other States in mid 2005, and has since declined to around 4 to 4½ per cent.

Chart 4: Unemployment rate^(a), major States

Source: Australian Bureau of Statistics

Note: (a) Seasonally adjusted, monthly data.

With the unemployment rate at historical lows, wage pressures have emerged in Western Australia. As Chart 5 shows, wages growth in WA has been above that of the other States since mid-2004, although wage pressures are now emerging in Queensland, while Victoria and NSW have seen relatively stable wage growth for the past year.

Chart 5: Wage price index^(a) growth^(b), major States

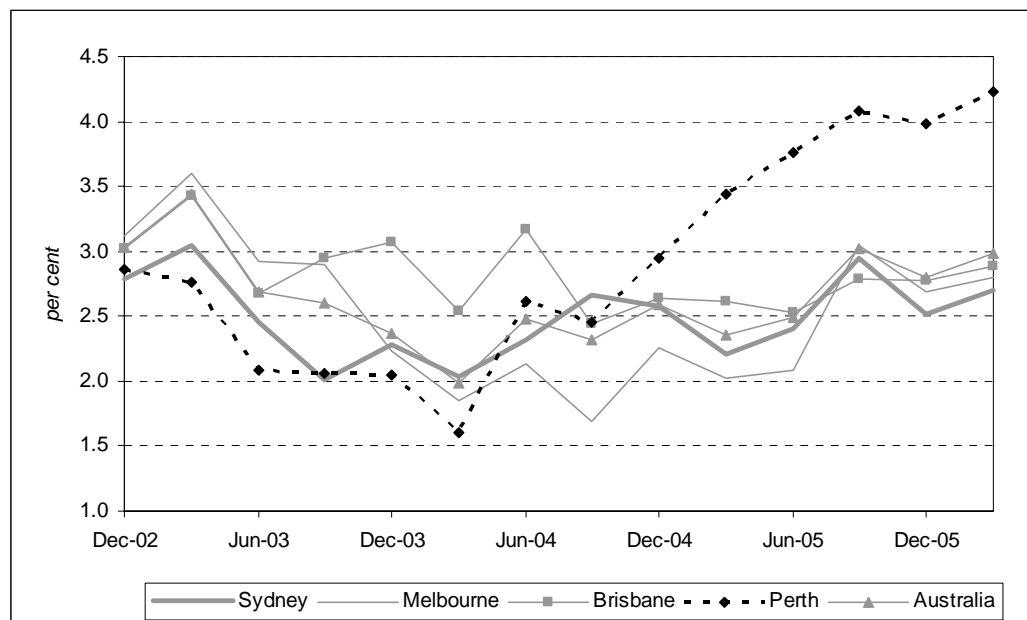
Source: Australian Bureau of Statistics

Note: (a) Private sector, total hourly rate excluding bonuses.

(b) Percentage change on same quarter in previous year.

A similar pattern has emerged in consumer prices (see Chart 6). Since December 2004, inflation in Perth has diverged from the other major capitals and has run at about 1 percentage point higher than the national average in annual terms. Growth in the price of new housing in Perth is responsible for the emergence of this gap.

Chart 6: Consumer price inflation^(a), capital cities^(b)

