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BENEFITS OF A FREE TRADE AREA BETWEEN AUSTRALIA AND THE US IN THE CONTEXT OF DEVELOPMENTS IN THE 'NEW ECONOMY'

by

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1.INTRODUCTION

1.1 Introduction

The term 'New Economy' is used in this paper in a broad sense to refer to the combined impact on national economies resulting from:

- globalisation
- developments in Information, Communications Technologies (ICT) including technological and commercial 'Convergence' of telecommunications, broadcasting and Information Technology
- application of ICT to 'old economy' sectors/industries including information intensive industries (such as financial services)
- developments in so-called 'knowledge-based' industries, including biotechnology
- growth of services as a % of GDP and trade.

The paper avoids the controversy over whether or not a 'new' economy has been developing. The fact is that the significant changes referred to above *are* occurring and *are* resulting in dramatic changes to some sectors of the US and Australian economies.

The primary force driving developments in the New Economy is developments in ICT. Box 1 indicates the range of hardware and software industries covered by the term ICT. The impact of ICT is pervasive. Investments in ICT are benefiting the high technology, knowledge-intensive industries, but also 'old' economy firms by enabling cost cutting, energy saving, and reduced waste. Farmers buying genetically altered seeds and sowing them from a tractor guided by a global satellite positioning system are benefiting as are textile firms using the Internet to take orders from customers around the world.

Despite recent setbacks, the forces driving developments in the New Economy are far from exhausted and the transformation to a 'digital economy' is probably only just beginning. There seems little doubt that the New Economy will survive both the collapse of new economy stocks and the cyclical downturn. Technology investments will continue to grow as a host of new technologies are rolled out, including voice recognition, expert systems, wireless systems devices, smart cards; e-books, cheap storage devices; new display devices and video software; intelligent transportation systems; third generation (3G) broadband wireless communication devices, etc. As economic activity shifts from manufacturing toward new technologies and information-based services, the nature of corporate assets is changing. Patents, copyrights, organizational and human capital, customer and employee satisfaction, and other non-material items are becoming increasingly important sources of value in corporations and in the economy. There will be a host of opportunities spawned by these developments. And there are indications that Australia is well positioned to grasp some of these opportunities.

Box 1: Information Communication Technology (ICT) Producing Industries

Hardware Industries	**Software/Services Industries**
Computers and equipment	Computer programming services
Wholesale trade of computers and equipment	Pre-packaged software
Retail trade of computers and equipment	Wholesale trade of software
Calculating and office machines	Retail trade of software
Magnetic and optical recording media	Computer-integrated system design
Electron tubes	Computer processing, data preparation
Printed circuit boards	Information retrieval services
Semiconductors	Computer services management
Passive electronic components	Computer rental and leasing
Industrial instruments for measurement	Computer maintenance and repair
Instruments for measuring electricity	Computer related services
Laboratory analytical instruments	
Communications Equipment Industries	**Communications Services Industries**
Household audio and video equipment	Telephone and telegraph communications
Telephone and telegraph equipment	Radio and TV broadcasting
Radio and TV communications equipment	Cable and other pay TV services

Source: Digital Economy 2000, US Department of Commerce, June 2000, p.23

This paper contends that a Free Trade Area[1] (FTA) between Australia and the US can help boost Australia's prospects for seizing these opportunities. Since the impact of any FTA between the US and Australia is yet to be negotiated and will take some years to impact, it has been necessary for the paper to take a longer term view of the benefits[2] of a FTA. Thus the focus of this paper goes well beyond considerations of the impact of a FTA current trade and investment patterns to the goods and services (many as yet unknown) being generated by the developments in the New Economy.

The underlying message of the paper is that to be able to seize New Economy opportunities in an era of rapid globalization, it will not be sufficient for Australia to continue to be a middle-ranking competitor. Customers are increasingly sourcing products and services globally, making it increasingly necessary to be a world leader with innovative best practice technologies, production processes, products and services. The benefits of linking more closely with the US is that despite the recent sharp slowdown in growth in the US economy (from an annual rate of nearly 5% in 1999-2000 to a current rate of just over 1%), it is at the forefront of developments in the 'New

Economy'. The US is still the world leader in many of the technologies that are impacting dramatically on the world economy, including health, biotechnology, financial services and IT. Moreover, the US possesses the sort of characteristics crucial for success in the New Economy, notably entrepreneurship and innovativeness.

Innovation and entrepreneurship are "dynamic efficiency" imperatives in the New Economy and include the ability of a nation's institutions and firms to continously innovate, learn, and change productively. Indeed, as markets change, technology accelerates, and competition comes not infrequently from unexpected places, such learning, creativity and adaptation have become principal sources of competitive advantage. Enabling and fostering constant innovation becomes crucial[3]. And this could be assisted by a FTA with the US. A closer exposure to world's best practice through a FTA with the US would help accelerate the process of moving to the frontier of developments in the New Economy and in regard to entrepreneurship and innovation.

Closer contact with the US through a FTA can also contribute towards exerting sustained pressure for improved competitiveness in Australia. Foreign Direct Investment (FDI) will help sustain the flow of state of the art technology and in management practices. A FTA with the US will help develop the requirements for sustainable growth and competitiveness in international trade.

Trade and FDI are significant sources of innovative ideas and concepts. A FTA can yield benefits not just in terms of access to US markets (and potentially the NAFTA partners and the Americas). A FTA can also be symbolically important to help dispel Australia's old economy image in favour of a new economy brand/image.

The benefits of a FTA go well beyond the US market. Exposure to intensified competition with US firms can serve to enhance the competitiveness of Australian firms so that they can be better equipped to access other markets in the Asian region. The need to satisfy sophisticated and demanding US customers will equip Australian business with the ability to satisfy customers elsewhere. This will be important well into the future as the technologies of the 'New Economy' are spread further throughout the rest of the world.

Of course, a FTA with the US is not a 'silver bullet' for improving Australia's economic and trade performance. This will require a range of conditions and policies. These include stable and supportive macroeconomic policies, significant liberalisation of product markets, for instance in transport, finance and communications, trade liberalisation; flexible labour markets; and a strong entrepreneurial climate.

Nevertheless, the need to install measures for improvement such as a FTA with the US is pressing. One indication of this is the eroding value of the Australian dollar. It may be true that the Australian dollar is undervalued. Nonetheless, the fact is that the current valuation of the dollar is to some extent a reflection of the perception of Australia's declining competitiveness and attractiveness as a repository of foreign investment. There are also concerns over policy backsliding e.g., in regard to competition policy. A falling dollar means that money / investment flowing out. That in relative terms, Australia is a less attractive place to be putting money/investment. A FTA with the US will help maintain the drive for market liberalisation and pro-competition regulatory reform within Australia. At very least it will make it more difficult policy backsliding to occur.

Australia’s trade and investment relationship with the US is already strong. And the signs are that it will strengthen further. Indeed, Australia's tracking of trends in the US economy - growth of services; impact of technology; use of IT - is striking. This similarity in the pattern of economic development has several implications.

It suggests that like the US, Australia will benefit from developments in the New Economy, including productivity improvements and a host of new products and services. Indeed, Australia is already experiencing such benefits.

It suggests that Australia exhibits the preconditions to quickly adopt technologies and processes developed in the US which is frequently at the forefront of developments in the New Economy. By keeping abreast with such developments, Australia will be better positioned to develop products and services that are competitive in various markets. During the past decade, the composition and direction of Australia's trade has changed as its trading partners have moved along the production chain. Initially Australia mainly exported food and raw materials. However, as Australia’s trading partners have matured, the composition of Australia’s exports have expanded into manufactured products and services.

