



MONASH University

**Submission on Support for Industrial Innovation
to the Department of Foreign Affairs and Trade
Review of Export Policies and Programs**

**Prepared by the Office of the Vice-Chancellor
June 2008**

1. Background

The following is a supplement to Monash University's Submission to the Department of Foreign Affairs and Trade (DFAT) Review of Export Policies and Programs. The previous submission highlights the importance of international education as Australia's third largest export industry, and the role that higher education has in promoting human capital development, improving productivity, and enhancing Australia's export and investment performance.

This supplement focuses on a complementary issue: the role for universities in supporting innovation through research and commercialisation partnerships with industry and government. Its key points are that:

- i) *Australia's future export success requires policies to encourage innovative manufacturing and service industries rather than simply relying on continued high demand for primary resources;*
- ii) *Australia must improve its performance in industrial innovation by strengthening linkages between scientific research and export industries; and*
- iii) *Monash University is playing a central role in driving export innovation in Melbourne through partnerships with CSIRO, industry and government to develop a Melbourne South East Innovation Corridor for the country.*

2. Beyond the Resources Boom

Taken at face value, Australia's endowment of natural resources and the record prices that these resources currently command in international markets allow for optimism regarding the nation's future export prospects. The Reserve Bank of Australia reports that Australia's terms of trade rose by approximately 40% between 2002 and June 2008 on the back of strong demand and high prices for our natural resource exports.ⁱ According to the most recent estimates from the Australian Bureau of Agriculture and Resource Economics' (ABARE) latest estimates, Australia's natural resource exports will deliver even greater returns in the future. Commodity export earnings are forecast to increase by 40% to a record \$212 billion in 2008-09. The value of Australia's minerals and energy exports is forecast to reach approximately \$178 billion in 2008-09, compared with an estimated \$120 billion in 2007-08. Earnings from exports of coal and iron ore are expected to rise by 123% and 72%, respectively.ⁱⁱ

But resource boom induced optimism should be tempered with realism. The beneficial effects of the resources boom, along with the success of Australian education exports, have not been matched in other sectors. Overall export growth has declined on average from 8% in the 1990s to 2.5%. The fall has been particularly pronounced in the manufacturing sector, where annual export growth has fallen from 12% in the 1990s to 3% this decade. As Australia's natural resources fuel China and India's industrial development and push the Australian dollar to historic highs, Australian manufacturers have been crowded out by new competitors from these and other emerging economies, with Australian-made goods rendered less attractive to foreign importers by unfavourable exchange rates and businesses pressured by rising interest rates.ⁱⁱⁱ This is compounded by the fact that the benefits of booming resource export markets are not shared equally amongst different regions. Westpac's Chief Economist Bill Evans recently

warned that south-eastern Australia risks falling into recession due to the impact of high interest rates on economic activity.^{iv} Finally, booming demand for imports suggest that the windfalls reaped from our booming commodities sector are being quickly spent.^v As the Issues Paper points out, Australia's Current Account Deficit grew to 7% by the December of 2007.

Resource and energy-driven export growth thus masks the longer-term challenge of how to ensure Australia's long-term export competitiveness, how to build long-term prosperity in areas untouched by the resources boom, and how to weather the uncertain effects that large-scale macroeconomic responses to climate change – such as the introduction of emissions trading in Australia and abroad – will have on Australia's traditional export industries. It is the view of Monash University that coordinated measures to encourage scientific and technological innovation lie at the heart of a coordinated public policy response to these challenges.

3. Playing Catch-Up: Australia's manufacturing innovation report-card

Australia's long-term export success requires Australia build more innovative export industries. On this issue, export statistics present a mixed picture. According to the issues paper, in 2007 Australia's exports comprised 33% resources, 22% services and 21% manufacturing. Analysis of the statistics for manufacturing exports reveals a sector stuck between two development paradigms. While some Simply Transformed Manufactures (STM) remain important sources of Australian export revenue, DFAT figures indicate that 65% of Australia's manufactures exports are Elaborately Transformed Manufactures (ETM).^{vi} Future export policy and procedures should focus on supporting these industries that lie further up the innovation value chain.

Encouraging the growth of innovative ETM exports requires strengthening the nexus between industrial development and academic research. Despite having only 0.3% of the world population, in 2004 Australia produced 3% of the world's innovation (measured by published scientific papers).^{vii} Despite this Australia generates a disproportionately small proportion of global revenue from royalties and license fees for intellectual property. There is significant underutilisation of capacity in the university sector by business and industry. Although business and industry contribute 53% of total Australian research and development income, only 3% of all domestically-based business expenditure on research and development occurs within the university sector.^{viii}

Australia's failure to keep pace in the innovation stakes has been noted internationally. Australia's ranking as a second tier innovator has been endorsed by recent innovation performance indices - the 2006 Global Innovation Scoreboard^{ix} and the World Economic Forum's Global Competitiveness Index 2007-2008^x place Australia well below leading innovator countries. Detailed analysis by the World Economic Forum shows that although Australia ranks highly in institutional and governance issues such as efficacy of corporate boards and quality of reporting standards, we ranked considerably below our overall global ranking (number 19) on capacity for innovation (30), availability of scientists and engineers (34) and the state of cluster development (49).