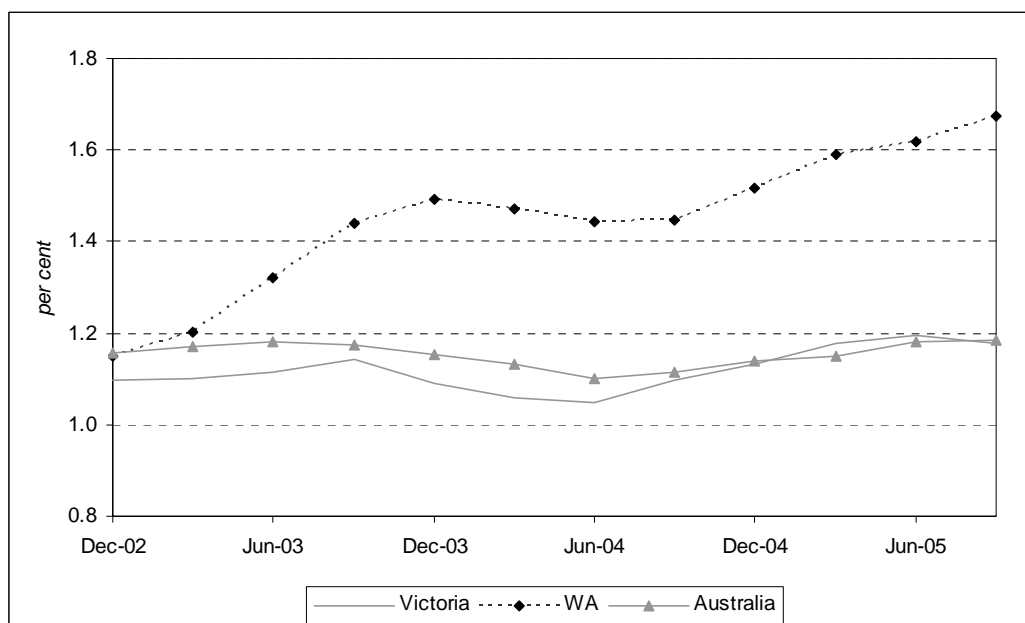


Source: Australian Bureau of Statistics

Note: (a) Consumer price index, percentage change on same quarter in previous year.

(b) The Australian CPI is a weighted average of the eight capital cities.

Demand for housing in Western Australia is being partly driven by interstate movement of labour. Western Australia's rate of net annual interstate migration has shifted from a net loss of around 1 600 people two years ago, to a net gain of around 2 000 people in the year to September 2005. The impact on population growth in Western Australia is shown in Chart 7. This alone is sufficient to add almost 0.25 percentage points to annual GSP growth in Western Australia. In addition, employment in Western Australian mining and construction has increased by 45 000 persons over the past three years, representing close to half of the total employment growth in that State over this period, and private investment in new machinery and equipment in Western Australia rose by 41 per cent over the two years to December 2005.

Chart 7: Population growth^(a)

Source: Australian Bureau of Statistics

Note: (a) Percentage change on same quarter in previous year.

Economic impact

A direct impact of higher commodity prices is to raise the rate of return on capital used in the mining sector. The immediate benefits will be focused in the resource-rich States, due to an increase in mining investment in those States, an increase in the demand for skilled labour and increased mining royalties paid to State governments.

There have, and will continue to be, some immediate positive and negative national effects:

- increased equity prices for, and dividends from, mining companies will raise company tax revenue, household incomes and consumer spending nationally;
- increased supply of investment goods, some of which will be sourced domestically, will be positive for national economic activity; and, on the negative side,
- there will be increased costs for firms that use mining commodities as inputs to their production, and higher consumer prices for commodity-intensive goods such as petrol.

Higher commodity prices also have an important indirect effect. Stronger world demand for Australian mining exports puts upward pressure on the exchange rate, making imports relatively cheaper and Australian non-mining exports less competitive. As Commonwealth Treasury economist David Gruen (Gruen, 2006, p.7) has observed, the exchange rate “plays the role of a shock absorber” by “imposing significant restraint on those export and import-competing sectors, including parts of the manufacturing sector, which are not experiencing strongly rising prices for their output or are not directly exposed to the booming sectors of the economy”. This “Gregory effect” or “Dutch disease” implies that the states with a larger share of agricultural, manufacturing and tourism exports are likely to be adversely affected. The effect was first recognised in the 1970s in the context of an earlier

Australian resources boom (Gregory, 1976), and in light of the impact of North Sea oil discoveries on European economies (Corden and Neary, 1982). At the same time, labour and capital are being absorbed by the resource industries, so non-resource industries are faced with higher labour and capital costs.

Methodology

This paper uses a computable general-equilibrium (CGE) model to estimate the impacts of the commodity price boom. CGE modelling allows the direct and indirect effects of the boom discussed in the previous chapter to be considered simultaneously. The model used is the Victorian DTF version of the MMRF-GREEN CGE model. This section discusses the model and its key assumptions, and describes the “shocks”, in the form of export and import price changes for resource commodities, imposed on the model to generate the results in the next chapter.