It suggests that Australia may have enhanced prospects of trade and investment (including through joint ventures and strategic alliances) in the US, particularly through specialisation in niche areas (as Canada, for instance, has done).

1.2 Structure of the paper

Following this introduction, Section 2 discusses developments in the so-called 'New Economy' in the US and also in Australia. The similarities in economic development between the US and Australia are discussed. Also discussed is Australia’s international trade prospects in the context of developments in the New Economy. Section 3 examines the implications of the FTA between Australia and the US in the era of the New Economy. Among the implications considered are the likely impacts of the FTA (including such intangible effects as the impact on Australia’s competitiveness, entrepreneurship and innovativeness) as a result of closer links with the US economy. Section 4 concludes the paper.

2. THE 'NEW ECONOMY' IN THE US AND IN AUSTRALIA

OECD studies[4] indicate that knowledge-based New Economy industries[5] comprise more than 55% of the business in Germany and the US; between 50% and 55% in Japan, the United Kingdom and Canada; and notably almost half in Australia. Both the US and Australia had growth rates that improved in the 1990s compared with the 1980s with several factors contributing to the increase in growth rates:

- capital investment, in particular, investment in ICT
- increased use of labour (with improved labour productivity)
- rising quality of labour (as the educational and skill levels rose)
- greater efficiency in how capital and labour are combined, (leading to improvements in multi-factor productivity).

In recent years, important structural changes have been occurring in the US as a result of:

- the growth of high technology industries, including the production of ICT products and services[6], as well as industries such as biotechnology, medical services and education; and
- growth of the services sector including trade in services;
- the impact of ICT and the Internet on the productivity and operations of traditional industries, with the substantial opportunities and scope this provides for redesigning the structure of firms, markets, institutions, and the economy itself.

In the US, these developments began to yield significant benefits by the mid-1990s by way of a higher growth rate, sharply lower prices and increased efficiency. Work conducted by the US Bureau of Economic Analysis) indicates that the direct contributions of high-tech products -- such as computers, software, and telecommunications -- to real GDP growth in 1995-2000 averaged 29% (or 1.20 percentage points) of the 4.1% growth in real GDP.

Work conducted by the OECD confirms that ICT was a major contributor to economic growth in the US and elsewhere. However, while ICT investment accelerated in most OECD countries, the pace and its impact on growth differed widely. ICT investment accounted for between 0.2 and 0.5 percentage points of growth in GDP per capita over the 1980-95 period. Over the 1995-99 period, this contribution increased to between 0.3 and 0.9 percentage points a year, with the US, Australia and Finland receiving the largest boost. The contribution of ICT investment to GDP per capita in Japan, Germany, France and Italy has increased only a little, and accounted for merely about 0.3 percentage points of total growth in the 1995-99 period. Table 1 compares the contribution of ICT capital to GDP growth for eight countries, differentiating between the role of ICT hardware and software. It shows that ICT contributed 0.9 percentage points to US GDP growth, three times more than in Japan, Germany and Italy. Australia and Finland also received large contributions of ICT investment in GDP growth.

A recent report by the OECD[7] highlights Australia, along with the US, Netherlands, Norway, Finland, Denmark and Ireland as economies that led the way in the 1990s in terms of growth and multi-factor productivity.

Australia has certainly been quick to apply ICT technology. In 1999, expenditure on ICT products and services in Australia exceeded US$36 billion. This placed Australia in the top 10 countries in the world. IT spending as a share of GDP and per capita ownership of computers -- 2nd highest in the world. As a percentage of GDP, the 'spend' in Australia was the fifth highest in the world. Moreover, the market is expected to maintain average growth rates of 8.5% per year in the next few years.

Table 1: ICT percentage points contribution to annual average GDP growth, business sector

		US	Japan	Ger-many	France	Italy	Canada	**Austra-lia**	Finland
IT and communications equipment	1990-95	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.2
	1995-99	0.6	0.3	0.2	0.2	0.2	0.4	0.4	0.4
Software	1990-95	0.1	0.1	0.1	0.0	0.0	n.a.	0.1	0.1
	1995-99	0.3	0.0	0.1	0.1	0.1	n.a.	0.2	0.2
Total ICT	1990-95	0.4	0.3	0.3	0.2	0.2	n.a.	0.5	0.2
	1995-99	0.9	0.3	0.3	0.4	0.3	n.a.	0.6	0.6

Note: The estimates are based on a harmonised deflator for ICT investment, adjusting for cross-country differences in methods. The estimates are not adjusted for the business cycle.
Source: OECD.

As Tables 2 and 3 indicate, Australia has not proven to be quite as adept at *producing* ICT. The OECD consider[8] that while the use of ICT is important for growth, having an ICT producing sector is not a prerequisite. While some OECD countries owe part of their expansion to ICT hardware production, others (like Japan) with a strong ICT sector recorded sluggish overall growth. Indeed, the OECD pointed to several countries with high productivity growth that do not have large ICT sectors. Moreover, only a few countries will have the necessary comparative advantages to succeed in ICT output. The OECD considered that "the key to benefiting from ICT is to focus on policies to foster its use, rather than its production." (p. 9)

However, there are concerns that Australia’s ICT ‘import bill’, could cause problems in the future. Certainly imports of automatic data processing machines have increased steadily as a proportion of total imports from 3.7% in 1991 to 4.7% in 2000. Items included in this category are personal computers, storage units (disk drives) and visual display units (monitors).

The US remains Australia’s main source of automatic data processing machines. The value of computer parts and accessories imported has increased by 91% from $1 317 million in 1991 to $2 518 million in 2000. However, their importance as a proportion of total imports has decreased from 2,7% in 1991 to 2.2% in 2000. The US has maintained its position as market leader, even though there has been an increase in competition from Asian countries.

Table 2: Australia's ranking as a producer of ICT goods — world production of ICT goods in 1997. (In millions of US Dollars)

	Electronic data processing	Office equipment	Radio comm. Incl mobiles and radar	Telecomm-unications	Consumer audio & video	Com-ponents	Total ICT
Greece	106	44	66	92	55	37	400
South Africa	174	6	137	434	229	52	1 032
Norway	243	0	322	354	7	146	1 072
Denmark	103	8	291	231	186	758	1 577
Portugal	399	19	137	211	617	608	1 991
Austria	430	47	64	578	658	1 239	3016
Australia	**1 045**	**30**	**746**	**784**	**230**	**376**	**3 211**
India	771	70	554	506	1 689	999	4 489
Israel	830	8	930	1 650	77	1 163	4 658
Belgium	1 927	85	534	969	796	925	5 236
Switzerland	697	83	310	490	2 739	1 202	5 521
Finland	925	5	2 259	1 748	161	624	4 722
Indonesia	1 100	77	437	400	2 139	1 680	5 833
Philippines	800	22	350	320	484	4 608	6 584
Spain	1 536	73	288	2 606	1 247	1 010	6 760
Netherlands	3 436	959	731	718	221	1 921	7 986
Hong Kong (China)	1 895	337	297	568	2 655	2 695	8 447
Canada	3 623	118	1 884	2 826	243	591	9 285
Sweden	218	16	5 124	2 612	7	1 472	9 449
Ireland	7 879	33	318	686	47	1 679	10 642
Thailand	5 732	264	414	541	1 786	3 323	12 060
Italy	5 637	290	1 950	3 623	645	3 940	16 085
Brazil	8 150	268	1 300	1 800	4 734	3 132	19 384
Malaysia	7 544	136	996	1 637	6 355	12 667	29 335
France	7 226	521	9 846	4 743	1 898	6 915	31 149
Chinese Taipei	17 885	51	764	1 473	863	10 331	31 367
Germany	8 423	913	4 968	6 624	2 343	11 217	34 488
UK	15 246	762	7 595	2 826	2 987	7 766	37 182
Singapore	25 000	335	1 284	419	2 357	13 361	42 756
Korea	7 915	339	3 903	2 297	5 669	28 187	48 310
Japan	67 686	6 215	19 248	21 752	18 711	84 380	217 992
United States	**82 391**	**5 058**	**57 551**	**36 151**	**6 435**	**79 212**	**266 798**

Source: Reed electronics Research as reported by OECD, *Information Technology Outlook 2000*, Paris 2000.

