



Australian  
Local  
Government  
Association

# State of the Regions 2000

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# 1. Overview

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The approach taken in State of the Regions (SOR) reports is to adopt an inclusive approach to Australia's regions. All Australia is broken into geographical units. The advantage of this approach is that we are able to examine what is happening in all parts of Australia and compare the performance of different types of region. Hence, we are able to focus on the broad economic, social and technological forces impacting all types of region as well as make inter-regional comparisons.

To understand regional economic performance and prospects, it is not sufficient to focus on rural-based regions. This leads to simple conclusions about cities versus the bush. Some rural regions are booming whilst others are experiencing long term decline. Some urban regions are stuck with high unemployment, low incomes and socio-economic problems, whilst the global centres have virtually returned to full employment.

All regions confront common challenges and these are addressed in SOR reports. Councils, regional agencies, regional businesses and communities are asking themselves the following questions.

- Are we well positioned in the global economy?
- What are the prospects for young people?
- How can we set our region onto a sustainable development path?
- How quickly can we transform ourselves into a knowledge-based economy?
- Can we strengthen local supply chains between producers and/or firms?
- Are our digital skills and infrastructure adequate to handle the vast increases in demand associated with the Internet and the widespread introduction of e-commerce?
- How can we increase capital investment in the regions?
- How will we maintain a sense of community and environmental harmony in a world of constant change?
- Are our business networks and community-based networks working well and creating opportunities for innovation?

In addition to addressing these issues, there are also regional specific issues that need to be addressed. Australia's regions confront serious environmental problems but the scale and type of problem differs from region to region. For example, major metropolitan areas are experiencing problems of traffic congestion and air pollution in inner city areas. Rural areas are experiencing problems with land degradation and water quality. Industrial regions are confronted with long term structural decline. Some regions are linked into global processes whilst others remain inward looking.

An issue confronting all regional researchers is the selection of the appropriate regional scale. If you select too many regions, for example at the locality level, you can provide a lot of detail but it is more difficult to understand the broad drivers of change. On the other hand, if there is too much aggregation, for example at the state level, you will not be able to examine the major differences at the sub-state level. SOR seeks a balance between too much aggregation and too much disaggregation.

SOR reports pick up some important regional trends such as population, economic growth, investment, employment, unemployment and occupational change. The limitations of this regional analysis need to be recognised. Some significant changes are occurring at the sub-regional or in many cases, at the sub-locality level. In some regions, high performing localities and poor performing localities tend to cancel each other out. Nor do we look in detail at the socio-economic problems confronting particular groups such as indigenous communities, pastoralists or small medium firms. These areas require detailed analysis.

The YourPlace<sup>1</sup> software developed by National Economics maintains databases on all 632 local government areas (LGAs) in Australia. Our regional framework for SOR amalgamates these LGAs into 58 regions. They are defined by a combination of factors: broad economic function, existing regional agencies and Australian Bureau of Statistics boundaries.

To assist the process of looking at regional specific issues, a simply typology has been developed to look at different types of regions in Australia: three are city-based regions and three are non-city based.

The six types of regions are:

1. Core metro;
2. Dispersed metro;
3. Production zones;
4. Resource based;
5. Rural based; and
6. Lifestyle based.

In reality, many regions are hybrid regions, comprising more than one driver. Mackay, for example, in Central Queensland has a strong rural based with its sugar cane industry, lifestyle areas in Whitsunday, and resource based areas in the Bowen Basin. In the SOR report, however, we have subjectively classified Mackay as a resourced based region because income from resource industries substantially impacts regional income.

The lay-out of the report is as follows. In Chapters 2-7, we provide a series of economic indicators for each region followed by a discussion of developments in selected regions and sub-region. The discussion of selected regions is not comprehensive but is designed to highlight how some individual regions are performing and some of the strategic issues they are facing.

In these chapters, we look at five indicators of change for the 58 regions over the past decade:

- population;
- gross regional product (GRP)
- productivity;
- employment growth; and
- occupational structure.

Most of these indicators are straightforward. Population figures are derived from Australian Bureau of Statistics (ABS) sources and updated to 2000 by National Economics. Employment estimates are derived from the ABS business register. In relation to occupational change, chapters 2-7 build on the work of leading labour market economist Robert Reich, and we extend it in order to look at the occupational structure of Australia's regions. This "Reichian" tool is useful because it enables us to break regional jobs according to knowledge content. The theory suggests that the more highly skilled a region's workforce, the better it will be positioned in the global economy, and the more flexible and adaptable it will be in the event of structural change or economic shocks. For the 58 regions, we consider five broad occupational groups<sup>2</sup>: symbolic analysts, high skilled in person workers, lower

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<sup>1</sup> For a description of the indicators in YourPlace and methodology, see Craig Shepherd et.al., "YourPlace – product information" in **National Economic Review**; No. 45, August 2000.

<sup>2</sup> R. Reich, **The Work of Nations**, Vintage, New York, 1992.

skilled in person service workers, routine workers and farmers. To assist understanding, these five categories are defined as follows.

### ***Symbolic analysts***

Creative and intellectual effort is central to the tasks undertaken by these workers. They use symbols, ideas, concepts and the existing knowledge base of their disciplines. Examples are research scientists, specialist managers, software engineers, engineering technologists, architects, lawyers and artists etc. Symbolic analysts include building & construction managers; researchers, real estate associate professionals; office managers; and accountants.

### ***High skilled in person service workers***

The distinguishing feature of this group is the importance of interpersonal relations. These occupations have a high knowledge content. Important high skilled in person service workers are nurses, teachers, sales and service managing supervisors, vocational education teachers, police officers, welfare and community workers and general medical practitioners.

### ***Lower skilled in person service workers***

This group comprises relatively lower skilled sales and service occupations. It includes sales assistants, check out operators, receptionists, bar attendants, waiters and sales representatives.

### ***Routine workers***

Much of the work undertaken by routine workers can be codified and automated. This is the grouping that is most vulnerable to job loss through industry restructuring and automation. Examples include cleaners, general clerks, secretaries, truck drivers, farm hands, motor mechanics, kitchen hands, carpenters, bookkeepers and storepersons.

### ***Farmers***

We have defined farmers (and farm hands) as a separate category, not only because they are important in their own right, but also because they straddle the other occupational types we are looking at. Although clearly concentrated in rural-based regions, we seem to have picked up a group of Pitt St and Collins St farmers in core metropolitan regions.

Chapter 8 devotes a whole section to our revision of unemployment estimates for all 58 regions. The chapter takes account of structural unemployment. Labour market, employment and official unemployment figures are provided from the Department of Employment Workplace Relations and Small Business. To standardised unemployment estimates over time, National Economics adjusts official unemployment figures to take account of changes in the definition of unemployment, enabling us to compare unemployment rates over the last 10 years. These estimates suggest that actual unemployment is higher than official rates.

Following the regional stocktake in Chapters 2-8, a series of chapters looks at major issues impacting regional Australia. This covers supply chains and their impact on regional performance, overcoming digital divide, the impacts of e-commerce on regional economic performance and the financial constraints to regional economic development.

Chapters 9 introduces the concept of supply chains, emphasising the need to strengthen Integrated Supply Chains if we are to compete more effectively.

Chapter 10 examines the regional dimension of supply chains. We look at the centrality of knowledge-based regions, the advantages of proximity, the role of tacit knowledge in economic development, need to tap into knowledge

Chapter 11 is concerned with the adequacy of digital infrastructure in Australian regions.

Chapter 12 examines and quantifies the impact of E-Commerce.

Chapter 13 analyses the strength of the industry supply chains in our regions across Australia.

Chapter 14 considers how the operation of the financial system impacts regional development.

The final chapter outlines an assessment of regional policy in Australia. It provides an outline of some policy directions that should be considered if we are to overcome the growing divergences in regional performance, to ensure that regions share in the benefits of a global knowledge-based economy and to maximise the contribution of the regions to national economic development. The appendices of the report include two papers; one from Roy Green on the Irish development model and one from Tony Gleeson on agriculture and rural innovation.



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## 2. Core metropolitan regions

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Core metro areas represent the core of Australia's major cities. We include Canberra in this definition. Despite the perception of Australia as a sparsely populated nation, the fact remains we are one of the world's most urbanised societies. The economic performance and prospects of core metro areas are important determinants of national economic performance. These cities are a product of the Australian Federal system, framed by our history, economic structure and geography. They evolved as business and administrative centres for their respective state economies, and, in the case of Canberra, a national capital. They are the home of large corporations, including the headquarters of national and state corporations, and the regional headquarters of a number of global corporates, particularly Sydney and Melbourne. They represent a focal point for public administration, finance and business services, high order retail, tourism and hospitality.

Demographic, technological and economic forces continually drive change in the form and structure of these city-regions. Urban growth, the shift to a service-based economy, improved livings standards and growth of automobiles and transport network shaped the development of core metropolitan regions in the second half of C20. These developments resulted in the growth of suburbia, and dispersal of population, industrial activities and retail businesses away from the city centre.

In the past two decades, new forces are shaping the performance and prospects of core metros regions. The two most important are globalisation and associated lifestyle choices creating opportunities for the redevelopment of inner city areas. Globalisation represents a major challenge to Australian core metropolitan areas. The extent to which core metros can position themselves in a global economy will be a major determining factor of our future economic prosperity. At an international level new economy industries and knowledge-based jobs are most concentrated in global cities. Some of the disparities in performance of our core metro regions can be explained in terms of their integration or lack of integration into the global economy.

All core metro cities are seeking to revitalise themselves through creating new residential opportunities in their inner city areas. In part this reflects new lifestyle choices for people to live in inner cities around working, cultural, entertainment and learning opportunities. It also is consistent with government policies to reduce pressure on the urban fringe through encouragement of higher density living or compact cities.

Population growth in core metropolitan areas over the past decade is set out in Table 2.1. The table indicates that the population of core metro regions is growing at around the national average. However, there are some significant differences, ranging from the high growth Northern and Central Perth, to low rates of growth in Hobart and Central Adelaide.

Table 2.2 shows Gross Regional Product and productivity changes in core metropolitan areas. The table indicates that high GRP growth rates were experienced in Perth, Brisbane and Sydney over the decade. Melbourne's growth over the decade was slower but in the past five years its growth rates accelerated. Melbourne, however, had a large increase in productivity per employed person.

Table 2.3 indicates significant differences in household-based employment growth rates in the core metro regions over the period 1991-2000. Employment in Perth grew by 31 per cent and the regions of Global Sydney and Inner West Sydney grew by 11 and 18 per cent respectively. On the other hand, ACT, Adelaide and Hobart have experienced limited growth in the number of residents employed, although official unemployment has come down over the past two years.

**Table 2.1 Population change in core metropolitan regions**

Region	Population 1993 (number)	Population 2000e (number)	Population growth 1993-2000 (% p.a.) <sup>3</sup>
ACT	298,591	311,536	0.61
Brisbane City	781,544	876,330	1.65
Central Adelaide	386,011	393,391	0.27
East Melbourne	796,380	832,932	0.64
Global Sydney	620,049	691,598	1.57
Hobart and Southern Tasmania	227,408	228,667	0.08
Inner Melbourne VIC	257,653	292,798	1.84
Inner West Sydney	212,561	224,536	0.79
Northern and Central Perth	687,156	772,486	1.69

Source: NIEIR's LGA YourPlace database.

**Table 2.2 Gross regional product in core metropolitan regions 1991-98**

Region	GRP including dwelling 1991 (1998 \$m)	GRP including dwelling 1998 (1998 \$m)	GRP including dwelling (% p.a.)	Productivity increase per employed person (% p.a.)
ACT	9,345.0	11,527.0	3.0	4.2
Brisbane City	22,736.2	31,105.4	4.6	3.2
Central Adelaide	12,976.1	15,661.2	2.7	3.1
East Melbourne	16,570.1	20,261.6	2.9	1.4
Global Sydney	43,367.9	58,310.3	4.3	3.9
Hobart and Southern Tasmania	4,167.5	4,946.6	2.5	1.6
Inner Melbourne VIC	27,722.8	34,770.3	3.3	3.4
Inner West Sydney	5,752.4	7,075.5	3.0	3.5
Northern and Central Perth	13,751.4	20,073.6	5.6	1.8

Source: NIEIR's LGA YourPlace database.

**Table 2.3 Employment change in core metropolitan regions 1991-2000**

Region	Employed 1991 (number)	Employed 2000 (number)	Employment growth 1991-2000 (% p.a.)	Employment growth 1991-2000 (per cent)
ACT	149,609	166,285	1.18	11.15
Brisbane City	370,204	453,438	2.28	22.48
Central Adelaide	172,670	186,986	0.89	8.29
East Melbourne	402,077	445,525	1.15	10.81
Global Sydney	322,699	358,805	1.19	11.19
Hobart and Southern Tasmania	93,968	96,083	0.25	2.25
Inner Melbourne VIC	128,974	148,022	1.54	14.77
Inner West Sydney	108,313	128,058	1.88	18.23
Northern and Central Perth	290,203	381,127	3.07	31.33

Source: NIEIR's LGA YourPlace database.

<sup>3</sup> All percentages are calculated in compound annual growth rates unless specified.

Table 2.4 provides a percentage breakdown of occupations using our “extended Reichian” categories<sup>4</sup>. In urban based regions, the higher the proportion of symbolic analysts and high skilled in person workers the better. We can always expect some growth in lower skilled in person service workers such as waiters and receptionists but the routine production workers are those that are most vulnerable to automation, outsourcing and down-sizing. The table suggests some significant differentials in terms of the proportion of symbolic analysts.

The proportion of symbolic analysts in ACT, Global Sydney and inner Melbourne is around 35 per cent of the total workforce in these regions, which is more than 50 per cent higher than in the other core metro regions. In the ACT this reflects the larger number of senior public servants and researchers, and in Sydney and Melbourne it reflects the larger number of corporate headquarters, finance and business service firms and IT&T firms.

**Table 2.4 Occupational breakdown of core metropolitan workforce 1996 (per cent)**

Region	Symbolic analysts	Low skilled service	High skilled service	Routine worker	Farm
ACT	35.9	19.3	16.1	28.5	0.2
Brisbane City	24.7	21.4	15.8	37.8	0.3
Central Adelaide	25.5	21.4	19.2	33.7	0.2
East Melbourne	23.8	21.8	17.1	37.2	0.1
Global Sydney	35.5	17.2	15.1	32.1	0.1
Hobart and Southern Tasmania	20.1	22.9	18.8	35.7	2.5
Inner Melbourne VIC	35.0	17.2	16.0	31.7	0.1
Inner West Sydney	24.4	21.0	18.6	35.9	0.1
Northern and Central Perth	24.2	22.1	18.2	34.9	0.6

Source: NIEIR's LGA YourPlace database.

## 2.1 Global Sydney

Sydney is recognised as Australia's only sub-global city, the major interface between the Asia-Pacific region and the Australian economy, and more broadly, the Asia-Pacific economy. We define the core metro region as a small inner western area and Global Sydney - a spine running from North Ryde through Chatswood and North Sydney, the CBD, surrounding inner city localities, and south to Kingsford Smith Airport and Port Botany<sup>5</sup>. Old industrial and residential areas impeded the city expanding southwards to the airport. However, with the construction of the New Southern Railway and developments such as the Australian Technology Park and Fox Studios, new economic and residential spaces are now being created in City South. These areas developed inside Sydney's greenbelt up to the 1960's. Global Sydney is:

- Australia's largest finance and business service centre;
- recipient of the largest share of foreign investment in Australian property and real estate;
- origin and destination point of most international and domestic business and leisure travellers;

<sup>4</sup> See definitions in Chapter 1.

<sup>5</sup> See National Economics, **State of the Regions report**, with the ALGA, 1998 and 1999.

- ❑ headquarters of the largest number of corporations; and
- ❑ the most likely location of Regional Headquarters of Australian based foreign companies servicing the Asia-Pacific region.

The emergence of global cities and Australia's integration into the global economy means that a new planning framework is required to enhance the position of Sydney as a sub-global city. Best practice infrastructure, specifically communications and air transport linkages, will be significant determinants of how well Sydney and the Australian economy perform and develop in the context of these global changes. Increasingly, the main competitors for Sydney will not be Melbourne and Brisbane (although historic rivalries remain) but cities such as Singapore and Hong Kong.

Two fundamental features of Global Sydney stand out. Firstly, it contains some of the most economically dynamic areas of Australia. In 1998, the city contained 40 of the 52 bank headquarters in Australia and 260 of the 408 of the regional headquarters of Australian-based multinationals<sup>6</sup>. Sydney CBD is Australia's major finance and advanced business services centre - encompassing the major banks, Australian Stock Exchange, business management, legal and financial funds. The CBD houses the headquarters of many of Australia's leading blue chip companies and is well-placed to build on this role over the next five years. Leading international financial institutions increasingly favour Sydney as a hub for their Australian and, in some cases, Asia-Pacific operations. Whether the CBD will be able to maintain its pre-eminence as a south-east Asian financial centre will hinge on how successfully it can compete with Tokyo, Singapore and post-colonial Hong Kong. On that score, Sydney CBD's fate will be inextricably linked with that of the Australian economy as a whole.

Sydney centre is a major destination for international and domestic tourists. Over half of Australia's international visitors arrive in Sydney. Higher order retailing and entertainment and hospitality precincts have strengthened whilst lower order retail and back offices have been progressively shifted out of the CBD.

Employment in the CBD remains steady, although the number of knowledge-based workers has increased dramatically. The economic functions have been strengthened with substantial investment in new premium office space and increasingly, higher density up-market apartments. Governments have invested heavily to position Sydney as a Global Sydney. This includes major redevelopment projects in Darling Harbour and the Rocks, investment in cultural, entertainment and heritage assets, and conservation of Sydney Harbour. A new rail link between the city and Kingsford Smith Airport has opened and a light rail system from the Central to the Sydney Casino has been extended to nearby residential areas. Sydney is a major media centre with headquarters of Fairfax and News Corporation. Fox studios are located at Moore Park, and a cluster of cultural industries and multimedia businesses is growing around the global centre.

Over the past 25 years, the city centre spread north over the harbour. A number of high technology businesses in electronics, information and communications technologies, bio-technology and pharmaceuticals have clustered around North Ryde, Lane Cove and North Sydney. The area is becoming a favoured location for the regional or national headquarters of global corporates including Microsoft, Oracle, Hewlett Packard and Optus.

The marketing hype about this "dot.com" spine is overstated. Firms locate in this area of global Sydney because of good amenities, access to good housing and high skilled professional workers, and the status of locating in a prestigious location. It is not an innovative cluster in the sense of the creation of new knowledge through ongoing interaction between firms and the local Macquarie

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<sup>6</sup> NSW Department of State and Regional Development, **The New South Wales Competitiveness Report: 1998-99**, New South Wales Government, 1999.

University. The University has established the Macquarie Business Park with the intention of increasing interaction between researchers and local firms.

## 2.2 Brisbane

Brisbane City Council, with a population of 865,000 people, is the largest local government area in Australia in Australia's fastest growing state. It covers the CBD, a large residential area and major port and airport infrastructure. It is the heart of South East Queensland (SEQ), a conurbation comprising lifestyle regions of the Sunshine Coast and Gold Coast to the north and south of Brisbane respectively, the industrial area of Ipswich and a number of agricultural shires to the west. This conurbation comprises around 65 per cent of Queensland population and accommodates more than 80 per cent of the state's population growth.

Brisbane is the major commercial, industrial, administrative, education and hospitality centre servicing Queensland. Its growth has evolved around its strategic role as a business centre serving the state's strong mining and agricultural industries, and more recently, expansion of tourism and post-retirement population growth in SEQ. Office investment in the CBD is strong and, over the past decade, office investment is spilling over into the CBD fringe areas, around Milton and Fortitude Valley. High population growth has driven retail investment in Brisbane. The challenge is to utilise high rates of population growth to transform the city into a knowledge-based and global city. Brisbane lacks the critical mass of finance and knowledge-based businesses of Sydney and Melbourne but is putting in place strategies to strengthen its economic base and the foundations to underpin the shift to a global city. Gross Regional Product is low by major metropolitan city standards, prompting a search for ways to shift the city onto a high value added growth path.

Both Brisbane City Council and the Queensland Government are putting in place strategies aimed to strengthen the competitive strengths of Brisbane and SEQ. The Brisbane Economic Development Strategy establishes a target to increase GRP growth from around 1.5 per cent pa to 3.4 per cent pa through concentrating on leading sectors, strengthening the foundations for growth and improving the regulatory and business environments. The strategy focuses on 15 sectors including value added manufacturing (machinery and equipment, printing products, wood products, chemicals and petroleum and processed foods); tertiary education, business services, transport and tourism and recreation<sup>7</sup>.

The Queensland Government aims to strengthen Brisbane's position as a strategic gateway for transport and a "smart city" investment location. The Port of Brisbane Corporation is seeking to become a dominant port in trade links between Australia and the Asia-Pacific region, offering services for trade in meat, grain, cotton, fertilisers, chemicals, industrial, and mining and energy. The Queensland Government has created the Trade Coast precinct at the mouth of the Brisbane River, which has become the recipient of significant investment from companies such as Virgin Airlines, TNT, Asia-Pacific Aerospace, P&O and Berri. The Brisbane Airport Corporation, of which the Queensland Government and the Port authority are equity partners, is seeking to develop Brisbane Airport as a major passenger and freight facility for domestic and international business. A project is underway to link Brisbane Airport to the city through a light rail system.

Significant public sector investment is taking place to support the growth of new economy industries, particularly in bio-technology and digital technologies. The Queensland Government has established an Innovation Start-Up Scheme to support high tech start-up companies. Much of this is clustered around Brisbane's university sector: QUT, University of Queensland and Griffith University.

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<sup>7</sup> Brisbane City Council, *Economic Development Strategy for Brisbane*, July 1999.

Following a report from the **BioIndustries Task Force**<sup>8</sup>, the Queensland Government established a 10 year plan for biotechnology industries to create a world class biotechnology industry. If successful, this will create a high technology biotechnology cluster in Brisbane and the Gold Coast. The plan includes funds to attract leading researchers, support for commercialisation and new knowledge infrastructure including: the establishment of an Institute for Molecular Bioscience, extension of the Queensland Institute for Medical Research and funds for the Health Scientific Services and laboratories.

## 2.3 Melbourne

Inner Melbourne encompasses the Melbourne CBD, inner city districts around Port Phillip Bay and inner northern areas from the city to Fitzroy. The city has the capacity to continually re-invent itself. In the 1980's, Melbourne was beginning to lose impetus. Structural change in manufacturing and the emergence of Sydney as a major regional financial centre undermined the traditional strengths of the Victorian economy and this in turn undermined inner Melbourne. People were leaving Victoria. This depressed the Victorian economy and the city.

This situation has been substantially reversed and inner Melbourne is a beneficiary of this. The state has experienced the highest increases in business investment in Australia with high rates of investment in industrial and commercial activities over the past 5 years. With attractive inner city living areas and the redevelopment of old industrial areas Melbourne is recapturing its dynamism. It is capturing a high share of Australia's knowledge-based jobs, and contains the headquarters of some of Australia's leading corporates such as ANZ and National Australia Bank.

Sydney is the preferred entry point of visitors to Australia and hence Melbourne works hard at staging international events such as the Australian Grand Prix, Melbourne International Festival and the Australian Tennis Open.

Melbourne CBD contains a very large retail sector. It includes major retail complexes and department stores such as Myer, David Jones and Daimaru, as well as heritage buildings, arcades and lane ways creating a pedestrian friendly environment<sup>9</sup>.

Lifestyle preferences are leading to re-population of these inner city areas. The population of Melbourne City Council area is increasing at 5.9 per cent per annum, one of the fastest growth rates in Victoria. A process of gentrification has occurred and new urban spaces are being created for apartment living. Over the past year, Melbourne has experienced the biggest increase in house prices in Australia<sup>10</sup>.

Melbourne is considered one of the world's great cities in terms of liveability. The city has a critical mass of service industries in finance, property and business services; information and communications, administration and education. Its features include outstanding urban design, public transport, entertainment and cultural facilities and a high skilled population. The centre includes education clusters around Melbourne University, RMIT and Victorian University of Technology. The area has world class facilities in health and medicine through the clustering of hospitals, universities and hospitals. The "Parkville Strip" is identified as a major national bio-medical research and

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<sup>8</sup> Queensland BioIndustries Task Force, **The Queensland BioIndustries Strategy – 2000 and beyond**, Queensland Government 2000.

<sup>9</sup> Melbourne City Council, Melbourne CBD Development Investment Prospectus, 2000.

<sup>10</sup> Australian Bureau of Statistics.

development precinct. The Victorian Government is committed to the **Bio21** initiative, a commitment to create a world-leading cluster of medical and scientific research institutes in the Parkville precinct.

The ethnic diversity of the city has resulted in the creation of multicultural precincts and festivals around Italian, Greek, Chinese, Vietnamese and Jewish communities.

The core metro can be divided into a number of sub-regions including the CBD itself, Southbank including Crown Casino, and St Kilda Rd. Melbourne City Council divides the city into a number of precincts. The city centre is experiencing significant investment in new office spaces and take-up of advanced service jobs, dominated by information and communications firms and business services.

The Victorian Government has made a significant commitment to revitalise inner Melbourne over the past decade. The major initiative is the Dockland project, one of Australia's major redevelopment projects, which is developing under-utilised land adjacent to the CBD. Led by the Docklands Authority, the project aims to create an outstanding living, working, learning and recreational environment in the heart of Melbourne. The Commonwealth Government has committed \$22 million from its Federation Funds to establish a Technology Park at the Docklands, focused on firms in multimedia, biotechnology, telecommunications and entertainment technologies<sup>11</sup>.

## 2.4 Hobart

Tasmania is Australia's smallest and poorest state and receives additional financial support from the Commonwealth to reflect some of its locational disadvantages. Additional funds were allocated to Tasmania from the sale of the second tranche of Telstra to support restructuring. An Intelligent Island Social Bonus Fund was set up with \$40 million to assist Tasmania to strengthen its position in the information economy. Much of the focus of activities will be in Hobart itself.

Hobart is an attractive administrative, commercial and tourist centre for the Tasmania. The city is a base for fishing and provides administrative and port facilities for Antarctica and southern ocean vessels, contains outstanding heritage buildings around Salamanca Place, and a retail and learning centre.

Hobart is seeking to build on its advantages as a low cost and environmentally friendly destination for investment, but with good global telecommunications links.

The population is not growing. The Tasmanian economy developed around primary and energy-intensive industries but these industries are not creating impetus for growth in the knowledge economy. The main focus on the future development for Hobart is concentrating on niches in tourism, marine engineering, information industries and adding value to agricultural produce.

The Tasmanian Government is concentrating on creating new economy jobs in the city and the state. One of the initial tasks for the new government in Tasmania was to conduct industry audits of all major sectors to determine their potential for future job growth. Of relevance to Hobart, industry audits were conducted on information industries, printing, government services and business and financial services. Emerging from these initiatives has been a commitment to build the knowledge base of the economy. The government is seeking to use the advantages created by the digital revolution to attract highly skilled and computer literate people to live in Tasmania.

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<sup>11</sup> Senator the Hon Richard Alston, "Major boost for R&D in Victoria", **Media Release**, 14 May 1999.

The Tasmanian Government has established the Intelligent Island Incubator Initiative, including an incubator centre to assist local entrepreneurs commercialise ideas and technologies through seed funding and business management skills. Tourism is a major focus. A major attraction is the city of Hobart itself and its heritage, and its use as a base for the Tasmanian wilderness. Hobart City Council is looking at new initiatives including the redevelopment of Civic Square and a Back of Track tramway proposal for the city.

The Tasmanian Technopark is another state government initiative. Developed in 1988, its role is to attract industries in advanced technology research, development and manufacture, with 27 companies operating on the park.

## **2.5 Adelaide**

Throughout its history, Adelaide has a reputation for innovation in planning, economic development and culture. Its size and distance from East Coast cities are important determining factors. The original Wakefield experiments of the 1830s set out to create a planned community of free settlers. To stimulate industrialisation after the Second World War, the Playford Government used public housing, infrastructure and aggressive business attraction strategies to attract foreign investment in manufacturing, primarily automobiles and defence industries. In the 1970's, the Dunstan Government created a new cultural milieu through investment in the arts and culture industries. Of all Australian cities, Adelaide has the highest metropolitan dominance of its state.

The South Australian economy confronts major structural challenges. Population growth has slowed significantly. Manufacturing employment has declined. More than any other state, SA is committed to the creation of an advanced manufacturing sector. Major Adelaide corporates have shifted their headquarters to other cities. The city's clout in finance has declined.

The city has a growing tourist industry – linked to the attractiveness of the city itself, world class activities in the arts particularly the Adelaide Festival, and state attractions such as the Barossa Valley and Riverlands, Flinders Ranges and Kangaroo Island. Adelaide remains a small market for international tourism, however, and must compete with the popular East Coast and top end destinations. The construction of the Alice Springs-Darwin rail link, although of dubious economic value in the short-medium term, will improve Adelaide's location as a freight hub and tourist destination.

The state is pressured by the loss of talented professionals, particularly in information communication technologies and electronics industries and is seeking to "bring them back home".

No Australian city understands the term sustainable development better than Adelaide. The deterioration of water quality of the Murray-Darling River due to excessive land clearing and irrigation poses a long-term threat to Adelaide's drinking water.

Future growth is highly dependent on how Adelaide positions itself in the global economy and its capacity to attract new residents. The main priority is to attract global information industries. The state government has out-sourced its IT&T operations, and provided large subsidies to locate IT&T firms in the state.

Adelaide centre itself is based on outstanding urban design surrounded by parklands and dissected by the picturesque Torrens River, and highly accessible from most residential areas. The city has some outstanding heritage buildings, including churches and universities. Well-planned streets are criss-crossed by laneways and the city has a recognised heart in Rundle Mall. The city is centrally located to the broader metropolitan area and is well served by public transport including a dedicated bus transitway from Tea Tree Gully in the northern suburbs.



The Economic Development Strategy for Adelaide identifies six priority sectors to support future growth – education, arts and tourism, IT, business services, retail and health<sup>12</sup>. The main objectives of the strategy are to increase investment, particularly from overseas and interstate investors; increase exports and increase local demand growth. Adelaide City Council is proposing to work with investors in the priority sectors to identify strategic and surplus sites for redevelopment. Charles Sturt Council has created a Digital Precinct on the fringes of the CBD to attract digital start-ups in IT&T and multimedia.

## 2.6 Perth

In just over a generation, Perth has been transformed into a dynamic city supporting high rates of population growth. The growth of metropolitan Perth is associated with its role as the major centre for world competitive agricultural, mining and energy sectors. This is due to its dominance in the state economy and its role as a specialist centre supporting primary industries. Whereas primary industries represent around 10 per cent of national product across in Australia, in Western Australia they represent around 20 per cent of Gross State product.

The city and state benefit from the rich and diverse range of minerals and energy commodities. The oil and gas industry is booming, the alumina industry is expanding, and whilst the gold and iron ore industries are experiencing subdued conditions, they remain very large industries by world standards. The weakness of the Australian dollar, combined with Perth's relative isolation from other major cities - in fact it promotes itself as the world's most isolated city - creates opportunities to develop new import replacement industries. Around one third of office leases in the CBD are associated with the mining industry. Perth has a growing tourist industry and has focused on creating new cultural, heritage and recreation spaces, such as the very successful regeneration of Freemantle.