The model

MMRF-GREEN is a regional CGE model of Australia, which treats each of the six States and two Territories as an economy in its own right, but within the context of certain overarching national economic constraints. There are four types of economic agents: industries, households, governments and foreigners. The 55 industry sectors identified in the DTF version of MMRF-GREEN can produce a variety of products. Capital is sector- and state-specific and, in each State, there is a single representative household and a regional government. There is also a federal government. Finally, there are foreigners, whose behaviour is summarised by demand curves for international exports and supply curves for international imports. The structure of MMRF-GREEN is documented in detail in Adams, Horridge and Wittwer (2002).

The DTF version of MMRF-GREEN was recently updated by the Centre of Policy Studies. This version incorporates trade in electricity between NSW, Victoria, Queensland, SA and Tasmania in a national electricity market (NEM).

The model was used with the following set-up and assumptions:

- (a) A comparative static framework was used, which compares the effect of the price rise to a base-case of unchanged commodity prices.
- (b) The “short run” impact of the price rise was modelled. The short run is defined as being a period over which:
 - (i) industry capital stocks do not adjust to price changes;
 - (ii) the supply of labour in each state is unchanged; and
 - (iii) labour market equilibrium is achieved by movements in the unemployment rate in each region, with wage rates unchanged.

This is consistent with current circumstances of capacity constraints in the mining sector and diverging unemployment rates between the States.

- (c) Attention was given to the treatment of returns to capital in the resources industries. The model is set up to return the capital income from foreign ownership overseas (i.e. it does not flow through into Australian income). Adjustments were made to distribute the Australian share of after-tax capital income to households across the States according to each State's share of GDP. This reflects the fact that resources companies are primarily owned through the share market, and assumes that households in each State hold a similar portfolio of assets.

Commodity price shocks

The modelling estimates the impact of the price rise from 2003-04 to 2004-05 for the commodities listed in Table 1. Since 2004-05, prices for most commodities have continued to rise. However, as the model is defined in year-average terms, the most recent full-year average price changes have been used. This is also the period in which prices for iron ore and energy resources increased significantly. Export and import prices for each commodity were assumed to increase by the same amount. Therefore, products are assumed to be homogeneous, which is a reasonable assumption for most Australian commodities.

To calibrate the shocks in MMRF-GREEN, changes to foreign-currency export prices were calculated by converting price changes in Table 1 to indices in a common foreign currency (the trade-weighted index). Since the model has a more aggregated industry structure than presented in Table 1, weighted average price increases for seven industries in the model database were calculated by weighting the price change for each industry in Table 1 according to its share of exports in each industry in the model (see Table 2).

Table 2: Estimated change in foreign currency commodity prices

MMRF-GREEN industry	% change in world price	MMRF-GREEN industry	% change in world price
Coal ^(a)	50%	Other Metal Ores ^(b)	24%
Oil	36%	Iron & Steel	40%
Gas	12%	Aluminium	8%
Iron Ore	34%		

Source: DTF calculations based on ABARE data and exchange rates from RBA database.

Notes: (a) Includes steaming and coking coal

(b) Includes uranium, copper, lead, zinc, silver and nickel.

The percentage changes in Table 2 were modelled as commodity-specific price shifts in foreign export demand curves. For completeness, the foreign-currency prices of imports of the same commodities were shocked by the same amounts, although this is not likely to have a significant impact on the results, as Australia imports relatively small amounts of resource commodities.

Caveats

All economic modelling of this type involves simplifying assumptions that impose limitations on the applicability of the results to the real world. The comparative-static nature of the DTF version of MMRF-GREEN model requires that some compromises be made in model set-up. This section discusses how these assumptions might affect the results, and their relationship to real-world observations.

The assumption that industry capital stocks are fixed in the short run is consistent with current capacity constraints in the resources and infrastructure industries in the resource-producing States. However, this assumption implies that investment is unchanged in the short run, which is not necessarily consistent with current strong growth in demand for business investment in Western Australia. Therefore, this simplification means that the results will under-state demand in the resource States. Some of this demand, such as for heavy machinery, is likely to be supplied from manufacturing

industries in other States. Therefore, the results also exclude some second-round effects on non-resource States, which may under-state demand in those States.

Short-run labour market equilibrium assumes that wage rates and the supply of labour in each State do not change. This is consistent with the lack of broad-based wage pressures in the Australian economy, and the recent divergence in unemployment rates across States. However, as discussed earlier, there is some evidence that net interstate migration to Western Australia has increased in the past year, and there are signs of localised wage pressure in Western Australia.