Table 3: Australia's Ranking in ICT traded goods in terms of export/import ratios for OECD countries, 1997

Country	**Population (millions)**	**Electronic Industry**	**Rank**	**Office Machinery & Computer Industry**	**Rank**
Iceland	0.3	00.1	27/28	0.27	20/28
Ireland	3.7	2.00		1.66	
New Zealand	3.8	0.16	26/28	0.07	26/28
Norway	4.4	0.46		0.26	22/28
Finland	5.1	1.97		0.75	
Denmark	5.3	0.87		0.43	
Switzerland	7.1	0.51		0.33	
Austria	8.1	0.79		0.35	
Sweden	8.8	1.94		0.30	
Portugal	9.9	0.61		0.13	24/28
Belgium	10.2	0.93		0.71	
Hungary	10.2	0.77		1.35	
Czech Republic	10.3	0.32		0.24	23/28
Greece	10.5	0.18	25/28	0.08	25/28
Netherlands	15.6	1.14		0.91	
Australia	**18.5**	**0.20**	**24/28**	**0.27**	**20/28**
Canada	30.3	0.55		0.55	
Poland	38.7	0.39		0.04	27/28
Spain	39.3	0.55		0.39	
Korea	46.0	1.58		1.74	
Italy	57.5	0.61		0.56	
France	58.66	1.05		0.75	
United Kingdom	59.0	0.93		0.96	
Turkey	63.7	0.23		0.03	28/28
Germany	82.1	1.09		0.59	
Mexico	93.6	1.03		2.19	
Japan	126.2	2.45		1.69	
United States	**266.8**	**0.80**	**12/28**	**0.60**	**10/28**
Average		0.86		0.65	

Source: Main Science and Technology indicators 1999, p.56, OECD 2000.

There has been a very large increase in imports of telecommunications equipment and parts and accessories, particularly since 1998. By 2000, telecommunications equipment accounted for 5.5% of Australia's total imports, compared with only 2.2% in 1991. This can be attributed to the increased use of mobile phones, modems and apparatus for digital line systems and networks.

The Prime Minister's Science, Engineering and Innovation Council[9] (PMSEIC) argues that if Australia is only a purchaser of these technologies then it may not get first access to the latest technology. As a non-producer, Australia will miss out on the benefits of the trade growth in the sector. This is so despite the undoubted improvements being achieved through using ICT in diverse sectors such as banking, stock broking, mining and manufacturing.

Australia *does* produce computing hardware, worth about 3.3 billion in 1999, but it is not a significant producer by international standards. In fact, it has the lowest ICT manufacturing intensity of all OECD countries. It does have, however, significant strengths in applications software and services. As indicated in Table 5, there are about 18,000 ICT firms in Australia, mostly small and medium sized businesses, which earned a combined A$62.6 billion in 1999.

Table 4 also indicates that the number of firms manufacturing ICT fell from 473 in 1996 to 294 in 1999. However, telecommunications companies increased from 410 to 869 and firms engaged in providing computer services increased in number from 9 673 to 14 731.

Table 4: Australia's ICT Sector, 1996 and 1999

	No. of businesses		**No. employed**		**Income ($m)**	
	1996	1999	1996	1999	1996	1999
Manufacturing	473	294	19,295	10,542	4,765	3,306
Wholesale trade	2,979	2,177	36,629	39,936	17,326	22,752
Telecommunications	410	869	91,701	74,467	18,733	26,083
Computer services	9,673	14,731	55,028	74,395	8,087	10,474
Total	13,535	18,072	203,653	199,341	48,913	62,616

Source: Australian Bureau of Statistics, 8126.0

Australia's ICT firms are said to have particular strengths in software and services related to mass media (including advanced audio, and animation and cartooning technology), photonics, quantum computing, Internet software, health and education software, and telecommunications applications.

The PMSEIC also counsels against a dependence on MNCs. The Committee argues that while MNCs are an important part of Australia's economy, they can work against the generation of exports in large part because many MNCs only operate sales and service operations (although a number have established local research centres).

One problem Australia faces in generating home grown ICT firms is scale. But this is not an insurmountable barrier since other small countries have been successful in creating competitive advantages in high technology industries, such as Israel, Singapore, Taiwan, Korea, Canada, Finland, Sweden, Ireland and Scotland. Each of these countries has shown that small countries can build their ICT industries through a concerted national effort, including the necessary underpinning educational activity. At any rate, the FTA could help increase effective market size.

Biotechnology

The term "biotechnology" is an umbrella term that covers human therapeutics, agricultural biotechnology, industrial biotechnology, materials science and bioengineering[10] Australia is regarded as having the beginnings of a biotechnology industry, but activity is small relative to countries in Europe and the US. Nevertheless, biotechnology is an area in which Australia has emerged as a successful niche player.[11]

Biotechnology is a vital technology for the 21st Century, providing new approaches to key social objectives and development constraints. It promises a next great wave of technological change, bringing changes as radical and pervasive as those wrought by the IT revolution.

Services

Another important development in both the US and Australia has been the increasing importance of the services sector both as a percentage of GDP but also as a percentage of international trade. This has occurred because of:
- the increasing size, importance and growth of the services sector
- globalisation
- technological and commercial 'convergence' and growth in e-commerce
- lowering of trade barriers through the WTO, etc,.

As Table 5 indicates, the US is the world's top ranking exporter and importer of services. Australia however, ranks at about 18th.

Table 5. Services: Top Five Exporter and Importer Countries

Exports	**Rank**	**1998**	**Imports**	**Rank**	**1998**
		US$ million			**$US million**
USA	1	261 699	USA	1	181 003
UK	2	99 486	Germany	2	126 401
France	3	85 421	Japan	3	111 833
Germany	4	83 423	UK	4	79 196
Italy	5	67 549	France	5	66 716
Australia	18	16 163	*Australia*	17	17 304
Total World		1 361 000	Total World		1 349 000

Source: IMF Balance of Payments Yearbook 1999.

Australia's service sector exports have increased over the past decade from about 19% of total exports in 1987-88 to about 23% in the late 1990s. The increase in service exports represents a shift away from traditional commodities such as rural exports.

Since 1988-89, exports of 'other services' have increased strongly at an average growth rate of some 11% per annum (8% in real terms). By contrast, imports of other services have grown relatively slowly over the last decade at an average growth rate of about 5% per annum (about 1%

in real terms). ('Other services' consist of services such as communications, construction, insurance, financial, computer and information, royalties, other business services, personal, cultural and recreational and government services.)

Table 6 shows that in 1999-2000, Australia's exports of services amounted to $A 28 219 million while imports of services amounted to $A 29 713 million (current prices) showing a trade deficit of $A 1 494 million. The principal services exports were travel services which accounted for 47% of services exports, and transportation services which accounted for around 24% of total service exports. Other significant service exports included other business services (10%), communications services (5%), and insurance services (3%). The most significant contributors to service imports were transportation (34%), travel services (33%), other business services (10%) and royalties and license fees (6%).

