IV.2

Falling Behind on ICT Adoption Indicators: Can We Afford This?

John W. Houghton

Introduction

Like many countries, Australia faces a dilemma in developing a leading-edge information infrastructure. On the one hand, we cannot afford to do it; and, on the other, we cannot afford not to. The analysis in this contribution illustrates the changes over a decade in the trade position of Australia in information and communication technology (ICT) equipment and the consequences in terms of the costs that must be incurred to build up a sophisticated national information infrastructure that includes telecom, computing and software applications. From a relatively strong base in domestic production capability in the early 1990s, rather than forging ahead, the country shows every sign of falling behind world-leaders on both production and usage indicators. This essay examines contributing factors to this development and suggests why a continuation of current trends may be problematic for Australia.

Structural Change in the Communication Industry

High network infrastructure costs present a significant barrier to entry and have ensured that telecom supply remains a game for large players. There are compelling forces towards further global integration – held back more by regulatory demands to see competition at the national level than by the underlying market dynamics. 'The telecommunications sector is the best example of how rapid technological development, in combination with regulatory reform, both enable and force companies to seek new partners across national and technical borders'. Between 1995 and 2000, there were 1,055 cross-border mergers and acquisitions (M&As) in telecom, more than five times the number in the first half of the decade; and at US$ 244.3 billion, the deal value was more than seven times that of the first half (OECD 2001b: 74-75). One consequence of this rapid globalisation is that in most smaller countries, including Australia, the major influences and larger players are from overseas.

Deregulation in the telecom sector not only introduced market forces into telecom services, but also into the entire communication value chain; from equipment, software and systems suppliers through to carriers and their major clients. Traditionally, suppliers to the major carriers faced monopsony purchasing, with

many national carriers pursuing strong local purchasing agendas. This led the major equipment suppliers to adopt a multi-domestic structure with production in many, if not most, industrialised countries. Deregulation brought with it the breakdown of monopsony purchasing, increasing trade in communication equipment and software and global rationalisation of production amongst the major equipment suppliers.

Between 1990 and 1999, OECD trade in ICT equipment increased from US$ 161 to US$ 475 billion, while communication equipment trade increased from US$ 20 to US$ 90 billion. Over the same period, Australia's ICT equipment trade increased from US$ 1.9 to US$ 4.3 billion, while communication equipment trade increased from US$ 308 million to US$ 1.4 billion. Growing demand accounts for some of this increased trade in communication equipment, but not all. For example, between 1992 and 1999, OECD country spending on ICT equipment increased by 78%, but ICT equipment trade increased by 156%. So a significant proportion of the recent increase in communication equipment trade is due to globalisation – the global rationalisation of production and the shift of the communication equipment industry from a multi-domestic to a transnational structure.

Policy Research and Practice

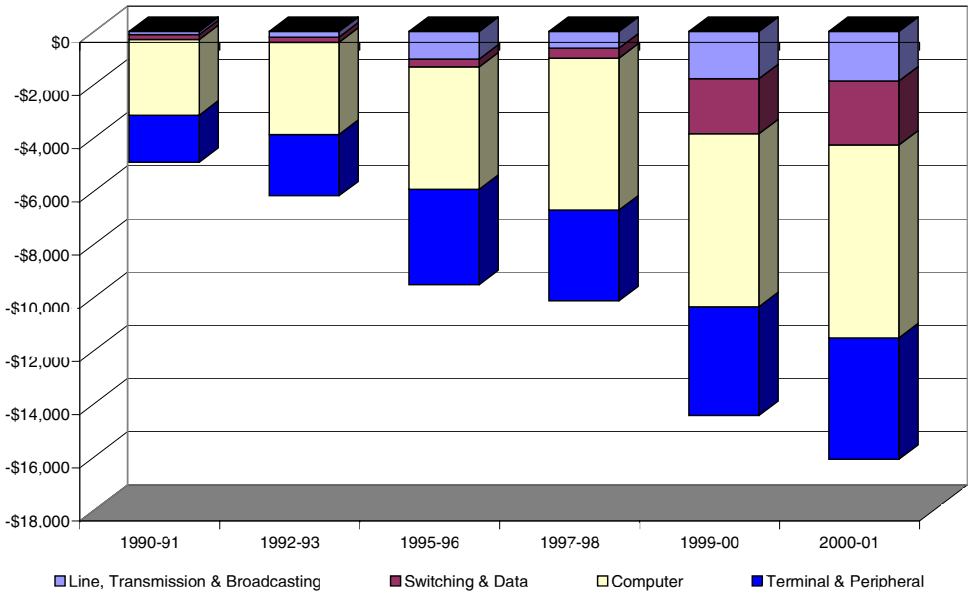
By the early 1990s, researchers at the Centre for International Research on Communication and Information Technologies (CIRCIT) in Australia were identifying major opportunities for this country in the production of communication equipment and software. In the 1980s, Australia's communication equipment trade performance showed promise, with exports increasing from AU$ 31 million in 1980-81 to AU$ 216 million in 1990-91, or by 600% over the decade. Imports greatly exceeded exports, at AU$ 111 million in 1980-81 rising to more than AU$ 600 million in 1989-90, but the communication equipment deficit had plateaued in the mid 1980s and began to decline in 1989-90. CIRCIT researchers also warned that, in the absence of policy intervention, the end of local monopsony purchasing and underlying structural transformation in the industry would lead to a decline in Australian communication equipment manufacturing.