Results

This section presents the results of the model simulation. It should be noted at the outset that the results presented below represent percentage changes in variables compared to what would have happened in the absence of the shocks. Therefore, a negative percentage change may imply a slower rate of growth, rather than an absolute decline. For example, a negative impact on a State's GSP of 0.5 per cent implies that a State which would normally have experienced, for example, 3.5 per cent GSP growth could now be expected to grow at around 3 per cent in that year.

Table 3 shows the simulation results for the impact of the commodity price rises on key macroeconomic variables for each State and Territory.

Table 3: Macroeconomic impact of commodity price increases

	Real GDP/GSP	Real household consumption	Exports (volume)	Employment (hours worked)
	% deviation from baseline			
New South Wales	-0.46	0.39	-6.58	-0.71
Victoria	-0.54	0.39	-6.43	-0.80
Queensland	-0.16	0.39	-1.63	-0.21
South Australia	-0.40	0.42	-5.92	-0.66
Western Australia	0.88	1.13	2.85	1.52
Tasmania	-0.16	0.64	-3.40	-0.24
Northern Territory	2.90	2.39	10.6	4.00
Australian Capital Territory	0.01	0.78	-9.84	0.00
Australia	-0.22	0.49	-2.97	-0.33

Source: MMRF-GREEN simulation

National results

The national impact from the increases in commodity prices of the last financial year is a short-run decline in economic activity (GDP down 0.22 per cent & employment down 0.33 per cent) compared to what they would otherwise have been, while consumption increases (up 0.49 per cent). The lower economic activity is driven by a significant fall in overall exports (down 2.97 per cent).

This result is driven by the relative capital intensity of the resources sector. Commodity exports make up about one third of total Australian exports. While commodity exports increase as expected, this is constrained in the short-term by the capital available to the industry for production. A significant expansion of exports requires additional investment, which is not captured in the modelling and is assumed will only come on-line in the longer term. This effect is particularly strong for the resources industries, which are highly capital

intensive – for example, capital accounts for about 80 per cent of primary factor costs for the coal, oil, gas and iron ore industries, compared to 40 per cent on average across all industries. In contrast, the more labour intensive export industries reduce production in the short term, by shedding labour or reducing their rate of hiring. Hence, national employment is negatively affected.

Higher demand for commodity exports causes the Australian dollar to appreciate by 1.8 per cent in real (price adjusted) terms, reducing the competitiveness of all other goods and services exports. This exchange rate impact appears small in the context of an annual average increase in the TWI of the order of 8 per cent over the past two years. The model results do not incorporate dynamic and expectation effects on the exchange rate, such as those arising in financial markets. Non-commodity exports comprise about two-thirds of all Australian exports and these exports fall by about 10 per cent on average. Thus, overall exports are 3 per cent lower than they would otherwise have been.

Because Australia is a net exporter of commodities, the terms of trade increase by 7.7 per cent. This appears to be a sensible result, considering we are only modelling the rise in commodity prices, and holding other export and import prices constant. The actual rise in the terms of trade was 10 per cent in 2004-05. The model's estimated rise in the terms of trade represents an increase in national income of roughly 1¼ per cent, and results in consumption increasing by 0.49 per cent, despite the fall in economic activity. Higher consumption contributes to a 0.18 per cent increase in imports.

Impacts on industries are as expected. In general the mining industries expand, while most other industries contract. The exporting and import-competing industries outside the resources sector contract by the largest amount. This includes the agriculture sector and the manufacturing sector. One of the few non-mining industries to expand is the "other services" industry, because it sells most of its output to consumers and is mostly non-traded. Some contrasting industry impacts can be seen in Table 4.

These results are consistent with Australia's recent economic experience as described in the first chapter. GDP and employment growth have been relatively subdued over the past year, despite the commodity price boom. It is also consistent with the fact that Australia's current account deficit has widened in the past year. Though the value of Australian exports has increased strongly, due to higher commodity prices, the volume of exports has not yet responded. Domestic demand and import growth have also been relatively strong.