More recently, major E-business/high-tech-using products/services have been emerging, including for example, insurance; banking and other financial services; computer and related business services; engineering, design, management consulting and related services.

Table 6: Australia's Services Trade Balance 1999-2000 (current prices)

	Exports ($A million)	Imports ($A Million)	Balance ($A million)
Services Total	28 219	29 713	- 1 494
Transportation	6 865	10 018	- 3 153
Passenger	5 848	3 876	1 972
Travel services	13 141	9 836	3 305
Business	1 040	2 536	- 1 132
Personal	12 101	7 300	4 801
Education-related	3 422	593	2 829
Other personal	8 679	6 707	1 972
Communications	1 374	1 664	- 290
Construction	23	0	23
Insurance	766	902	- 136
Financial	747	527	220
Computer & Information	668	458	210
Royalties & license fees	572	1 805	- 1 233
Other business services	2 852	3 046	- 194
Miscellaneous business			
Professional & technical	2 336	1 883	453
Other personal, cultural and recreational	300	125	175
Government services	736	649	87

Source: ABS Catalogue 5302.0

Australia's overall performance in the New Economy

Box 2 provides an overview of Australia's performance based on OECD analysis. The overview suggests that in many respects Australia is well equipped to benefit from developments in the new knowledge-based economy. And Box 3 confirms this assessment, ranking Australia number 2 in E-readiness on the basis of criteria explained in Box 4, behind only the US.

Box 2: OECD Overview of Australia's Performance in the Context of the Knowledge Based New Economy

Metric	Australia's status
General macro-economy	
GDP – average annual growth rate 1989-98	>3% exceeded OECD, EU averages and also Canada, UK, Germany, US and Japan; ranked 9/29
Employment growth – 1989-98	Similar to US and exceeds OECD, EU, Germany, UK, Japan; ranked 13/29
Knowledge based industries and services	
Real value added growth rates 1985-96	Growth rate for knowledge-based industries ~ 4%
	Exceeded OECD, EU, UK, US, Germany, and
	Japan, ranked 3/20
Information and communication technology	
(ITC) expenditures as %GDP 1997	~8% of GDP, exceeding OECD, EU, US, UK, Japan, Canada, Korea. Ranked 3/27
(eg., hardware/software & telecommunications)	
Computers, Internet and Communications	
Cost of Internet access – July 2000	Ranked 4th lowest of 29; behind Finland, Korea and Italy
No Internet hosts per 1000 people -- Sept 1999	Ranked 9/29
Cellular phones per 1000 people -- June 1999	Ranked 12/29
Secure Web servers per 100,000 people - March 2000	Ranked 3/29
Human resources	
Flow of graduates Science & Engineering 1996 as a % of total employment	>0.2% of total employment, ranked 2 of 29
R&D effort	
Gross domestic expenditure on R&D as % GDP	Mid-ranked of 29 countries
% business expenditure on R&D to total R&D	Mid-ranked of 29 countries
All researchers per 10,000 labour force 1997	Ranked 7/29 countries, behind 6th placed US
Researchers in government and higher education per 1,000 labour force 1997	Ranked 1/29, above all other nations
Total basic research expenditure as % GDP 1997	Ranked 4/18, one above US
R&D expenditure by government plus higher education as % GDP	>0.8% of GDP, better than EU, OECD, Japan, US, Canada, UK, Korea, ranked 7/29
Tax treatment of R&D	
Tax subsidy per one US$ of R&D 1998	>0.1$ subsidy had Australia ranking 4/29
Other types of metric reported:	
Investment in venture capital as % GDP and growth rate of venture capital; high technology industries (eg., chemicals, food, drugs, computers) in international trade; share of intermediate (eg., value added components) in trade with EU countries; foreign direct investment, mergers and acquisitions, shares of foreign affiliates in high technology manufacturing and industrial R&D; international high technology alliances between firms; cross border ownership of inventions; international cooperation in science and technology, etc	Australia scored higher than average or mid-range with most competitor nations in respect of these metrics. The metrics indicate performance on globalisation in high technology or knowledge-based industries. Of interest is the presence of research-performing foreign affiliates eg., manufacturing R&D enabling the host country to benefit from technology transfer. Best performing was Ireland with some 68% of its total manufacturing R&D done by foreign affiliates. Australia was ranked 4/17.

Source: OECD, *Science Technology and Industry Scoreboard 1999 Benchmarking Knowledge Based Economics,* (1999).

Box 3: E-Readiness Rankings

E-readiness ranking (of 60)	Country	E-readiness score (of 10)
	E-Business leaders	
1	US	8.73
2	Australia	8.29
3	UK	8.10
4	Canada	8.09
5	Norway	8.07
6	Sweden	7.98
7	Singapore	7.87
8	Finland	7.83
9	Denmark	7.70
10	Netherlands	7.69
11	Switzerland	7.67
12	Germany	7.51
13	Hong Kong	7.45
	E-Business contenders	
14	Ireland	7.28
15	France	7,26
16(tie)	Austria	7.22
16(tie)	Taiwan	7.22
18	Japan	7.18
19	Belgium	7.10
20	New Zealand	7.00
21	South Korea	6.97
22	Italy	6.74
23	Israel	6.71
24	Spain	6.43
25	Portugal	6.21
	E-Business followers	
26	Greece	5.85
27	Czech Republic	5.71
28	Hungary	5.49
29	Chile	5.28
30	Poland	5.05
31	Argentina	5.01
32	Slovakia	4.88
33	Malaysia	4.83
34	Mexico	4.78
35	South Africa	4.74
36	Brazil	4.64
37	Turkey	4.51
38	Colombia	4.24
39	Philippines	3.98
40(tie)	Egypt/Peru	3.88
42	Russia	3.84
43	Sri Lanka	3.82
44	Saudi Arabia	3.80
45	India	3.79
46	Thailand	3.75
47	Venezuela	3.62
	E-Business laggards	
48	Bulgaria	3.38
49	China	3.36
50/51 (tie)	Ecuador/Iran	3.30
52/53 (tie)	Romania/Ukraine	3.20
54/55 (tie)	Algeria/Indonesia	3.16
56	Nigeria	2.91
57	Kazakhstan	2.76
58	Vietnam	2.76
59	Azerbaijan	2.72
60	Pakistan	2.66

Source: The Economist Intelligence Unit/Pyramid Research. “e-readiness Rankings”, E-business forum.

Box 4: Economist Intelligence Unit E-readiness ranking criteria

The six categories that feed into the EIU rankings (and their weighting in the EIU model) are:

Connectivity (30%): E-business simply cannot function without adequate telecommunications and Internet infrastructure. "Connectivity" measures the access that individuals and businesses have to basic fixed and mobile telephony services, including voice and both narrowband and broadband data. Affordability and availability of service (both a function of the level of competition in the telecommunications market) also figure as determinants of connectivity.

Business environment (20%): In evaluating the general business climate, the EIU screens 70 indicators covering criteria such as the strength of the economy, political stability, the regulatory environment, taxation, and openness to trade and investment. The resulting business environment rankings measure the expected attractiveness of the general business environment over the next five years.

E-commerce consumer and business adoption (20%): Payment and logistics systems form the backbone of this set of criteria. The extent of credit-card ownership is evaluated as well as the existence of secure, reliable and efficient electronic payment mechanisms, the ability of vendors to ensure timely and reliable delivery of goods, and the extent of website developments by local firms.

Legal and regulatory environment (15%): The legal framework governing e-business is a vital factor that can enhance or inhibit the development of electronic trading. The extent of legal support for virtual transactions and digital signatures is considered. Ease of licensing and the ability of firms to operate with a minimal but effective degree of regulation are other criteria.

