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Appendix F – Comparison of other countries' manufacturing policies

Introduction

F.1 A handful of advanced economies came up in discussion during the inquiry as being 'successful' manufacturers from whom lessons might be learned. Table F.1 compares the economies with Australia, on both objective and subjective criteria. The economies are roughly ordered by the frequency with which they were nominated as exemplars.

F.2 Manufacturing looms larger in all the comparison economies than in Australia, although this is partly because many of them have virtually no mineral deposits to mine and limited farmland to grow crops. The smaller economies included, especially those on the European periphery, benefited from the necessity of having a greater export focus.

F.3 Finland and Singapore stand out as apparently being stronger performers than Australia on education and research. Germany and Sweden are also stronger on research despite having schools regarded as weaker than in Australia. Finland and Ireland are highly regarded for their venture capital and all the comparison economies are regarded as being better than Australia at forming links between universities and business.

Table F.1 Comparison of selected economies: manufacturing and economic performance

	Australia	Ireland	Singapore	Finland	Taiwan	Germany	Sweden
Mfg employment							
% of total[1]	11	14	17	18	27	22	15
% change[2]	-4	11	0.9[3]	2	1.1	-11	-14
Mfg output							
% of GDP[1]	12	27	28	22	21	23	20
Recent growth rate[4]	1.6	5.1	5.2	1.9	n.a.	1.0	2.7
Mfg exports							
% of goods exports[1]	25	86	81	84	94	83	79
R&D							
Spending / GDP[5]	1.8	1.2	2.3	3.5	n.a.	2.5	4.0
Personnel numbers[6]	1.9	2.4	3.5	6.1	3.9	3.6	5.4
Basic research[7]	13th	24th	5th	10th	30th	8th	19th
Research quality[8]	16th	15th	10th	7th	21st	6th	8th
Corporate spend[9]	28th	15th	11th	6th	12th	4th	5th
Uni-business links[10]	25th	19th	8th	3rd	7th	5th	2nd
Education							
Science teaching[11]	24th	30th	1st	5th	6th	36th	32nd
Science teaching[12]	29th	16th	1st	2nd	10th	34th	37th
Overall teaching[13]	12th	6th	2nd	1st	9th	33rd	24th
Venture capital							
Venture capital[14]	15th	7th	14th	3rd	13th	27th	12th
Venture capital[15]	15th	7th	13th	4th	24th	16th	11th
Average income							
GNY per head[16]	30.6	34.7	29.8	31.2	n.a.	29.2	31.4

Sources: *OECD, Labour Force Statistics 1985–2005, 2006; Ministry of Manpower, Singapore, Statistics, Employment 1996–2005; Directorate-General of Budget, Accounting and Statistics Taiwan, Statistical Yearbook of The Republic of China 2005, 2006; World Bank, World Development Indicators 2007; Forfás Ireland, Forfás Annual Report 2006; IMD, World Competitiveness Yearbook 2006; World Economic Forum, Global Competitiveness Report 2006-07; Agency for Science, Technology and Research Singapore, National Survey of R&D in Singapore 2005, 2006; ABS, Research and Experimental Development 2004–05, cat. no. 8112.0; Taiwan Economic Statistics, March 2007.*

1 2005.
2 1995–2005.
3 1996–2005.
4 Annual average percentage change, 2000–2005.
5 Gross expenditure on R&D as per cent to GDP, 2004–05.
6 R&D personnel (full-time equivalent) in business per thousand people.
7 Ranking out of 61 economies for whether basic research enhances long-term economic development from IMD survey.
8 Ranking out of 125 economies, WEF survey: quality of scientific research institutions (universities and government).
9 Ranking out of 125 economies for company spending on R&D from WEF survey.
10 Ranking out of 125 economies for business collaboration with universities on R&D from WEF survey.
11 Ranking out of 61 economies for whether science is sufficiently emphasised in schools from IMD survey.
12 Ranking out of 125 economies for whether schools sufficiently emphasise mathematics and science from WEF survey.
13 Ranking out of 125 economies on how education system meets the needs of a competitive economy from WEF survey.
14 Ranking out of 61 economies for availability of venture capital from IMD survey.
15 Ranking out of 125 economies, WEF survey: can entrepreneurs with innovative but risky projects find venture capital.
16 Gross national income per person, 2007, purchasing power parity basis, thousands of US dollars equivalent.

Ireland

F.4 Ireland was often mentioned during the inquiry as the exemplar of successful manufacturing policy. Among the OECD economies it is one of a few where manufacturing employment has increased. High-tech manufactures are the highest proportion of manufacturing exports of any OECD economy. Overall economic growth was also very impressive, earning it the name of the 'Celtic Tiger'.