The city is looking at ways of shifting into higher technology industries. The Western Australian Technology Park, for example, associated with Curtin University, has sought to create an environment for high technology incubators and investors. The city has strong ties with South East Asia and Southern Africa. Around 60 per cent of merchandise exports are destined for South East Asia. Manufacturing capabilities remain weak, and the city remains vulnerable to movements in international commodity prices. Nevertheless, it has become a much more complex and diversified urban economy.

Perth has a strong dominance in Western Australia. The city has a population of 1.32 million, or 73 per cent of the state's population of 1.8 million. This metropolitan dominance is set to continue. The state is experiencing high rates of population growth in lifestyle oriented areas in the state's south west and commuter areas to the south of Perth in its southern corridor, but inhospitable climate and remoteness impede the growth of much of central and northern WA. Much of the state's capital intensive resource industries are located in remote regions, with relatively lower order services provided by local communities and higher order business and technical services provided from Perth. The production systems in large resource projects are predominantly organised on a fly in-fly out basis, with managers and workers commuting to and from Perth on a regular basis.

The geographical growth of Perth has been difficult to constrain. It is a linear city stretching from Yanchep to Rockingham. With abundant low cost land and a liberal approach to land development, urban sprawl became a problem. More recently, the problems of car dependence have focused attention of city redevelopment and improvements in public transport. The city has developed a rapid transit network linking northern Perth to the city. The reopening of the rail link between Freemantle and the city has boosted tourism. Leading proponents of sustainable cities reside in Perth and, along

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<sup>12</sup> Corporation of the City of Adelaide, *City Strategies – Economic Development Strategy*, 1998.

with community organisations, they have influenced policy and infrastructure investments regarding compact cities.

In recent years, major urban redevelopment projects have taken place. This includes Commonwealth-state government for the redevelopment of East Perth – a major project involving redevelopment for housing, commercial and community uses, new transport and recreational amenities. Other projects include a major urban redevelopment project in Subiaco. Employment in the Perth CBD has stabilised and office employment is becoming more decentralised in West Perth, South Perth and Victoria Park. Similarly, retailing has become more decentralised. Higher density housing is becoming more important in the city centre. Planning authorities are looking at ways of better integrating land use and transport infrastructure planning.

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### 3. Dispersed metropolitan regions

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Dispersed metropolitan regions accommodated the highest proportion of Australia's population growth over the past 50 years. Australian cities developed at low-density with population growth spreading out from their inner city centres. They are predominantly residential areas with workers commuting to employment centres in core metro areas or production zones. The dispersed metropolitan regions in SOR reports are: Central Coast, North and north western Sydney, Outer Western Sydney, Southern Sydney, Outer South Western Sydney, Southern Adelaide, Southern Perth, East Melbourne, Westernport and North Brisbane<sup>13</sup>.

Many dispersed metropolitan regions are doing well. Successful dispersed regions have developed vibrant educational, cultural and recreational centres. They offer quality of life opportunities. Adelaide and Perth have developed innovative rapid transit systems to provide better commuter access to their core metro regions.

In the last quarter of the 20<sup>th</sup> Century, there was increasing concern about urban sprawl, and the continuous outward spread of Australian cities. The main concerns are growing car dependence and poor public transport, social and environmental impacts of urban growth, and distance from employment centres, and increasing costs of infrastructure provision. The critical economic issues for these predominantly residential areas is where jobs are located in relation to where people live and how efficient is the transport system to get them to work. For dispersed regions to function well, they need efficient and equitable transport access to major employment centres and/or a strong local employment base.

In the early phases of the development of these regions, there was always a lag between workforce and population growth in these areas, on the one hand, and, on the other hand, the growth of local employment opportunities and infrastructure networks.

In the post-war period, manufacturing investment relocated from central cities to greenfields sites or production zones in proximity to these dispersed metro regions. Industry growth fuelled population growth, predominantly through immigration, and population growth in turn fuelled industry growth. Abundant land, improvements in transport infrastructure, and a growing industrial labour pool attracted industries.

Over the past 20 years, population growth in dispersed metropolitan areas has been a factor driving local employment growth. The dispersal of jobs often wasn't fast enough to keep up with high labour force growth, but it managed to reduce unemployment in these regions. The major employment opportunities have been in retailing, community services particularly health and education, transport and storage, construction, and local business and recreational services.

Increasingly, in the knowledge-economy, the issue is becoming where people live in relation to "good" jobs. The new knowledge-based jobs are re-concentrating around the core metro regions. This poses a challenge for dispersed metro regions. Should more attention be given to improving infrastructure links to core metro areas, and/or should new strategies be put in place to attract more knowledge-based jobs into regional centres and business parks (as well as giving encouragement to home based businesses).

Despite the inner city renaissance in the larger metropolitan cities, population rates in dispersed regions remains high. The main drivers for growth are the availability of land to support new

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<sup>13</sup> We have defined Brisbane, the biggest LGA in Australia, as a core metro region, even though parts of it should really be considered as dispersed metro.

residential development, particularly affordable housing for first and second home buyers. These outer area are becoming increasingly attractive to higher income residents, who want access to metropolitan cities but are also seeking lifestyle attributes such as rural based residential dwellings on the periphery.

Dispersed metropolitan regions are some of the fastest growing regions in Australia, certainly in absolute terms (Table 3.1). The fastest growing are North Brisbane, South Perth and Central Coast NSW. Land constraints are often a factor in low growth dispersed metropolitan regions, such as Southern Sydney.

Dispersed metropolitan regions tend to have strong GRP growth rates (Table 3.2), driven by residential growth, construction, service industries supporting population growth and industrial firms located in dispersed metropolitan areas because of the availability of land and lower locational costs than core metro locations.

**Table 3.1 Population change in dispersed metropolitan regions**

Region	Population 1993 (number)	Population 2000e (number)	Population growth 1993-2000 (% p.a.)
Central Coast NSW	252,986	293,518	2.15
North Brisbane	414,199	526,621	3.49
North North West Sydney	585,260	623,796	0.92
Outer South West Sydney	242,085	270,848	1.62
Outer West Sydney	289,678	314,298	1.17
Southern Adelaide	363,482	378,883	0.59
Southern Melbourne	330,384	351,131	0.87
Southern Perth	538,396	608,990	1.78
Southern Sydney	401,242	428,892	0.96
West Melbourne	501,775	554,532	1.44
Westernport VIC	660,585	729,714	1.43

Source: NIEIR's LGA YourPlace database.

Table 3.3 shows significant employment growth over the decade of residents in North Brisbane, Outer South West Sydney, Outer West Sydney and Central Coast NSW. Other regions are more reliant on commuting to core metro areas and/or have higher unemployment rates.

Table 3.4 indicates that dispersed regions have a lower proportion of symbolic analysts than core metro regions, as would be expected. North and North Western Sydney and Southern Melbourne have higher proportion because they are linked more into to global regions of Sydney and Melbourne. These regions also tend to have a large number of routine production workers, particularly those that have concentrated groupings of people living in affordable housing areas.

**Table 3.2 Gross regional product in dispersed metropolitan regions 1991-1998**

Region	GRP including dwelling 1991 (1998 \$m)	GRP including dwelling 1998 (1998 \$m)	GRP including dwelling (% p.a.)	Productivity increase per employed person (% p.a.)
Central Coast NSW	3,213.7	4,280.2	4.2	1.5
North Brisbane	3,984.7	5,997.0	6.0	2.2
North North West Sydney	11,965.6	15,273.8	3.5	2.4
Outer South West Sydney	2,757.2	3,703.5	4.3	2.1
Outer West Sydney	3,609.5	4,883.8	4.4	2.3
Southern Adelaide	4,309.2	5,379.9	3.2	2.4
Southern Melbourne	6,150.1	8,343.4	4.5	3.0
Southern Perth	10,752.8	13,289.1	3.1	1.6
Southern Sydney	6,638.8	8,163.4	3.0	2.2
West Melbourne	7,611.7	9,308.1	2.9	2.4
Westernport VIC	8,900.9	10,697.0	2.7	0.8

Source: NIEIR's LGA YourPlace database.

**Table 3.3 Employment change in dispersed metropolitan regions 1991-2000**

Region	Employed 1991 (number)	Employed 2000 (number)	Employment growth 1991-2000 (% p.a.)	Employment growth 1991-2000 (per cent)
Central Coast NSW	82,700	111,134	3.34	34.38
North Brisbane	148,586	228,715	4.91	53.93
North North West Sydney	289,008	336,486	1.70	16.43
Outer South West Sydney	102,756	136,079	3.17	32.43
Outer West Sydney	119,101	163,722	3.60	37.46
Southern Adelaide	162,235	169,057	0.46	4.21
Southern Melbourne	145,116	171,762	1.89	18.36
Southern Perth	236,217	296,705	2.57	25.61
Southern Sydney	197,300	211,460	0.77	7.18
West Melbourne	204,332	253,137	2.41	23.89
Westernport VIC	291,760	343,491	1.83	17.73

Source: NIEIR's LGA YourPlace database.

**Table 3.4 Occupational breakdown in dispersed metropolitan regions 1996 (per cent)**

Region	Symbolic analysts	Low skilled service	High skilled service	Routine worker	Farm
Central Coast NSW	14.8	26.3	19.1	38.7	1.1
North Brisbane	15.3	26.4	18.2	36.9	3.2
North North West Sydney	24.6	22.8	18.3	33.6	0.7
Outer South West Sydney	14.2	23.2	19.2	40.6	2.8
Outer West Sydney	15.3	23.6	19.8	39.4	2.0
Southern Adelaide	16.9	24.0	20.2	36.1	2.9
Southern Melbourne	21.7	21.0	15.5	41.5	0.2
Southern Perth	19.8	22.6	14.6	42.2	0.8
Southern Sydney	18.6	23.8	19.1	38.3	0.1
West Melbourne	17.5	21.3	15.9	44.7	0.6
Westernport VIC	16.3	22.1	16.7	42.1	2.8

Source: NIEIR's LGA YourPlace database.

### 3.1 Dispersed Brisbane

North Brisbane is experiencing high population growth particularly in Caboolture and Pine Rivers local areas. Caboolture is in fact one of Australia's fastest growing localities, growing at around 10 per cent pa. These areas form part of a northern corridor linking Brisbane to the Sunshine Coast. Although a high proportion of the workforce commute to Brisbane, new retail complexes and industrial estates are opening up, whilst the tourist industry is growing. Caboolture has been designated a Key Metropolitan Centre.

Rapidly growing areas of North Brisbane are Fitzgibbon, Mango Hill and Caboolture. Many of these new urban areas have poor access to rail transit, poor integration of public transport services and infrequent rail services. The Queensland Government<sup>14</sup> has developed longer term transport infrastructure strategy, which includes addressing the bottlenecks in North Brisbane.

### 3.2 Dispersed Sydney

Despite a concerted and partially successful policy to increase population in inner city areas, most of Sydney's population growth is accommodated in the dispersed metropolitan areas of Greater Western Sydney (and the Western Sydney parts of the Sydney Production Zone) and the Central Coast.

Around 30,000 people commute from Gosford-Wyong on the NSW Central Coast to Sydney each day. The rail network and the F3 freeway are operating at close to full capacity, and both require further upgrading. Upgrading the rail network imposes challenges because of environmental sensitivities on both sides of the Hawkesbury River. Expanding the number of lanes on the freeway would improve traffic flows but traffic congestion mounts as the freeway intersects with urban Sydney at Hornsby. The alternative is to increase employment self-containment in the Central Coast. With rapid population growth, the area is experiencing job growth in retail and community services.

<sup>14</sup> Queensland Transport, 2007 A Vision – a draft transport technical paper, 1999.

Major new retail complexes have been developed and expanded at Tuggerah and Erina. Wyong City Council is aggressively pursuing a strategy to attract new industry and tourism investment.

Examples include the establishment of the Tuggerah Business Park and revitalisation of the Entrance town centre, the latter designed to enhance liveability and the tourist industry opportunities. The Ourimbah Education Campus involves co-habitation of Newcastle University and TAFE, but more investment is required in higher education. Gosford Centre - arguably one of Australia's most scenically located centre - is under-performing as a centre.

Over the next 20 years, the population of Greater Western Sydney is conservatively forecast to grow by around 500,000, even if urban consolidation strategies are successful in significantly increasing the population of inner city areas. This is around half of the total population growth in NSW over the next 20 years. This population will be accommodated in three dispersed regions in metropolitan Sydney – Outer South West, Outer West and North-north western Sydney, as well as in Liverpool, Blacktown, Holroyd and Parramatta, parts of the Sydney Production Zone in GWS. Impediments to economic development in the region include:

- ❑ much of the residential area developed at a low density making provision of infrastructure costly;
- ❑ increasing environmental problems with the Hawkesbury-Nepean rivers due to urban run-off;
- ❑ the area is not yet self contained in terms of employment and there is a lack of higher order jobs;
- ❑ some areas of the highest concentrations of unemployment in urban Australia. Unemployment is higher than average in metropolitan Sydney;
- ❑ increasing car dependence in outlying areas and poor public transport. The region is experiencing increasing problems with congestion, due to capacity problems on the freeway system, and poor intra and inter-regional transport links. A major regional objective is to gain the support of the Federal Government to fund the Western Sydney Orbital, the portion of the National Highway that traverses Western Sydney;
- ❑ many areas are lagging in the provision of adequate public transport resulting in a high use of private vehicles, particularly for travelling to work;
- ❑ the regional centres are not performing well and most have been bypassed by the construction boom of the past 5 years. The level of activity in the regional centres has not met expectations. Apart from retail centres and associated entertainment such as cinema complexes, higher order office jobs have lagged disappointingly in the centres in relationship to the workforce; and
- ❑ State government cultural facilities are almost non-existent whilst they are being further consolidated in the Sydney CBD.

### **3.3 Dispersed Melbourne**

Melbourne has a number of geographical advantages over Sydney including the central location of the CBD, relatively flat topography and a relatively efficient public transport system. Metropolitan planning instruments restricted outward growth of the city and planning authorities have had a long history of encouraging employment growth in areas of high accessibility along rail-based corridors. Dispersed Melbourne has developed a number of transit oriented district centres such as Frankston, Box Hill, Moonee Ponds and Footscray, which provide for a range of employment, shopping and community and cultural amenities<sup>15</sup>. Prior to the election of the new Victorian Government, many of

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<sup>15</sup> Paul Mees, *A Very Public Solution – Transport in the Dispersed City*, Melbourne University Press, Melbourne 2000.

the strategies to concentrate employment in district centres were relaxed in favour of a more laissez faire approach. Dispersed metropolitan areas of Melbourne are experiencing solid growth rates again. Established areas are being redeveloped and new greenfield residential areas are being developed in the outer suburbs. In Melbourne, population growth is occurring in outer north western, south western and south eastern localities at a faster rate than the state average.

The Victorian Government is preparing a new metropolitan strategy, commencing with background papers and consultations. A recently released issues paper shows that most employment growth in Melbourne is occurring outside Melbourne's core metropolitan regions<sup>16</sup>. In fact, between 1971 and 1996, around 80 per cent of new jobs were created outside of the inner region. The report suggests that numerous economic activities are expanding outside the inner areas including information technology, retail, manufacturing and warehousing. Some important spatial variations are occurring in relation to employment creation. According to Challenge Melbourne, most non-CBD jobs are occurring to the south of the city. Excluding the CBD, between 1981 and 1996, the share of metropolitan jobs north of the Yarra fell from 49 to 37 per cent, whilst the share south of the Yarra increased from 49 to 61 per cent.

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<sup>16</sup> Victorian Government, Challenge Melbourne – issues in metropolitan planning for the 21<sup>st</sup> Century, 2000.

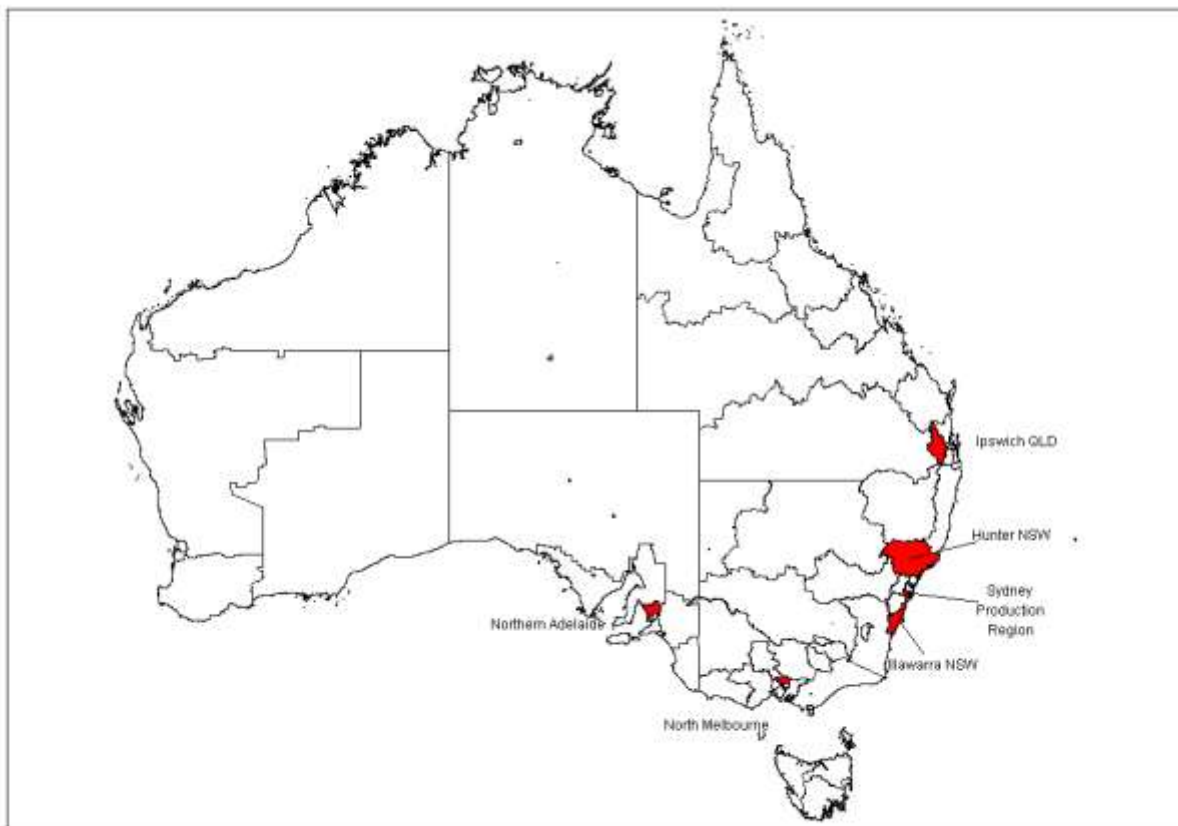


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## 4. Production regions

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By production zones we are referring to areas characterised by a high concentration of manufacturing industries. We consider them as distinct regions because they have a number of features in common. Apart from the proportion of manufacturing in the local economy, other characteristics include a high proportion of semi-skilled workers, tradespeople and routine production workers, high structural unemployment, a large number of residents from non-English speaking backgrounds, and a shortage of opportunities for young people.



These production areas take a number of forms. Some are major regions in their own right, including the Lower Hunter focused on Newcastle and the Northern Illawarra based around Wollongong. Smaller industrial cities including Geelong, Whyalla and Rockingham-Kwinana, which are incorporated into broader regions; yet retain specialised manufacturing industries and infrastructure. Others are distinct and relatively self-contained regions in the major cities. Examples include what we have termed the Sydney Production Zone, stretching from Bankstown, through Liverpool, Fairfield, Holroyd, Parramatta and Blacktown. In Melbourne, production zones are located at in North-East Melbourne (Broadmeadows, Preston), West Melbourne and Dandenong. North and Western Adelaide - including the localities of Port Adelaide Enfield, Charles Sturt, Salisbury and Playford - is one of Australia's largest production zones.

To varying degrees, these production zones are being transformed. Some are accelerating growth of service based industries such as tourism (Hunter, Wollongong, Geelong), some are seeking to establish a base in advanced manufacturing (North and Western Adelaide) and others are seeking further industrial growth based on state economic growth and opportunities for processing raw materials (Freemantle-Kwinana).

Over the past 25 years, these regions have undergone fundamental restructuring. The main drivers of change were structural change, trade liberalisation and loss of international competitiveness in key sectors. Although Australia retains a number of globally competitive manufacturing firms, Australian manufacturing continues to perform poorly by international standards.

Population growth rates are set out in Table 4.1, indicating reasonable aggregate growth rates. In the case of the Hunter and Illawarra, this is because they both contain high growth areas – Lake Macquarie and Port Stephens in the Hunter and the Shoalhaven, which is more of a lifestyle sub-region in the Illawarra.

**Table 4.1 Population change in production regions 1993-2000**

Region	Population 1993 (number)	Population 2000e (number)	Population growth 1993-2000 (% p.a.)
Hunter NSW	540,249	577,439	0.96
Illawarra NSW	323,258	347,964	1.06
Ipswich QLD	169,920	184,785	1.21
North Melbourne	651,781	696,840	0.96
Northern Adelaide	415,975	432,959	0.57
Sydney Production Region	1,166,626	1,277,906	1.31

Source: NIEIR's LGA YourPlace database.

Gross Regional Product growth rates are about average, with Ipswich QLD slightly above and North Adelaide and the Sydney Production Region slightly below. Manufacturing industries that survived in these areas have undergone significant restructuring and improvements in productivity.

**Table 4.2 GRP changes in production regions 1991-98**

Region	GRP including dwelling 1991 (1998 \$m)	GRP including dwelling 1998 (1998 \$m)	GRP including dwelling (% p.a.)	Productivity increase per employed person (% p.a.)
Hunter NSW	10,479.9	13,704.5	3.9	3.1
Illawarra NSW	5,293.8	6,867.3	3.8	1.6
Ipswich QLD	1,888.0	2,608.3	4.7	3.8
North Melbourne	9,720.5	12,530.6	3.7	2.3
Northern Adelaide	5,510.4	6,864.1	3.2	3.0
Sydney Production Region	21,286.0	27,017.7	3.5	2.8

Source: NIEIR's LGA YourPlace database.

Employment growth rates are outlined in Table 4.3. Those production regions experiencing reasonable employment growth are those showing strong population growth at a sub-regional level, with job growth in service industries such as retail, community services and property and business services. Illawarra and Hunter economies are diversifying into new industries; particularly tourism and education related activities. The production region experiencing the most severe structural problems is North Adelaide. Despite significant investment, including in high technology industries, low population growth and a lower rate of diversification into labour-intensive industries is holding down employment growth.

**Table 4.3 Employment change in production regions 1991-2000**

Region	Employed 1991 (number)	Employed 2000 (number)	Employment growth 1991-2000 (% p.a.)	Employment growth 1991-2000 (per cent)
Hunter NSW	223,631	258,087	1.60	15.41
Illawarra NSW	129,525	156,557	2.13	20.87
Ipswich QLD	68,412	86,336	2.62	26.20
North Melbourne	274,231	309,290	1.35	12.78
Northern Adelaide	169,194	187,546	1.15	10.85
Sydney Production Region	499,614	586,046	1.79	17.30

Source: NIEIR's LGA YourPlace database.

The occupational breakdown for production regions shows that these regions have a much lower share of symbolic analysts than core metro regions and they have a much higher share of routine production workers. It is the latter group -two out of five workers are routine production workers - are a concern. They are most vulnerable to automation, as well as to redundancy in the event of a downturn of the economy.

**Table 4.4 Occupational breakdown in production regions 1996 (per cent)**

Region	Symbolic analysts	Low skilled service	High skilled service	Routine worker	Farm
Hunter NSW	16.3	22.6	16.4	42.1	2.6
Illawarra NSW	17.2	22.2	18.0	41.5	1.1
Ipswich QLD	14.2	21.9	16.1	41.7	6.1
North Melbourne	17.5	21.1	16.5	44.4	0.4
Northern Adelaide	17.2	21.9	15.1	44.2	1.7
Sydney Production Region	19.3	19.8	14.5	46.1	0.3

Source: NIEIR's LGA YourPlace database.

## 4.1 Newcastle and the Lower Hunter

The Lower Hunter is Australia's most recognisable production region, particularly focused around Newcastle. Traditionally a heavy industrial and resource based region, the Lower Hunter has undergone a process of transformation. Employment in traditional manufacturing such as textile, clothing and footwear, non-metal mineral products and basic metals has declined. Somewhat forcing the issue, BHP has recently closed its steel making operations in Newcastle.

A new industrial base is taking shape. A shift is occurring towards highly productive, skilled and knowledge intensive industries in processed foods, IT&T, multi-media, defence and transport equipment. The Hunter has a long history of involvement in regional development issues – with a strong commitment from business, unions and community based organisations to regional development. The area has a number of important regional agencies such as the Hunter Economic Development Corporation. Regional groups lobby hard for major projects, such as the Navy's Minesweeper project. The region has been at the forefront of efforts to create industry clusters and networks, such as HunterNet, a network of metals and engineering firms collaborating on training and market opportunities. Initiatives are underway to strengthen linkages and collaboration between firms in the IT&T sector and tourism industry.

The economy has become more diversified and complex, with significant growth in the wine industry, tourism and hospitality, community services, education, business and producer services, personal services and finance. Around half of the employment growth in the region over the past decade has taken place in Lake Macquarie, which offers lifestyle amenities, rapid access to Sydney and is experiencing a high rate of population growth<sup>17</sup>.

Associated with the shift in the economic base, the occupational base of the region is becoming more skilled<sup>18</sup>. As with metropolitan Sydney as a whole, the region is shifting quickly towards a high skilled workforce. In the inter-censal period, 1991-1996, the region became more skill-intensive, with a dramatic increase in the number of professionals (up 50 per cent from 21,000 to 32,000), para-professionals (up 50 per cent from 14,000 to 22,500), and plant and machine operators (up 20 per cent to 23,000). In tandem with the shift to the knowledge economy, education attainment is improving, with a substantial increase in residents with under-graduate qualifications (up a third to over 20,000) and a doubling of those with associate diplomas from TAFE.

A priority for Newcastle is the development of its arts and cultural industries. A job summit in Newcastle two years ago identified the arts as second to tourism as the most significant sector for job creation and growth<sup>19</sup>. The city has invested in creating new tourist and recreational amenities around the foreshores of Newcastle Harbour.

The Hunter's reputation as a centre for green technology will soon be enhanced by the relocation of CSIRO's Energy Technology Division to the Steel River eco-industrial park. The park is a joint venture of BHP and Baulderstone. The Council has created a welcoming environment for sustainable industries. One innovation is its 28-day approval process that removes any delays in development approvals once the design concept has the green light.

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<sup>17</sup> National Economics, **Lake Macquarie Non-Centre Employment Strategy**, Lake Macquarie City Council, 1998.

<sup>18</sup> Roy Green, **Unemployment and Structural change: The Regional Experience**, Employment Studies centre, University of Newcastle, Newcastle NSW 2308, unpublished, 1998.

<sup>19</sup> Initiatives to use arts and cultural industry as a means to regenerate industrial cities have been implemented in a number of production regions including Newcastle, Geelong and Wollongong. For the economic potential of cultural industries, see Marla Guppy and National Economics, **A Cultural Industries Audit for Wollongong**, for Wollongong City Council, 2000.

The three largest councils in the Hunter, Newcastle, Lake Macquarie and Port Stephens are also active members of Sustainable Industries Inc (SII) together with around 35 companies. Newcastle and Port Stephens are also part of SII's lead team that sets strategic directions for the group. SII is a non-profit incorporated association that supports, promotes and initiates environmentally responsible and sustainable industry products, services and practices.

The result of this joint activity of government and business is that the Hunter Valley is developing a reputation as a centre of excellence in sustainability.

## **4.2 Wollongong and Northern Illawarra**

Wollongong developed over the past 50 years as an important industrial city based around its heavy industry base associated with coal, steel, clothing and engineering industries. Demand for lower skilled industrial workers and specialised tradespeople was the major driver for population growth. With labour shortages nationally, migration provided a major source of labour, resulting in development of a working class multicultural community.

The major characteristics of the Wollongong economic development path pursued over the period 1945-2000 were as follows: Firstly, wealth creation emanated from the natural resource base of the region and the employment of manual workers in manufacturing. Secondly, up until the 1980s, the city was characterised by a monopoly business culture, dominated by BHP, with hierarchical work places and class conflict. Strategic investment, employment and management decisions were made external to the region. In the last 20 years, strategies to diversify the regional economy have been pursued – with the major focus on tourism and hospitality, education and health and information technologies.

Although high value added manufacturing will remain important, new industries - particularly high value added manufacturing and service based industries - are expected to drive employment growth in future. The industrial city age ended in the last years of last century, but what is to replace it is the challenge that confronts the region. Wollongong has struggled to establish a new identity and economic development path following massive job losses in the early 1980s in the steel, coal, engineering and clothing industries. The steel industry crisis left its mark on the city. The future of the steel industry remains uncertain, particularly with BHP separating its steel operations from its other activities and growing industrial tension due to increased use of out-sourcing.

Unemployment remains high, many workers have missed out on the benefits of a booming state economy in the later part of the 1990's, many young people look forward to leaving Wollongong, and incomes for significant sections of the population remain low. Significant sections of the population have become economically and socially marginalised.

It has been recognised since the late 1970s that Wollongong couldn't sustain itself as a heavy industrial city and needed to diversify. Through the efforts of the local business community, unions, community groups and support of government, Wollongong has expanded investment in new areas. The region has won greater autonomy for its port authority and has had some success in diversifying into agricultural exports, although it remains vulnerable as a coal exporter. The northern parts of the region are becoming integrated into the Sydney labour market, with a high proportion of people commuting to Sydney.

The Illawarra Technology Corporation, itself the outcome of the economic crisis of the 1980's, opened new opportunities for the region in high technology industries including information technology. Associated with the university, it has established itself as an important research base in telecommunications through a partnership with Nortel.

The University of Wollongong has evolved from an outpost of UNSW in the 1960s to an important university and a major employer in its own right. The University has developed a national reputation with its industry research work and is taking on an increasingly international orientation with its student enrolments.

A major focus over the past two decades has been the development of the tourism and hospitality industry. Significant resources have been allocated to tourism infrastructure, facilities and marketing. Early visions of creating a “leisure coast” similar to the Gold Coast to replace heavy industry were unrealistic. Although tourism emerged as an important local industry, it hasn’t had the success of many competitor regions such as the Hunter, Australia’s Holiday Coast and the Far North Coast. Tourist strategies emphasised the spectacular escarpment and coastal and proximity to Sydney, but generally ignored the fact that Wollongong is an industrial city.

Wollongong remains a working class city and is likely to remain an important manufacturing centre for the foreseeable future. Hence, the first challenge is to integrate the competitive advantages of spectacular environment with the reality that Wollongong is an industrial city. The second challenge is to take the industrial heritage of Wollongong and reposition it as a valued asset and draw-card for visitors to the area.

### **4.3 Sydney Production Region**

The Sydney Production Region comprises Canterbury, Bankstown, Auburn, Holroyd, Fairfield, Parramatta, Liverpool and Blacktown. Except for Canterbury-Bankstown, the region forms the core of Greater Western Sydney (GWS), but excludes the higher income peripheral areas of the west, which we have discussed as dispersed metropolitan.

These localities, the focus for Sydney’s industrialisation over the past 50 years, contain Sydney’s major industrial zones. The zone provides around 45 per cent of Sydney’s industrial production. A large proportion of Sydney’s population growth over the past 50 years was accommodated in the region. A high proportion of people moving to the area came from non-English speaking backgrounds - attracted by low cost housing and industrial jobs. It still accommodates much of Sydney’s growth. Blacktown and Liverpool are two of the fastest growing localities in Australia.