Supporting e-services (10%): No business or industry can function efficiently without intermediaries and ancillary services to support it. For e-business markets, these include portals and other online intermediaries, web-hosting firms, service providers (ISPs), as well as web site development and e-business consultants. The rankings assess the extent to which local companies and organisations have access to these services.

Social and cultural infrastructure (5%): Education and literacy are necessary preconditions to a population's ability to navigate the web and drive future domestic Internet development. Because entrepreneurship and risk-taking play such an important role in building new e-commerce models, we also assess the national proclivity to business innovation and receptiveness to web content.

E-business leaders: These countries already have most of the elements of e-readiness in place, though there are still some concerns about regulatory safeguards.

E-business contenders: these countries have both a satisfactory infrastructure and a good business environment. But parts of the e-business equation are still lacking.

E-business followers: these countries – the largest group featured in the rankings – have begun to create an environment conducive to e-business, but have a great deal of work to do.

E-business laggards: these countries risk being left behind, and face major obstacles to e-business growth, primarily in the area of connectivity.

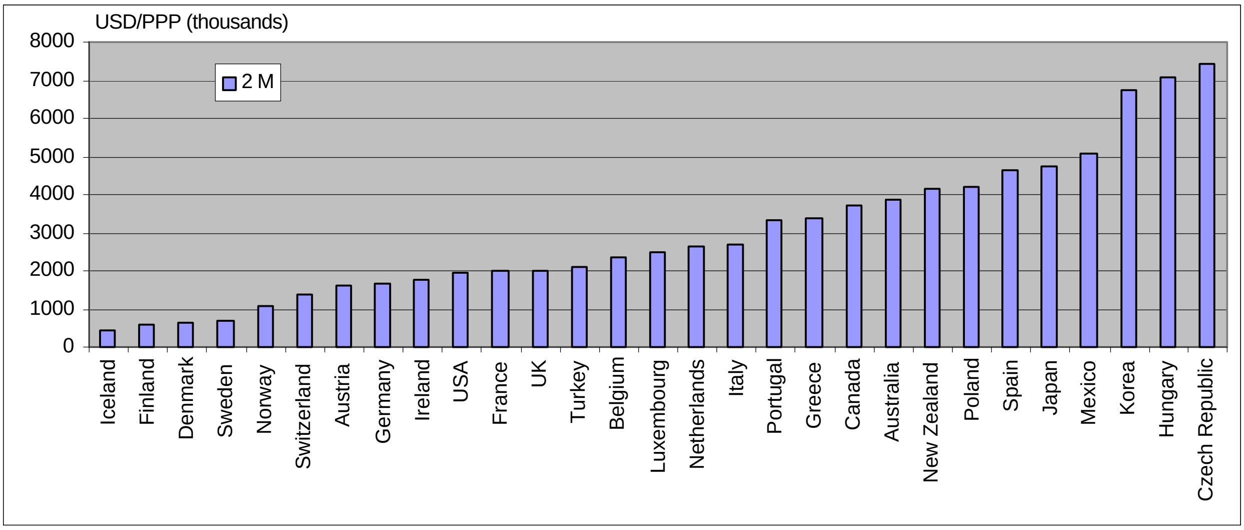
Communications infrastructure

The investment and diffusion of ICT depends not just on the cost of the investment goods themselves, but also on the associated costs of communication and use once the hardware is linked to a network. The US and Australia have developed extensive domestic and international communications networks that facilitate fast, reliable and cost effective access. The relatively earlier liberalisation of the telecommunications sector in the US and Australia resulted in a boost to infrastructure investment and lower prices and consequently a wider usage and diffusion of ICT technologies than those countries that followed later.

Leased lines

The rapid availability of leased lines at cost-oriented prices is important, not least for the provision of cheaper Internet services and the development of e-commerce services. As Figure 1 indicates, an OECD comparison of leased line tariff baskets as at November 2000 (adjusted for purchasing power) ranked prices in the US 10th and prices in Australia 21st among 29 OECD countries.

Figure 1. Comparison of OECD Leased Line Tariff Baskets, November 2000 (in USD/PPP)



Note: VAT is excluded.
Source: OECD

Growth in Internet use

Table 7 indicates that the US is well ahead in terms of growth in Internet use and predicted to remain so. New Zealand ranks second and a cluster of countries ranks third, including Australia, Canada and Singapore.

Table 7: Growth in Internet Use in the Asia Pacific 2000-2003

Projected Internet Penetration for Individuals 2000-2003 (per cent)		
	2000	**2003**
Australia	**34.3**	**62.1**
Brunei	1.5	2.5
Canada	40.9	62.1
Chile	3.1	5.8
China	0.7	1.6
Taiwan	21.7	47.1
Hong Kong	23.7	47.5
Indonesia	0.2	0.6
Japan	15.4	27.1
Korea	20.2	58.6
Mexico	1.3	2.7
Malaysia	5.6	17.5
New Zealand	29.8	65.3
Papua New Guinea	0.1	0.2
Peru	1.5	4.0
Philippines	4.0	1.8
Russian Federation	1.8	6.9
Singapore	39.7	62.3
Thailand	1.3	3.2
United States	**44.5**	**71.0**
Vietnam	0.1	0.5
Total Number of Users (millions)	197	388

Source: Australian Department of Foreign Affairs & Trade (DFAT) based on projections made by DFAT, ITU and Goldman Sachs.

As Table 8 indicates, as of December 2000, Australia ranked 13th of OECD countries in terms of broadband access with the US ranking 3rd.

Looking ahead, 3G mobile broadband service will be important and will further stimulate changes in the New Economy by providing mobile Internet access. Australia has avoided very high auction prices and should seize the opportunity for first mover advantages by accelerating service provision. In Japan there are 24 million subscribers to NTT DoCoMo's i-mode service. This is evidence that there is consumer interest in the sort of service 3G mobile will provide. Indeed, contrary to recent scepticism, 3 G mobile is a reality, and there are already some 4,000 people in Japan who are currently using it. Content providers will be very important in a 3G world and Australia has demonstrable competitive advantage in content provision (as evidenced, for example, by its success in the film industry).

A recent OECD study[12] shows that the US had the highest number of secure servers per million inhabitants with Australia in third ranking (behind Iceland). The study indicates that barriers to entrepreneurship are lower in Australia and in the US than in many other OECD countries (OECD 2001, p. 18)

Table 9 indicates that in purchasing power parity terms, Internet access prices were 3rd lowest in the US, and 8th lowest of all OECD countries in Australia. Figure 2 indicates the correlation between the price of Internet access and Internet host penetration. The US has low Internet

Table 8: OECD Comparison of Broadband Access Lines per 1000 inhabitants (Dec 2000)

Country	DSL	Cable Modem	B2 (Ethernet service)	Total
1. Korea	5.88	3.32		9.20
2. Canada	1.29	2.62		3.91
3. United States	**0.89**	**1.36**		**2.25**
4. Austria	0.48	1.22		1.70
5. Netherlands	0.09	1.58		1.68
6. Belgium	0.42	1.00		1.42
7. Sweden	0.45	0.62	0.14	1.21
8. Denmark	0.49	0.56		1.05
9. Iceland	0.70	0.00		0.70
10. Finland	0.29	0.29		0.58
11. Japan	0.01	0.49		0.50
12. Switzerland	0.06	0.38		0.43
13. Australia	**0.05**	**0.34**		**0.39**
14. Norway	0.01	0.34		0.34
15. France	0.11	0.21		0.31
16. New Zealand	0.25	0.02		0.27
17. Portugal	0.01	0.24		0.25
18 Germany	0.24	0.00		0.24
19 Spain	0.12	0.02		0.14
20 Czech Republic	0.00	0.10		0.10
21 United Kingdom	0.05	0.03		0.09
22 Italy	0.05	0.00		0.05
23 Hungary	0.02	0.03		0.05
24 Mexico	0.00	0.02		0.02
25 Ireland	0.01	0.00		0.01
26 Greece	0.00	0.00		0.00
27 Luxembourg	0.00	0.00		0.00
28 Poland	0.00	0.00		0.00
29 Slovak Republic	0.00	0.00		0.00
30 Turkey	0.00	0.00		0.00

Notes: Number of DSL and cable modem lines installed are per 100 inhabitants as of 1 January 2001. B2 is a Swedish broadband provider that provides broadband access to urban areas using technology that bypasses the local loop. Lines are per 100 inhabitants.
Source: OECD

charges and the highest penetration, while Australia also has low prices and ranks about middle in terms of penetration.