F.5 Ireland stands out as having a concerted and clear policy of developing its manufacturing sector. However, there were a number of aspects of Irish policy that contributed to this success and there is a range of opinion about the relative importance of them. There is therefore scope for advocates of differing views to cite Ireland as 'proof' of the efficacy of their preferred approach.

F.6 One reason the Irish economy was able to grow faster than the rest of western Europe was just that it 'came off a very low base'[17]; twenty years ago Ireland's GDP per capita was only around 60 per cent of the western European average (it caught up around 2000). The economic growth literature makes clear that is easier for economies to grow fast when they are 'catching up' than when they are near the frontier, and membership of the EU likely made catching up easier.

F.7 Related to this is that as a (formerly) relatively poor member of the European Union, Ireland received substantial subsidies from the EU. These peaked at around four per cent of GDP in the mid-1990s, but have now ceased—indeed Ireland is about to become a net contributor to the EU budget.[18]

F.8 Ireland also placed substantial emphasis on education. In addition it was able to draw on the Irish diaspora. As Ireland became a more vibrant and wealthier economy, some former Irish emigrants and their descendants brought their skills back to Ireland. The diaspora may also have played some part in attracting foreign investment to Ireland.

F.9 Initially Ireland had relatively low wages by western European standards. While this is no longer true, some of the multinational companies initially attracted by low wages are now embedded in the Irish economy.[19]

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17 Dr S Kennedy, Treasury, *Transcript*, 1 December 2006, p. 5.

18 Professor R Green, private capacity, *Transcript*, 14 November 2006, p. 23.

19 Australian Manufacturing Workers' Union, *Submission no. 34*, pp. iii–iv and 54.

F.10 Ireland's total R&D is not particularly high but it is focussed on high-tech manufactures.

F.11 The Irish Development Agency offers grants of up to 60 per cent of the cost of new investment and R&D following a cost-benefit analysis.

F.12 The Australian Council of Trade Unions (ACTU) cited the Irish Development Agency's description of its strategy:

> IDA Ireland set a new course aimed at contributing to the continued transformation of Ireland to a world-leading, knowledge-based economy at the forefront of technology and business innovation. We formulated a strategy comprising three key elements:
>
> • A focus on winning new investments where the activities were at the quality end of the business value chain.
>
> • The growth and development of our existing clients through the addition of new functions and activities in Ireland, which raised the value-add of the Irish operation and increased its strategic relevance to the parent.
>
> • Actively working to develop the business environment and infrastructure, both educational and physical throughout Ireland needed to support knowledge intensive businesses. Regional development is a special priority in this regard.[20]

F.13 The ACTU also stressed that Irish policies were more successful because they had bipartisan support which gave them continuity for over a decade, and so were more likely to affect business planning.[21]

F.14 Ireland encouraged the development of clusters, and was very welcoming to foreign companies. The Irish Government tendered for providers of Centres for Science, Engineering and Technology (CSETs), offering substantial funding. CSETs were charged with forming innovation partnerships with Irish companies. Regional universities were given the opportunity to link up with the CSETs for research. Most of the contract winners were large multi-national subsidiaries that, as a result of their participation, later became embedded in the local economy.

F.15 Professor Roy Green explained to the committee:

> The Science Foundation Ireland exercise was of a similar approach. It set up a number of competitively funded CSETs—centres for

20 Australian Council of Trade Unions (ACTU), *Submission no. 27*, p. 6, citing *IDA Annual Report* 2004, p. 3.

21 ACTU, *Submission no. 27*, p. 26.

> science, engineering and technology—which had to be part of innovation partnerships with companies. In many cases these were the subsidiaries of very large companies that had sited in Ireland and the resources were used to leverage the expertise of the university with the company on specific R&D projects, which were then pursued through the structure of the company as a whole. Now HP in Galway is a major part of HP's whole R&D strategy, but it did not happen spontaneously. There was a policy instrument.[22]

F.16 Ireland has an agency for attracting investment, the IDA, and a much larger organisation, Enterprise Ireland, encouraging innovation and linkages between companies and researchers through clusters.

F.17 Ireland also lowered its corporate tax from 40 per cent in 1993 to 12.5 per cent. This gave it a temporary advantage over its European competitors. However, the average corporate tax rate in the EU-15[23] fell from around 50 per cent in 1985 to 30 per cent in 2006.[24] A number of Eastern European countries, for example Poland and the Slovak Republic, now have corporate tax rates in the 16-19 per cent range.[25]

F.18 As noted above, it is hard to decide which of these factors has been the most important. The Australian Manufacturing Workers' Union downplayed the importance of taxes and emphasised the importance of industry policy:

> If the [Australian] Treasury thesis had been slavishly followed in other countries, Ireland would still be producing potato chips rather than computer chips.[26]

F.19 The independent commentators appearing before the committee agreed that Ireland's success could not just be attributed to low corporate taxation (or any other single factor):

> And the story around Ireland is not just about a bit of industry assistance or local tax rates. There are a number of things going on there.[27]

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22 Professor R Green, private capacity, *Transcript*, 14 November 2006, p. 18.