Improvements in transport infrastructure, the growing industrial labour force in GWS, the development of industrial estates with abundant land was the catalyst for the relocation of industrial firms from inner Sydney in the 1970s.

An employment and income gap opened between this region and the rest of Sydney. The number of knowledge-based jobs is low, whilst the region contains Sydney largest share of routine production jobs. Areas like Liverpool-Fairfield have experienced - behind North and Western Adelaide - the highest rates of urban unemployment in Australia.

The standardised median household income fell across the decade in all localities. This included falls in real terms of between 8 and 10 per cent in Bankstown, Holroyd and Fairfield. The skills base is industrial with about 60 per cent of the adult population having no qualifications. In Fairfield’s case two thirds of the adult population are without any vocational qualifications. With the exception of Fairfield, there has been a slight reduction in the proportion of unqualified adults over the decade. Conversely, the proportion of the population with degree or diploma qualifications is low by Metropolitan standards: between 11-15 per cent with only 9 per cent of Fairfield’s population having completed some form of higher education.

The industrial orientation of the workforce and their low skills base makes residents particularly susceptible to job loss through automation and internationalisation of investment in low skill production areas. More than 60 per cent of residents work in the Sydney Production Region.

In terms of labour market performance Auburn, Canterbury and Fairfield stand out as losing metropolitan competitiveness. Less than 50 per cent of the adult population in these areas were in employment at the time of the 1996 Census and the proportion fell over the decade (Fairfield from 52 to 48 per cent; Auburn from 48 to 46 per cent and Canterbury from 52 to 49 per cent). All three localities have a high proportion of residents born in non English speaking countries (40-50 per cent) and around 17 per cent of the overseas born population did not speak English well. This places them at a strong disadvantage in seeking new vocational skills and in finding work in the communications intense service sectors where jobs are growing.

Most manufacturing firms Sydney Production Region were engaged in import replacement activities supporting the rapidly growing metropolitan and national markets. Until relatively recently, much less emphasis was given to exports. Protected by quotas and high tariffs, local manufacturing thrived in the booming post-war economy. Industry clusters emerged – chemicals at Parramatta-Auburn; aerospace at Bankstown; processed foods in Blacktown; automobile components and transport and mining equipment in Fairfield; electrical and telecommunications industries at Moorebank, and glass and plastics at Campbelltown.

Industrial firms were either predominantly locally owned small medium enterprises (SMEs) supplying intermediate products for the housing and construction industries, textiles and clothing and components for large corporations, or branch plants of large global companies who located in the region to manufacture for the Australian market behind tariff barriers.

The expansion of manufacturing jobs in the region in the post-war boom economy and additions and improvements of both public and private housing stock in turn drove demand for more labour which in turn encouraged population growth through immigration and the movement of young Australian families into the region.

Companies invested in the region looking for cheap and serviced land, good transport links and access to an abundant industrial labour force. The location of Sharp and Sony at Huntingwood industrial estate heralded a new phase of development. Although the previous criteria remained important, high value added industries were looking for other attributes, including attractive environment and design of industrial areas. With anchors such as Sony and Sharp, and location on the M4 Freeway, Huntingwood created a more up-market industrial estate.

The area has difficulties competing for high technology industries. Sydney's premier high technology parks are located in the global centre, particularly in the high tech spine running from North Sydney through Willoughby and Lane Cove to North Ryde. High tech companies search for business park environments, proximity to high-income residential area with high skilled workers and access to cultural and entertainment facilities offered by the central Sydney.

The region faces a major structural challenge. Lower rates of employment growth are projected due to vulnerability to job loss through automation and globalisation processes. A downturn in the construction industry, which provided good jobs during the pre-Olympic period, is expected to hit the region over the next two years, negating many recent employment gains.

Its future depends on its capacity to attract investment in globally competitive industries in advanced manufacturing and business services and tourism, whilst maintaining strong growth in industries linked to population growth: transport, retailing and community services<sup>20</sup>. This in turn depends on a commitment to strengthen the foundations for growth: including transport infrastructure, innovative regional centres, technology precincts such as biotechnology at Westmead and telecommunications at Moorebank, and education and training infrastructure.

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<sup>20</sup> National Economics and Devine Erby Mazlin, **Strategic Planning and Transport – A vision and directions statement for Greater Western Sydney**, A report to the Greater Western Sydney Economic Development Board, 2000.

Parramatta is developing further as Sydney's second CBD. The construction of the Parramatta-Chatswood rail link will strengthen the region's links with the high technology areas of North Ryde, Willoughby and North Sydney.

#### **4.4 Geelong**

Although Geelong is part of the rural based Golden Region, the city itself is a production centre. Geelong is in the process of transformation from an industrial city and port dominated by automobile, chemicals and metal industries to a more diverse city. Its economic future depends on its capacity to maintain the competitiveness of its existing industry base and to develop new industries. Geelong has succeeded in creating outstanding educational infrastructure (Deakin University has a national reputation in distance learning), revitalising the city centre and creating opportunities for serviced based SMEs. Geelong has come to national attention due to its drive to bring the Guggenheim Museum to Australia and locate a facility in Geelong. Increasingly, the city links with Melbourne and local lifestyle attributes are creating new opportunities.

The city has a strong regional identity and involvement in regional economic development planning, through the Geelong City Council and the Geelong Economic Development Board and its predecessors.

In its economic development vision, Geelong City Council<sup>21</sup> has specified a number of objectives:

- a target for population growth of 3 per cent per annum;
- employment growth equal to or above the Victorian average;
- strategic improvements including a 45 minute link to Melbourne;
- a major transport and freight hub associated with the development of Avalon airport, which will include warehouses packaging and freight facilities as well as an aircraft service centre; and
- a regional education centre and leader in health services.

#### **4.5 North and Western Adelaide**

North and Western Adelaide comprises the industrial core of the South Australian economy, one of Australia's most highly concentrated manufacturing regions<sup>22</sup>. The region developed around strong clusters of manufacturing industries including automobiles and components, metals and engineering, defence, chemicals and pharmaceuticals, and textiles, clothing and footwear. It contains a number of major plants, including the main Australian manufacturing plant for General Motors, Fauldings, BAE British Aerospace, DSTO and facilities for the Australian Submarine Corporation. There is a strong project focus. Major current projects include GMs plans to increase exports to the Middle East, the announcement of the construction of the Alice Springs-Darwin rail link (which will link Adelaide to Darwin, and the construction of the Collins Class submarines.

The infrastructure foundations of the region are strong; including Port Adelaide, Adelaide Airport, rail and a well-planned road networked. The region borders Adelaide CBD, hence enhancing links with the administrative and business centre.

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<sup>21</sup> [www.geelongcity.vic.gov.au](http://www.geelongcity.vic.gov.au)

<sup>22</sup> Definitions of the region are flexible. To analyse the core industrial activities, we use the definition used by six councils collaborating in the Creating Employment Links project, namely: Charles Sturt, West Torrens, Port Adelaide Enfield, Salisbury, Playford and Tea Tree Gully, although the latter shares geographical proximity with the rest but not its industrial composition.



It includes significant proportion of public housing and some higher income housing closer to some of the city's beaches. In recent years, some inner suburbs close to Adelaide became more gentrified. More recently, innovative housing developments such as Golden Grove and Mawson Lakes have been designed to attract high-income professionals into the area.

This industrial region has experienced significant structural change including plant closures due to tariff liberalisation and associated loss of international competitiveness. The fact that Adelaide has a relatively small and slow growing population is a further constraint on manufacturing.

The state has given priority to attracting global corporates in IT&T. The region was the base of the doomed Multi Function Polis, which may have diverted the city away from more achievable development projects. Nevertheless, the region has been successful in the establishment of the Technology Park. Located next to the University of South Australia and Mawson Lakes housing estate, the Technology Park has attracted significant investment in information technology and telecommunications including operations from Optus, Motorola, and EDC.

The SA Government has provided substantial subsidies to attract global high technology companies, and most of them are based in the region. The long term challenge will be whether the Tech Park remains a high tech oasis, or whether it creates the opportunities for local researchers and SMEs to create internationally competitive businesses in IT&T.

The region confronts long term unemployment. The region has the highest unemployment rates in metropolitan Australia. A number of communities have become marginalised, experiencing low incomes, social isolation and few job opportunities, and resulting disturbing social problems.

One of the major challenges is to improve skills formation in the region and to shift workers into higher skilled job opportunities. Using Reichian occupational categories, the regional workforce can be broken down as follows:

- ❑ symbolic analysts are small by metropolitan city standards. The largest occupations in this category are sales and service managers, business analysts, information system analysts;
- ❑ in person service workers are engaged predominantly health and learning occupations. The proportion engaged in tourism and hospitality remains low; and
- ❑ routine production workers are mainly intermediate clerks, production machinery operators, and construction trades workers. This high proportion of routine production workers presents the region with a long term challenge because these workers are most vulnerable to job loss, and are engaged in tasks that are quickly becoming codified and automated. They are predominantly workers who are least likely to be engaged in long term education and training.

## **4.6 Ipswich, Queensland**

Ipswich City, located 40 km to the west of Brisbane, developed as a mining and manufacturing centre for South East Queensland. In the 1980s, the region experienced severe structural change, associated with loss of competitiveness in some mining activities, manufacturing and rationalisation of rail facilities. Unemployment increased and remains around 10 per cent. The city has had some important successes in shifting itself onto a high development path and its population is growing at around 2 per cent per annum.

The city has a number of positive attributes. Firstly, its proximity to Brisbane and good infrastructure links has enabled it to tap into the rapid growth of South East Queensland. The Springfield Lakes development, an integrated residential development with shops, recreational amenities and learning facilities, located 11 km to the east of the city, is designed to be a model community with a plan to accommodate 60,000 people, which in turn will stimulate Ipswich.

Secondly, the regional economy has a number of important assets, including the Amberley RAAF base, which houses Boeing facilities; rich agricultural land and an important processed food industry; and a number of important redevelopment and heritage sites in the city.

Most importantly, Ipswich is considered a leader in local economic development. The Council has taken a pro-active approach to economic development. The main priorities are information industries, education, cultural industries and city revitalisation. The council was an innovator in establishing Global-info links, designed to ensure that local businesses and communities were positioned to be early leaders in the information economy. The project provides Internet links and runs Internet awareness sessions. All local education institutions (118 in all) were provided with free Internet access and a modem. The city has been successful in attracting the University of Queensland to establish a campus in the city, which is destined to become a major regional education centre linked to the city itself. As a focus for redevelopment, the Council has entered into a partnership with the Queensland Government and Queensland Rail to redevelop the local rail yards. The Queensland Government and Queensland Rail are investing \$20 million to redevelop the Workshops site. Proposed projects include a Rail Museum and Technology Centre, recreational gardens, sporting and leisure facilities and a park linking the Workshops to the river.

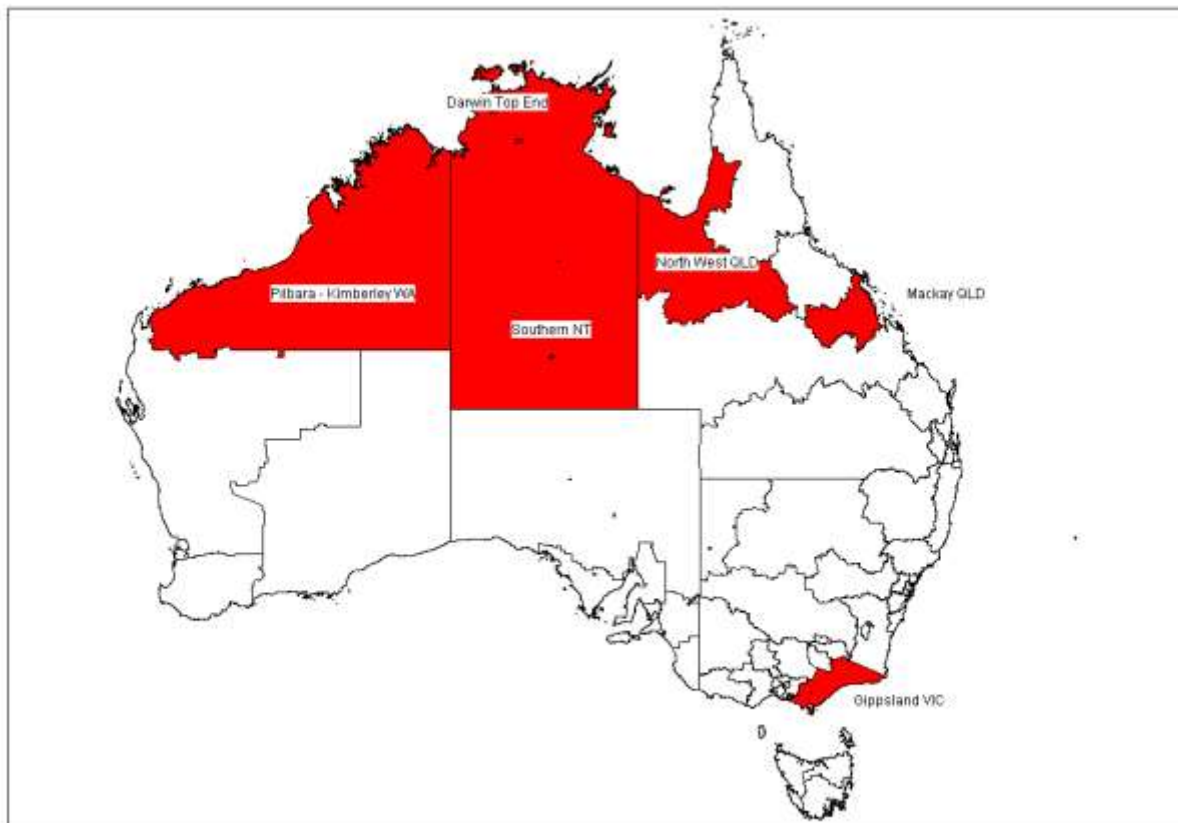
The city has initiated a CBD revitalisation project, which involves conserving heritage buildings, improving design, and identifying opportunities for inner city living as well as expansion of retail and commercial activities. The historic Town Hall has been redeveloped as a major tourism and cultural facility. The project incorporates the Global Arts Links project, which aims to use telecommunications technology and visual arts to promote interest in cultural activities, learning and links.

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## 5. Resource based regions

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Resource-based regions evolved around our resource endowments in minerals and energy - including coal, oil and natural gas, iron ore, copper, uranium, alumina, lead and zinc, nickel and gold. Australia is a major player in global minerals and energy markets and this has resulted in some distinct patterns of regional development. We have some clearly recognisable resource based regions but often the boundaries get a bit hazy. Major areas include the Pilbara WA, Upper Hunter NSW, Central Queensland, Central South Australia, Northern Territory Top End and the La Trobe Valley in Victoria.



Some resource abundant areas dominate their local economies. The Pilbara in North Western Australia is a good example. Iron ore resources spurred the creation of the mining industry and the discovery and development of rich oil and gas reserves in the North West Shelf resulted in the development of a number of mining communities.

Other resource-based areas are part of more diverse regional structures. Mackay, for example, which we have classified as a rural region, is actually more of a hybrid region containing the rich coal resources of the Bowen Basin, sugar cane around coastal areas, and lifestyle areas around Whitsunday. The development of Bowen Basin and Central Queensland coal resources has led to the creation of a number of mining communities such as Moranbah and Dysaght and added impetus to agricultural based towns such as Emerald. Other mining communities may be specialised areas within rural and remote regions, including Mt. Isa and Broken Hill, Mersey Lyell and Gippsland. Many regions have strong resource based sub-regions.

Darwin Top End is a difficult region to classify. It is actually a hybrid region including urban Darwin, which is a rapidly growing city with important links to Asian economies. The same applies to Gippsland, which includes the resource intensive areas of the La Trobe Valley and oil and gas reserves of Bass Strait but also includes timber resources and rural industries.

Resource-based regions are very capital intensive regions and don't require much labour per unit of output. Major resource projects mainly located in remote locations. Hence, they generally have low or negative population growth (Table 5.1). Darwin Top End is growing faster but the drivers for growth are not resource industries.

**Table 5.1 Population change in resource based regions**

Region	Population 1993 (number)	Population 2000e (number)	Population growth 1993-00 (% p.a.)
Darwin Top End	99,566	117,437	2.39
Gippsland VIC	235,659	233,401	-0.14
Mackay QLD	113,432	127,808	1.72
North West QLD	37,379	35,390	-0.78
Pilbara – Kimberley WA	66,993	71,576	0.95
Southern NT	28,990	31,183	1.05

Source: NIEIR's LGA YourPlace database.

The resource-based regions show significant variations in GRP (Table 5.2). The big performers are Pilbara-Kimberley and Mackay. Strong GRP growth in the Pilbara is associated with Australia's big export earners – liquefied natural gas, oil and iron ore. Strong GRP growth in Mackay is due to continuing productivity and output growth in coal exports (despite sluggish prices) along with non-resource based growth in sugar (until recently) and tourism.

**Table 5.2 GRP changes in resource based regions 1991-1998**

Region	GRP including dwelling 1991 (1998 \$m)	GRP including dwelling 1998 (1998 \$m)	GRP including dwelling (% p.a.)	Productivity increase per employed person (% p.a.)
Darwin Top End	2,686.0	3,539.4	4.0	0.9
Gippsland VIC	7,912.2	6,485.4	-2.8	-1.2
Mackay QLD	3,148.8	5,132.6	7.2	3.8
North West QLD	1,344.8	1,595.7	2.5	1.9
Pilbara - Kimberley WA	5,885.2	8,712.3	5.8	5.2
Southern NT	869.3	808.7	-1.0	-0.9

Source: NIEIR's LGA YourPlace database.

Employment growth is generally slow and most if not all employment growth is due to non-resourced activities in Mackay and Darwin Top End (Table 5.3).

**Table 5.3 Employment change in resource based regions 1991-2000**

Region	Employed 1991 (number)	Employed 2000 (number)	Employment growth 1991-2000 (% p.a.)	Employment growth 1991-2000 (per cent)
Darwin Top End	46,864	57,985	2.39	23.73
Gippsland VIC	103,422	85,996	-2.03	-16.85
Mackay QLD	49,463	64,804	3.05	31.02
North West QLD	18,525	18,883	0.21	1.93
Pilbara - Kimberley WA	35,319	36,696	0.43	3.90
Southern NT	14,024	15,809	1.34	12.73

Source: NIEIR's LGA YourPlace database.

Because of their location, resource based regions often have a fair number of farmers. They have a smaller share of symbolic analysts and a larger number of routine workers (Table 5.4).

**Table 5.4 Occupational breakdown in resource based region 1996 (per cent)**

Region	Symbolic analysts	Low skilled service	High skilled service	Routine worker	Farm
Darwin Top End	24.4	20.8	16.8	37.1	0.9
Gippsland VIC	13.4	20.4	19.2	35.5	11.5
Mackay QLD	14.4	21.4	13.4	44.1	6.8
North West QLD	15.4	19.2	12.3	46.1	7.0
Pilbara - Kimberley WA	17.7	21.2	14.1	44.6	2.4
Southern NT	21.7	23.7	20.1	33.4	1.1

Source: NIEIR's LGA YourPlace database.

The fortune of resource-based regions depends on world price trends and markets for minerals and energy. In the past year, oil and gas prices have more than doubled, boosting oil and gas abundant regions particularly in North-Western Australia. Low gold prices have resulted in a number of closures, rationalisations and consolidation of operations. Western Australia produces around three-quarters of Australia's gold output.

The low value of the Australian currency has accelerated take-overs by foreign companies of Australian producers. Depressed conditions in North Asian economies continue to impact prices of iron ore and coal producers, both thermal coal and coking coal, hence impacting major exporter regions in the Pilbara, Central Queensland and the Upper Hunter Valley. Alumina and aluminium sales and prices continue to improve, creating new opportunities or capacity expansion in south-western WA and Gladstone in Central Queensland. The latter is actively pursuing a resource intensive development strategy, based on expansion of the aluminium industry and power capacity, and the creation of a magnesium industry.

In the “new economy” resource based industries have become less attractive for shareholders. Although major players in global industries, they have become relative small compared to leading high technology companies. With the rise of IT&T companies such as Microsoft, Cisco, Intel and Sun Systems, resource based companies have found it more difficult to raise capital for new projects. This is due to a number of factors including the degree of dematerialisation in the new economy, the high up-front risks with mega resource projects and the higher rates of returns in some of the successful high technology industries.

Apart from global markets, a number of factors influence the performance and prospects of resource-based regions including:

- economic prospectivity, global competition and cost of recovery;
- industry structure and corporate strategies;
- the policy regime: taxes such as excises and production levies, infrastructure investment (and who pays for it), native title, environment and political processes (e.g. Uranium);
- adequacy of infrastructure; and
- cost competitiveness compared with international competitors, including transport costs. Environmental constraints such as the possible global implementation of greenhouse gas targets, which may have substantial impacts on Australia’s coal producing regions.

The fortunes of Australia’s resource based regions vary according to movements in global markets, commodity prices, are predominantly export oriented. An important exception is the La Trobe Valley, which supplies brown coal resources for Victoria’s coal fired power stations. Over-investment in new capacity in the 1980’s, designed to attract energy-intensive industries, created an economic and political environment that resulted in the privatisation of the state’s power industries in the 1990’s. The La Trobe region has experienced severe job loss over the past decade and faces a major structural challenge to develop new industries and to increase job growth.

Resource based industries are dominated by global companies in high wage economies such as Australia. Large global resource companies dominate ownership and control of minerals and energy sectors. They generally have operations in a number of countries, can access large amounts of capital and are engaged in a number of different resource industries. The capital requirements and risks associated with these industries are important factors driving corporate restructuring. Over the past decade, massive increases in productivity have occurred as companies seek to control costs and increase profitability through the introduction of new work practices, larger machines and equipment and widespread use of computer technology to monitor and control resource flows.

An important case study is the Australian coal industry, which has undergone vast changes. In the 1980s, a major locational shift occurred, associated with technological changes and industry concentration that led to opening of new open cuts mines in the Hunter Valley and Central Queensland, particularly in the Bowen Basin. Older underground mines had difficulty competing. This negatively impacted communities in the Southern Coalfields in NSW, predominantly the Burratorang Valley and Wollongong; Southern Queensland around Ipswich and the NSW Western Coalfields in the vicinity of Lithgow.

During this period, employment and incomes in the new open cut regions expanded rapidly. More recently, the open cut regions have been subject to enormous change. Over the past three years, for example, employment in the coal mining industry has decline by a third, from around 30,000 workers to around 20,000 workers. Price pressures have resulted in a major restructuring of the industry, despite the fact that Australia remains highly competitive internationally. The restructuring has a number of elements<sup>23</sup>.

Firstly, there has been widespread introduction of 12-hour shifts. The move from three daily shifts to two daily shifts has resulted in greater utilisation of machinery and minimisation of downtime through what has been termed “hot seat” changeovers.

Secondly, the size of machines has expanded. For examples, the size of trucks has expanded from between 70-140 tonnes ten years ago, to around 220 tonnes. The size of draglines hasn't increased significantly over this period but their efficiency has increased.

Thirdly, global companies have introduced new IT systems to monitor and control production performance. For example, weight sensors are attached to draglines and trucks linked to a supervisor who monitors output – including how many passes is it taking to fill a truck and how they are going in relation to targets.

Most commentators predict the substitution of capital for labour in high wage countries to continue unabated. Some are suggesting that almost complete automation of truck driving will occur within 5 years. Hence, direct employment in mining will continue to decline. As capital intensity increases, the spin-offs to mining towns and resource based regions will continue to decline.

One trend has been the introduction of fly-in fly-out mining, particularly in remote regions. In these projects, mines are virtually self-contained and have little or no contact with surrounding communities. Managers and workers are flown in with supplies and technical support. Miners work intensively (say 10-14 days for 12-hour shifts) before being flown out and replaced. In these cases, regional spin-offs or multipliers – such as fuel supplies, maintenance, business services, and retailing and hospitality – are minimal or non-existent.

A variation could be termed drive-in drive out, where miners travel from home to work and stay for a number of days before returning home. A number of miners in Central Queensland have set up home in coastal areas around Mackay and commute for a few days at a time to work in mines in the Bowen Basin. This raises issues about the long term viability of small company towns in the Basin, already weakened by the loss of direct jobs noted above.

Despite competition between resource companies, there is also a significant degree of collaboration. Some of the world's largest resource companies, including those with a strong Australian base - BHP, WMC, Rio Tinto, Alcoa and Alcan – have joined together with Andersen Consulting to establish a Global Procurement Portal, an e-procurement initiative which will centralise purchasing of machinery, equipment and services. This will enable the resource companies to source globally based on competitiveness of suppliers from all countries.

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<sup>23</sup> Interview with Peter Colley, National Research officer with the CFMEU.

Corporate strategies, in association with the growing capital intensity of resource industries, have resulted in weak links between resource companies and their local regions. Highly competitive resource industries have generated high wages in some regions. For example, East Pilbara and Belyando in Central Queensland are two of the highest income earning localities in Australia. But in both cases, the population is declining. Whereas local government once welcomed resource based investment in their communities, there is now concern that local communities are not sharing in the benefits.

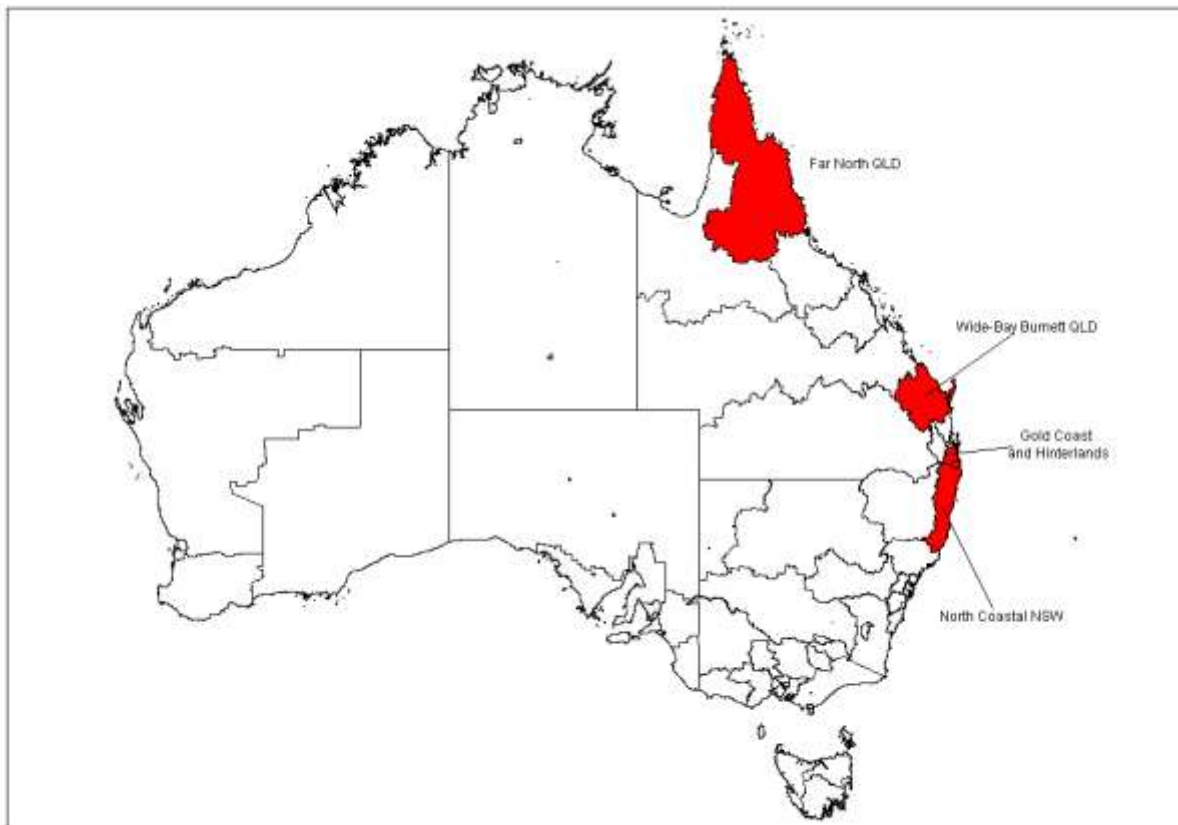


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## 6. Lifestyle regions

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Lifestyle regions are those areas where lifestyle attributes are driving population and economic growth. These regions are concentrated on Australia's east coast - Australia's Holiday Coast, Northern Rivers, Gold Coast, Sunshine Coast, Wide-Bay Burnett and Tropical Far North Queensland. South-eastern NSW and Shoalhaven have some of the characteristics of lifestyle regions. South Western Australia is taking on many of the attributes of a Lifestyle region. The fastest growing area in Western Australia is Peel, south of Perth, which is growing at 5.3 per cent per year, predominantly because of its lifestyle attributes.



Lifestyle regions tend to have good year round climate, scenic surroundings, and strong environmental and cultural assets. Coastal access tends to be a defining feature attracting residents, visitors and tourists. Although much of the wealth of these regions has been associated with their natural resource base, including timber and fertile soils, the main drivers of wealth are increasingly associated with lifestyle choices.

Three related features of lifestyle regions are high population growth, high unemployment and infrastructure backlogs. The successful lifestyle regions are attractive to a wide range of socio-economic groups, which results in their diversity. It includes retirees, young creative people and, increasingly, highly skilled "sea-change" professionals. Less successful lifestyle regions tend to have an ageing population and the drivers for change have been tourism and post-retirement, which in turn has attracted investment in support industries: building and construction, wholesale and retail and community services.

The less successful lifestyle regions are those that attract a high proportion of retirees, a high proportion of the population on social security benefits, and lag in infrastructure and services including public transport and community services. They also lack economic diversity. These areas are coming under great pressure from growth. Some of these areas have the fastest rates of population growth in regional Australia but also the highest unemployment rates.

What determines the relative performance of these regions? Climate, access to major cities, relative size and diversity of their economic base, developer strategies and physical surroundings are all contributory factors.

South-eastern NSW, although we have defined it as a rural-based region, has a number of innovative lifestyle towns and amenities. It attracts retirees from Canberra and Melbourne. On the other hand, it has a colder climate compared to regions further north. It also suffers from relatively poor transport infrastructure.

The Shoalhaven, with a population growth rate at just under 4 per cent, has many lifestyle region attributes and is one of the fastest growing areas in NSW. Its administrative boundaries incorporate it in the Illawarra, which is dominated by the production centre of Wollongong. It has created affordable retirement areas and is located at an accessible distance to Sydney and Canberra, but road and rail infrastructure links require significant investment.

All lifestyle regions are experiencing strong population growth (Table 6.1). Gold Coast is showing extraordinary high growth rates off a high base. It is becoming increasingly integrated into the SEQ conurbation. Growth in Far North Queensland and North Coast NSW has slowed, but long term population growth rates are forecast to be high.

**Table 6.1 Population change in lifestyle regions 1993-2000**

Region	Population 1993 (number)	Population 2000e (number)	Population growth 1993-2000 (% p.a.)
Far North QLD	191,961	227,879	2.48
Gold Coast and Hinterlands	595,985	745,566	3.25
North Coast NSW	437,982	487,462	1.54
Wide-Bay Burnett QLD	207,148	236,374	1.90

*Source:* NIEIR's LGA YourPlace database.

GRP growth also tends to be high; driven by industries such as retail and community services linked to population growth, infrastructure development and investment in new industries including horticulture, tourism

Employment growth is set out in Table 6.3. All show reasonable job growth but this needs to be compared with labour force growth. Employment self-containment on the Gold Coast and North Coast NSW is strengthening, although unemployment remains high in certain areas. Employment growth slowed in Far North Queensland due to over-supply problems in the building industry and the impact of the Asian economic crisis on the tourist industry. Wide-Bay Burnett has experienced slower growth and high rates of unemployment.