Industrial comparisons support this negative assessment. Australian Bureau of Statistics show that manufacturing innovation has stagnated, with 39.5% of firms innovating in 2001-03 against 41.7% in 1991-93.^{xi} A 2006 University of Queensland study showed that based on OECD figures, Australia was second last in growth of high and medium

technology exports between 1994 and 2003 with a decline of 7%, behind Turkey, Poland, and the Slovak Republic. The same study also indicated that the share of US patents held by neighbouring Asian nations had increased by 440% between 1990 and 2003, but those held by Australia by only 50%.^{xii} Perhaps most worrying is the lack of emphasis that Australian manufacturers have accorded innovation. Only 27.5% of Australian manufacturers surveyed placed innovation in the top 3 factors driving competitiveness, compared with 63.3% of manufacturers in the European Union.^{xiii}

4. Encouraging Australian export innovation hubs

The low base of business investment in R and D and the shallow level of business-university interactions in Australia highlight the need for strategic government engagement to support stronger links between universities and industry. Small and Medium Enterprises (SMEs) are especially worthy of consideration in relation to the need to strengthen links between universities and business. There are 1.3 million SMEs in Australia accounting for 96% of all businesses.^{xiv}

Monash University is committed to collaboration with government, the CSIRO and industry to promote innovative export opportunities. Monash has a long history of research-led commercial development such as Monash IVF Australia, Biota and Acrux Limited. To take this engagement to the next level Monash University is centrally involved in the planning and development of a Melbourne South East Innovation Corridor. This plan aims to develop the critical mass of resources that exist in or adjacent to Monash's main campus at Clayton in Melbourne's south eastern suburbs, which encompasses:

- Australia's largest university with a comprehensive research and teaching portfolio spread over ten faculties;
- The largest site of the CSIRO, which focuses on materials science and engineering, mineral processing, and health and medicine;
- The Australian Synchrotron;
- The Monash Medical Centre;
- 40% of Victoria's manufacturing capacity in adjacent suburbs;
- The \$45 million Australian Nanofabrication Facility; and
- The Toyota Engineering Design Centre.

Capitalising on the geographical clustering of these resources will enable the consolidation of resources currently distributed across research organisations and SMEs, enhance technology diffusion, and promote the development of new and innovative export manufacturing industries.^{xv} Development will focus on furthering existing capacity in light manufacturing, advanced materials, engineering and medical/ health research excellence through substantive collaborations with CSIRO, the Australian Synchrotron, the State Government of Victoria and the Commonwealth Government of Australia, as well as nearby and distant businesses and industries. This is a substantive step towards the research-led export growth strategies followed by first-tier innovation nations.^{xvi} This vision has attracted significant Victorian State Government support and industry support, including the establishment of a \$30 million trans-Tasman research commercialisation fund which will drive interdisciplinary research at Monash University and allied facilities such as the Australia Synchrotron, Australian Regenerative Medical Institute and the Australian Stem Cell Centre.

5. Conclusion

The vigorous development of innovative export industries can ensure long-term and balanced economic competitiveness for Australia during the current resource and energy export supercycle and beyond. A prerequisite for achieving this goal is redoubled support from State and Commonwealth governments for initiatives that build links between university-based scientific research and emergent ETM export industries. Monash University is committed to this goal through its central role in developing the Melbourne South East Innovation Corridor.

6. References

- i D. Andrews and R. Arculus, 'Australian Exports and Developing Asia', *Reserve Bank Bulletin*, June 2008. http://www.rba.gov.au/PublicationsAndResearch/Bulletin/bu_jun08/aus_exports_dev_asia.html
- ii *Australian Commodities, June Quarter 08.2*, ABARE, Canberra, June 2008.
- iii Andrews and Arculus, 'Australian Exports and Developing Asia.'
- iv T. Colebatch, 'Boom talk followed by gloom', *The Age*, 25 June 2008. <http://www.theage.com.au/national/boom-talk-followed-by-gloom-20080624-2w60.html?page=-1>
- v 'Imports surge but oil demand waning', *Sydney Morning Herald*, 18 June 2008. <http://business.smh.com.au/imports-surge-but-oil-demand-waning-20080618-2ssu.html>; 5439.0 - International Merchandise Imports, Australia, May 2008, Australian Bureau of Statistics. <http://www.abs.gov.au/AUSSTATS/abs@.nsf/ProductsbyReleaseDate/A775D2DBB49F623CCA2568B7001B4591?OpenDocument>
- vi Australian Government, Department of Foreign Affairs and Trade, *Trade at a Glance 2008*. Carew defines ETM as, "finished or near-finished goods with high added value." Edna Carew, *Language of Money*. Allen and Unwin, 1996.
- vii Thomson ISI, 2006, *National Science Indicators Database*
- viii ABS Yearbook Australia 2006, Research and Experimental Development 8112.0 2004-2005, Table 3
- ix Global Innovation Scoreboard (GIS) 2006: Comparative Analysis of Innovation Performance, http://www.trendchart.org/scoreboards/scoreboard2006/pdf/eis_2006_global_innovation_report.pdf
- x World Economic Forum's Global Competitiveness Index 2007-2008, <http://www.gcr.weforum.org/>
- xi *Australian Innovation in Manufacturing: Results from an international survey*, report prepared for the Australian Business Foundation by Mark Dodgson and Peter Innes, 2006, p. 8.
- xii D. Hine et al., 'Is Our Global Science and Technology Built on a House of Cards?', Faculties of Business Economics & Law and Biological & Chemical Sciences, University of Queensland, 2006, <http://www.bacs.uq.edu.au/CurriculumReview/HouseofCards.pdf>
- xiii Dodgson and Innes, *Australian Innovation in Manufacturing*, p. 17
- xiv Small and Medium Enterprise Research Centre, Faculty of Business and Law, Edith Cowan University, <http://www.business.ecu.edu.au/schools/man/smerc.htm>
- xv M. Fujita, P. Krugman and A. Venables, *The Spatial Economy: Cities, Regions, and International Trade*, MIT Press, 2001, pp. 284-5
- xvi *National Innovation Systems: Finland, Sweden and Australia Compared -- Learnings for Australia*, report prepared for the Australian Business Foundation by Goran Roos, Lisa Fernstrom and Oliver Gupta, November 2005, p. 26