Figure 3 shows that in terms of the location of multimedia content, the US again ranks first, with Australia among the leaders (along with Sweden, New Zealand and Canada.

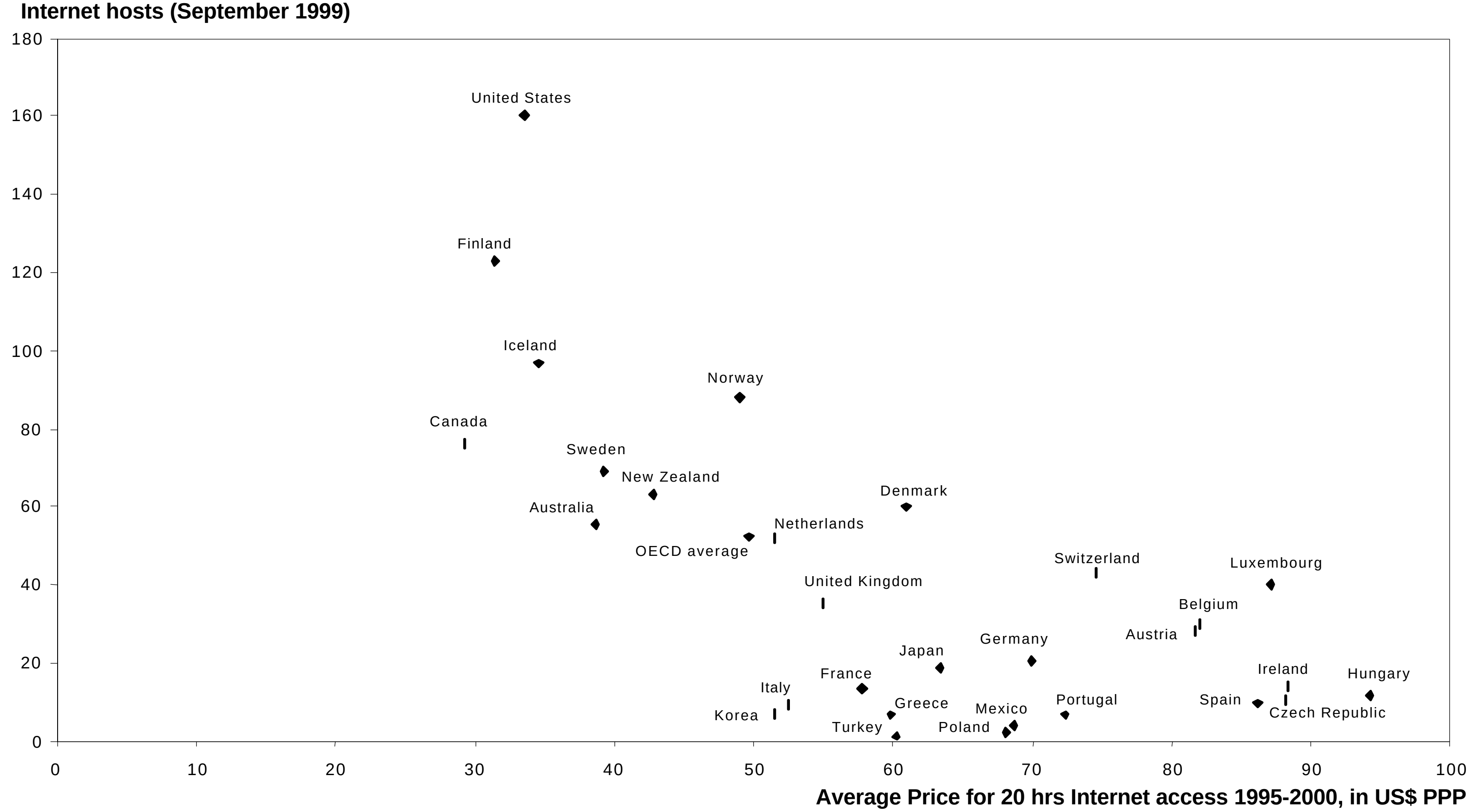
Table 9. OECD Internet access basket for 30 hours at peak times using discounted PSTN rates, including VAT, September 2000

	PSTN fixed charge		PSTN usage charge		ISP charge		Total	
	US$	PPP	US$	PPP	US$	PPP	US$	PPP
Finland	11.55	11.41	17.15	16.95	7.26	7.17	35.97	35.53
France	11.64	11.19	0.00	0.00	23.72	22.81	35.36	34.00
United States	14.29	14.29	3.50	3.50	16.45	16.45	34.23	34.23
Italy	12.43	13.97	18.52	20.81	0.00	0.00	30.96	34.79
Korea	2.42	3.90	15.70	25.32	3.77	6.09	21.89	35.31
Canada	17.11	20.61	0.00	0.00	12.63	15.22	29.74	35.83
Mexico	17.01	23.62	0.00	0.00	8.88	12.34	25.89	35.96
Australia	8.55	9.71	2.78	3.16	21.60	24.55	32.92	37.41
Turkey	2.11	3.83	6.58	11.96	12.28	22.33	20.96	38.12
Japan	18.45	10.61	34.07	19.58	21.77	12.51	74.29	42.70
New Zealand	17.73	22.73	0.00	0.00	17.07	21.89	34.80	44.61
Iceland	7.30	5.57	39.72	30.32	12.32	9.41	59.35	45.30
Greece	7.95	9.82	12.44	15.36	17.28	21.34	37.68	46.52
Germany	12.42	11.94	27.02	25.98	9.96	9.58	49.40	47.50
Sweden	12.07	10.14	41.84	35.16	2.76	2.32	56.67	47.62
Norway	19.17	14.52	37.71	28.57	11.82	8.95	68.70	52.05
Spain	11.55	14.08	38.95	47.51	0.00	0.00	50.50	61.58
OECD average	13.63	15.84	30.27	32.94	11.63	13.78	55.53	62.57
Netherlands	15.37	15.84	46.10	47.53	0.00	0.00	61.47	63.37
Ireland	15.40	16.56	30.94	33.26	15.04	16.17	61.37	65.99
Denmark	15.81	12.35	69.09	53.98	0.00	0.00	84.91	66.33
Switzerland	15.36	11.72	72.98	55.71	0.00	0.00	88.34	67.44
United Kingdom	19.12	16.48	65.94	56.84	0.00	0.00	85.06	73.32
Austria	17.07	16.41	67.86	65.25	0.00	0.00	84.93	81.66
Luxembourg	13.39	13.39	0.00	0.00	70.24	70.24	83.64	83.64
Portugal	12.79	17.53	34.96	47.89	18.93	25.94	66.69	91.35
Poland	5.88	10.89	47.65	88.25	0.00	0.00	53.54	99.14
Belgium	15.85	16.18	87.19	88.97	0.00	0.00	103.05	105.15
Czech Republic	4.82	11.22	45.14	104.98	12.35	28.73	62.32	144.93
Hungary	39.12	88.91	13.20	30.01	20.19	45.90	72.52	164.81