Table 4: Model results from commodity price increases from 2003-04 to 2004-05, industry output

	Animal Agriculture	Iron Ore	Transport Equipment	Financial Services	Other Services
% deviation from baseline					
New South Wales	-1.48	0.00	-4.06	-0.19	0.06
Victoria	-1.51	0.00	-2.59	-0.17	0.05
Queensland	-1.81	0.00	-4.03	-0.13	0.12
South Australia	-1.28	4.90	-2.24	-0.17	0.08
Western Australia	-1.76	8.52	-5.42	-0.04	0.79
Tasmania	-1.33	4.88	-4.28	-0.21	0.22
Northern Territory	-2.86	0.00	-12.70	-1.28	1.54
Australian Capital Territory	-3.06	0.00	-4.17	-0.28	0.21
Australia	-1.60	8.40	-3.23	-0.18	0.17

Source: MMRF-GREEN simulation

State results

In the short run simulations, Western Australia and the Northern Territory are the only States in which economic activity (as measured by GSP) increases, due to the high resource intensity of their industry structure. Resource commodities make up about 80 per cent of Northern Territory exports and 70 per cent of Western Australian exports. Although these States' other exporting and import-competing sectors contract, their relatively small non-resource share in total exports implies that overall their export sectors and economies expand.

In the short run, economic activity contracts in those States without a large mining sector. The modelling results in Table 3 show that Victorian and NSW GSP are about 0.5 per cent lower. Most industries in these States contract, apart from the mining industries. However, even in these States consumption increases due to higher incomes from the resource sector.

The results for Queensland show a small decline in GSP, which appears somewhat surprising at first because it accounts for more than half of Australia's coal exports. However, Queensland also has large shares of agricultural and tourism exports – both of which are sensitive to exchange rate movements - and a fall in these exports outweighs the rise in commodity exports. While Queensland's GSP declines slightly, it still fares better than the national average, and declines by much less than that for NSW, Victoria and SA. It is likely that the second-round impacts of investment in the mining sector, which are not incorporated in this analysis, would have strong positive impacts on Queensland, offsetting the negative impacts on non-mining exports.

The modelling also shows that the development of the National Electricity Market smooths the impact of the terms of trade shock across the States. Victorian electricity industries

gain from additional demand from the national market as energy-intensive industries expand nationally. In addition, as brown coal is generally not exported, Victorian electricity producers are partly insulated from world coal prices and become relatively more competitive when compared to black coal and gas-fired generators.

The results above have shown that the boom in commodity prices from 2003-04 to 2004-05 has taken approximately 0.5 per cent off the level of Victorian GSP in the short run. This is the short-term effect from one year's price rises. Commodity prices have continued to rise significantly in 2005-06, and the increase is likely to be of a similar or greater magnitude to that in the previous year. This implies there could be another 0.5 per cent reduction in the level of Victorian GSP, with the effect being felt a year later. This result can be interpreted to mean that in the short term (ie. the next two to three years), annual Victorian GSP growth has been reduced by up to half of one percentage point in each year.

Long run implications

The long-run impact of the resource boom has not been formally modelled in this paper, as the results would be determined by assumptions about the future path of commodity prices, which are highly uncertain. Instead, this paper has focused on the impact of price changes that have been observed so far in the "real world". This section discusses some of the issues around long-term commodity prices, and their implications for the national economy and the States.

In the medium-term (three to five years), new investment in mining infrastructure will come on line, increasing the supply of commodities from both Australia and overseas. This should serve to pull commodity prices back down to more 'reasonable' levels reflecting the marginal cost of supply. However, the booming BRIC economies (Brazil, Russia, India and particularly China) are likely to keep demand for commodities high, as mineral consumption tends to increase exponentially in the early stages of development. Expansion of supply into higher cost regions implies that prices are likely to remain above pre-boom levels, provided over-investment does not lead to significant excess capacity.

The long-term impact on Australia, and the non-commodity states such as Victoria, will depend on the future path of commodity prices and the future size of commodity exports from Australia's resource-intensive states. There is some evidence from contract prices for coal and iron ore that continued rises in the terms of trade are coming to an end as supply eventually responds (see, for discussion, RBA, 2006, pp.40-42). However, as long as world demand remains strong, new capacity will see Australian commodity export volumes and GDP expand.

In the long run, labour mobility would result in patterns of net interstate migration shifting to favour the relatively resource-intensive States, reducing disparities in unemployment rates and wage rates between the States. The resource States would also attract investment from the rest of the country. In other words, permanently higher commodity prices are likely to have a net positive impact on the size of the Australian economy, but change both the industry composition and regional distribution of economic activity.

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