In the early days of deregulation, network development and expansion ensured growing demand and the production side looked healthy. Australia's total exports of line, transmission and broadcasting equipment increased by 330% during the early 1990s, peaking at AU$ 416 million in 1997-98. Australian produced exports of switching and data communication equipment also increased rapidly, peaking at AU$ 414 million in 1995-96. Unfortunately, with the end of local monopsony purchasing and with no specific development policies in place, local production has faltered.

Employment in Australia's telecom and broadcasting equipment manufacturing industry reached almost 8,300 in 1993, but declined to just over 5,000 (or by 38%) between 1993 and 1999. Over that same period, the number of telecom and broadcasting equipment manufacturing businesses operating in Australia declined from 140 to just 73 (or by 48%), and industry income declined from AU$ 1.9 to AU$ 1.5 billion. Cable and wire manufacturing is also in decline.

As a result, Australian-produced exports of line, transmission and broadcasting equipment have declined since the mid 1990s – from AU$ 378 million in 1997-98 to AU$ 225 million in 2000-01, or by 40% (see Figure IV.2.1). Similarly, switching and data communication equipment exports have declined from AU$ 414 million in 1995-96 to AU$ 267 million, or by 36%. Australia's deficit on trade in line, transmission and broadcasting equipment expanded from AU$ 630 million in 1997-98 to AU$ 1.9 billion in 2000-01 (almost 200%), while the deficit on trade in switching and data communication equipment increased from AU$ 373 million to AU$ 2.4 billion (or by 545%).

Figure IV.2.1 Composition and Balance of Trade in ICT Equipment, Australia 1990-91 to 2000-01 (AU$ million)



Source: Houghton (2001: 15)

It is much more difficult to track production and trade in communication related software, but anecdotal evidence suggests similar fortunes. The introduction of competition reshaped the local communications software industry, with Australian suppliers seeking to build business with new entrants into the telecom market and use this as a springboard for international expansion. There have been a number of success stories, but the concern among industry players is that, driven by financial markets and extensive foreign investment, Australian carriers have become risk-averse and are increasingly looking to the United States for their requirements. Richard Favero (2001: 54), CEO of Soprano argues that,

> The carriers' mentality is that to buy from the USA is a low risk option. Telstra, Optus, Vodafone – they all look to the USA, at the risk-taking carriers, and copy what they are doing. Ten or 15 years ago the Australian industry led the world in many segments of the telecom market – now we don't want to, or can't afford to.

Australian innovations are being taken up and developed overseas. Two well known cases are illustrative. The Australian Photonics Cooperative Research Centre has spun off a number of innovative businesses, including Indx. Indx was sold to JDS Uniphase Corporation, the leading fibre optic component maker in the United States, in late 1997. Drs Skellern and Weste started Radiata in 1997, using radiocommunication technology originally developed and patented by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Macquarie University. In November 2000, US-based Cisco Systems bid AU$ 567 million for the 89% of Radiata it did not already own. It was the first major purchase by Cisco in Australia and allowed Cisco to acquire wireless local area network technology. Cisco took over the technology licences.