**Table 6.2 GRP changes in lifestyle regions 1991-98**

Region	GRP including dwelling 1991 (1998 \$m)	GRP including dwelling 1998 (1998 \$m)	GRP including dwelling (% p.a.)	Productivity increase per employed person (% p.a.)
Far North QLD	3,302.9	5,020.2	6.2	2.6
Gold Coast and Hinterlands	6,738.4	10,168.0	6.1	1.5
North Coastal NSW	5,376.7	6,560.8	2.9	1.9
Wide-Bay Burnett QLD	2,535.2	3,560.8	5.0	2.6

Source: NIEIR's LGA YourPlace database.

**Table 6.3 Employment change in lifestyle regions 1991-2000**

Region	Employed 1991 (number)	Employed 2000 (number)	Employment growth 1991-2000 (% p.a.)	Employment growth 1991-2000 (per cent)
Far North QLD	73,347	102,055	3.74	39.14
Gold Coast and Hinterlands	256,773	331,553	2.88	29.12
North Coastal NSW	155,741	171,395	1.07	10.05
Wide-Bay Burnett QLD	88,301	95,285	0.85	7.91

Source: NIEIR's LGA YourPlace database.

The lifestyle regions have a low proportion of symbolic analysts, a higher share of lower skilled in person service workers (retail, hospitality and health care) than most other regional types, and, with the exception of the rapidly urbanised Gold Coast, a large number of farmers.

**Table 6.4 Occupational breakdown of the workforce in lifestyle regions 1996 (per cent)**

Region	Symbolic analysts	Low skilled service	High skilled service	Routine worker	Farm
Far North QLD	15.5	24.6	16.8	36.1	7.0
Gold Coast and Hinterlands	17.5	27.6	17.1	36.5	1.2
North Coastal NSW	13.8	24.1	19.4	36.5	6.2
Wide-Bay Burnett QLD	12.6	22.2	15.7	38.3	11.3

Source: NIEIR's LGA YourPlace database.

## 6.1 Northern Rivers

North Coast NSW is subdivided into two: Northern Rivers and Australia's Holiday Coast.

Over the past 15 years, the environmental and lifestyle attributes of Northern Rivers have driven employment growth. Between 1981-99, the number of employed residents has grown by 50 per cent, from 60,000 to 90,000. More jobs have been created for women, and 60 per cent of all new jobs have been part-time. The capacity of the region to capture and respond to the advantages of globalisation, the digital revolution, dramatic changes in employment and labour markets and growing environmental awareness will be major determinants of employment growth over the next 10 years.

The major concern is high unemployment. In the past, labour force growth outstripped job growth, resulting in the highest unemployment rate in NSW. Indigenous people have not shared in the benefits of high growth, many young people leave the region, and a narrow skills base has limited job opportunities for a large number of people in the workforce. The inland centres of Grafton, Casino and Lismore are struggling whereas the coastal centres of Ballina and Byron Bay are booming.

An important trend is that over the past decade its capacity to create jobs has improved substantially. Jobs are growing faster than the labour force, and, as a consequence, unemployment has come down. Between 1991-1996, employment grew by 13,000 and the labour force grew by 12,200. The number of employed residents grew by an extraordinarily high 2,450 per year. This has contributed to a decline in unemployment from 16.4 per cent in 1994 to 13.0 per cent in 1998. Although more detailed analysis is required, it appears as though population has attained a level enabling many industries to reach critical mass. Northern Rivers is the fastest growing region in NSW.

## 6.2 Australia's Holiday Coast

AHC is one of the fastest growing regions in Australia. Over the past 20 years, regional population has grown by 100,000 to over 260,000. Population growth has been driven by the lifestyle attributes of the region – including a wonderful climate, coastal resources and spectacular mountains and river valleys. Population growth and economic opportunities are concentrating around the rapidly growing coastal centres, particularly Port Macquarie and Coffs Harbour and surrounding communities. The traditional centres such as Kempsey and Taree, as well as the Nambucca and Gloucester shires, are not sharing in the benefits of growth to the same degree.

The critical issues confronting the region are as follows:

1. population and labour force growth will remain high but at a lower rate than in the past;
2. unemployment has come down but the region remains vulnerable because of its high rate of labour force growth, narrow economic base and low level of skills;
3. indigenous communities are not sharing in the benefits of economic development; and
4. a substantial effort is required to upgrade skills, particularly knowledge-based skills in the areas of IT technologies, business services and communications.

The regional economic base developed around agricultural and forestry industries, with a small but regionally important manufacturing sector in areas such as Taree. Although these industries remain important, the region has shifted towards a serviced based economy, predominantly serving population growth – retail, community services, and construction - and tourism and hospitality industries. These industries have brought significant employment opportunities to the region but also challenges, particularly due to the difficulties of absorbing labour force growth and the resulting high rates of unemployment, particularly for young people.

Regional industrial structure is characterised by small firms, many are indeed micro businesses. New industries are emerging. Most of the new opportunities will be knowledge-based and require a high Information Technology component. Over the past 10 years, there has been considerable improvement in regional infrastructure. The development of the Coffs Harbour Educational Campus, investments by TAFE and the growing private training sector is providing impetus to the development of a higher skilled region. Long awaited improvements in the Pacific Highway are likely to accelerate the economic renewal, particularly in the southern part of the region around Taree.

The region is experiencing both high job growth and high unemployment. This is a reflection of high labour force growth, the skill base and a relatively narrow economic base. The challenge is to use improvements in infrastructure and to focus on skill development as a means to accelerate employment opportunities in growing high skilled occupations.

The region is ageing, with the proportion of retirees increasing and the proportion of young people declining. Strategies need to be developed to ensure that the area remains attractive for retirees, but at the same time increases its attractiveness to high skilled and entrepreneurial working age people, and expands the facilities and amenities to slow the outflow of young people from the region.

AHC has a significant indigenous population accounting for 7,000 residents. As with other indigenous Australians, indigenous residents of AHC experience high rates of unemployment and lower incomes. A high priority is to stimulate greater employment and training opportunities and support for indigenous residents.

### **6.3 Gold Coast**

The Gold Coast, arguably Australia's initial lifestyle region based around the coastal towns of Coolangatta and Surfers Paradise, has become part of the South East Queensland conurbation. With good access to Brisbane and its own major airport, it is the second largest local government area in Australia, behind Brisbane. The current population is around 400,000 and it is consistently the fastest growing city in Australia. Between 1986-96, population growth averaged around 7 per cent per annum. It attracts around 4 million visitors a year. Around 27 per cent of population growth in South East Queensland is accommodated in the Gold Coast. It has attracted significant international investment in tourism, entertainment and property markets. This includes theme parks such as Sea World, Movie World, a Casino, and a number of international hotels. The Queensland Government is constructing a Gold Coast Convention Centre. Residential development includes high rise apartment living between Surfers Paradise and Coolangatta and new low-density housing estates.

The highest rates of employment growth are in retailing, property and business services, and health and community services. Manufacturing and tourist related activities continue to show strong employment growth. More than one third of employed residents work part-time. The unemployment rate of 9.4 per cent remains significantly higher than the state and national average.

Although its lifestyle attributes remain central, the region is seeking to transform itself into an Innovative City, based on development and diffusion of technology, educational facilities, investment in human capital and links to Brisbane. The region is seeking to strengthen clusters in tourism and lifestyle activities such as health and sport, business and property services and building and construction, those activities that underpin its function as a lifestyle region.

The Gold Coast City Council is seeking to create a knowledge-based region through the development of clusters around information industries, marine engineering, biotechnology, environmental products and services and film and television. The council and Griffith University are investigating the establishment of a high technology park in association with the Gold Coast campus on the university. Funds have been committed to establish a Centre for Biomolecular Research and Drug Discovery at Gold Coast Campus of Griffith University.

## 6.4 Far North Queensland

Far North Queensland is a scenically spectacular region comprising a narrow coastal plain, rainforests, mountainous areas including Atherton and Mareeba tablelands and flat agricultural lands to the west of the tablelands. Most of the region's population lives on the coastal plain. It grew very quickly over the past 15 years, around 2.5 per cent pa but its growth has slowed recently to around 1.5 per cent pa. This is partly explained by the downturn in Asian tourism resulting from the Asian economic crisis. Around 55 per cent of the region's population of 225,000 live in Cairns. Tourism and post-retirement migration are major drivers for growth. The region also has strengths in agriculture, aquaculture and mining. A number of service-based industries – retail, community services, business services, building and construction – have grown to underpin population growth and the tourist industry. The region has a small but growing manufacturing sector focused on local demand and import replacement. It is seeking to use its location, particularly its proximity to Asian-Pacific economies compared to southern regions, to position itself as an export hub.

Cairns is a case study that illustrates how strategic infrastructure investment, in this case Cairns Airport, can be used to accelerate regional economic development. In the 1980s, despite its popularity as a tourist destination, Cairns Airport was capacity constrained by its owner, the Federal Airports Corporation, and unable to handle long distance international flights. Lack of support from the Commonwealth Government spurred the Cairns Port Authority to push for autonomy and to raise capital to construct and international length runway and modern terminal. The success of this strategy enabled Cairns to emerge as one of Australia premier entry points for international tourists.

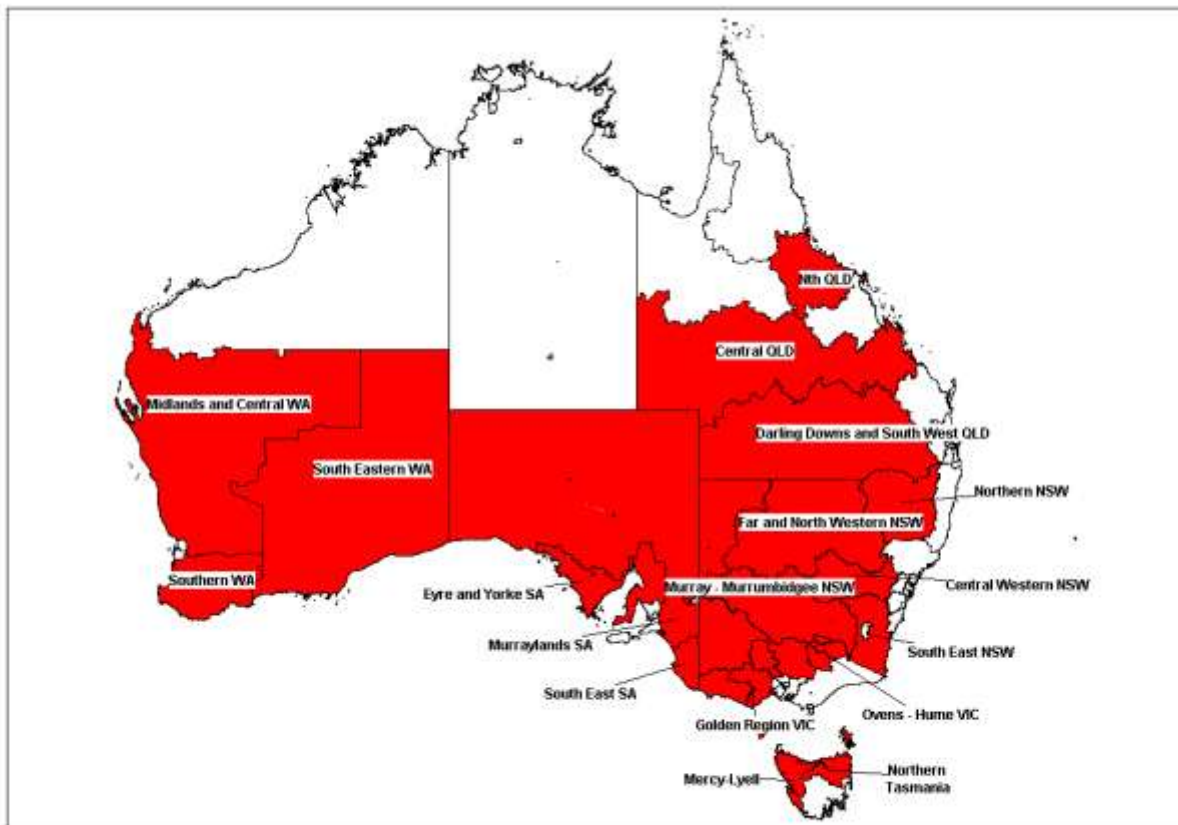
Far North Queensland accounts for 23.0 per cent of Queensland's takings from accommodation, dominated by Cairns, and, to a lesser extent, Douglas Shire. New projects include the construction of Stage 2 of the Cairns Convention Centre, upgrading the Cairns port through the CityPort project. The region has a number of major resort projects, hotels, apartments and recreational facilities such as golf courses under construction. The Queensland Government is investing heavily to upgrade the rail network between Brisbane and Cairns. The Great South Pacific Express, with an upgrade costing \$35 million, has commenced services between Brisbane and Cairns. Funds have been allocated for the Cairns Tilt Train Project. The region is seeking to expand opportunities in value-added industries. The Tablelands Sugar Mill is a recently completed project, as is a new kaolin export oriented processing plant.

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## 7. Rural based and remote regions

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The debate about regional Australia is heavily concentrated on rural-based regions. This is partly for political reasons but partly because of objective economic and social hardships in the “bush”. These hardships have been highlighted by widespread media coverage and government initiatives such as the Commonwealth Government’s Regional Summit - some call it the Rural Summit - and held in Canberra in October 1999. Of the 58 SOR regions, 22 are defined as rural-based and remote<sup>24</sup>. In our framework, rural-based regions are those areas that derive much of the wealth from agriculture, forestry and fishing.



These regions are very diverse. For example, they include:

- remote pastoral areas of North Western and Far west NSW, south west Queensland, and Central WA;
- timber and agricultural areas of South Western WA, and Tasmania;
- rich farming areas such as the Darling Downs; and
- water intensive and irrigated regions in the Murrumbidgee NSW and Riverlands SA, Northern and (parts of) Central Queensland.

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<sup>24</sup> We have excluded unincorporated territories from statistical analysis.

Although favourable weather conditions, world demand/supply imbalances, changing agricultural industry composition, and policy changes can positively impact rural industries, the fact remains that much of rural Australia is confronted with a long term structural crisis<sup>25</sup>.

The major issues confronting rural based regions include:

- ❑ continuing population decline, an ageing population and out-migration of young people;
- ❑ decline in farm viability due to reduction in revenues and increases in costs;
- ❑ relatively low average household incomes, low participation rates and high unemployment;
- ❑ continuing decline of the family farm and economic viability of farming in a number of commodity-based industries. Australia has been “losing” about 2000 farms a year, a decline of around 1.3 per cent pa<sup>26</sup>;
- ❑ growth of agribusiness and capital-intensive agriculture, resulting in fewer direct jobs; and; with growth in outsourcing and sub-contracting, fewer spin-offs to local towns; and
- ❑ decline of small towns through declining population base and employment opportunities, and improved transport and communication infrastructure. It is manifest in a reduction of government services, closure of banks and small business.

Much of Australia’s agriculture wealth has been associated with the production and sale of unprocessed rural based commodities from these regions – wool, beef, lamb and wheat. Australian producers also emerged as major producers of sugar, cotton and horticulture and viticulture. The Australian wine industry is often cited as an example of a successful high value added cluster.

Agriculture is highly export-intensive, with around two-thirds of output destined for export markets. These regions were linked into global markets at a very early stage of Australia’s economic development. It has been claimed that this early export orientation made these regions our first global regions. This is not precisely correct. Globalisation refers to the degree of integration and interaction across national borders. In fact, the traditional rural economic unit, the family farm, has not had, until recently, a high degree of integration and interaction with the global economic system. The traditional model of economic development focused on the creation of statutory authorities to protect and market Australian agriculture exports.

Previous versions of State of the Regions have quantified some of the socio-economic disparities between rural regions and some of the core metro regions. Specifically, unemployment and underemployment is relatively high, productivity lower, household incomes tend to be lower, and these regions tend to lag in terms of education outcomes. Other studies have pointed to poorer health services, lack of emerging industries, backlogs in transport and communication infrastructure, poorer services, and out-migration of young people to the cities.

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<sup>25</sup> For a good summary of these issues, see Hugh Campbell and Geoffrey Lawrence, “Assessing the Neoliberal Experiment in Antipodean Agriculture: an Investigation into the ‘Sociology of Instability?’” Paper presented in Symposium F: Agriculture, Nature and Social Change, **Xth World Congress of Rural Sociology** ‘Sustainable Rural Livelihoods: Building Communities, Protecting Resources, Fostering Human Development’, Hotel Gloria, Rio de Janeiro, Brazil, 30 July - August 5, 2000

<sup>26</sup> ABARE, **Changes in non-metropolitan population, jobs and industries**, a preliminary report to the Department of Transport and Regional Services, October 1999.



It is a fundamental mistake to view rural Australia as a homogeneous entity. There are major differences in the performance and prospects of rural based regions. These differences are due to:

- variations in their resource endowments;
- health of their “natural capital”;
- whether or not they have a critical mass of population to support the economic viability of towns and cities;
- physical, social and knowledge infrastructure;
- location in relation to metropolitan centres;
- rural industry composition and innovation;
- ownership patterns;
- diversity of the regional economic base; and
- access to major markets and cities.

ABARE conducts regular reviews of Australian agriculture<sup>27</sup>. The current report documents some of the variations in rural based regional performance based on the vagaries of the weather and markets. One good performer is NT (which we define as resource based), where high beef prices and resurgence in live cattle exports have stimulated producer earnings. Northern and North Western NSW grain-producing regions have also benefited from above average crop yields. ABARE cites dry seasonal conditions for low average incomes in the Upper Eyre Peninsula, North Central SA, Western NSW, southern Victoria, Central Highlands of Tasmania, and Central Highlands of Queensland.

Table 7.1 shows population trends in rural based regions over the past decade. Most are growing below national average population growth. In some, population growth has stagnated or is declining: Eyre and York Peninsula SA, Far and North Western NSW, Mallee-Wimmera Victoria, Mercy-Lyell Tasmania, Midlands and Central WA, Murraylands SA, Northern NSW, Northern Tasmania, Ovens-Hume Victoria and Western Victoria. Two higher population growth regions are Loddon in Victoria, spurred by development in Bendigo and good access to Melbourne, and Southern WA which comprises a number of vibrant regional centres, lifestyle opportunities and growing industries.

Table 7.2 shows wide variations in GRP growth. Some areas experienced high growth rates to 2000 due to higher agricultural commodity prices. Examples include wheat in Midlands and Central WA, wine and horticulture in Murraylands, mining and service sector growth in North Queensland. It should also be remembered that 1991 was a drought year in many regions.

Table 7.3 shows employment growth in rural based regions. Good performers are southern WA, South East WA, Murraylands SA and Ovens-Hume Victoria.

It is almost a tautology to say that rural based regions have a large number of farmers. In fact, those with the highest proportion of farmers tend to be the regions with the lowest degree of diversification.

Some of these – Mallee-Wimmera, Western Victoria and South East SA, are faced with major structural challenges.

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<sup>27</sup> ABARE, **Outlook 2000**, Proceedings of the National Outlook Conference, Canberra, 29 February – 2 March, vol. 2, **Agriculture and Regional Australia**, ABARE, Canberra.

**Table 7.1 Population change rural regions 1993-2000**

Region	Population 1993 (number)	Population 2000e (number)	Population growth 1993-2000 (% p.a.)
Central QLD	185,624	194,695	0.68
Central Western NSW	171,001	174,708	0.31
Darling Downs & S W QLD	226,111	227,225	0.07
Eyre and Yorke SA	154,783	152,097	-0.25
Far and North Western NSW	143,557	140,474	-0.31
Golden Region VIC	371,026	387,195	0.61
Goulburn VIC	180,742	188,761	0.62
Loddon VIC	155,062	163,214	0.73
Mallee – Wimmera VIC	141,524	139,330	-0.22
Mercy-Lyell TAS	111,522	108,302	-0.42
Midlands and Central WA	109,177	114,386	0.67
Murray – Murrumbidgee NSW	258,120	261,798	0.20
Murraylands SA	68,012	68,464	0.09
Northern NSW	184,573	173,310	-0.90
Northern Tasmania	132,729	132,907	0.02
Nth QLD	186,485	200,171	1.02
Ovens – Hume VIC	88,338	91,548	0.51
South East NSW	174,272	183,078	0.71
South East SA	62,913	63,079	0.04
South Eastern WA	53,040	59,523	1.66
Southern WA	222,907	259,957	2.22
Western Victoria	101,405	98,614	-0.40

Source: NIEIR's LGA YourPlace database.

**Table 7.2 GRP in rural based regions 1991-1998**

Region	GRP including dwelling 1991 (1998 \$m)	GRP including dwelling 1998 (1998 \$m)	GRP including dwelling (% p.a.)	Productivity increase per employed person (% p.a.)
Central QLD	4,721.7	6,681.1	5.1	3.2
Central Western NSW	2,999.0	4,088.3	4.5	4.4
Darling Downs and South West QLD	3,873.6	5,007.3	3.7	2.4
Eyre and Yorke SA	3,316.8	3,904.7	2.4	4.4
Far and North Western NSW	2,535.0	3,249.0	3.6	4.1
Golden Region VIC	5,824.7	6,671.5	2.0	1.8
Goulbourn VIC	2,995.6	3,495.0	2.2	3.4
Loddon VIC	2,021.6	2,397.4	2.5	2.5
Mallee - Wimmera VIC	2,261.1	2,986.2	4.1	4.4
Mercy-Lyell TAS	2,008.4	2,325.8	2.1	2.6
Midlands and Central WA	2,382.2	3,992.4	7.7	6.4
Murray - Murrumbidgee NSW	4,461.5	6,000.0	4.3	4.0
Murraylands SA	989.0	1,578.3	6.9	8.2
Northern NSW	3,418.1	4,032.2	2.4	3.6
Northern Tasmania	2,263.1	2,534.6	1.6	1.8
Nth QLD	3,635.0	5,585.5	6.3	3.9
Ovens - Hume VIC	1,534.4	2,002.2	3.9	2.8
South East NSW	3,063.8	3,795.2	3.1	3.1
South East SA	1,055.1	1,542.1	5.6	5.9
South Eastern WA	2,198.3	3,303.9	6.0	3.4
Southern WA	4,424.4	6,361.6	5.3	3.0
Western Victoria	1,666.4	2,081.7	3.2	4.0

Source: NIEIR's LGA YourPlace database.

**Table 7.3 Employment change in rural based regions 1991-2000**

Region	Employed 1991 (number)	Employed 2000 (number)	Employment growth 1991-2000 (% p.a.)	Employment growth 1991-2000 (per cent)
Central QLD	80,240	96,691	2.09	20.50
Central Western NSW	76,223	76,475	0.04	0.33
Darling Downs & SW QLD	89,103	115,577	2.93	29.71
Eyre and Yorke SA	103,188	55,936	-6.58	-45.79
Far and North Western NSW	63,460	59,912	-0.64	-5.59
Golden Region VIC	148,307	177,887	2.04	19.95
Goulburn VIC	76,361	88,381	1.64	15.74
Loddon VIC	59,677	61,042	0.25	2.29
Mallee – Wimmera VIC	59,513	66,819	1.29	12.28
Mercy-Lyell TAS	46,610	44,563	-0.50	-4.39
Midlands and Central WA	49,131	55,251	1.31	12.46
Murray – Murrumbidgee NSW	107,236	126,576	1.86	18.03
Murraylands SA	20,820	33,011	5.25	58.55
Northern NSW	83,785	77,214	-0.90	-7.84
Northern Tasmania	53,564	59,092	1.10	10.32
Nth QLD	83,498	88,755	0.68	6.30
Ovens – Hume VIC	40,795	49,534	2.18	21.42
South East NSW	68,087	82,613	2.17	21.33
South East SA	20,461	32,412	5.24	58.41
South Eastern WA	25,245	31,277	2.41	23.89
Southern WA	103,878	122,480	1.85	17.91
Western Victoria	44,599	46,379	-0.44	-3.99

Source: NIEIR's LGA YourPlace database.

**Table 7.4 Occupational breakdown in rural based regions 1996 (per cent)**

Region	Symbolic analysts	Low skilled service	High skilled service	Routine worker	Farm
Central QLD	14.8	21.2	14.2	42.3	7.5
Central Western NSW	12.7	20.8	16.9	37.7	12.0
Darling Downs and South West QLD	12.4	20.3	16.1	36.3	14.9
Eyre and Yorke SA	12.4	20.0	16.2	36.1	15.3
Far and North Western NSW	11.6	20.7	16.9	37.0	13.8
Golden Region VIC	13.8	20.9	18.3	40.2	6.8
Goulburn VIC	12.5	19.2	16.8	35.2	16.3
Loddon VIC	13.7	21.7	20.3	37.2	7.1
Mallee - Wimmera VIC	10.5	19.1	16.7	30.7	23.0
Mercy-Lyell TAS	13.7	21.8	15.6	42.1	6.8
Midlands and Central WA	13.7	16.4	13.4	37.0	19.4
Murray - Murrumbidgee NSW	13.6	20.3	15.8	37.6	12.8
Murraylands SA	9.7	16.8	13.0	35.6	25.0
Northern NSW	13.4	20.3	18.0	34.2	14.1
Northern Tasmania	15.6	23.5	17.3	38.2	5.4
Nth QLD	15.3	21.9	15.6	41.2	6.0
Ovens - Hume VIC	16.0	20.1	18.6	37.4	7.9
South East NSW	17.5	21.0	17.9	35.7	8.0
South East SA	11.9	17.5	12.8	40.6	17.2
South Eastern WA	19.0	17.5	11.4	46.9	5.2
Southern WA	13.3	19.3	14.6	38.4	14.4
Western Victoria	10.8	19.1	16.4	32.4	21.2

Source: NIEIR's LGA YourPlace database.

Rural based regions developed around natural resource base – land, soil, water – and are heavily influenced by climatic conditions. Their competitiveness depends on a combination of factors.

**Natural resource endowments** A critical determinant of rural competitiveness is the natural resource endowment. Variations in climatic, soil and water conditions impact the development path for rural based regions, the intensity of land-use and productivity. An important point made by farmers, environmentalists and researchers is that – because of the implementation of inappropriate grazing, cropping, horticultural practices and over-exploitation of timber and fishing stocks - the quality of this “natural capital” is deteriorating; leading to long term decline in productivity capacity and loss of export earnings. The productive capacity of some regions has been enhanced by investment in irrigation systems and dams. The Murray-Murrumbidgee, North and Central Queensland are examples, with Emerald a recent case study of a rural town that is doing well because of the benefits of irrigation.

**Location** Natural resource endowments and location advantages are related. The well-endowed regions are more likely to have developed major centres and good infrastructure links. Proximity to domestic markets, regional centres and the adequacy of infrastructure influence competitiveness. Remote areas can be impeded by high transport costs, inadequate and costly communications, and a lack of local supporting industries in their regional catchment areas such as maintenance, technical and business services. Examples include Mid West WA, Eyre Peninsula and Outback SA, South Western Queensland and Far Western NSW. The larger regional economies are more likely to have better financial and business services, agricultural extension services, and good cultural and entertainment facilities. Parts of Central West NSW (Bathurst-Orange), Darling Downs and Central Victoria (including Bendigo and Ballarat) are benefiting from relatively good access to the metropolitan cities.

**Regional specialisation, industry structure and market demand** Globalisation leads to increased specialisation between regions. For globally competitive regions selling into rapidly growing markets, this enhances economic opportunities. Viticulture and value added horticultural industries have benefited from new markets and greater specialisation. But rural-based regions locked into low growth and declining production paths such as wool and mixed use broadacre farming are vulnerable to reduced returns and increase volatility.

In part, the capacity to enhance regional competitiveness depends on the proportion of value added undertaken within the region. If local stakeholders can influence production, processing, packaging, transport and distribution they are more likely to share regional returns on an equitable basis, even though they are unlikely to be able to influence market prices.

Unfortunately, the development path for most regions has specialised in commodity production alone, rather than capturing more value adding within the region. There are important exceptions to this, where value added clusters have developed at regional level, particularly in relation to perishables such as dairying co-operatives.

**Infrastructure** The adequacy of transport infrastructure and services are important determinants of the competitiveness of rural regions. Globalisation requires that regions be linked to markets and suppliers through global distribution systems. This requires speedy and cost effective movement of products to intermediate industries for processing and to final customers. It also requires that business people, farmers and tourists can get around easily, hence the need for good rail and airport infrastructure. This requires well-planned and maintained transport networks.

Some regions are finding it difficult to keep up with the investments required in the road system. In 1998, ALGA undertook an inquiry into the transport needs of local government<sup>28</sup>. The major finding was that there was a significant potential shortfall in local government's ability to maintain its infrastructure in the future. It advocated greater funding, improved coordination between the three tiers of government to address transport shortfall and strengthening of linkages between national, state and local roads and their importance to the regional economy.

**Capital base and access to capital** Rural-based regions have difficulty in raising capital to finance expansion and redevelopment. This is partly due to lack of critical mass or smaller projects, credit worthiness of some low return producers and perception of higher risk in poorer regions subject to the vagaries of the weather and product cycles. But it also due to the way of financial system is organised, with major banks and institutional investors focussing on big city and global market opportunities. Many rural industries are locked out of financial networks and the bigger banks have rationalised their services in regional Australia. These impediments are partially being addressed by the activities of the Bendigo Bank, the development of new regional development vehicles such as the NSW Regional Development Trust, and work the Australian Stock Exchange is doing with regions to nurture "investment ready" proposals.

**Regulatory environment (global and national)** The regulatory environment has important impacts on agricultural competitiveness in all countries. The current policy thrust is towards deregulation. Under National Competition Policy guidelines established by Commonwealth and state governments, reviews are conducted of major sectors with a view to improving economic efficiency and competition. This can have significant distributional impacts between regions. Two current examples impacting rural-based regions are the review of wheat marketing and the deregulation of the dairy industry.

Under the Wheat Marketing Act, for example, AWB (International) Ltd. is designated with the right to export Australian wheat. This "single desk" authority, currently being reviewed by a committee established by the Commonwealth Government, has sparked a lively debate about the role of the Australian Wheat Board.

On the one hand, supporters of a centralised marketing authority refer to premium prices received by wheat growers over time and services that support Australian producers in the tough global market place. According to the AWB<sup>29</sup>, these benefits include: "research and development, logistics capacity, superior information, economies of scope and scale, integration of the value chain, strong customer relationships, continuity of supply, consistent quality, reliable performance and effective risk management".

The advocates of competition policy economic reform agenda<sup>30</sup>, on the other hand, point to the efficiency gains, cheaper domestic prices, greater flexibility and enhanced innovation resulting from the abolition of the "single desk".

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<sup>28</sup> Cited in ALGA, **Submission to the Inquiry into Infrastructure and the development of Australia's Regional Areas**, Prepared for the House of Representatives Standing Committee on Primary Industries and Regional Services by the Australian Local Government Association, April 1999.

<sup>29</sup> [www.singledesk.awb.com.au/sreview.cfm](http://www.singledesk.awb.com.au/sreview.cfm)

<sup>30</sup> Productivity Report, **Impact of Competition Policy Reforms on Rural and Regional Australia** (Draft report), Canberra, 1999, p193.

## 7.1 An unsustainable rural development path?

The current development path for many rural-based regions is not sustainable. This is manifested in:

### *Poor economic performance and prospects*

Continuing decline in agricultural commodity prices impedes the capacity of a number of rural based regions to restructure. The evidence indicates poor financial performance for many producers, low returns on capital and the decline of family farms. Low world commodity prices and protected overseas markets are limiting market opportunities. Farmers are also getting squeezed on the cost side by rising costs of fuel and fertiliser as well as distribution and marketing costs.