23 The EU-15 comprises the 15 countries in the EU before the 1 May 2004 expansion; Austria; Belgium; Denmark; Finland; France; Germany; Greece; Ireland; Italy; Luxemburg; Netherlands; Portugal; Spain; Sweden and United Kingdom.

24 R de Mooij and G Nicodeme, 'Corporate tax policy: entrepreneurship and incorporation in the EU', *European Economy Economic Papers*, European Commission, December 2006, p. 5.

25 OECD, Tax database, *Taxation of corporate and capital income (2006), Table 11.1,* viewed 6 May 2007, < http://www.oecd.org/dataoecd/26/56/33717459.xls>.

26 Australian Manufacturing Workers' Union (AMWU), *Submission no. 34*, p. iv.

Singapore

F.20 Singapore is the only one of 17 advanced economies examined by ACCI where manufacturing's share of GDP increased between 1978 and 2000.[28]

F.21 Singapore's Economic Development Board targeted bioscience, pharmaceuticals and high-tech manufacturing and product design as they realised that assembly jobs in electronics would move to China. Singapore has emphasised being part of global supply chains, and its location on key trade routes and efficient ports have helped achieve this.

F.22 The Board has three key criteria is deciding which firms to assist:

> Knowledge intensity including development of new technology and innovation; tradability which in Singapore's situation means a high export orientation; and value added per worker.[29]

F.23 A stable government and a very weak political opposition mean that firms can be confident that policies will be sustained.

F.24 Singapore is a low tax country. The corporate tax rate is 20 per cent, the top personal tax rate is 21 per cent and the VAT rate is five per cent.

Finland

F.25 Finland is renowned as a relatively small economy with innovative high-tech firms such as Nokia that are competitive around the world. Finland usually ranks very high in rankings of competitiveness.

F.26 Finland is the small state with which Ireland compares itself most. There is a lot of exchange at the civil service level between Finland and Ireland—and Singapore to some degree as well.[30]

F.27 Finland has one of the highest R&D to GDP ratios in the OECD.

F.28 The 'Centres of Expertise Programme' of Tekes in Finland was emphasised by the Australian Electrical and Electronic Manufacturers' Association (AEEMA). Tekes is the main public funding organisation for research and

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27 Mr G Davis, Treasury, *Transcript*, 1 December 2006, p. 5. Similar points were made by Dr P Brain, National Institute for Economic and Industrial Research, *Transcript*, 22 November 2006, p. 38 and Professor R Green, private capacity, *Transcript*, 14 November 2006, p. 15.

28 Australian Chamber of Commerce and Industry, *Submission no. 33*, p. 10. Their sample did not include Ireland.

29 ACTU, *Submission no. 27*, p. 10.

30 Professor R Green, private capacity, *Transcript*, 14 November 2006, p. 24.

development in Finland. The goal of Tekes' funding through loans and grants for the research projects of universities, research institutes and companies is unashamedly to build technological competence in regional clusters.[31]

Taiwan

F.29 AEEMA held up Taiwan as 'the shining blueprint of economic outcomes from science/innovation-based productivity'.[32] In particular, they referred to its 'strategic commitment to the telematics industry'.

F.30 AEEMA opined that:

> The Taiwanese spell out a continuum from idea to research to development to commercialisation to 'industrialisation'. They also seem to understand better than Australia the importance in external industry development of the inter-relationship and bundling of R&D collaboration, manufacture, strategic alliances, investment attraction and export facilitation.[33]

F.31 AEEMA described the Taiwanese approach as seeking to 'create a comparative advantage'. It employed a public sector research institute, ITRI, as the vehicle for technology leverage.

F.32 Taiwan's tax rates are below Australia's, but not dramatically. The corporate tax rate is 25 per cent, the top personal tax rate is 40 per cent and the VAT rate is five per cent.

F.33 Education (especially science) is accorded a priority in Taiwan. The committee heard that:

> We [Australians] cannot get teachers who can teach kids about electricity or gravity, but here are the Taiwanese teaching primary school kids about nanotechnology.[34]

31 Australian Electrical and Electronic Manufacturers' Association (AEEMA), *Submission no. 44*, p. 14.

32 AEEMA, *Submission no. 19*, p. 7.

33 AEEMA, *Submission no. 19*, pp. 7–8.

34 Mr P Laver, Australian Academy of Technological Sciences and Engineering, *Transcript*, 28 August 2006, p. 43.