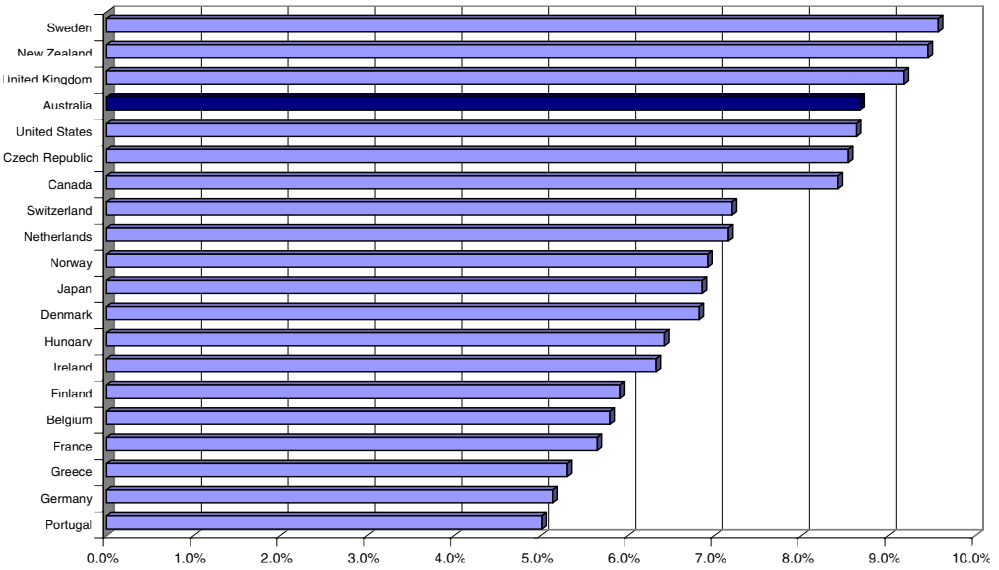
At the same time, some of the major players have been reducing their activities in Australia. During the early 1990s, IBM and Alcatel had been Australia's leading ICT equipment exporters, with IBM accounting for around half of Australia's information technology equipment exports and Alcatel for almost half of Australia's communication equipment exports. In the mid 1990s, IBM Australia sold its manufacturing facility at Wangaratta in Victoria to Bluegum, which was established by venture capitalists as a contract manufacturing operation. IBM placed its local manufacturing requirements with Bluegum on a contract basis. Alcatel soon followed suit, contracting much of its manufacturing requirements to Bluegum. The change was significant, with the contract manufacturer having a domestic market rather than export focus. In mid-2000, contract electronics manufacturer, Solectron, bought the Bluegum Group, acquiring its manufacturing

and office sites in Wangaratta, Sydney, Melbourne and Singapore. Faced with a downturn, Solectron closed the Wangaratta plant in early 2001. While this was playing out, Alcatel moved its Asia-Pacific base from Sydney to Shanghai.

An International Perspective

Putting Australia's position into an international perspective is instructive. Among OECD countries, the enormous contribution of Nokia and Ericsson to communication equipment exports from Finland and Sweden is clear. The index of revealed comparative advantage in communication equipment for Finland in 1999 was 6.05 and for Sweden 4.76 (see Figure IV.2.2).[7] The next highest was the Ireland at just 2. At the opposite end of the scale, Australia had a revealed comparative advantage index value of 0.28; and only Portugal, Norway and Japan experienced greater declines in revealed comparative advantage between 1990 and 1999.

Figure IV.2.2 Revealed Comparative Advantage in Communication Equipment, 1990 and 1999