Despite continuous eulogising about the benefits of free trade and how efficient producers will gain when the protection walls come tumbling down, the fact remains that major markets in North America, Europe and Asia remain protected and their producers subsidised.

The economic policy framework to deal with the structural economic crisis in rural Australia has been severely limited, or in many instances negative. There are three components to policy reform: global governance, macro-economic reform and micro-economic reform.

Firstly, Australia has been an enthusiastic supporter of the global reform of agriculture trade, particularly the establishment of the World Trade Organisation (WTO). Much of the work of Australian trade and agricultural ministers focuses on reducing protection and subsidies in Australia's main markets. The argument is a good one: If other countries can be pressured to move to an open market, then efficient primary producers such as Australia will be the prime beneficiaries.

Economic models built on free trade assumptions point to the enormous benefits to Australia if countries stopped protect their producers. The only problem with this argument is that governments, even the most committed to the principles of the WTO, will continue to protect the interests of their producers. Despite these efforts, many markets remain highly restricted, hence the argument of the huge gains to Australian rural producers are somewhat over-stated.

Secondly, macro-economic reforms, by emphasising market-oriented reforms and a reduction of the role of government, resulted in the withdrawal of government services and a reduction in capital expenditures in rural regions. Examples include closure of government offices in provincial cities, cut-backs in infrastructure investments, and rationalisation of agricultural extension services.

Thirdly, the micro-economic reform agenda – with emphasis on deregulation, privatisation and the introduction of user pays principles in relation to infrastructure and services - has not resulted in significant economic benefits to rural based regions. Associated with this agenda, agricultural policy has been based on a number of premises. A long-standing priority has been to encourage farmers to “get big or get out”. For many farmers, this has resulted in higher levels of debt in low growth industries.

### *Social dislocation*

Marginalisation is occurring in many small rural communities due to low incomes, lack of economic opportunities and the out-migration of young people. Marginalisation is not new in rural based regions. Indigenous Australians living in rural-based regions have long experienced prejudice and associated appalling living conditions, health problems and lack of employment opportunities.

Many family farms are working longer and longer hours just to stand still. Over the past 20 years, there has been a significant increase in the reliance of “off-farm” income to keep rural properties going. Many pastoralists can’t afford to stay on their properties but can’t find buyers because of the depressed state of pastoral industries, particularly wool. Communities are feeling the pressures as the numbers of hours worked per farm increases. Sugar farmers in the Burdekin and Hinchinbrook refer to negative effects on the community due to intensification of sugar production, as a result of agreements reached with mill owners<sup>31</sup>.

### *An ecological crisis*

Australia’s rural regions are under severe ecological stress. This is due to over-exploitation of land and water resources and inappropriate farming practices in fragile eco-systems. Major problems have been well documented including water quality and rising levels of salinity, deteriorating soil erosion, loss of bio-diversity and land clearing. The extent of the crisis is recognised by all major stakeholders and is one area where there is strong agreement between different political parties, although there are likely to be significant battles regarding who is going to bear the cost of improving environmental quality.

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<sup>31</sup> National Economics interviews.

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## **8. Unemployment, productivity and regional inequality**

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In the 1999 State of the Regions report, National Economics introduced a new measure of unemployment that accounted for those in the population who were considered to be structurally unemployed. Based upon detailed DSS and Centrelink data the constructed series allowed us to identify regions that had very high effective rates of under-employment due to structural issues in their workforce. Structural barriers that were identified included disability, single parenthood, migrant unemployment, mature aged unemployment and long term unemployment. Each was included for its effect in reducing the opportunities for the person in question obtaining full-time employment. All who faced these barriers were considered to be non-job ready. Measuring job readiness was seen as a holistic indicator of the scale of job creation that was required to reach full employment in each area. The regional differences in non-job readiness rates that were identified in the 1999 State of the Regions report were stark.

When job readiness was studied in time series in the National Economics YourPlace regional database, specific issues arose. One of the issues identified was the high growth in the number of people receiving disability support pensions in various areas of Australia. The second was the large growth in the number of non-job ready throughout the 1990s, Australia-wide. It was clear that this growth meant that the official unemployment rate was no longer adequate for analysis, especially in the official small area format. Documented falls in unemployment rates between 1991 and 1998 were simply not supported by the non-job ready series. The National Economics non-job ready series was designed to capture additional issues than employment alone such as long-term versus short-term unemployment, migrant jobs growth and the access of single parents to the workforce.

Unfortunately changes designed to limit the access of researchers to Centrelink data have precluded an identical update of this series. However, data has been sourced that allows us to rebuild regional unemployment rates to remove the effect of DSP policy changes. This analysis finds that regional areas, indeed practically all of Australia except Sydney, have unemployment rates that are the same or worse than they were in 1991. The figures show that a gap exists between employment growth outcomes and the success in promoting and funding regional economic initiatives, that have undoubtedly added to the prosperity of local regions. Further, the long-term implications of migration patterns that are related to social security classification threaten to reinforce low local investment, poor education and training outcomes and crippling skill shortages.

### **8.1 Background**

In June 1991 there were 380,000 people on disability support pensions and unemployment was notionally at 9.4 per cent. From labour force surveys 802,635 people were identified as unemployed and 643,614 receiving unemployment benefits at this time.

Since 1991 major changes in the allocation of government benefits have occurred including an enormous increase in the number of people receiving disability support pensions. Other changes have included the introduction of 'mutual obligation' and the blurring of definitions of study and job seeking amongst youth.

To illustrate the magnitude of the changes and their different regional impacts it is necessary to present a number of summary tables. Table 8.1 outlines the total number of recipients of the disability and sickness type benefits. The vast majority (95 per cent) receives the Disability Support Allowance. Other benefit types include Mobility, Sickness and Rehabilitation allowances (year dependent).



**Table 8.1 Disability Support Pensions (DSP)**

Year	DSP* recipients	% adults 18-65
1991	384304	0.036
1996	515092	0.045
1998	570613	0.048
2000	638406	0.052

*Note:* \* includes sickness and mobility allowance recipients

*Source:* NIEIR's LGA YourPlace database.

When an individual moves from unemployment benefits to a disability support pension, their circumstances are likely to remove them from estimates of the size of the labour force. As a result, the unemployment rate, which is a measure of the number of people who are unemployed in the labour force, will improve. The official unemployment rate will report that unemployment has decreased, without any additional people becoming employed, without any improvement in the welfare of the individual or the community they live in.

To illustrate imagine there are nine people in a room of whom five are unemployed.

$$\text{Unemployment Rate}^1 = 5/9 \cong 55\%$$

Now one person leaves to access the DSP.

$$\text{Unemployment Rate}^2 = 4/8 \cong 50\%$$

The unemployment rate has fallen by 5 percentage points without one job being created.

This magnitude of the number of adults moving out of the labour force is witnessed in the labour force estimate. The size of the labour force can be expressed as a percentage of adults aged between 18 and 65 years. Using this measure, the size of the labour force has fallen by approximately 1.6 per cent, almost identically matching the rise in DSP payments.

The artificiality of the constructed official unemployment rate is highlighted by the fact this DSP trend alone is responsible for a reduction in the official rate of 2.1 per cent. Considering the economy has experienced significant change, including a period of extraordinary economic growth it is alarming that 75 per cent of the improvement in the official unemployment rate is attributable to a growth in the number of Australians who are unable to work due to a classified disability.

Examination of the tables that follow reveals the enormous regional differences in these effects. Certain areas have received far higher rates of growth in number of DSP recipients as hence their local unemployment estimates have been distorted even more than the national average.

## 8.2 Methodology

To estimate how large the 'true' or underlying unemployment rate for a region would have been, if the increase in the number of people receiving the disability support pension had not occurred, we have reconstructed a series called a *corrected unemployment rate*. To derive the *corrected unemployment* the first step is to take out the effect of the increase in disability support pensioners on the labour force. The DSP changes have made the labour force smaller.

The modified labour force is equal to reported size plus the number of people who have been put on disability support pensions who otherwise wouldn't have been. To determine who would or wouldn't have previously classified as qualifying for DSP we must make an assumption about each region. We assume that the proportion of the population in 1991 that received the DSP is the best representation of the proportion of that population who would receive it in the long run, i.e. the proportion of people within the population who are receiving disability support pensions is assumed to remain fixed.

Hence, we have assumed that the number of disability support pension recipients in 1991 will only grow as fast as population growth in that region. Any growth in DSP over and above that amount is assumed to be excess growth. Of course a region may have slower growth in DSP than population growth which is assumed to have positive impact on corrected unemployment.

Using our estimated excess or shortfall growth we then reversed the scenario of the nine people in the room. To arrive at the corrected unemployment rate we add back the excess growth to the ranks of unemployed as well as adding the same number to the labour force. The estimate of the number of corrected unemployed we use is the number of recipients of unemployment related benefits. This is not the same definition as used in the official rate. The official rate relies on a survey of a limited number of people, as is most useful at the aggregate or macro level. In the context of regional information the actual number of people being paid is of far more consequence.

The number of people receiving benefits is not the same as the number of unemployed. This is due to differences in eligibility criteria for classification both for welfare as well as within the survey instrument. In the labour force survey the respondent is assumed to be employed if they undertook at least one hour of paid work during the reference week, or one hour of unpaid work if they helped in the family business. Therefore, a major distortion to the statistics from the labour force survey is being introduced by Government mutual obligation policies to encourage some labour market participation for social security benefits. This is not criticism of this policy, merely pointing out that this distorts the statistics meaning that the labour force survey should not be used in its current form for gaining a true picture of underlying labour market conditions.

The two social security policy changes which led to this outcome are:

- (i) the tightening of the work (activity) test; and
- (ii) the loosening of the income eligibility (means) test.

By the tightening of the work test is meant the tightening of the criteria in terms of steps that must be taken to actively secure work in order to retain benefits. By the loosening of the income test is meant increases in income that can be obtained from working a few hours a week and still retain benefits. The effect of both these changes has had the effect, in the context of the labour force survey, of transferring people from the unemployment/not in work force column to the employed column.

To further complicate the issue in the year 2000 is the change in Government policy regarding Youth Allowance. All those persons aged between 16 and 24 who are unemployed no longer receive the normal unemployment benefits but will receive the Youth Allowance benefits. All eligible youth whether they are engaged in education, training or they are unemployed receive a youth allowance. The Youth Allowance statistics cloud the issue of how many youth are employed; how many are unemployed and how many are training or in school. In order to construct a series that allows us to compare effective unemployment between regions, we add back an estimated number of those people receiving Youth Allowance into those receiving unemployment benefits (New Start). There are about 605,000 people who are receiving New Start Allowance which would equate to an unemployment rate of about 6.4 per cent which is in line with the official Unemployment rate. But that doesn't include any youth who are unemployed. In 1996, they made up approximately 140,000 of the pool of unemployed at that time. For the purposes of year 2000, using region by region estimates of the

proportion of total unemployed that are youth, we calculate that 125,576 Youth Allowance recipients are actually unemployed.

Table 8.2 shows that in 1991, the number of recipients was below measured unemployment in the labour force. This was due to two factors. Firstly, the unemployment rate was rising rapidly through 1991 to peak at 11 per cent in 1992. Consequently given the lag between becoming unemployed and receiving benefits, it would be expected that the number of recipients would be less than the number of unemployed through 1991. Secondly, when unemployment changes suddenly, as was the case in 1991, many people who become unemployed, perhaps for the first time, were not eligible for benefits because of means tests. However if they remain unemployed and their personal finances deteriorate they then become eligible, the end result recipients should approximate the levels of unemployment.

	1996	2000
NewStart Allowance > 21 yrs old	684864	576359
NewStart <= 21 yrs old	139763	29404
<b>NewStart Total</b>	<b>824627</b>	<b>605763</b>
Youth Allowance <= 21	–	363095
Additional estimated youth unemployment	–	125576
<b>Effective total unemployment recipients</b>	<b>824627</b>	<b>731339</b>
Labour force estimate (unemployed persons)	760131	627169

Source: NIEIR's LGA YourPlace database.

In the year 2000, however, Table 8.3 is problematic for public policy because it is a little strange that the government is willing to pay 730,000 people unemployment benefits but only admits that 610,000 are unemployed.

Year	Labour force unemployed	Recipients including YA correction
1991	802635.0	643614.2
1996	760131.4	819995.0
1998	735045.5	803388.0
2000	627168.8	720431.5

Note: \* includes sickness and mobility allowance recipients

Source: NIEIR's LGA YourPlace database.

### 8.3 Results

The regional patterns in corrected unemployment are detailed in Table 8.4. These figures include the corrections made for excess growth in DSP as well as including estimated youth unemployment. For comparison, we have also included the small area labour market estimate of unemployment.

**Table 8.4 Corrected unemployment rates**

Region	1991	1996	1998	2000	Official June 2000
ACT	4.0	8.0	8.2	7.3	5.3
Brisbane City	6.4	8.5	8.3	7.8	6.0
Central Adelaide	7.7	15.4	16.5	14.1	6.4
Central Coast NSW	8.5	10.6	11.2	10.4	7.0
Central QLD	6.9	14.3	10.7	9.7	8.0
Central Western NSW	7.0	9.8	10.1	11.2	5.2
Darling Downs and South West QLD	6.7	8.0	9.2	8.7	5.7
Darwin Top End	12.3	12.1	11.4	13.0	3.8
East Melbourne	4.3	5.9	6.0	5.2	4.5
Eyre and Yorke SA	7.1	13.4	14.9	16.6	10.4
Far and North Western NSW	9.4	12.0	13.3	13.7	7.0
Far North QLD	11.1	11.7	11.4	12.8	8.1
Gippsland VIC	7.2	13.3	12.7	16.2	10.5
Global Sydney	5.1	6.5	5.4	3.4	3.2
Gold Coast and Hinterlands	8.6	12.6	12.7	12.1	8.0
Golden Region VIC	8.9	10.9	12.8	11.6	8.0
Goulburn VIC	7.1	10.1	11.0	10.4	7.1
Hobart and Southern Tasmania	10	17.6	20.2	16.5	9.4
Hunter NSW	8.1	13.2	12.7	12.4	7.9
Illawarra NSW	9.8	11.4	13.7	11.7	7.0
Inner Melbourne VIC	10.2	15.4	12.3	11.0	5.6
Inner West Sydney	5.3	6.3	5.4	3.3	3.1
Ipswich QLD	7.9	9.7	11.7	11.7	8.0
Loddon VIC	9.2	13.8	12.5	13.5	8.0
Mackay QLD	7.9	13.9	9.8	9.0	7.8
Mallee – Wimmera VIC	8.4	10.0	10.3	10.1	5.2
Mercy-Lyell TAS	11.5	14.0	16.3	21.1	10.6
Midlands and Central WA	8.9	8.1	7.3	8.8	6.3
Murray – Murrumbidgee NSW	7.2	7.8	8.9	9.0	6.3
Murraylands SA	15	11.6	11.3	10.7	8.9
N.N. West Sydney	2.0	3.0	2.9	2.1	2.3
North Brisbane	10.2	14.9	15.9	12.2	9.6
North Coastal NSW	13.9	19.1	19.7	20.2	11.1
North Melbourne	8.0	10.7	11.1	10.2	8.5
North West QLD	5.4*	1.8*	2.1*	5.6*	7.4
Northern Adelaide	9.6	12.6	14.4	14.1	9.6
Northern and Central Perth	8.6	8.9	7.2	7.1	5.6
Northern NSW	7.8	10.7	12.2	12.9	6.6
Northern Tasmania	10	13.1	14.7	14.9	7.2
Nth QLD	7.2	11.6	10.4	11.5	8.3
Outer South West Sydney	6.8	8.4	9.1	7.0	7.3
Outer West Sydney	4.5	8.5	8.0	6.7	4.8
Ovens – Hume VIC	5.7	9.1	9.1	8.9	6.4

**Table 8.4 Corrected unemployment rates (continued)**

Region	1991	1996	1998	2000	Official June 2000
Pilbara - Kimberley WA	7.3	8.2	7.0	11.2	8.6
South East NSW	7.8	8.0	8.6	11.6	6.9
South East SA	9.8	7.6	7.8	7.8	6.4
South Eastern WA	11.3	6.7	5.0	7.7	5.7
Southern Adelaide	6.3	5.5	4.7	8.5	7.7
Southern Melbourne	6.2	7.8	7.2	5.9	3.8
Southern NT	13.6	12.3	13.1	16.8	5.0
Southern Perth	8.6	8.2	7.8	8.0	6.8
Southern Sydney	3.6	4.9	5.2	3.9	3.4
Southern WA	7.1	7.4	7.5	8.2	6.2
Sydney Production Region	9	11.8	10.9	8.8	6.1
West Melbourne	9.2	12.4	10.9	9.3	8.1
Western Victoria	6.7	8.1	9.6	9.1	6.7
Westernport VIC	7.1	9.1	7.8	6.8	6.7
Wide-Bay Burnett QLD	10.2	13.2	13.8	13.9	10.7
<b>Australia</b>	<b>7.55</b>	<b>10.14</b>	<b>10.06</b>	<b>9.41</b>	<b>6.59</b>
Official U.R.	9.4	8.4	7.9	6.6	

*Note:* \* Remote area figures may be unreliable  
*Source:* NIEIR's LGA YourPlace database.

**Table 8.5 Corrected unemployment rates**

Region	1991	1996	1998	2000	Official June 2000	Savings rates (2000)
ACT	4.0	8.0	8.2	7.3	5.3	0.5
Brisbane City	6.4	8.5	8.3	7.8	6.0	1.2
Central Adelaide	7.7	15.4	16.5	14.1	6.4	1.9
Central Coast NSW	8.5	10.6	11.2	10.4	7.0	-2.5
Central QLD	6.9	14.3	10.7	9.7	8.0	-1.2
Central Western NSW	7.0	9.8	10.1	11.2	5.2	-3.0
Darling Downs and South West QLD	6.7	8.0	9.2	8.7	5.7	-4.8
Darwin Top End	12.3	12.1	11.4	13.0	3.8	0.5
East Melbourne	4.3	5.9	6.0	5.2	4.5	0.0
Eyre and Yorke SA	7.1	13.4	14.9	16.6	10.4	-2.9
Far and North Western NSW	9.4	12.0	13.3	13.7	7.0	-2.7
Far North QLD	11.1	11.7	11.4	12.8	8.1	-0.4
Gippsland VIC	7.2	13.3	12.7	16.2	10.5	-5.0
Global Sydney	5.1	6.5	5.4	3.4	3.2	4.4
Gold Coast and Hinterlands	8.6	12.6	12.7	12.1	8.0	-6.1
Golden Region VIC	8.9	10.9	12.8	11.6	8.0	-4.2
Goulburn VIC	7.1	10.1	11.0	10.4	7.1	-6.7
Hobart and Southern Tasmania	10	17.6	20.2	16.5	9.4	-2.6
Hunter NSW	8.1	13.2	12.7	12.4	7.9	-0.8
Illawarra NSW	9.8	11.4	13.7	11.7	7.0	-1.7
Inner Melbourne VIC	10.2	15.4	12.3	11.0	5.6	5.5
Inner West Sydney	5.3	6.3	5.4	3.3	3.1	3.8
Ipswich QLD	7.9	9.7	11.7	11.7	8.0	-6.6
Loddon VIC	9.2	13.8	12.5	13.5	8.0	-6.1
Mackay QLD	7.9	13.9	9.8	9.0	7.8	-0.2
Mallee - Wimmera VIC	8.4	10.0	10.3	10.1	5.2	-5.5
Mercy-Lyell TAS	11.5	14.0	16.3	21.1	10.6	-3.8
Midlands and Central WA	8.9	8.1	7.3	8.8	6.3	-2.7
Murray - Murrumbidgee NSW	7.2	7.8	8.9	9.0	6.3	-3.6
Murraylands SA	15	11.6	11.3	10.7	8.9	-5.6
N.N. West Sydney	2.0	3.0	2.9	2.1	2.3	2.3
North Brisbane	10.2	14.9	15.9	12.2	9.6	-6.1
North Coastal NSW	13.9	19.1	19.7	20.2	11.1	-4.3
North Melbourne	8.0	10.7	11.1	10.2	8.5	-2.4
North West QLD	5.4*	1.8*	2.1*	5.6*	7.4	
Northern Adelaide	9.6	12.6	14.4	14.1	9.6	-4.8
Northern and Central Perth	8.6	8.9	7.2	7.1	5.6	-3.2
Northern NSW	7.8	10.7	12.2	12.9	6.6	-4.0
Northern Tasmania	10	13.1	14.7	14.9	7.2	-4.3
Nth QLD	7.2	11.6	10.4	11.5	8.3	-0.7
Outer South West Sydney	6.8	8.4	9.1	7.0	7.3	-5.9
Outer West Sydney	4.5	8.5	8.0	6.7	4.8	-5.3
Ovens - Hume VIC	5.7	9.1	9.1	8.9	6.4	-5.0

**Table 8.5 Corrected unemployment rates (continued)**

Region	1991	1996	1998	2000	Official June 2000	Savings rates (2000)
Pilbara - Kimberley WA	7.3	8.2	7.0	11.2	8.6	8.6
South East NSW	7.8	8.0	8.6	11.6	6.9	-3.4
South East SA	9.8	7.6	7.8	7.8	6.4	-4.3
South Eastern WA	11.3	6.7	5.0	7.7	5.7	2.4
Southern Adelaide	6.3	5.5	4.7	8.5	7.7	-4.1
Southern Melbourne	6.2	7.8	7.2	5.9	3.8	1.3
Southern NT	13.6	12.3	13.1	16.8	5.0	2.7
Southern Perth	8.6	8.2	7.8	8.0	6.8	-3.7
Southern Sydney	3.6	4.9	5.2	3.9	3.4	1.5
Southern WA	7.1	7.4	7.5	8.2	6.2	-5.3
Sydney Production Region	9	11.8	10.9	8.8	6.1	-1.5
West Melbourne	9.2	12.4	10.9	9.3	8.1	-2.6
Western Victoria	6.7	8.1	9.6	9.1	6.7	-5.1
Westernport VIC	7.1	9.1	7.8	6.8	6.7	-7.0
Wide-Bay Burnett QLD	10.2	13.2	13.8	13.9	10.7	-6.0
<b>Australia</b>	<b>7.55</b>	<b>10.14</b>	<b>10.06</b>	<b>9.41</b>	<b>6.59</b>	
Official U.R.	9.4	8.4	7.9	6.6		

*Note:* \* Remote area figures may be unreliable. The savings rate is approximately consistent with the ABS's National Accounts definitions of net savings. Gross savings will be higher because of depreciation allowances.

*Source:* NIEIR's LGA YourPlace database.

## 8.4 Savings rates and regional vulnerability

The regional household net savings rates are given in Table 8.5. The ratios are derived in accordance with National Accounts definitions of net savings.

Given a negligible net household savings ratio at the national level, it is not surprising that very few regions have positive net savings ratios. The regions which have positive savings ratios are:

- ACT;
- Brisbane City;
- Central Adelaide;
- Darwin;
- Global Sydney;
- Inner Melbourne;
- Inner West Sydney;
- NW West Sydney;
- Pilbara-Kimberley;
- South Eastern WA;
- Southern Melbourne;
- Southern NT; and
- Southern Sydney.

That is, only 13 of the 58 SOR regions have a positive savings ratio. Some of the savings ratios for the negative savings regions are large. Regions with savings ratios of less than -6 include:

- Gold Coast and Hinterland;
- Goulburn;
- Ipswich;
- Loddon;
- North Brisbane;
- Westernport; and
- Wide-Bay Burnett.

As Figure 8.1 indicates, the savings ratios are inversely related to the unemployment rate. That is, in general, the higher the corrected unemployment rate, the lower the savings rate. That is, already vulnerable regions will, in general, be relatively more adversely affected by a deterioration in economic conditions.

## **8.5 Productivity and inequality**

Table 8.6 reproduces the GRP data in a common table that was used in Sections 1 to 7. The most striking feature is the productivity differentials between regions. Workers in Global Sydney have a level of productivity which, in 1998, was \$28,000 above the average for all regions. On the other hand, workers in North Brisbane have a productivity which is \$21,000 below the regional average. That is, for North Brisbane workers the productivity gap, compared to Global Sydney workers, is just under \$60,000.

Figures 8.2 and 8.3 show the correlation between productivity and unemployment and the productivity differential and the change in unemployment over the 1990 decade. Low productivity can lock the region into a vicious cycle of decline.

The task of regional policy in Australia over the foreseeable future is to close the productivity differential between regions. How this will be done is explored in Chapter 15.

## **8.6 The economic outlook**

The 1998 State of the Regions report gave projections to 2005. After 2000 the projections produced a softening in economic activity because of:

- household debt saturation and, therefore, the need to increase savings rates and reduce consumption expenditure;
- a slowdown in the United States' economy; and
- slower economic growth in East Asia.

Despite the Australian Government's optimism to the contrary, these factors are already in evidence. That is, the expectation is that the national economic growth rate over the next two to three years is still expected to be significantly less than the rate of growth over the last four years. If this expectation occurs, the inequality between regions is likely to accelerate over the next few years.

This topic will be returned to in next year's State of the Regions report.



**Table 8.6 Productivity and unemployment rate by region**

Region	GRP including dwelling 1991-98 (% p.a.)	GRP per employed person 1991 (1998 \$m)	GRP per employed person 1998 (1998 \$m)	Growth in GRP per capita 1991-98 (% p.a.)	Difference in output per employed person 1998 from average for all regions <sup>(a)</sup> (1998 \$m)	Effective unemployment rate 2000 (%)	Change since 2000 over 1996 (%)
ACT	3.0	57522	76760	2.4	11270.9	7.3	-0.7
Brisbane City	4.6	48267	59989	2.9	-5500.8	7.8	-0.7
Central Adelaide	2.7	52743	65089	2.5	-400.1	14.1	-1.3
East Melbourne	2.9	59532	65573	2.4	83.9	5.2	-0.7
Global Sydney	4.3	71732	93545	2.8	28056.1	3.4	-3.1
Hobart & Southern TAS	2.5	49639	55523	2.3	-9966.1	16.5	-1.1
Inner Melbourne VIC	3.3	65834	83273	1.5	17783.4	11.0	-4.4
Inner West Sydney	3.0	63485	80545	2.3	15055.4	3.3	-3.0
Northern and Central Perth	5.6	52136	59089	3.7	-6400.6	7.1	-1.7
<b>Core Regions</b>	<b>3.9</b>	<b>59648</b>	<b>73395</b>	<b>2.7</b>	<b>7905.0</b>	<b>7.3</b>	<b>-1.7</b>
Central Coast NSW	4.2	51294	57103	2.0	-8386.7	10.4	-0.2
North Brisbane	6.0	38059	44346	2.2	-21143.6	12.2	-2.8
North North West Sydney	3.5	72751	85923	2.7	20433.2	2.1	-0.9
Outer South West Sydney	4.3	49617	57408	2.7	-8081.6	7.0	-1.3
Outer West Sydney	4.4	49307	57938	3.2	-7551.6	6.7	-1.8
Southern Adelaide	3.2	46594	55095	2.6	-10394.1	5.6	0.1
Southern Melbourne	4.5	54174	66610	3.6	1120.7	5.9	-1.8
Southern Perth	3.1	52476	58490	1.2	-6999.6	8.0	-0.2
Southern Sydney	3.0	63972	74424	2.1	8934.9	3.9	-1.0
West Melbourne	2.9	50210	59168	1.5	-6321.6	9.3	-3.1
Westernport VIC	2.7	50155	53052	1.2	-12437.2	6.8	-2.3
<b>Dispersed Regions</b>	<b>3.6</b>	<b>53585</b>	<b>61367</b>	<b>2.0</b>	<b>-4123</b>	<b>6.9</b>	<b>-1.3</b>
Far North QLD	6.2	41974	50167	3.4	-15322.6	12.8	1.2
Gold Coast and Hinterlands	6.1	41102	45695	2.6	-19794.6	12.1	-0.5
North Coastal NSW	2.9	37234	42485	1.3	-23004.2	20.2	1.0
Wide-Bay Burnett QLD	5.0	36419	43441	2.7	-22048.1	13.9	0.7
<b>Lifestyle Regions</b>	<b>5.0</b>	<b>39315</b>	<b>45278</b>	<b>2.4</b>	<b>-20211.0</b>	<b>14.5</b>	
Hunter NSW	3.9	54658	67669	2.9	2179.3	12.4	-0.8
Illawarra NSW	3.8	58318	65232	2.7	-257.3	11.7	0.3
Ipswich QLD	4.7	37934	49239	3.4	-16250.3	11.7	2.0
North Melbourne	3.7	50602	59403	2.8	-6085.9	10.2	-0.5
Northern Adelaide	3.2	44253	54474	2.5	-11015.6	14.1	1.6
Sydney Production Region	3.5	50204	60831	2.0	-4658.4	8.8	-3.0
<b>Production zones</b>	<b>3.6</b>	<b>50498</b>	<b>60946</b>	<b>2.5</b>	<b>-4543.0</b>	<b>10.8</b>	

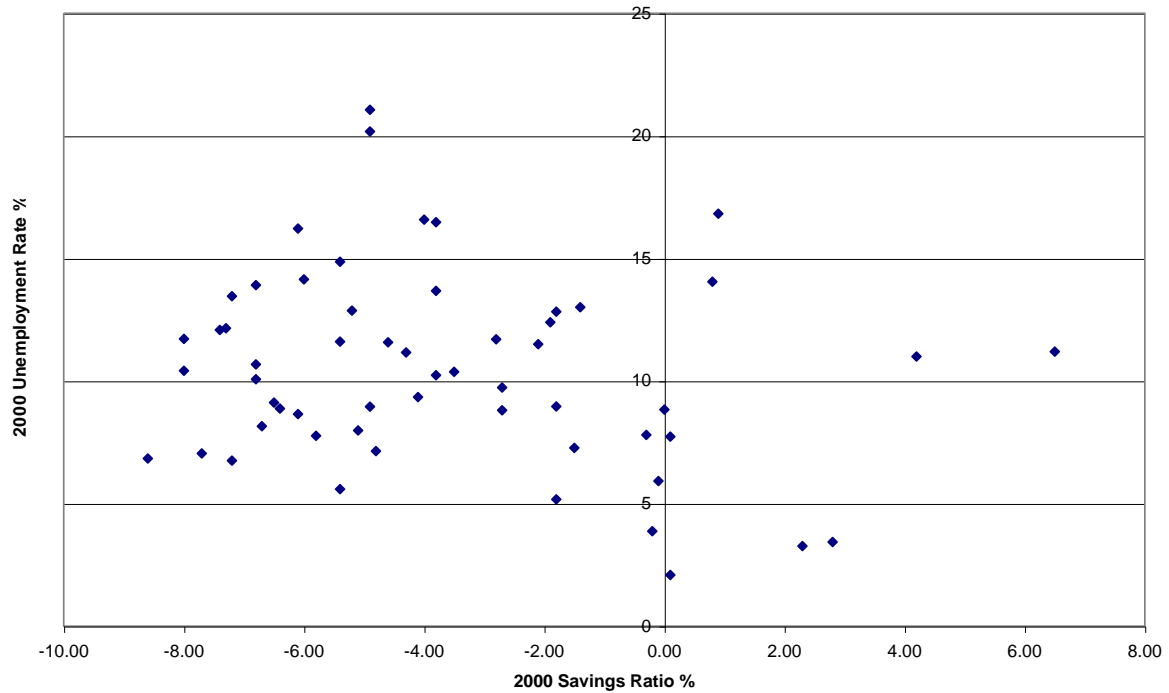
**Table 8.6 Productivity and unemployment rate by region (continued)**