Note: PSTN fixed charges include monthly rental fee and additional monthly charges related to discount plans, if applicable. Includes 30 one-hour calls. In France and Luxembourg, ISP and PSTN usage charges are bundled and included under the ISP

Source: OECD, http://www.oecd.org/dsti/sti/it/cm/

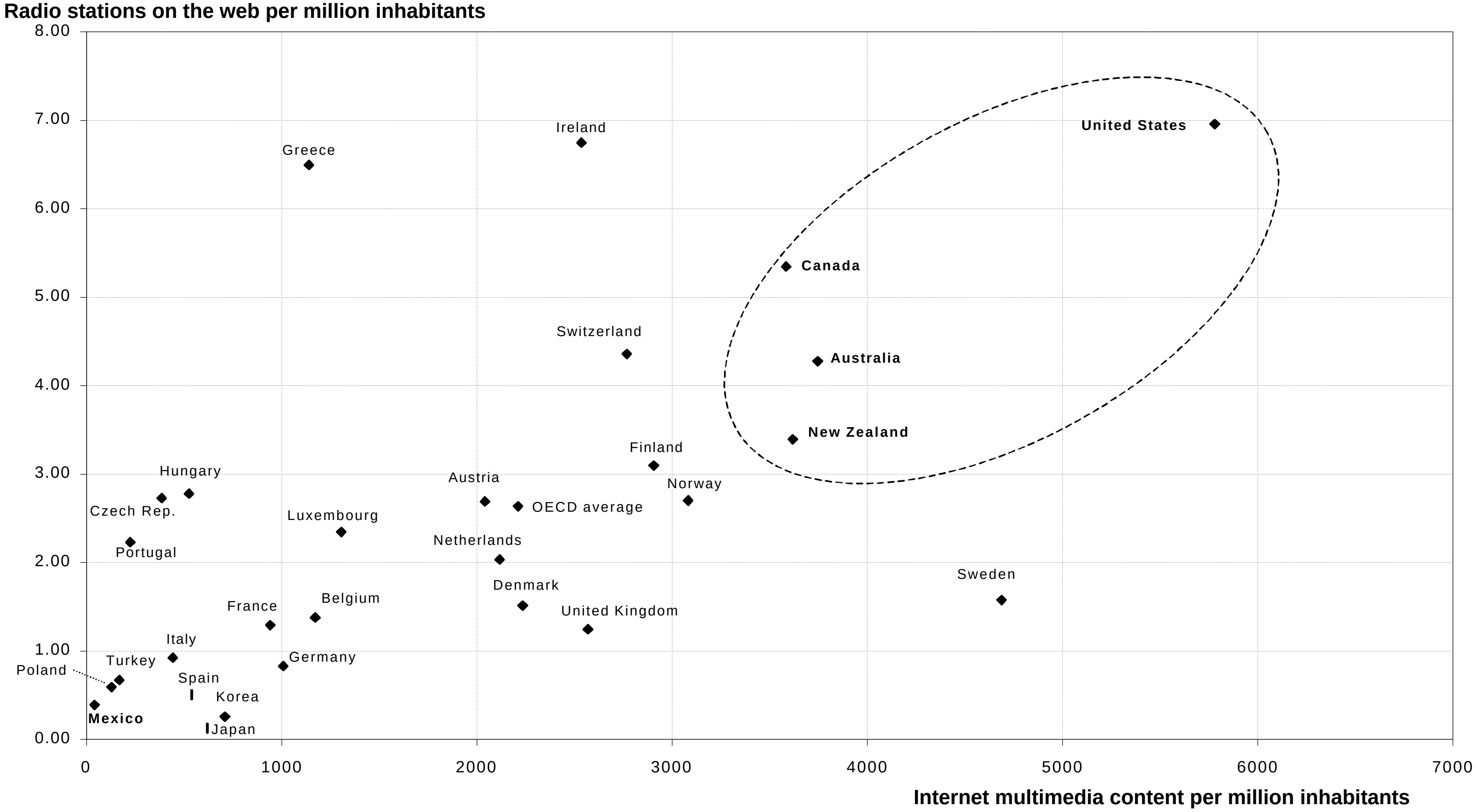
Figure 2: Average price of 20 hours of Internet access (1995-2000) and Internet host penetration



Note: Data on hosts for Luxembourg is from mid-1999. Internet access costs include VAT.

Source: OECD (www.oecd.org/dsti/sti/it/cm) and Telcordia Technologies (www.netsizer.com)

Figure 3. Location of Multimedia content in the OECD area



Source: OECD, 2000.

Competitiveness

In recent years, the US has been ranked as the world's most competitive economy by the IMD Survey of Competitiveness (Table 10). As the Table indicates, Australia ranks in 11th place (out of the more than 50 countries ranked) in 2001. Notably, Australia was in 14th place in regard to the 'business efficiency' criterion while the US was again in first place. This relative ranking between the two countries is referred to later in making the case for Australia to develop a closer relationship with the US towards the aim adopting some of the skills and processes of US business efficiency.

Table 10: The US and Australia in the IMD Competitiveness Ranking

	2001	**2000**	**1999**	**1998**	**1997**
Overall Competitiveness					
Australia	11	10	11	12	15
USA	1	1	1	1	1
Economic performance					
Australia	28	24	20	17	15
USA	1	1	1	1	1
Government efficiency					
Australia	5	6	6	7	14
USA	8	8	10	5	7
Business Efficiency					
Australia	14	14	14	18	18
USA	1	1	1	1	1
Infrastructure					
Australia	6	8	11	9	18
USA	1	1	1	1	1

Source: IMD World Competitiveness Ranking 2001

3. LONGER TERM AND BROADER IMPLICATIONS OF AN US-AUSTRALIA FTA

As noted earlier, the prospective benefits of a US-Australia FTA benefits perceived in this paper are not so much the short term effects of trade and investment with the US. Rather there are seen to be longer term benefits of a FTA in preparing Australia for trade and investment not only with the US but with other countries well into the future. While it is of course impossible to predict the extent to which benefits will materialise, and accordingly they should not be exaggerated, neither should they be underrated.

3.1 Implications for exports and imports

There could be improved trade in goods and services and this could embody efficiencies and promote competition that improves productivity[13]. The US is a large market of more than 270 million of wealthy consumers providing critical mass and a wealth of opportunity. Improved access to the US market could certainly help address a significant disadvantage Australia faces in producing goods and services for the New Economy -- the lack of economies of scale. It is frequently pointed out that there are other countries producing high-technology products such as Canada, Denmark, Finland and Switzerland that also face the problem of small domestic markets. But it is notable that Canada has had the US as a very accessible market (through a FTA) and Switzerland has had access to the German market. So easier access to the US might go some way towards removing the disadvantages of scale (especially if this also removes barriers to the Americas).

Trade between Australia and the US is already strong, constituting almost 15% of Australia's total trade. The US was the second largest destination for Australian exports in 2000 and the largest source of imports. And ICT products already have only low trade barriers, but a FTA could help neutralize advantages provided to other countries on the basis of their trade agreements with the US. Moreover, there are also less transparent barriers in the implementation of market liberalisation. For instance, in regard to telecommunications, installing appropriate legislation with the right regulatory rules is only the first step in providing a level playing field. The pro-competition rules need to be applied promptly and vigorously.