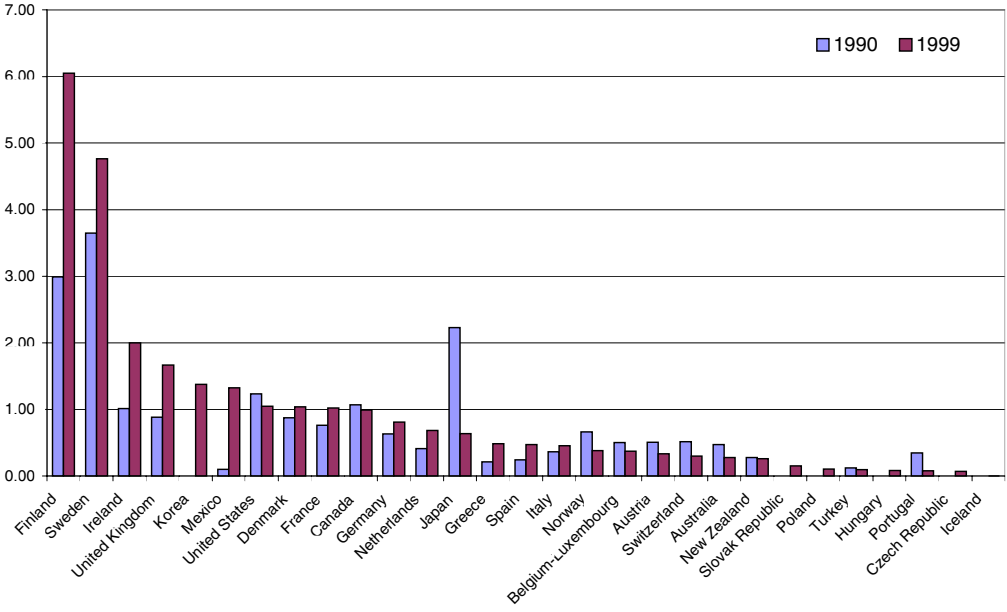


Source: OECD FTS Database <www.sourceoecd.org>, author's analysis

Australia is widely seen as a leading user of ICTs, with fixed and mobile phone penetration rates, and Internet take up in businesses and homes among the highest in the world (see Figure IV.2.3). In 1999, Australia ranked fourth among OECD countries in terms of the ratio of ICT expenditure to Gross Domestic Product (GDP) – behind Sweden, New Zealand and the United Kingdom. Australians spent the equivalent of 7.2% of GDP on ICTs in 1992, rising to 8.7% in 1999.

Australia's recent growth and productivity performances have also been relatively good. OECD (2001c) estimates of the increase in GDP per hour worked, adjusted for the business cycle, show that South Korea, Ireland and Luxembourg had the highest rates of labour productivity growth in the 1990s. Ireland, Australia, the United States, Greece and Germany experienced an acceleration in labour productivity growth during the late 1990s. Ireland and Finland also experienced the most rapid increases in multifactor productivity growth during the 1990s, with strong acceleration during the latter half of the decade in Ireland, Finland, Belgium, Australia, Canada and the United States. Some analysts of productivity growth in the United States and Australia have concluded that the use of ICTs is as, if not more, important for productivity improvement than is production.[8]

Figure IV.2.3 Ratio of ICT Expenditure to Gross Domestic Product, 1999



Source: World Information Technology and Services Alliance (2000)

Nevertheless, Australia's ICT trade deficit continues to expand at an alarming rate. In 2000-01, total imports of ICT equipment into Australia cost AU$ 17.7 billion – up from AU$ 5.58 billion a decade earlier. ICT equipment now accounts for around 16% of Australia's total merchandise imports. To put this into perspective, in 1999-2000 Australians paid AU$ 3.94 billion for food imports, AU$ 4.2 billion for textiles, clothing and footwear imports, AU$ 7.7 billion for non-industrial transport equipment (principally motor vehicles), AU$ 1.4 billion for civil aircraft, AU$ 7.5 billion for fuels and lubricants, AU$ 3.6 billion for chemicals and pharmaceuticals, and AU$ 3.2 billion for books, toys and leisure goods.

Australia's ICT equipment imports (excluding software, services and content) cost more than imports of cars and fuel combined, and more than imports of food, textiles, clothing, footwear, civil aircraft, chemicals, pharmaceuticals, books, toys and leisure goods combined. Can we afford this?

There is some evidence that perhaps we cannot. Australia's formerly strong record on ICT adoption has recently flagged. For example, in July 1995 Australia ranked seventh among OECD countries in terms of Internet hosts per 1000 population, but by July 2001 Australia's ranking had slipped to tenth; in 1998 Australia ranked ninth among OECD countries in terms of Web sites per 1000 population, but by July 2000 Australia's ranking had slipped to thirteenth; and in 2000 Australia ranked thirteenth among OECD countries in terms of penetration of broadband – with 0.59 adopters per 100 population, compared to an OECD average of 1.96 and South Korea's 13.9 – but by June 2001, Australia's ranking had slipped to sixteenth. While not conclusive, these trends are suggestive of an emerging problem.

Where To From Here?

There is little sign of significant change in policy in Australia. The conventional wisdom is that it is the use of ICTs that matters; not their production. To a large extent, of course, that is true. However, it is not an either-or choice. There is no reason why Australia could not be a leading-edge user *and* producer – as are Finland, Sweden, South Korea and the United States. OECD analysis shows that some of the major ICT producing countries have enjoyed rapid productivity improvements during the 1990s – such as Ireland, Finland and South Korea. What is clear is that by vacating ICT production Australia is creating a significant import burden. There are obvious benefits from specialisation and trade, and no country should seek to balance trade line-item by line-item. But with declining terms of trade and a declining dollar, it is going

to be increasingly difficult for Australia to afford to be a leading-edge user of ICTs. Early signs of falling behind on a number of ICT adoption indicators suggest that Australia's failure to produce ICTs may be undermining its ability to use them.