Region	GRP including dwelling 1991-98 (% p.a.)	GRP per employed person 1991 (1998 \$m)	GRP per employed person 1998 (1998 \$m)	Growth in GRP per capita 1991-98 (% p.a.)	Difference in output per employed person 1998 from average for all regions <sup>(a)</sup> (1998 \$m)	Effective unemployment rate 2000 (%)	Change since 2000 over 1996 (%)
Darwin Top End	4.0	62675	66871	1.5	1381.7	13.0	0.9
Gippsland VIC	-2.8	93007	85376	-2.7	19886.2	16.2	3.0
Mackay QLD	7.2	65957	85710	5.3	20220.9	9.0	-5.0
North West QLD	2.5	75703	86585	3.4	21095.4	5.6	3.8
Pilbara - Kimberley WA	5.8	181517	258849	5.0	193359.3	11.2	3.0
Southern NT	-1.0	67577	63558	-2.1	-1931.6	16.8	4.5
<b>Resource Regions</b>	<b>2.7</b>	<b>91515</b>	<b>103610</b>	<b>1.9</b>	<b>38121.0</b>	<b>12.4</b>	
Central QLD	5.1	60853	75754	4.4	10264.5	9.7	-4.5
Central Western NSW	4.5	43215	58385	4.3	-7104.0	11.2	1.4
Darling Downs and South West QLD	3.7	41296	48631	3.7	-16858.7	8.7	0.6
Eyre and Yorke SA	2.4	49341	66789	2.8	1299.6	16.6	3.1
Far and North Western NSW	3.6	45356	60097	4.0	-5392.3	13.7	1.7
Golden Region VIC	2.0	46068	52195	1.6	-13293.9	11.6	0.7
Goulbourn VIC	2.2	39236	49640	1.7	-15849.2	10.4	0.4
Loddon VIC	2.5	40835	48439	1.9	-17050.2	13.5	-0.3
Mallee - Wimmera VIC	4.1	37277	50510	4.4	-14979.2	10.1	0.1
Mercy-Lyell TAS	2.1	48856	58419	2.6	-7070.7	21.1	7.1
Midlands and Central WA	7.7	51675	79684	7.0	14194.8	8.8	0.8
Murray-Murrumbidgee NSW	4.3	41321	54314	4.1	-11175.8	9.0	1.2
Murraylands SA	6.9	31648	54906	6.8	-10583.8	10.7	-0.9
Northern NSW	2.4	45320	58197	3.4	-7292.3	12.9	2.2
Northern Tasmania	1.6	44312	50145	1.5	-15344.3	14.9	1.7
Nth QLD	6.3	44806	58429	5.4	-7060.1	11.5	-0.1
Ovens - Hume VIC	3.9	40095	48654	3.5	-16835.5	8.9	-0.2
South East NSW	3.1	42191	52136	2.4	-13353.2	11.6	3.6
South East SA	5.6	34917	52311	5.7	-13178.9	7.8	0.1
South Eastern WA	6.0	89571	112865	4.0	47375.5	7.7	1.0
Southern WA	5.3	51690	63624	3.1	-1865.8	8.2	0.7
Western Victoria	3.2	37902	49734	3.6	-15755.8	9.1	1.0
<b>Rural Regions</b>	<b>4.0</b>	<b>45266</b>	<b>58081</b>	<b>3.7</b>	<b>-7408.0</b>	<b>11.0</b>	0.9
<b>Total</b>	<b>3.8</b>	<b>53559</b>	<b>65489</b>	<b>2.6</b>	<b>0</b>	<b>9.3</b>	-0.8

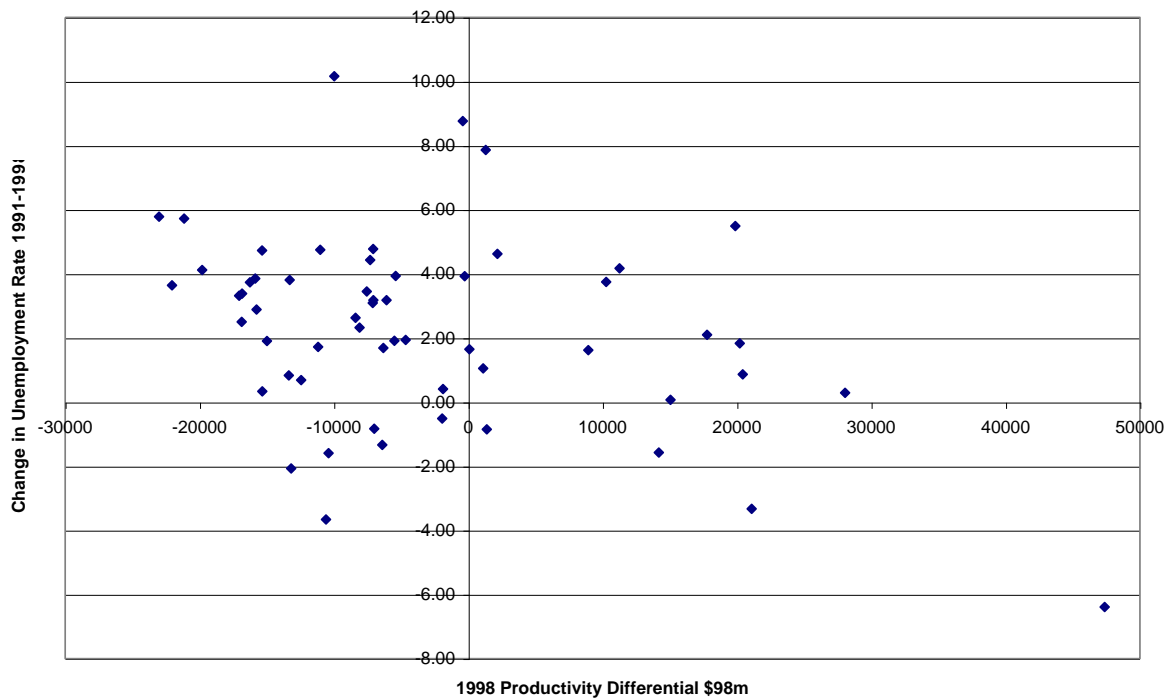
*Note:* (a) The GRP estimates employ a common national deflator. This productivity growth in resource regions in Australian dollars will be less than the quantity shipped because of declines in Australia's terms of trade. Some rural regions have high growth rates because of the effects of the 1991 drought.

*Source:* YourPlace LGA database.

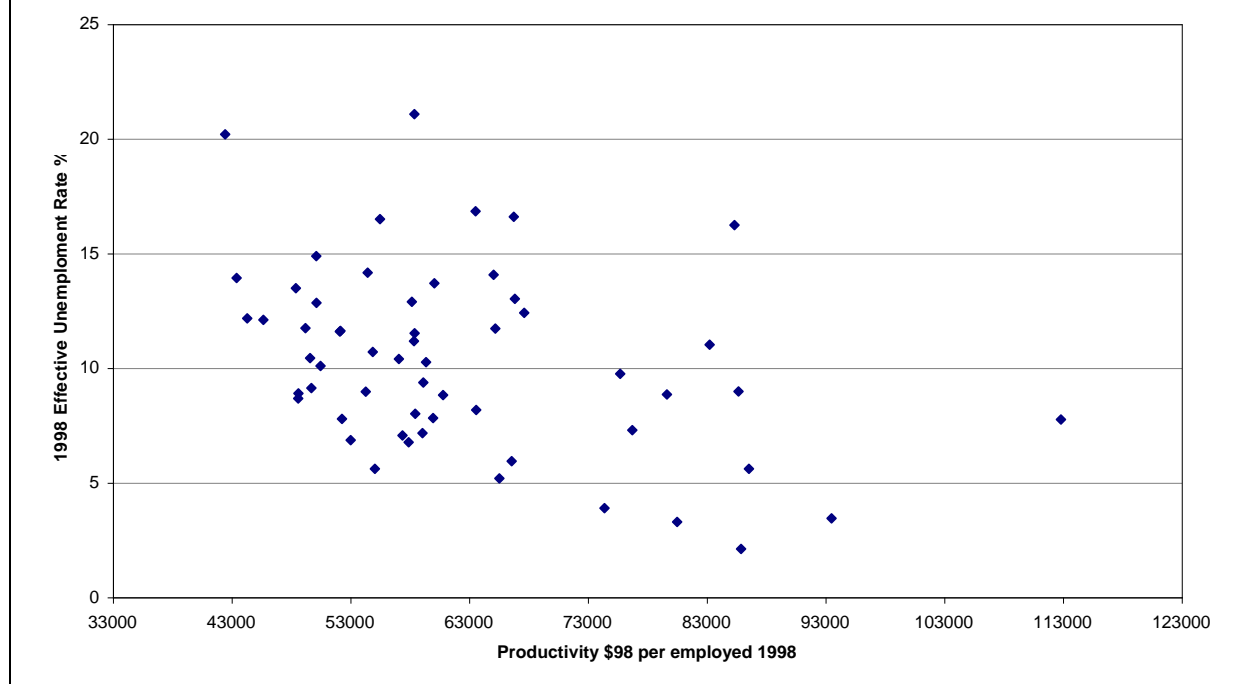
**Figure 8.1: Unemployment rate versus savings ratio**



**Figure 8.2: Productivity differential versus unemployment rate change**



**Figure 8.3: Regional inequality unemployed versus productivity**



## 8.7 Conclusion

From a regional point of view, what matters about regional economic development is not so much growth in gross regional product as growth in incomes received within the region, and in employment. These two aspects of growth are increasingly divorced, particularly in areas where technological change is improving labour productivity and allowing employers to dispense with local labour.

Over the country as a whole, the official ABS unemployment rate declined from 9.4 per cent in 1991 to 6.6 per cent in 2000. As noted above, much of this decline reflected official window-dressing, particularly the transfer of recipients of unemployment allowances to disability pensions, and the requirements of work-for-the-dole schemes and other efforts to increase the number of people who work at least an hour a week and hence are not officially unemployed, even though they remain dependent on social security. Reversing the window-dressing reverses the trend in unemployment, which is now upwards, from 7.6 per cent unemployed and dependent on social security in 1991 to 9.4 per cent in 2000. We will term this the adjusted social security unemployment rate. As described above, the adjusted rate is derived from social security returns rather than from the labour force survey, and estimates the number of people receiving social security payments due to unemployment, with social security eligibility kept constant at 1991 definitions.

The adjusted unemployment rate was below the official rate in 1991, for reasons considered above. In 2000 it was 43 per cent higher than the official rate over the country as a whole. In areas with low official unemployment rates, the official rate and adjusted rates were similar, while in areas with high official unemployment rates (the highest was 11.1 per cent) the adjusted rate was roughly double the official. The social security system is much more likely to transfer an unemployed person to disability pension or onto work-for-the-dole in areas where unemployment is high. The NT provides two outliers to this relationship, with particularly high adjusted unemployment for its level of official

unemployment. The high level stands out by comparison with adjacent Western Australia and Queensland and may be related to the treatment of Aboriginal unemployment in the Territory.

During the 1990s, adjusted unemployment rates fell in three of the seven Sydney regions (and in three more the increases were marginal), in two of the six Melbourne regions (and in three more the increases were marginal), and in both regions in Perth. There were also falls in the Western Australian and South Australian farming/wheat belt, possibly an effect of seasonal conditions. At the other extreme, increases in unemployment of 9 or more percentage points were recorded in Mersey-Lyell, Eyre and Yorke (which includes the South Australian iron triangle) and Gippsland. The rest of Tasmania, Central and North Adelaide, Loddon in Victoria, North Queensland and the greater part of rural New South Wales experienced increases of 4 but less than 9 percentage points.

At the national level, the increase in adjusted unemployment occurred between 1991 and 1996. In the boom from 1996 to 2000 the adjusted unemployment rate fell from 10.1 to 9.4 per cent (and the official rate fell from 8.4 to 6.6 per cent). However, regional experience diverged, with 29 regions experiencing an increase in adjusted unemployment from 1996 to 2000, and 29 experiencing a fall. The falls were nearly all in the cities (particularly Sydney), and in the Queensland coal field regions. During the second half of the 1990s the adjusted unemployment rate rose in most country regions, with particularly large increases in Mersey-Lyell (Tasmania), the Southern Northern Territory and Eyre and Yorke (South Australia).

Many of these changes accentuated the differences between low and high unemployment areas. By 2000 Global, Southern and North Western Sydney were experiencing full employment, and East and Southern Melbourne and Westernport were not far short. At the other extreme, unemployment rates in excess of 14 per cent applied in the whole of Tasmania, in Eyre and Yorke and Central and Northern Adelaide; in Gippsland, in the Northern Rivers of NSW and in the Southern NT. WA and QLD were free of such afflicted regions, though parts of Queensland came close.

Good economic and regional economic development policy requires a solid assessment of the underlying economic combinations in a region. The current labour force indications do not do that.

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## **9. The regional supply chain: changes under the impact of globalisation and e-commerce**

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The implications of globalisation and e-commerce are generally discussed at the national level. However, it is at the regional level that the effects will be registered. The best framework to analyse the consequences is in terms of the industry supply chain at the regional, national and international level. It is through changes in the industry supply chain that the benefits and costs from globalisation and e-commerce will be realised.

### **9.1 The inter-relationship between globalisation and e-commerce**

The term ‘globalisation’, or more correctly, the ‘pressures of globalisation’, is much used. The current focus on globalisation should not be interpreted as implying that it is a new concept. In many ways the current focus on globalisation simply represents the end of the line of forces unleashed by the transport revolution of the 19<sup>th</sup> Century.

The 19<sup>th</sup> Century’s transport revolution (railways, refrigerated fast shipping) allowed agriculture and mining production to reach global markets. Regions that possessed efficient farms and mines prospered at the expense of regions with poorer levels of productivity in these industries.

The technological changes that came with the electricity-driven manufacturing process technologies of the early 20<sup>th</sup> Century allowed large scale plants to be constructed with the capacity to satisfy significant shares of the world market. Regions that did not construct world scale plants lost out to regions that did. The current wave of plant closures in Australia reflects the fact that in traditional industries, such as metals, chemicals, paper and industrial machinery, Australia failed to develop large scale plants between 1960 and 1990 which were capable of high levels of exports.

The current, or third, wave of globalisation represents the end of the line that started with agriculture. It represents the end of the line in that the new information technologies described by the generic description of e-commerce have widened the potential for interaction trade to most service industries.

In the distribution industries (retail and wholesale) e-commerce, by reducing the intermediary or third party, effectively allows for increased import competition. In the health and education industries e-commerce allows the export of services from anywhere in the world to anywhere else in the world.

However, the current pressures of globalisation have improved the earlier waves of globalisation in the primary and manufacturing industries. Remaining traditional national barriers of protection within the supply chain of these industries are being swept aside. The effective global reach of the industries has been greatly enhanced. Most importantly, the monetary and control features of e-commerce will greatly alter the way supply chains operate and, therefore, the determinants of regional economic competitiveness. The implications for the supply chain will be explored in some detail.

Before this is done, however, it is necessary to explain why the current wave of globalisation has greatly increased the strategic importance of manufacturing.

## 9.2 The strategic importance of manufacturing

Except in Australia, New Zealand and, to a lesser extent, Britain, manufacturing has been seen in developed economies as the strategic foundation for sustained high level growth. The strategic importance of manufacturing comes from:

- ❑ manufactured products are where wealth is created for advances in science, knowledge and available technologies;
- ❑ manufacturing enterprises are the strategic core of most supply chains of high value; and
- ❑ advanced manufacturing processes are the vehicle in which new technologies, skills and experience are introduced into an economy, which then are dispersed over other manufacturing and service industries to lift economy-wide productivity.

The transport equipment industry in Australia has been the industry that first introduced advanced manufacturing technologies and has provided the skills and experience to apply the technologies across a broader range of industries. The positive spillover benefits from advanced manufacturing production creates a multiplier value of at least between 4 and 6, or three to four times the traditional multiplier.

Table 9.1 shows the important role manufacturing has played in driving growth in the high growth economies of the world economy over the 1990 decade. Indeed, the renaissance of the United States' economy over the 1990 decade has been built around its manufacturing sector.

**Table 9.1 Economy-wide growth rates compared to manufacturing growth in 19 OECD countries: 1990 to 1998**

	% growth: 1990-1998 in production		
	Manufacturing	Economy	Manufacturing growth to economy growth
Canada	24.8	18.0	1.4
United States	37.2	23.1	1.6
Mexico	38.4	27.4	1.4
Japan	-6.5	11.3	-0.6
Korea	59.2	52.2	1.1
Australia	12.2	30.2	0.4
New Zealand	17.5	18.8	0.9
Austria	19.1	18.8	1.0
Denmark	25.3	23.4	1.1
Finland	40.1	11.8	3.4
France	7.3	10.7	0.7
Germany	9.3	14.4	0.6
Ireland	138.8	70.1	2.0
Italy	8.5	9.4	0.9
Netherlands	16.0	23.0	0.7
Norway	22.1	33.5	0.7
Spain	17.5	17.7	1.0
Sweden	35.8	8.3	4.3
United Kingdom	4.5	17.2	0.3

Australia's saving problem, that is the high current account deficit, is in fact a manufacturing problem. Australia's share of manufacturing at 13 per cent of GDP is 5 to 6 per cent below the share of a comparable OECD economy.

This is history. What is important is that e-commerce has further increased the strategic role of manufacturing. This is because e-commerce has enabled the final product manufacturer to capture a greater share of post-production value-added.

Australia made a large scale strategic error in the 1970s and 1980s when it decided that there was easier and better value in exploiting the post-production value-added potential of emerging technologies rather than the hard task of producing them in Australia. As Table 9.2 shows, not only is Australia now locked out of the fastest growing areas of world trade, the post-production value-added potential is being eroded by the ability of manufacturers to import distribution and servicing into Australia by e-commerce.

The strategic policy error in the 1970s and 1980s when, in effect, Australia decided that manufacturing was no longer important, will compound the problems of regional development in Australia well into the 21<sup>st</sup> Century.

**Table 9.2 The locking of Australia out of the faster growing industries in world trade: import share of the domestic market 1996 (per cent)**

	Australia	OECD average (16 countries)
Aerospace	80	33
Office and computing equipment	71	61
Drugs and medicine	48	20
Communication equipment	70	34
Professional equipment	79	42
Auto	43	30
Electrical machinery	57	25
Chemicals	42	34
Other transport equipment	34	26
Non-electrical machinery	67	26
Rubber and plastics	25	16
Ship building	28	14
Other manufacturing	69	24
Non-ferrous metals	7	25
Non-metallic minerals	12	11
Metal products	17	14
Petroleum refineries	16	13
Ferrous metals	11	15
Paper products	14	10
Textile, clothing and footwear	46	39
Food and beverages	9	12
Wood products and furniture	9	16



### **9.3 The features of a supply chain**

In product markets a supply chain is a grouping of suppliers and customers who, at various levels of co-ordination, buy, fabricate, distribute and wholesale/retail goods and services among themselves with the end result of the sale of a finished product to a final consumer.

The supply chain covers the following capabilities and functions:

- (i) product design;
- (ii) product engineering;
- (iii) raw material supplies (mines);
- (iv) production facilities;
- (v) transport, distribution and communication support;
- (vi) retail outlets; and
- (vii) marketing.

The characteristics of functions and outputs in the supply chain are determined by the original equipment manufacturer (OEM). The OEM, in turn, is constrained by the requirements of the final consumer.

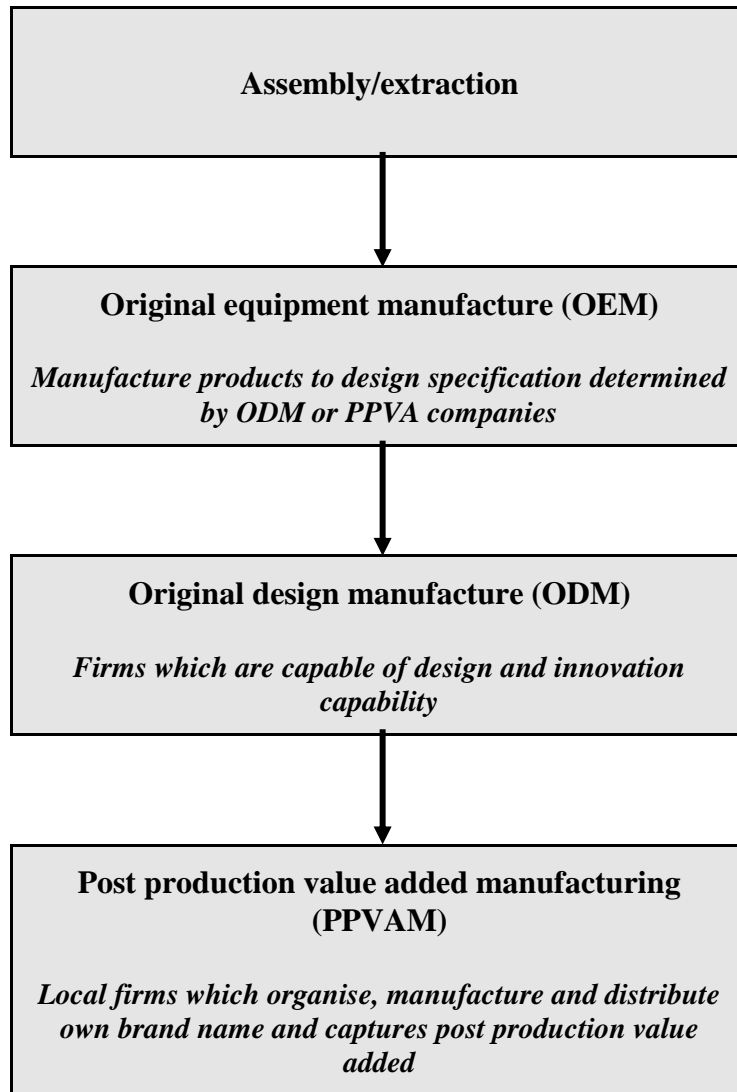
Enterprises in the supply chain will have varying degrees of value-adding capability. Figure 9.1 outlines and defines the goals of value-adding capacity. At the lowest level is assembly/extraction capability. At the next stage are those enterprises with original equipment manufacturing capability, followed by those manufacturers with their own design and manufacturing capability. Finally, at the core of a supply chain will be the manufacture with post-production value-added capability that supplies the product to final consumer markets with capital equipment or consumer goods.

The supply chain structure is outlined in Figure 9.2. The status of firms in the ‘fabricators, components and modules’ supplier group will be a mixture of assembly, OEMs, ODMs and, for advanced manufacturing industries, PPVAMs.

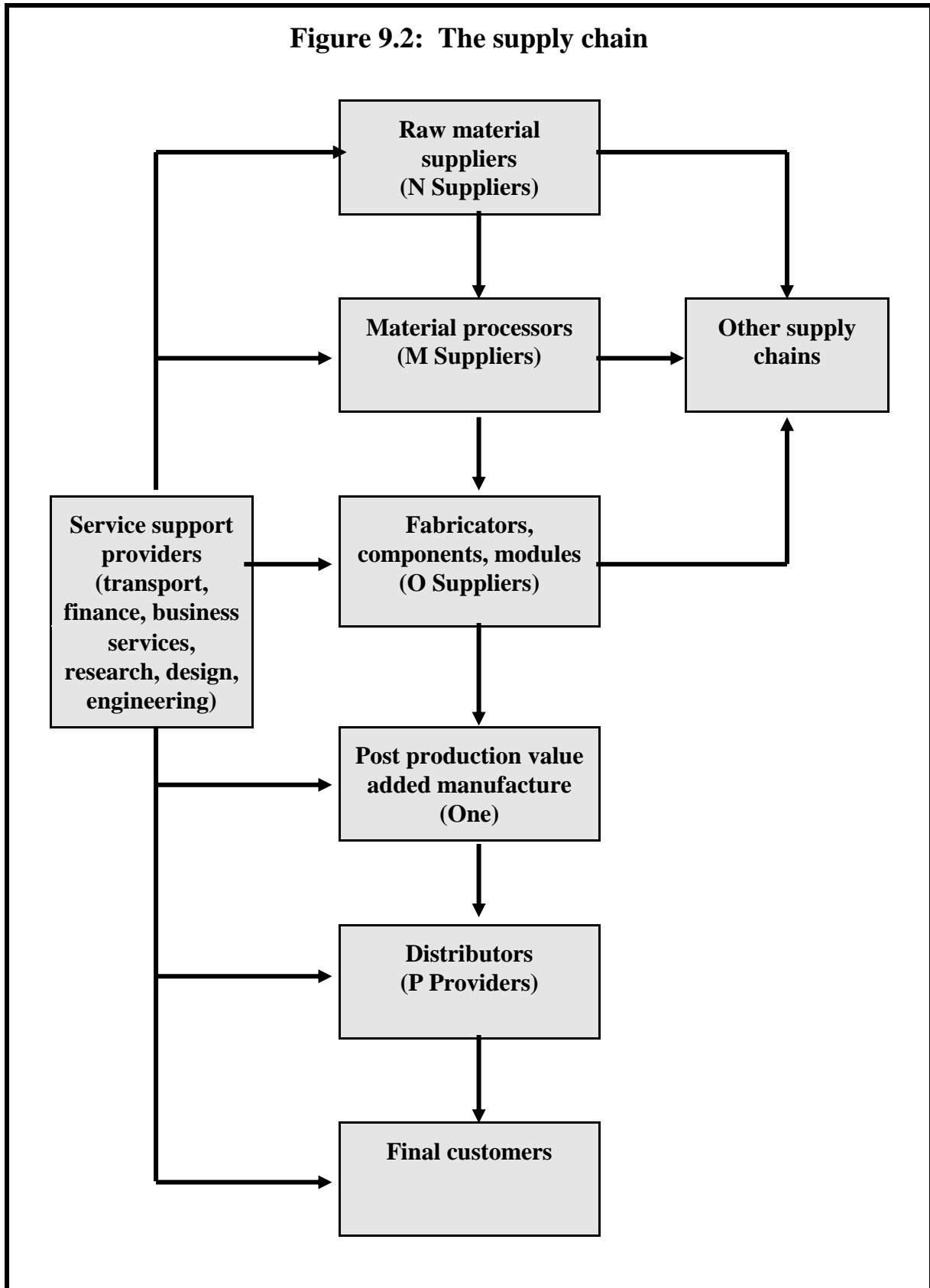
### **9.4 Regional supply chains in Australia**

In resource-based regions in regional Australia the supply chain ends at the initial processors. For remote regions the supply chain ends at the first stage in Figure 9.2, that is at the raw material supplier stage. The relative lack of PPVAMs across Australian regions means that for many regions the supply chains end at the fabricator, component and module stage.

**Figure 9.1: The stages of firm value adding capability**



**Figure 9.2: The supply chain**



## 9.5 The traditional supply chain

The traditional supply chain could be organised according to two polar extremes:

- (i) a formal supply chain within a vertically integrated company structure (e.g. BHP); and
- (ii) an unmanaged supply chain.

The unmanaged supply chain is characterised by:

- no or little regard for sharing benefits and risks;
- short term focus and no regard for mutual long term objectives and success between supply chain members;
- cost and delivery performance are the main criteria used for determining continued supply chain memberships;
- the PPVAM only concerned with members of the supply chain in close proximity to themselves; and
- legislative and political adversarial relationship describes the inter-relationship between supply chain members.

In terms of the unmanaged supply chain product development is generally undertaken by the PPVAM with the status of the suppliers generally at least of OEM status. That is, outside the PPVAM the skills required to support the supply chain were low.

## 9.6 The new supply chain: supply chain integration

The general forms of globalisation are forcing both the vertically integrated and the unmanaged traditional supply chains to evolve towards a standard new supply chain structure designated the integrated supply chain.

The integrated supply chain (ISC) simulates the co-ordination of the vertically integrated enterprise with independent membership at all stages of the supply chain. The ISC is a collection of independent suppliers who work to maximise their collective performance in producing the OEM final product. The members of the chain are bound together by shared objectives, trust and the knowledge that supply chain membership is voluntary and can be discontinued if collective responsibilities are not met.

In the vertically integrated company structure, captive or bonded supply relationships lead to inefficiencies, inflexibility and final product uncompetitiveness.

The days of both types of traditional supply chain were numbered when the pressures of globalisation and e-commerce achieved:

- increased cost competitiveness;
- short product life cycles;
- short product development cycles;
- increased product recognition with products being distributed across world markets;
- best practice quality required for competitiveness; and
- accelerating rates of innovation.

The destruction of the vertically-integrated company by outsourcing and the greater co-ordination of the unmanaged supply chain to produce the ISC have enhanced supply chain competitiveness by:

- improved focus, quality and simplification of remaining in-house OEM operations;
- lower production and inventory costs;
- risk sharing and co-ordination to reduce product development costs;
- wider access to technological choices (by widening supply chain membership);
- relative ease in expanding best practice manufacturing capacity by expansion of supply chain membership; and
- greater access to strategic skilled labour.

In short the ISC characteristics are a reverse of the characteristics of the traditional unmanaged supply chain.

It has been the development of the ISC in the United States technology-based industries in the late 1980s and early 1990s, and the extension of the concept to the more traditional manufacturing and service industries, that is the core explanation for the recent renaissance of the United States economy. The model is now being applied world-wide with the major impetus coming from the projected growth in business-to-business e-commerce over the years to 2003.

In Australia the formation of integrated supply chains has taken on distinctive characteristics in that it has typically been associated with the outsourcing strategies of large vertically integrated companies. In the main this outsourcing has generated opportunities for enterprises outside the region with a greater share of the supply of goods and services going to regions in Australia better placed to supply skills that are competitive in the global economy. The skills in the main are sourced from the global city segments in Australia (Sydney/Melbourne) or from overseas.

In terms of creation of ISC from the traditional unmanaged chain, the beneficiaries have been Australian regions that have the skills and scale of production to compete effectively. This has increased regional economic inequalities. The lack of a buoyant manufacturing sector in Australia means that the accelerated formation of integrated supply chains in Australia over the next few years will continue to unleash negative forces in the regions containing the core of the supply chain. Other Australian regions will obtain some of the benefits however.

## **9.7 Integrated supply chain management**

Effective management of the integrated supply chain requires:

- resources for managing and supporting the supply chain; and
- investments in supply chain integration software and supporting information systems.

In general the OEM will take the lead in strategic co-ordination and managing of the supply chain, while delegating to individual members the management of relationships in close proximity to them.

Effective supply chain management requires:

- the minimisation of friction, barriers and waste of resources within the supply chain;
- maximisation of functional and procedural synergy between members;
- fast response to shifts in market requirements;
- minimisation of excess capacity and inventory levels; and
- minimum time product development cycle at minimum costs.

Management practices within the supply chain members require transfer from the commercial and contract model to a management model which focuses on shared interests, shared resources and shared risks. Management's task is to be able to manage informal networks to achieve outcomes requiring complex co-ordination.

Maintaining an enterprise's position in the supply chain requires personnel with high levels of interpersonal skills and being able to maintain long term relationships. Research staff, design engineers, sales staff and logistic persons need to build bonds of trust and credibility with their peers in other enterprises within the supply chain.

The ISC turns the traditional supply chain on its head. Stand-alone responsibility, secrecy and the general adversarial stance towards suppliers of the traditional model is replaced by information sharing, openness, win-win negotiations and sharing risks and rewards with other enterprises in the supply chain.