The WTO is lowering barriers to trade but allows many exemptions. For example, governments can choose the services in which they make markets access and national treatment commitments. They can also limit the degree of access and national treatment they provide. Issues in the services area that require further negotiations include subsidies, government procurement, qualification requirements, technical standards, licensing arrangements and regulatory transparency.

A FTA might help the following issues to be addressed:

- discrimination in favour of domestic firms, eg., tax rate or the application of regulation;
- restrictions on investment;
- limitations on the number of foreign service providers or asset and transaction limitations; and

- non-transparent procedures or unnecessary delays in such things as licensing.

In recent years, trade has also increasingly affected sectors of the economy previously considered non-tradable, thereby strengthening competition and the diffusion of new concepts, technologies and ideas to these (services) sectors, and contributing to improved performance. In several services, such as retailing and retail banking, expansion at international level is important when a firm faces saturated domestic markets. It also allows companies to gain access to new knowledge, innovative concepts, services and ideas, and to new technologies.

This could be important because what is often under-recognised in the IT deficit debate is that Australia is a successful provider of IT or knowledge services[14].

3.2 Foreign Direct Investment

FDI is a very important influence on trade and economic development and performance. The ability to attract FDI is identified as the basis for much of Ireland's success[15] (OECD 1999). The short-term effect on investment flows of a free trade agreement with the US may also not be large. The investment relationship is already more intense than the trade relationship with the US and seems unlikely to be improved by a 'free trade agreement'. The US is already the largest single investor in Australia. Furthermore, US firms are dominant among the firms that have established 'regional headquarters' in Australia. Outward investment by Australian firms in the US is already active and it does not seem likely to be much affected by a free trade agreement.

The US is already Australia's largest inward investor, with the stock of investments almost doubling in nominal terms since 1990. US firms continue to be major investors in Australia and to develop its regional interests from a regional headquarters base in Australia. An important consideration though is that Australia is located a long way from the key global centres of economic activity. A FTA with the US would help put Australia on the horizon of US investors.

The FTA can increase networking and alliances between Australian and US firms and this can enhance economic performance. Collaboration has become an important factor in the discovery, application and diffusion of technologies. Networking can take many forms: research joint ventures, research contracts or cross-licensing agreements. Technology alliances and related co-operative arrangements allow firms to share costs, extend product range and access knowledge and markets. Networking can be especially important for small firms, as it offers a way to combine the advantages of small size, such as flexibility, with economies of scale at the network level.

Smaller countries such as Australia need to have technology alliances with a large foreign firm that can take products globally, while reaping economies of scale. The facility to make such alliances becomes even more important where the prospects to develop local clusters are minimal. Access to highly specialised skills and knowledge, institutions, rivals, related businesses, such as sophisticated consumers.

3.3 Efficiency and enhanced competitiveness

Competition brings pressures to increase efficiency and explore new ways of doing business, including the adoption of new technologies. Firms are more likely to invest in efficiency-enhancing technology and in innovation if competition and regulatory exert pressure on them to do so. Competition is also important for lowering costs, a key factor in the diffusion of technologies, such as ICT and the Internet.

3.4 Impact on innovation

Comparative advantage is dynamic not static making it necessary to seek to continously adapt the use of technology through innovation[16]. In Australia, there seems a lack of the skills, experience and appetite for risk taking and entrepreneurship crucial to success in the New Economy[17]. The FTA with the US could help to bring about improvements in this regard in Australia.

3.6 Venture capital

It is not enough to simply have an innovative idea. There must be the ability to turn ideas into commercially viable projects. Venture capital can significantly promote the link between knowledge and profitability. The economies that can sustain success in fostering and commercialising innovations will be the ones that will succeed in the international market place.

The task is get US venture capitalists more interested in Australian projects and an FTA could help in this regard.

4. CONCLUSION

The structural changes taking place in technology intensive industries.including those occurring in telecommunications and biotechnology, the Internet, ICT, the development of knowledge-intensive industries, will boost Australia's developing strengths as a technologically abreast knowledge-based economy.

This will be critically important in underpinning Australia's efforts to progress from being a middle-ranking performer in terms of competitiveness. This is important because in a globalised economy it is not sufficient to be a middle-ranking competitor. With customers sourcing products and services globally, it is increasingly necessary to be a world leader with leading edge goods and services. Closer contact with US competitors will exert pressure for enhanced competitiveness. The need to meet the demands of demanding sophisticated US customers will equip Australian producers to satisfy customer in other countries too.

The trade and investment relationship between Australia and the US is likely to be strengthened by the developments in the New Economy. Closer relations with the US will enhance prospects of technology and skills being transmitted quickly from the US which is at the frontier of developments in the New Economy. And there are distinct indications that Australia can learn from the US and upgrade to world's best practice since Australia already tracks the US and is not far behind. In sum, Australia could gain much through a FTA with the US especially in regard to its longer term impacts.

ENDNOTES

1 A free trade area (FTA) aims to eliminate all tariff and non-tariff restrictions on imports among member countries, but each country retains its own set of tariffs and quantitative restrictions against nonmembers. Customs Unions (CUs), like FTAs, aim to eliminate all trade barriers among members, but differ from the latter in that member countries adopt a common set of barriers against nonmembers.

2 This paper does not consider the tangible and intangible costs of a FTA between Australia and the US.

3 Progressive Policy Institute, Economic Development Strategies for the New Economy, (www.ppionline.org)

4 OECD, A New Economy – Beyond the hype, Paris 2001.

5 The OECD defines knowledge-based economies as those that are directly based on the production, distribution and use of knowledge and information. The knowledge-driven economy encompasses the exploitation and use of knowledge in all production and service activities; not just those sometimes classified as 'high-tech' or 'knowledge-intensive'.

6 The OECD classifies a firm as ICT if it produces: office, accounting and computing machinery; insulated wire and cable; electronic valves and tubes; television and radio transmitters and apparatus for line telephony; television and radio receivers, recording equipment; instruments and appliances for measuring, checking, testing or navigating; industrial process control equipment; wholesaling of machinery. Equipment and supplies; renting of office machinery and equipment; telecommunications; and computer and related activities. See OECD, Measuring the ICT Sector, Paris 2000.

7 OECD, The New Economy- Beyond the hype, Paris 2001.

8 OECD, The New Economy: Beyond the Hype, Final Report on the OECD Growth Project, Meeting of the OECD Council at Ministerial Level, 2001.

9 Report of the Prime Minister's Science, Engineering and Innovation Council, Australia's Information & Communications Technology (ICT) Research Base -- Driving the 'New Economy', 30 November 2000.

10 (Australian Government) Department of Foreign Affairs and Trade, Australia's Trade -- Influences into the new Millennium, Canberra 2001.

11 Report of the Prime Minister's Science, Engineering and Innovation Council, Australia's Information & Communications Technology (ICT) Research Base -- Driving the 'New Economy', 30 November 2000.

12 OECD, The New economy- Beyond the hype OECD, Paris 2001, p. 10.

13 OECD, A New Economy? The changing role of innovation and information technology in Growth, OECD, Paris 2000.

14 Harcourt, Tim, "Should we worry about the IT deficit?" tim.harcourt@austrade.gov.au

15 OECD Economic Surveys – Ireland, OECD, Paris 1999.

16 Factors driving innovation include:

- access to high level skills and strong research infrastructure;
- clustering of industry and research capabilities;

- effective entrepreneurship and commercialisation infrastructure;
- intellectual property rights;
- effective capital markets and availability of venture capital;
- international market access;
- high overseas profile; and
- the right regulatory and taxation environment.

17 Progressive Policy Institute, Rules of the Road: Governing Principles for the New Economy, New Economy Task Force Report, September 1999. Available at http://www.ppi.org