Increasingly a supply chain's competitiveness and, therefore, the region's competitiveness will depend on whether or not the high level profile skills required to achieve supply chain integration are available within the region. Regional competitiveness will depend on whether or not a region can develop or import such skills.

## **9.8 E-commerce and supply chain integration software**

E-commerce and the associated supply chain management software will greatly aid the effective management of the supply chain. High level in-house information and control systems are integrated with the system of the PPVAM and the other members of the supply chain. This enables the integration of:

- purchasing, logistics and manufacturing across all enterprises in the supply chain;
- final product orders with the entire manufacturing and distribution process;
- just-in-time inventory co-ordination; and
- post sales servicing.

This enables the manufacture and distribution of a single product to be:

- minimised in terms of costs;
- minimised in terms of time;
- maximised in terms of customer requirements; and
- monitored over its life for defects and durability characteristics.

By 2003 this type of high level software capability for supply chain management will be common place in all world best practice chains. Other supply chains which are not rapidly converging to a ISC and the use of e-commerce will be candidates for extinction over following years unless national barriers of protection are in place.

In a more formal sense, what e-commerce will do is allow the integration of the computer integrated manufacturing (CIM) systems of identical enterprises across the supply chain. Within enterprises the CIM links the computer aided manufacturing (CAM) system of the factory floor to the other enterprise functions of ordering, accounting, finance, logistics and goods shipment.

What the world is moving towards is:

*“The supply chain in 2020 dominates the manufacturing landscape, with hardware and components manufactured by a whole new tier of job shops and speciality houses – virtual corporations made up of groups of knowledge workers.”*

## **9.9 The requirements for integrated supply chain membership**

Many of the Australian supply chains are the traditional type. The extension of the telecommunication infrastructure and the growth in e-commerce will exert massive pressure on regional supply chains to become integrated or be eliminated. In order to become members of the newly forming integrated supply chains many Australian small and medium enterprises (SMEs) will have to upgrade their capabilities to at least the OEM level. To do this, however, many SMEs will have to very quickly revolutionise their operations.

The SMEs will have to have:

- CIM and CAM systems;
- managers with the ability to participate in the management of the entire supply chain;
- strong strategic alliances with other core members of the supply chain;
- an open risk sharing, information sharing and communication system;
- a sound financial balance sheet so that the risks of continued innovation can be covered;
- a workforce involved in life-time learning;
- full e-commerce enablement (work sites, integrated systems);
- skill acquisition on a world-wide basis (the sole use of local inferior skills not an option); and
- access to appropriate design and development skills.

In specific terms the following inputs will have to be employed if enterprises are to remain or gain access to membership of an integrated supply chain.

A stocktake of how many enterprises possess most, or all, of the above capabilities across regional Australia would produce depressing results.

**Table 9.3 Use of manufacturing technologies, 1994 (per cent)**

Technologies and techniques	Current use	Planned use
PCs, non-manufacturing	90.6	3.6
Material requirements planning (MRP II)	56.1	28.2
Just-in-time manufacturing (JIT)	61.7	14.2
Preventive maintenance	59.2	28.3
Local area networks (LANs)	31.7	18.3
Employee teams	52.8	26.6
PCs, shop floor	36.6	25.7
CAD with computer-aided engineering (CAE)	39.4	15.7
Internet	n.a.	n.a.
SPC and statistical quality control (SQC)	36.2	23.9
Electronic business transactions	35.2	29.8
Numerically controlled (NC) or computer numerically controlled (CNC) machines	28.6	7.6
Data collection devices	23.1	31.6
CAD with CAM	17.0	13.2
Manufacturing cells	n.a.	n.a.
Computer integrated manufacturing (CIM)	10.2	20.3
Automated material handling	17.0	20.2
ISO 9000/QS 9000 certification	4.2	36.6
Automated in-process inspection	8.9	15.9
Rapid prototyping	n.a.	n.a.
Distance learning	n.a.	n.a.
ISO 14000 certification	n.a.	n.a.

Source: Youtie and Shapira, 1997.



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## 10. The regional dimension of supply chain integration

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The analysis of previous sections focused on supply chain integration, largely ignoring the geographical dimension. In practice the enterprises in the supply chain will be located across the regions of the Australian economy.

In theory the advent of e-commerce should further reduce the importance of the regional dimension. E-commerce will make it possible for anyone to connect with anyone else, anywhere in the world. In practice over the last decade it has been noticed that new integrated supply chains tended to take on a strong regional dimension. They tended to locate a high proportion of members in one region, so that they were in close proximity to one another.

Most of the regions with a high concentration of ISC's are knowledge-based. In Australia, this means that the highest concentrations of ISC's are in the core metro areas with the strongest global links.

This raises two issues for regional development. Firstly, is geographical proximity a pre-requisite to support the creation of Integrated Supply Chains? Secondly, what knowledge-based infrastructure is required to underpin ISC's and regional competitiveness?

### 10.1 The concept of a knowledge-based region

As the OECD report "*Up-grading Knowledge and Diffusing Technology in a Regional Context*" (1999) points out, the concept of a knowledge base cannot be easily quantified. However, the knowledge base will have two complementary elements, namely knowledge infrastructure and knowledge enhancing linkages.

**Knowledge infrastructure** is measurable, including universities, technical colleges, research centres, technology intermediaries, private research and engineering services, technological parks and large concentrations of advanced technology institutions and commercial activity called technopoles.

**Knowledge enhancing linkages** are less measurable. Knowledge enhancing linkages consist largely of unmeasurable connectivity, inter-actions and inter-relationships between the knowledge-based institutions and local firms, and the strength of the inter-relationships between the firms.

The question is: Is it possible to be a knowledge-based region without extensive knowledge infrastructure? The answer to that question is a qualified yes, if the region possesses only industries that do not greatly depend on high levels of support from knowledge infrastructure. For most medium technology industries access to codified knowledge, integrated local supply chains and appropriate qualification and experience of personnel in the firms in the supply chain are sufficient conditions for a knowledge-based region, provided some support is available from TAFE colleges and other registered training organisations (RTOs) in the region.

On the other hand, high levels of local knowledge infrastructure will contribute little to the innovative capacity of a region without dense inter-relationships with local industry and/or agricultural producers. These types of regions are designated "cathedrals in the desert" regions.

Table 10.1 sets out the necessary conditions that have to be satisfied for a region to be classified as knowledge-based. In terms of the performance conditions, industry may well be contracting for a knowledge-based region but that contraction is to a core set of activities and supply chain activities that are sustainable over the longer term.

**Table 10.1 The determinants of regional knowledge status**

Industry typology	Supply chain	Firm inter-relationships	Knowledge infrastructure	Performance	Regional status
Industrial	Integrated	Strong	Weak but adequate	Sustainable	Knowledge-based
Industrial	Traditional	Weak	Inadequate	High vulnerability	Traditional
High technology	Integrated	Strong	Strong	Sustainable	Knowledge-based
High technology	Weak	Weak	Strong	Failed to develop	Traditional

The description ‘traditional’ implies a non-knowledge-based region. The industry typology description ‘industrial’ implies resource based or medium technology industries.

The important implication from Section 9 is that the development of the integrated supply chain across all industries over the next few years will mean that if the existing supply chains are not lost or, at the very least, sustainably diminished, then all regions to a greater or lesser extent are going to have to become knowledge regions. Regions which cannot adapt (the rich resource based regions aside) will incur one or more of the following:

- loss of population;
- loss of high income employment; or
- loss of employment.

## 10.2 The economic advantages of proximity

In the context of regional competitiveness there are a number of reasons why proximity, that is having a significant number of supply chain members in the same region, is an advantage. These advantages stem from:

- (i) the importance of tacit knowledge;
- (ii) the nature of the innovation process;
- (iii) the importance of inter-personnel relationships;
- (iv) labour flexibility; and
- (v) knowledge spillovers.

### 10.2.1 The importance of tacit knowledge

As noted, globalisation means that producers have to be at or near world best practice standards to ensure longer run survival. The irony is that the pressure of globalisation has increased the role of the region in delivering best practice standards. There are a number of reasons for this.

One reason is that the individual producer's skills and technology are only one element of competitiveness. Another element is the skills, technology and knowledge used by suppliers of goods and services to the producer. In many cases natural barriers or constraints force producers to source these services locally. Unless the region's overall supply base is at or near world best practice, individual producers will be at a competitive disadvantage.

Another reason is that an important element of competitiveness is tacit knowledge. Codified knowledge, as available in education courses and over the Internet, is available to everybody and, therefore, in the long run is not a strategic instrument of competitiveness. It is no more than a necessary requirement for survival.

Tacit knowledge is regionally based. Agriculture and mining regions will differ in rainfall, sunshine, soil quality and resource quality and, therefore, will differ in the optimum production structures and technological applications given the available stock of codified knowledge and available farm input options. Tacit knowledge is a key ingredient in the search for optimum production and technology configurations.

Tacit knowledge in country regions will become even more important in the years ahead as agricultural production will increasingly diversify across commodities (olive trees, ostriches, horticulture, meat, sheep) and by greater specialisation in what up to now have been regarded as homogenous products (wheat, dairy). A region's competitive success in agriculture will largely depend on its ability to combine tacit knowledge with codified knowledge.

In metropolitan regions tacit knowledge can be an important ingredient in determining the effectiveness of production techniques or as inputs into the creation of new ideas and innovation. Tacit knowledge becomes most relevant at the regional level when it is used to adapt and apply existing technologies, products and processes to create and new value within the region.

Tacit knowledge is of most use if it is widely disseminated within the region. This involves the fast identification of best practice farms, firms and mines in the region and the reasons for this status. The speed of dissemination of such knowledge depends on whether or not a region is a knowledge-based region.

### **10.2.2 The nature of the innovation process**

Necessary conditions for successful innovation at the regional level include:

- access to relevant codified knowledge;
- availability of the appropriate knowledge workers (engineers, scientists, etc.);
- capacity to create Integrated Supply Chains; and
- education and training structures to enable workers to adapt to the technologies.

However, even if all the above features are in place, the general rule is that isolated firms do not innovate or readily adapt to new technologies. The reality is that, even though one firm may take the final step in the innovation process, the knowledge increment behind the innovation involves numerous interactions between firms and institutions, many of which would not have been possible without proximity.

The importance of proximity in the local innovation process is further enhanced by the role of tacit knowledge in innovation. By definition tacit knowledge is, in general, only available locally or at the very least only recognised to be important locally.

### **10.2.3 The importance of inter-personnel relationships**

The emergence of the ISC with its dependence on shared objectives, integrated inter-firm operations and shared risks and knowledge has given a strong role to trust and good inter-personnel relationships in the development of a competitive supply chain.

Trust and the maintenance of good inter-personnel relationships are best developed with good connectivity between individuals. In turn this is best achieved when firms operate in the same region.

### **10.2.4 Labour flexibility**

The development of a knowledge-based economy requires that the appropriate knowledge workers be available in the region or be attracted and retained in the region. Integrated supply chain management generally requires that these workers in part be accessed from the local service sector, if only for the reason that very high cost knowledge workers are most economically available, either as consultants or on a short term contract basis. High skilled knowledge workers will only accept these employment conditions if they know that if they locate to the region there is good probability of continuous or simultaneous employment. This in turn will depend on the industrial climate in the region and the demand for services of skills in given categories.

Thus, regions with concentrated industrial clusters producing high level demands for certain skills will be highly competitive in attracting the skills to the region, both in terms of the income opportunities and the duration of effective employment. The attraction of best practice skills will, in turn, imply the capture of world competitiveness for the region.

This mechanism explains, in part, the visitor growth cycles of global cities over the 1990 decade. However, it is regional characteristics that create this visitors cycle and the benefits of proximity in terms of skill agglomerations within a region.

### **10.2.5 Knowledge spillovers**

To some extent regional boundaries are arbitrary. The smaller the region geographically, the more important are the characteristics of neighbouring regions in attracting or repelling investment. Proximity via the mechanism of knowledge spillovers from neighbouring regions are an important determinant of regional advantage.

## **10.3 Conclusion**

Proximity is an advantage. This means that Australian regions that have existing developed supply chains have an inherent advantage in retaining and enhancing the supply chain, despite the pressures from supply chain integration and e-commerce. However, given the speed of change many Australian regions may have to move very quickly for the benefits of proximity to remain an advantage.

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## 11. The closing of the digital infrastructure divide

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Over the past couple of years, Australia has had an intensive debate about the digital infrastructure divide, or the lack of access to quality telecommunication infrastructure in regional and rural areas, compared to metropolitan areas.

The issue with the digital divide is not access to telephones, which with satellite phones is now universally available. The issue with the digital divide is effective Internet access.

### 11.1 The Internet access standard

The possibility and the quality of delivery of e-mail images, software, or any other electronic product depend on the capacity of the telecommunications network. In this context, “capacity” means the bandwidth of the network measured in terms of bits per second. The bandwidth determines the speed at which data can flow through the network.

Bandwidth capacity is important because of the diverse demand placed on Internet infrastructure. In the early days of the Internet the main usage was in the sending of text messages. In this case low bandwidth capacity did not pose a problem.

The uses of the Internet now extend well beyond text messages. The full image of multi-media applications now requires the Internet (or Internets) be used for text, images, sounds, software, video, telephony, etc. Efficient use of these services requires reasonable access and transfer speeds. This in turn requires a high (that is, fast) bandwidth connection.

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**Table 11.1 Transfer speed ranking for 10 megabyte file**

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Modem speed (kilo bits per second)	Transfer time
9.6	2.3 hours
14.4	1.5 hours
28.8	46 minutes
128 (ISDN)	10 minutes
1.54 mbps F1 connection	52 seconds
4 mbps cable modem	20 seconds
8 mbps ADSL	10 seconds
10 mbps cable modem	8 seconds

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*Note:* mbps is mega bits per second.

*Source:* US Department of Commerce: “*The Emerging Digital Economy*”, 1998, PA2-13.

The full capability of the Internet will only become available to all farms, households and businesses when the infrastructure is in place for cable and satellite (wireless) modems are widely accessible. These are the technologies that supply the high bandwidth capabilities.

Speed and quality of Internet go hand in hand. Video transfer is not only unreasonably lengthy with low bandwidth copper twine, it is also of poor quality.

The key question is: what should be the minimum standard in terms of kbps in order to enable effective use of Internet based services in all Australian regions, especially for commercial services by 2005? In general, the current answer to this question is a minimum standard of 128 kbps. For simple e-mail and web browsing and current Internet e-commerce uses 28.8 kbps is adequate. At 14.4 kbps only e-mail and web browsing are effective.

The quality of the rural network in regard to data transmission standards is summarised in Table 11.2.

Transmission rate	2.4 kbps		9.6 kbps		14.4 kbps		28.8 kbps	
	1998	2000	1998	2000	1998	2000	1998	2000
Urban and provincial centres network coverage	99	100	95	99	85	95	60	75
Rural areas network coverage	99	99	70	90	45	85	30	60

*Source:* Telstra-ACA communications, as reported in ACA Digital Data Inquiry, 1998, pages 55 and 56 for 1998 and Telecommunications Service Inquiry “*Connecting Australia*”, 2000.

In 2000 a substantial proportion of provincial and rural areas did not have access to the 28.8 kbps standard.

The widening gap in the city-country telecommunications infrastructure divide can be further seen from the fact that city users have increasing access to Direct Subscriber Line technologies capable of delivering 10 mbps performance. Many remote and rural area users have a quality of access at or below 14.4 kbps. In this instance the gap in service quality is some 700 fold in favour of the city users.

## **11.2 The infrastructure availability schedule**

The rate of closure of the digital divide will depend on the roll out of the telecommunications infrastructure capable of delivering a quality Internet service. There are a variety of technologies being rolled out.

### **11.2.1 Satellite**

Currently all Australians, in theory, can access one-way satellite services. In theory because there is capacity limits which would be quickly reached if demand increased significantly above current levels. The one-way satellite technology for Internet services involves downloading of data via satellite and sending out (uploading) data via the telephone network.

The download speeds are currently between 64 kbps and 1 mbps. While the one-way service is suitable for house use, it is not satisfactory for commercial services where uploading is just as, and perhaps more, important as downloading. Uploading quality is constrained by the quality of the telephone system.

The technical solution for remote Internet services will come with the introduction of two-way satellite services. By 2002 there are likely to be at least three two-way satellite services including Telstra (to be introduced in early 2001) and the Hughes system.

## 11.2.2 ISDN technology

The integrated service digital network (ISDN) is now available to 96 per cent of the Australian population at a transmission rate of 64 kbps.

## 11.2.3 DSL technology

Digital Subscriber Line (DSL) technology is the name for technologies which send data at high speed over copper wires. There are a number of technologies that send data at different speeds. The DSL technology currently being rolled out has up to 1.5 mbps download speed. By 2002 DSL technology will be available to 81 per cent of the population. However, its download speeds are considerably greater than upload speeds.

The current speeds available for Australian DSL service providers is between down/upload speeds of 256/64 and 1,500/256.

## 11.2.4 HFC cable modem

By 2002 two-way high-speed fibre optic modem connections will be available to 30 per cent of Australian households. These households will be mainly in metropolitan areas. Mildura is the only provincial city to have a HFC network.

## 11.2.5 Wireless services

Asymmetric high-speed wireless-based technologies are now available with two-way services for the business market, becoming generally available over the next two years.

## 11.3 The cost dimension

It is one thing to have a technical solution to the digital divide, it is another thing to have an effective solution. If the costs of using the services are too high the take-up rate will be low.

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**Table 11.3 Comparative hourly charges for Internet access**

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	Total cost per hour
Ozemail – no local call access	\$16.38 (peak) \$4.57 (off-peak)
Big Pond – no local call access	\$12.48 (peak) \$4.67 (off-peak)
Big Pond – rural connect	\$4.62
Big Pond – local call access	\$1.92

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Currently households and businesses without local call ISP access are paying substantially greater rates than households with local call access (Table 11.3). However, this problem will disappear over the next two years with the introduction of the extended zone system. This will give local call access to ISP at local call rates, along with a program to subsidise ISP access at local call rates for the remainder of the population outside the extended zones.

The remaining problem is high-speed Internet connection rates. ISDN is relatively expensive in terms of connection and rental charges, while DSL charges are high compared to some European and Asian economies. However, political, regulatory and competitive pressure will no doubt reduce the gap between Australian charges and overseas charges for high-speed access.

## **11.4 Conclusion**

By 2003 to 2005 almost all Australians (including farmers) will have access to a minimum standard 128.8 kbps upload Internet service at local call rates. Four-fifths of businesses/households will have access to this service via DSL and ISDN services, while the remaining one-fifth will have available two-way satellite and wireless services at subsidised usage rates. The digital infrastructure divide will have ended. However, as the digital infrastructure divide is closed the digital economic divide will accelerate as regional structural differences are revealed. This will be the paradoxical result from the current initiatives to close the digital infrastructure divide.



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## 12. Australian regions: the impact of e-commerce

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Over the next three to five years the digital infrastructure divide will be largely removed and the full potential of e-commerce will be available to Australian households and businesses.

The key question: Is it possible that some regions in Australia will benefit from e-commerce and others will lose? The answers to the question will be explored over this and the next section of this report.

There is no doubt that the short-term impact of e-commerce and the Internet have been oversold over the last few years. In part this has been linked to the equity price bubble. The key point for this study is that, looking ahead a decade or more, there is little doubt that many of the current expectations will not only be realised, but significantly exceeded.

### 12.1 Business-to-consumer e-commerce

The United States is the highest Internet-using economy. The reality here is that on-line sales still account for only 1 per cent of retail transactions, whereas their old fashioned competitor, the catalogue, accounts for 10 per cent of retail transactions. On-line sales have been concentrated in the purchase of books, toys and music.

In some ways business-to-consumer e-commerce can be viewed as:

- a more efficient substitute for the catalogue system where distribution utilises the existing transport systems and the post office; or
- a return of the home delivery system of the pre-1960s (for food, groceries, etc.) where distribution systems have to be re-established.

Modern information technology can allow a consumer to order extensively, with a maximum range of choice, in an electronic environment just as if the customer was in the actual store. Beyond retail sales of books and CDs, the most fundamental problem is how to deliver the goods to the customer and maintain cost efficiency.

There is little doubt that consumer e-commerce will grow rapidly over the next few years because of the increasing availability of quality telecommunication infrastructure, quality websites and improved payment security, which will deliver quality on-line shopping services. Predictions that this will deliver a ten-fold increase in on-line retail sales over the next five years appear plausible. A plausible outlook would be that the impact of such a growth in on-line sales would be to reduce the rate of growth of off-line sales by between 1 to 2 per cent.

Currently, and in the short-term future, the highest rate of growth of on-line commerce will be for goods and services that can actually be delivered over the Internet. These are:

- computer software;
- tickets (travel, entertainment);
- stockbroking services;
- banking;
- insurance; and
- recorded music and videos.

Increasingly, as electronic readers become more user friendly, newspapers and books will be delivered over the Internet.

These trends are, of course, already being realised. In the United States in 1999 financial on-line brokerage achieved 15 per cent of the brokerage market. Nine per cent of computer hardware/software, 5 per cent of books, and 2 per cent for travel, multi-media products and electronic products were sold on-line<sup>32</sup>.

The conservative assessment is that the impact of the Internet will stop here. The advantages of bricks and mortar retailing, plus the fact that shopping is also a social activity, will blunt further major advances in business-to-consumer e-commerce.

This conservative view is, however, too conservative for provincial and rural regions. E-commerce for general retailing has large benefits for non-metropolitan households in that the variety of choice is greatly enhanced.

The current situation is typified by Figure 12.1. The Internet has resulted in a more complex retailing chain, with the traditional bricks and mortar wholesale/retailing activities being augmented by e-commerce, and the transport distribution segment being co-ordinated and controlled by the existing retail infrastructure.

This view assumes that manufacturers will remain passive. The manufacturer has no interest in allowing market penetration to be blunted by:

- the high capital costs of bricks and mortar retailing;
- the high stock levels carried by retailers; and
- inefficiencies that arise from having an intermediary disconnecting the manufacturer/content provider from the customer.

The manufacturer/content provider has every incentive to depress the retail margin as far as possible in order to:

- connect directly with customers (and cut marketing expenses); and
- split the saved retail margin savings between themselves and the customer.

In the long run, the retail margin will be eliminated (Figure 12.2) where it can be. This has already happened in the sale of books, music and computer software. Electronic goods are being sold through buying clubs or through auctions. By the margin being eliminated is meant that the manufacturer/content provider captures a large share of the remaining distribution margin.

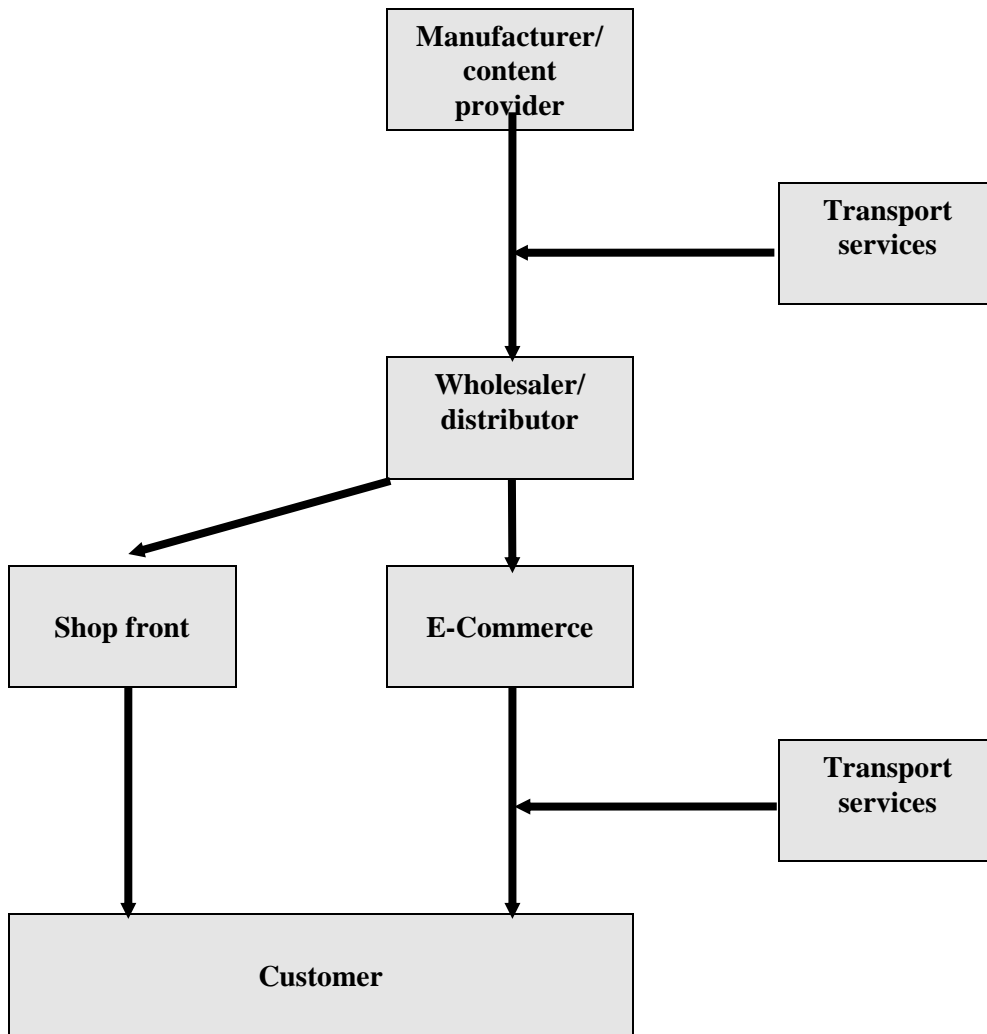
The computer manufacturer, Dell Computers, provides the general manufacturer with a role model for direct ordering and selling of computer hardware to the public. With its on-line trade facility, Dell provides the means by which it can exactly meet the customer's desired computer configuration. In 2000 the motor vehicle companies have produced websites to follow the Dell lead. Cars can be ordered on-line with the orders transmitted to the factory for customised design assembly. The major motor companies are now buying-out dealers to facilitate the move to direct distribution.

Virtual factory websites which will become available over the next two to three years will allow clothing and other manufacturers to bypass retail margins by selling direct.

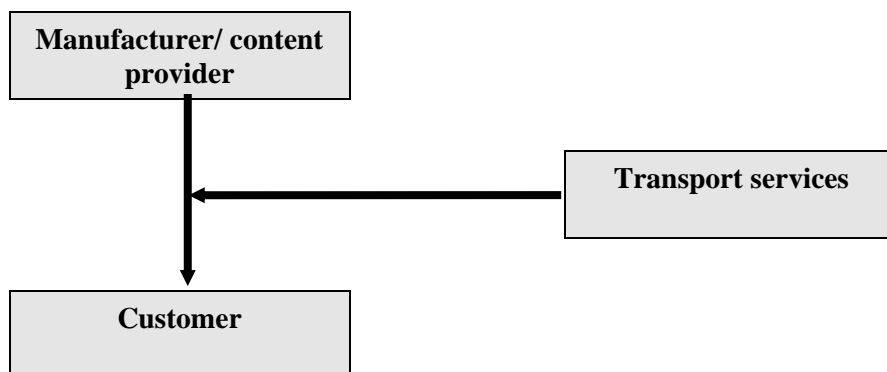
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<sup>32</sup> **The Economist**, 26 February 2000, "Survey E-Commerce", page 34.

**Figure 12.1: Retailing – the existing value chain**



**Figure 12.2: The Internet and the end of retailing**



The two components of Figure 12.3 are useful depictions of traditional and e-commerce, showing flows of total revenue. A comparison of the two components shows the change in institutional relationships and the change in revenue flows. The general impact of e-commerce is to place the manufacturer/content provider at the centre of the supply/value chain.

In the provincial and rural regions, it is the ability to have a choice that will drive growth in business and household e-commerce. Customers will have effective access to the same range of goods and services as available in major city centres. While this currently comes at a cost premium, as manufacturers, content providers and distributors design wholesaling and warehousing infrastructure to minimise distribution cost to remote markets, the cost premium will decline. This will have the effect of squeezing local wholesaling and retail activity. The major beneficiaries of the e-commerce driven infrastructure developments are likely to be the major existing provincial cities. However, these cities will lose traditional retail activity as customers no longer have to travel to them to shop. As a result the major provincial cities may be net losers, with the loss of traditional shopping outweighing the gains from the e-commerce infrastructure.

In provincial and rural regions, as in the larger cities, those retailers that survive will be the ones which:

- combine retailing with wholesaling;
- offer electronic and real time showroom functions; and
- become platforms for related entertainment (fashion stores, book groups, etc.) and social activities.

## **12.2 E-commerce real income gains and increased regional import penetration**

There will, of course, be offsetting household real income gains. For Australia as a whole and especially for provincial regions, the income elasticity of demand for goods and services produced locally will be reduced. This is simply another way of saying that most regions of Australia do not produce such products as:

- electronic, electric and computer equipment;
- transport equipment;
- multi-media entertainment and products; and
- high value added financial services,

to which the household consumer is currently allocating a high proportion of marginal income towards. As a result, for many regions the real income gains that will be associated with business-to-consumer e-commerce will result in an increase in import penetration into the regions.

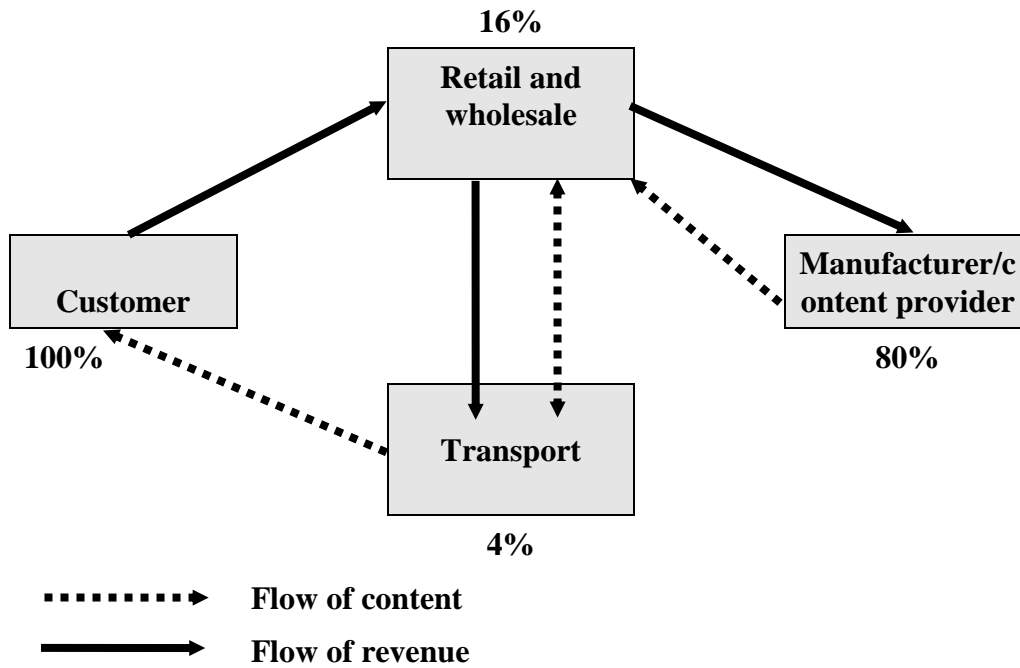
## **12.3 Business-to-business e-commerce**

There is a general consensus that the biggest impact of e-commerce over the next decade will be in business-to-business e-commerce. By 2005 a consensus projection is that business-to-business e-commerce will be ten times the value of business-to-consumer e-commerce.

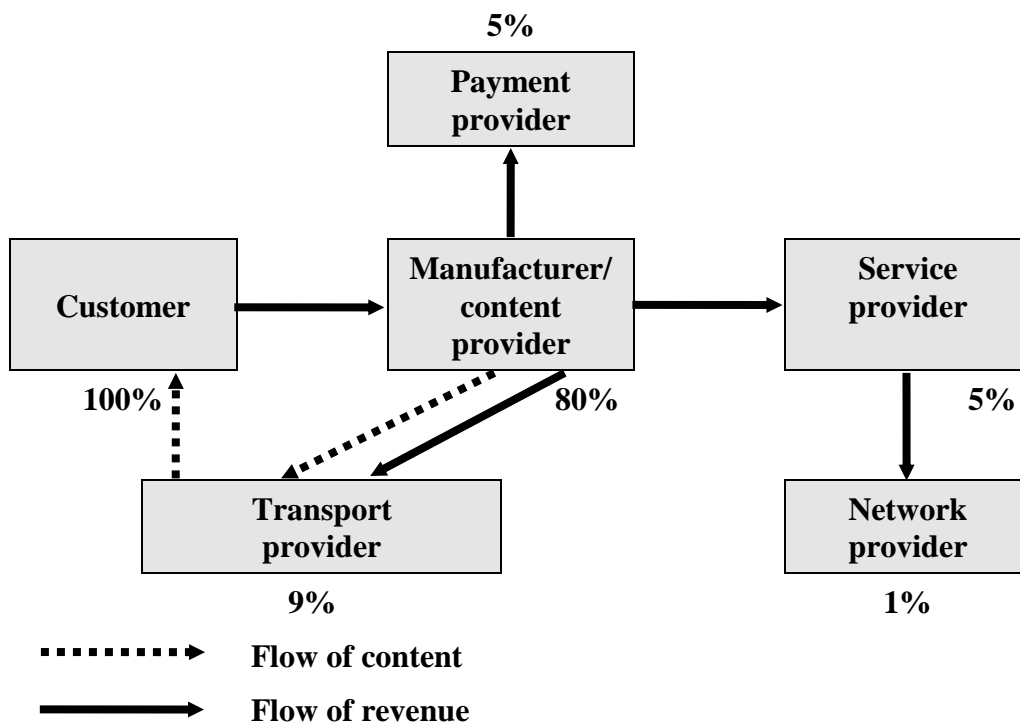
Consensus estimates are that business-to-business e-commerce, when widely adopted, will reduce business costs by the order of 10 per cent for manufacturers/content providers. For the economy generally the cost savings will be in the order of 5 per cent. These cost savings will accrue over the next 5 to 10 years.

Figure 12.3: Value chains for consumer products

*Traditional commerce*



*Electronic commerce*



Source: Databank Consulting "Preliminary Estimate of the Multiplier Effects of Electronic Commerce on EU Economy and Employment".

The cost savings will come from:

- competitive bidding supply chains;
- reduction in the wholesale margin;
- lower inventory costs; and
- exchange markets for components.

The first phase of the impact of business-to-business e-commerce has already been felt in most provincial and rural regions with the substitution of local business services (banking, insurance, legal, accounting) by out-of-region suppliers. This will continue.

The more positive side of this process is that it enables businesses and farmers to:

- (i) source business goods and service inputs that are world best practice in terms of both cost and quality; and
- (ii) build up existing supply chains with new platforms enabling local producers to access world markets.

This can be as important in mining as it is in agriculture, or indeed in any industry. As many consumers open up their supply chain to competitive bidding and away from long-term contracts, medium to small scale mining operations will become less vulnerable and market access will become easier. Naturally, they still have to be competitive on costs.

The problem here is that business-to-business e-commerce will diminish or destroy the typical region's traditional supply chains unless the region upgrades to integrated supply chains anchored, in more cases than not, in a knowledge economy.

## **12.4 The impact of e-commerce on regional Australia: the NOIE study**

The first study in Australia to analyse the economy-wide and regional impact of e-commerce is the National Office for the Information Economy "*E-Commerce Across Australia*", 2000. The study uses the Monash CGE model of the Australian and regional economies. This study will be referred to as the NOIE study.

The present change in region's gross regional product and employment, compared to what would have otherwise been the case, is shown in Table 12.1. The results are long run results in the sense that they represent the outcomes around 2016.

The results can be quickly summarised. The key points are:

- regions have a similar outcome to the state to which they belong;
- the export orientated states, especially those exporting high levels of agriculture and mining products relative to gross state produce, do relatively poorly;
- the regions in the primary commodity exporting states generally have an increase in GRP of between 1 and 2 per cent with employment declining; and
- the industrialised states of New South Wales and Victoria do relatively well with the increase in regional product being between 2.5 and 3.5 per cent.

**Table 12.1 Australian regional impact : The NOIE study  
(compared to what otherwise would have been the case)**

Region	Long run per cent change in employment	Per cent change in GRP
<b>Australian Capital Territory</b>		
<b>New South Wales</b>		
Central West	0	0.3
Far West	-0.1	2.5
Hunter	0.1	2.8
Illawarra	0.4	3
Mid-North Coast	0.4	3
Murray	0	2.5
Murrumbidgee	0.2	2.6
Northern	0	2.5
North Western	-0.4	2.2
Richmond-Tweed	0.5	3
South Eastern	0.4	3
Sydney	1	3.8
<b>Northern Territory</b>	0.4	2.5
<b>Queensland</b>		
Brisbane	-0.7	2.1
Central West	-1.5	1.6
Darling Downs	-1	1.3
Far North	-1.5	1.5
Fitzroy	-1.4	1.1
Mackay	-1.5	1
Moreton	-0.6	1.9
Northern	-1	1.4
North West	-2.4	-0.3
South West	-1	1.1
Wide Bay-Burnett	-1	1.3
<b>South Australia</b>		
Adelaide	0.4	2.9
Eyre South	-0.4	1.5
Murray Lands	-0.2	2.1
Northern	-0.3	2.1
Outer Adelaide	0.3	2.7
South East	-0.1	2.2
Yorke and Lower North	-0.4	1.9

**Table 12.1 Australian regional impact : The NOIE study  
(compared to what otherwise would have been the case) – continued**

Region	Long run per cent change in employment	Per cent change in GRP
<b>Tasmania</b>		
Greater Hobart	0.3	2.8
Mersey-Lyell	-0.2	2.3
Northern Tasmania	0.3	2.7
Southern Tasmania	0.2	2.4
<b>Victoria</b>		
Barwon	0.8	3.3
Central Highlands	0.8	3.3
East Gippsland	0.6	2.6
Gippsland	0.8	3
Goulburn	0.5	3
Loddon	0.8	3.2
Mallee	0.5	2.8
Melbourne	1	3.7
Ovens-Murray	0.8	3.3
Western District	0.4	2.7
Wimmera	0.2	2.4
<b>Western Australia</b>		
Gascoyne	-1	1.1
Goldfields-Esperance	-1.8	0.1
Great Southern	-1.1	1.7
Kimberley	-0.1	1.7
Mid West	-1.3	0.6
Peel	-0.7	1.3
Perth	-0.5	1.7
Pilbara	-1.8	0
South Western	-1.3	0.5
Wheatbelt	-1.4	0.6
<b>Total</b>	<b>0.4</b>	<b>2.5</b>

The message is that Australia in general can be relaxed about e-commerce. The majority of regions and the bulk of the population will experience growth in GRP and employment, with real income increasing by approximately 2.5 per cent. Some regions will lose employment but this will be offset by real income gains. Most importantly, a finding of the study is that provincial and rural regions will not be discriminated against. That is, the results show that metropolitan and non-metropolitan regions have an equal probability of being a substantial or minor winner from e-commerce.

An examination of the assumptions underlying the results undermines confidence that these conclusions will be valid.



### **12.4.1 The NOIE study: a critique**

The NOIE study takes an extremely simplistic and naive approach to analysing the implications of e-commerce for the economy.

Like all CGE models the core implicit assumption is that the economy is as efficient as it can be with the exception of where government intervention can be measured. In the first instance, therefore, the impact of e-commerce will be to lower costs to the consumer (by reducing the distribution margin) and increasing capital and labour productivity and thereby increasing the output that can be achieved from available resources. The potential for supply expansion is reflected in a fall in industry output prices, which increases demand.

The study makes assumptions about how each industry will respond to e-commerce. This response pattern is fairly uniform across the region, so that, if the potential for industry X from e-commerce is for an increase in output by 3 per cent, the expansion in industry X will be around the 3 per cent mark in each region.

Three industry groups, however, contract. These are agriculture, mining and retail trade. Retail trade contracts because the demand for retail services will contract due to business-to-consumer e-commerce as outlined above. The agricultural and mining industries contract because:

- (i) the additional productivity and competitiveness of Australian export industries will result in an increase in supply which will improve the trade balance and, therefore, increase the exchange rate; and
- (ii) the increase in productivity from e-commerce will increase real wages will further squeeze export industries.

The study makes three fundamental errors. These are:

- (i) the assumption of maximum efficiency and, therefore, the zero profits from e-commerce which impacts on natural barriers of protection between regions;
- (ii) the assumption that Australia unilaterally adopts e-commerce; and
- (iii) the assumption of uniform elasticities of demand for a industry's output whether it is sourced locally or from other regions of the world.

### **12.4.2 E-commerce and natural barriers of protection**

The structural analysis of regions given above indicates that there are significant differences in competitiveness for the same industry across regions. Competitiveness of an industry in a region will be a function of:

- the strength of the local supply chain;
- the skills content of the supply chain;
- the strength of the supply chain;
- infrastructure availability;
- taxation rates and wage costs, etc.; and
- the innovation potential of the region.

Currently industry activity of a given type continues to exist in some regions despite large productivity/competitive disadvantages. One reason for this is the existence of natural barriers limiting import competition. Distance, lack of information, inter-personal relationships and just-in-time supply are all factors which can limit import competition.

One effect of e-commerce will be to break down natural barriers and increase the degree of inter-regional competition. That is, an industry in a region that has productivity/competitive disadvantages will steadily lose market share as e-commerce intensity increases. This in turn will place increased pressure on other local industries in its supply chain.

E-commerce coupled with the potential for just-in-time delivery will open up regions to inter-regional competition. This provides the incentive to install transport and distributor supply chains to enhance inter-regional competition. Without some natural barriers to competition personal relationships are greatly weakened as a force protecting local industry.

A fundamental flaw in the NOIE study is that it assumes that the increase in e-commerce intensity does not combine with the absolute productivity/efficiency/competitiveness differences of industries across the Australian regions to affect export and import activity. Thus the industry responsiveness to e-commerce, irrespective of regions, will be largely determined by the productivity enhancing quality of e-commerce on the industry.

The reality is that e-commerce will enable industries in regions with high levels of competitiveness to expand relatively to and absolutely at the expense of industries in regions with relatively low levels of productivity/efficiency/competitiveness. This increased degree of inter-regional competition will not be limited to regions within Australia's national boundaries, but will apply to foreign regions that do, or will, compete with Australian regions. In this context it could well be that at the national level industry activity will contract under the impact of e-commerce.

The fundamental rule is that unless, for an industry in a region, the total supply chain strength, skill content, level of innovation and infrastructure availability are approaching world levels of competitiveness, the industry will contract absolutely and may well ultimately disappear.

### **12.4.3 The assumption of unilateral introduction of e-commerce**

The modelling results are derived from a framework that assumes that Australia unilaterally adopts e-commerce. In this context only a positive result would be expected.

The reality is, however, that e-commerce is being introduced simultaneously around the world. If the universal assumption of the introduction of e-commerce is made then a number of negative factors are introduced into the equation. They are:

- (i) increasing import penetration from foreign regions which are better placed than Australia to use e-commerce to accelerate the formation of the integrated supply chains. It is here where Australia's failure to invest in knowledge-based regions and innovation resources and culture will be costly;
- (ii) the reduction in distribution margins will, in part, be offset by foreign PPVAM capturing a greater proportion of the margin. That is, the cost benefits to Australian consumers from e-commerce are likely to be less than the reduction in distribution/retail activity. There will be a greater flow of income out of the country; and
- (iii) the fact that other regions in the world will be exploiting e-commerce faster than Australia will mean that these regions will be more attractive to foreign investment that would have otherwise come to Australia and will also be more attractive to Australian higher skilled labour that would otherwise have stayed in Australia.

#### **12.4.4 The assumption of uniform income elasticities**

In the NOIE study the comparability of regional response to e-commerce is, in part, due to the assumption of uniformity in income elasticity of demand for the same product irrespective of source. As has been pointed out above, the notion that the low value added low technological products of many Australian regions have the same income elasticities of demand as the high value added high technology products for the same industry supplied by foreign regions is absurd. This is another factor which would lead one to expect that e-commerce will lead to an increase in international import penetration and increased import penetration of products from Australian regions that are knowledge-based.

#### **12.4.5 E-commerce: a win-lose outcome likely**

To sum up it is highly unlikely that Australian regions will experience the win-win outcome suggested by the NOIE study. Rather it is likely that the structure of benefits across the region will be a win-lose result. The proportion of regions in the lose category will be determined by the policy responses to the implications of e-commerce. If the policy response is not appropriate and properly resourced, the majority of the population is likely to be in the lose category.

### **12.5 E-commerce: the first round impact on the distribution and related service industries**

The way e-commerce will impact on the Australian economy will be complex. At this early stage the best way to approach the problem is by sequential partial analysis which builds up understanding of the issues even if it does not provide a comprehensive answer.

The first step in this approach is to analyse the first round impact effect of e-commerce (the shift from the structure in Figure 12.1 to the structure in Figure 12.2) on the distribution and related service industries.

#### **12.5.1 E-commerce and the intensity of structural change on distribution and related industries**

Table 12.2 lists those industries expected to be noticeably affected by e-commerce. Industries that are not significantly affected are not shown in the table.

An index of one in the table means that over the next 10 to 15 years labour demand will increase by up to 5 per cent over the level that would have otherwise prevailed in the absence of e-commerce. A value of -1 indicates that the level of employment will fall by up to 5 per cent compared to what would have otherwise been the case. A value of -2 indicates that the fall in the employment level will be up to 10 per cent below what would have otherwise been the case.

In general the wholesale industries are moderately positively affected by e-commerce, while sections of the retail industry are significantly adversely affected. Industries expected to be significantly adversely affected by e-commerce include:

- car retailing;
- travel agency services;
- banks;
- photographic film processing; and
- recorded music retailing.

The large gains from e-commerce will be in:

- ❑ short distance transport (courier services); and
- ❑ road freight service activity.

The impact on actual employment levels is shown in Table 12.3 for the SOR regions. The important result is that the greater the intensity and diversity of existing retail and service infrastructure, the greater the negative first round impact. The less the currently available service infrastructure per capita, the less the impact. Thus, the ACT, Global Sydney and Inner Melbourne have the largest decline in employment of around 3 per cent.

On the other hand, regions such as the Sydney Production Region and North Melbourne, which possess large distribution hubs, are relatively lightly affected. The loss in employment for these regions is around 1 per cent.

Rural areas that are currently under-provided with retail infrastructure and banking services are also relatively lightly affected by the first round impact of e-commerce on the distribution segment of the supply chain. The loss of employment in these regions is generally between 1 and 2 per cent.

At the national level the loss in employment is 2 per cent of total employment. This is within the estimates of the productivity/real income enhancing effects of business-to-consumer e-commerce.

## **12.6 Conclusion**

E-commerce over the next decade will radically alter the distribution segment of the supply chain. The first-round loss in employment will be between 1 and 3 per cent, depending on the region's economic structure.

For provincial and rural areas it would be prudent to assume that the real income offsets will claw back no more than around 40 per cent of the first-round employment loss.

Although for some of the metropolitan regions the employment loss is higher, the regions have the capacity to claw back a greater percentage of the losses from the second round real income effect. This is because:

- ❑ the economic base of these regions are more diverse ensuring that the increase in import penetration from e-commerce will be contained; and
- ❑ the regions will export a greater level of goods and services to provincial and rural regions as a result of e-commerce.

The claw back to metropolitan regions and some large provincial regions is likely to be between 50 and 120 per cent.

However, the most important consideration in terms of assessing the impact of e-commerce is not business-to-consumer e-commerce, but business-to-business e-commerce. At the regional level the effect of these changes will depend on the structure and strength of the local supply chains.

**Table 12.2 E-commerce : impact on distribution and related service industries - dislocation scale**

Commerce		Commerce	
Wool Wholesaling	1.0	Fresh Meat, Fish, Pltry Retailing	-1.0
Cereal Grain Wholesaling	1.0	Fruit & Vegetable Retailing	-2.0
Farm Prod, Supp Wholesaling,	1.0	Liquor Retailing	-3.0
Petroleum Product Wholesaling	1.0	Bread & Cake Retailing	-1.0
Metal & Mineral Wholesaling	1.0	Takeaway Food Retailing	1.0
Chemical Wholesaling	1.0	Milk Vending	2.0
Timber Wholesaling	1.0	Specialised Food Retailing,nec	-2.0
Building Supplies Whlsing,nec	1.0	Department Stores	-5.0
Farm, Constrn Mach Wholesaling	1.0	Clothing Retailing	-5.0
Professional Equip Wholesaling	2.0	Footwear Retailing	-1.0
Computer Wholesaling	3.0	Fbrc, Other Soft Good Retailing	-1.0
Business Mach Wholesaling,nec	2.0	Furniture Retailing	-1.0
Elctrl, Elctrc Equip Whlsng	2.0	Floor Covering Retailing	-1.0
Machinery, Equip Wholesaling	1.0	Domestic Hrdwre, Hware Retailing	-2.0
Car Wholesaling	2.0	Domestic Appliance Retailing	-7.0
Commercial Vehicle Wholesaling	2.0	Recorded Music Retailing	-8.0
Motor Vehicle New Part Dealing	2.0	Sport, Camp Equipment Retailing	-2.0
Mtr Vhcl Dismntng, UsdPrtDeal	1.0	Toy & Game Retailing	-2.0
Meat Wholesaling	2.0	Newspaper Book Statnry Retailing	-4.0
Poultry, Smallgood Wholesaling	2.0	Photographic Equipment Retailing	-3.0
Dairy Produce Wholesaling	2.0	Marine Equipment Retailing	-3.0
Fish Wholesaling	2.0	Phrmceutcl, Cosmtc, Tltry Retng	-4.0
Fruit & Vegetable Wholesaling	2.0	Antique & Used Good Retailing	0.0
Confectionery, Soft DrnkWhlsng	2.0	Garden Equipment Retailing	-1.0
Liquor Wholesaling	2.0	Flower Retailing	-1.0
Tobacco Product Wholesaling	2.0	Watch & Jewellery Retailing	-1.0
Grocery Wholesaling, nec	2.0	Retailing, nec	-2.0
Textile Product Wholesaling	1.0	Car Retailing	-5.0
Clothing Wholesaling	2.0	Motor Cycle Dealing	-3.0
Footwear Wholesaling	1.0	Trailer & Caravan Dealing	-1.0
Household Appliance Wholesaling	2.0	Road Freight Transport	1.0
Furniture Wholesaling	1.0	Transport, nec	4.0
Floor Covering Wholesaling	1.0	Parking Services	-1.0
Household Good Wholesaling,nec	1.0	Services to Water Transport,	-0.5
Photographic Equip Wholesaling	2.0	Services to Air Transport	-2.0
Jewellery & Watch Wholesaling	1.0	Travel Agency Services	-7.0
Toy, Sporting Good Wholesaling	2.0	Road Freight Forwarding	5.0
Book & Magazine Wholesaling	3.0	Freight Forwarding (ExceptRoad)	4.0
Paper Product Wholesaling	1.0	Customs Agency Services	0.5
Pharmaceutical, ToiletryWhlsng	2.0	Services to Transport, nec	3.0
Wholesaling, nec	1.0	Grain Storage	0.0
Supermarket & Grocery Stores (down more the fruit and vegetables)	-4.0	Storage, nec	3.0

**Table 12.2 E-commerce : impact on distribution and related service industries - dislocation scale (continued)**

Commerce		Commerce	
Postal Services	7.0	Commercial Art & DisplayServ	2.0
Courier Services	15.0	Market Research Services	-3.0
Telecommunication Services	2.0	Employment Placement Services	7.0
Banks	-8.0	Contract Staff Services	6.0
Building Societies	-4.0	Secretarial Services	-1.0
Credit Unions	-1.0	Contract Packing Services,nec	6.0
Deposit Taking Financiers,nec	-1.0	Central Government Admin	-2.0
Other Financiers	-2.0	State Government Administration	-3.0
Financial Asset Investors	-2.0	Local Government Administration	-2.0
Life Insurance	-4.0	Justice	-1.0
Superannuation Funds	-1.0	Technical & Further Education	5.0
Health Insurance	-1.0	Film & Video Production	1.0
General Insurance	-2.0	Film & Video Distribution	-5.0
Financial Asset BrokingServices	-1.0	Radio Services	-2.0
Services to Finance, Invest,	-1.0	Television Services	-2.0
Services to Insurance	-3.0	Libraries	-1.0
Real Estate Agents	-4.0	Sound Recording Studios	2.0
Data Processing Services	1.0	Lotteries	-2.0
Info Storage, RetrievalServ	2.0	Casinos	-1.0
Computer Maintenance Services	2.0	Gambling Services, nec	3.0
Computer Consultancy Services	7.0	Video Hire Outlets	-3.0
Legal Services	-4.0	Photographic Film Processing	-8.0
Accounting Services	-1.0	Photographic Studios	-3.0
Advertising Services	-5.0		

Source: NIEIR's LGA YourPlace database.

**Table 12.3 Impact of e-commerce service industries by region – degree of impact 0.0500**

	ACT	Brisbane City	Central Adelaide	Central Coast NSW	Central QLD	Central Western NSW	Darling Downs and SW QLD	Darwin Top End	East Melbourne
<b>Input/Output 1996</b>									
4501 Wholesale trade	0.4	3.4	1.4	0.3	0.3	0.3	0.4	0.2	2.5
5101 Retail Trade	-2.6	-9.1	-4.4	-2.1	-1.7	-1.3	-1.9	-0.8	-7.8
6101 Road transport	0.0	0.4	0.1	0.0	0.1	0.1	0.1	0.0	0.1
6401 Air and space transport	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6601 Services to transport; storage	-0.3	-0.5	-0.4	0.0	-0.1	-0.1	-0.1	-0.2	-0.1
7101 Communication services	0.7	3.5	2.1	0.3	0.4	0.3	0.4	0.2	2.3
7301 Banking	-0.8	-4.8	-2.9	-0.5	-0.5	-0.4	-0.6	-0.3	-2.4
7302 Non-bank finance	0.0	-0.3	-0.1	0.0	0.0	0.0	-0.1	0.0	-0.1
7303 Financial asset investors	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
7401 Insurance	-0.1	-0.9	-0.4	0.0	0.0	0.0	0.0	0.0	-0.2
7501 Services to finance, investment and insurance	-0.1	-0.4	-0.3	0.0	0.0	0.0	0.0	0.0	-0.2
7702 Other property services	-0.2	-1.0	-0.6	-0.2	-0.1	-0.1	-0.1	-0.1	-0.5
7801 Scientific research, technical and computer services	0.9	1.7	0.9	0.1	0.0	0.0	0.1	0.1	1.9
7802 Legal accounting, marketing and business management services	-0.5	-2.6	-1.3	-0.1	-0.1	-0.1	-0.2	-0.1	-0.7
7803 Other business services	0.3	1.7	1.2	0.1	0.2	0.1	0.2	0.1	0.7
8101 Government administration	-3.7	-3.7	-1.8	-0.3	-0.5	-0.5	-0.5	-0.8	-0.7
8201 Defence	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8401 Education	0.2	0.9	0.3	0.1	0.2	0.2	0.1	0.0	0.6
8601 Health services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8701 Community services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9101 Motion picture, radio & television serv.	-0.1	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
9201 Libraries, museums and the arts	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9301 Sport, gambling & recreational services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
9501 Personal services	-0.1	-0.4	-0.2	-0.1	-0.1	0.0	-0.1	0.0	-0.2
<b>Total</b>	<b>-6.1</b>	<b>-12.4</b>	<b>-6.6</b>	<b>-2.5</b>	<b>-2.1</b>	<b>-1.7</b>	<b>-2.4</b>	<b>-1.9</b>	<b>-4.8</b>
Per cent change of total regional employment	-3.2	-2.0	-2.2	-2.7	-1.9	-1.9	-1.9	-3.0	-1.3

**Table 12.3 Impact of e-commerce service industries by region – degree of impact 0.0500 (continued)**

	Eyre and Yorke SA	Far and North Western NSW	Far North QLD	Gippsland VIC	Global Sydney	Gold Coast and Hinterlands	Golden Region VIC	Goulburn VIC	Hobart and Southern Tasmania
<b>Input/Output 1996</b>									
4501 Wholesale trade	0.2	0.2	0.3	0.3	4.1	0.9	0.4	0.3	0.3
5101 Retail Trade	-1.1	-1.1	-1.8	-1.6	-9.2	-5.4	-2.9	-1.4	-1.7
6101 Road transport	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.0
6401 Air and space transport	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6601 Services to transport; storage	0.0	-0.1	-0.7	-0.1	-2.1	-0.6	-0.1	-0.1	-0.1
7101 Communication services	0.2	0.2	0.4	0.3	5.7	1.1	0.6	0.3	0.4
7301 Banking	-0.4	-0.4	-0.5	-0.5	-13.5	-1.4	-0.8	-0.5	-0.6
7302 Non-bank finance	0.0	0.0	0.0	0.0	-0.5	-0.1	0.0	0.0	0.0
7303 Financial asset investors	0.0	0.0	0.0	0.0	-0.3	0.0	0.0	0.0	0.0
7401 Insurance	0.0	0.0	0.0	-0.1	-2.4	-0.1	-0.1	0.0	-0.1
7501 Services to finance, investment and insurance	0.0	0.0	0.0	0.0	-1.4	-0.1	0.0	0.0	-0.1
7702 Other property services	-0.1	-0.1	-0.2	-0.1	-1.5	-0.9	-0.2	-0.1	-0.1
7801 Scientific research, technical and computer services	0.0	0.0	0.1	0.1	5.8	0.3	0.2	0.0	0.1
7802 Legal accounting, marketing and business management services	0.0	-0.1	-0.2	-0.1	-6.4	-0.6	-0.2	-0.1	-0.3
7803 Other business services	0.1	0.1	0.2	0.2	2.5	0.3	0.2	0.1	0.1
8101 Government administration	-0.3	-0.3	-0.7	-0.3	-3.8	-0.6	-0.5	-0.3	-1.3
8201 Defence	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8401 Education	0.2	0.1	0.1	0.2	1.2	0.3	0.1	0.1	0.1
8601 Health services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8701 Community services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9101 Motion picture, radio & television serv.	0.0	0.0	0.0	0.0	-0.7	0.0	0.0	0.0	0.0
9201 Libraries, museums and the arts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9301 Sport, gambling & recreational services	0.0	0.0	0.0	0.0	0.1	-0.1	0.0	0.0	0.0
9501 Personal services	0.0	0.0	-0.1	0.0	-0.7	-0.2	-0.1	0.0	-0.1
<b>Total</b>	-1.1	-1.3	-3.3	-1.8	-22.9	-7.1	-3.3	-1.5	-3.4
Per cent change of total regional employment	-1.5	-1.9	-2.9	-1.9	-2.9	-2.8	-2.1	-1.7	-3.0



**Table 12.3 Impact of e-commerce service industries by region – degree of impact 0.0500 (continued)**

	Hunter NSW	Illawarra NSW	Inner Melbourne VIC	Inner West Sydney	Ipswich QLD	Loddon VIC	Mackay QLD	Mallee - Wimmera VIC	Mercy- Lyell TAS
<b>Input/Output 1996</b>									
4501 Wholesale trade	0.9	0.4	2.3	0.7	0.2	0.2	0.3	0.3	0.2
5101 Retail Trade	-4.4	-2.3	-6.4	-1.9	-1.0	-1.2	-1.0	-1.2	-0.8
6101 Road transport	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0
6401 Air and space transport	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6601 Services to transport; storage	-0.1	-0.1	-1.3	-0.1	0.0	0.0	-0.1	-0.1	0.0
7101 Communication services	0.8	0.6	4.3	0.7	0.1	0.3	0.2	0.2	0.1
7301 Banking	-1.1	-0.6	-9.3	-1.0	-0.2	-0.4	-0.3	-0.4	-0.2
7302 Non-bank finance	-0.2	-0.1	-0.3	0.0	0.0	0.0	0.0	0.0	0.0
7303 Financial asset investors	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	0.0
7401 Insurance	-0.1	-0.1	-1.3	-0.1	0.0	0.0	0.0	0.0	0.0
7501 Services to finance, investment and insurance	-0.1	0.0	-1.0	0.0	0.0	0.0	0.0	0.0	0.0
7702 Other property services	-0.4	-0.2	-0.7	-0.2	-0.1	-0.1	-0.1	0.0	-0.1
7801 Scientific research, technical and computer services	0.2	0.3	3.4	0.8	0.0	0.0	0.0	0.0	0.0
7802 Legal accounting, marketing and business management services	-0.4	-0.2	-4.3	-0.3	-0.1	-0.1	-0.1	-0.1	-0.1
7803 Other business services	0.5	0.2	1.9	0.1	0.1	0.1	0.1	0.1	0.1
8101 Government administration	-0.8	-0.5	-3.6	-0.3	-0.2	-0.2	-0.2	-0.3	-0.2
8201 Defence	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8401 Education	0.4	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1
8601 Health services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8701 Community services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9101 Motion picture, radio & television serv.	0.0	0.0	-0.3	0.0	0.0	0.0	0.0	0.0	0.0
9201 Libraries, museums and the arts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9301 Sport, gambling & recreational services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9501 Personal services	-0.2	-0.1	-0.4	-0.1	0.0	0.0	-0.1	0.0	0.0
<b>Total</b>	-5.1	-2.2	-16.7	-1.5	-1.1	-1.3	-1.3	-1.3	-0.9
Per cent change of total regional employment	-2.0	-1.7	-3.2	-1.4	-1.8	-2.2	-1.8	-1.7	-1.9

**Table 12.3 Impact of e-commerce service industries by region – degree of impact 0.0500 (continued)**

	Midlands & Central WA	Murray - Murrumbidgee NSW	Murraylands SA	N.N. West Sydney	North Brisbane	North Coastal NSW	North Melbourne	Northern Adelaide	Northern & Central Perth
<b>Input/Output 1996</b>									
4501 Wholesale trade	0.2	0.5	0.2	1.6	0.5	0.6	1.1	0.8	1.5
5101 Retail Trade	-0.7	-2.1	-0.5	-4.4	-3.1	-3.7	-4.2	-2.7	-6.7
6101 Road transport	0.0	0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.1
6401 Air and space transport	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6601 Services to transport; storage	-0.1	-0.1	0.0	-0.2	-0.2	-0.3	0.1	0.1	-0.8
7101 Communication services	0.2	0.4	0.1	0.6	0.6	0.8	1.0	0.6	2.4
7301 Banking	-0.3	-0.7	-0.2	-1.7	-0.9	-1.0	-1.2	-0.5	-4.0
7302 Non-bank finance	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	-0.2
7303 Financial asset investors	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.1
7401 Insurance	0.0	0.0	0.0	-0.1	0.0	-0.1	0.0	0.0	-0.4
7501 Services to finance, investment and insurance	0.0	0.0	0.0	-0.1	0.0	-0.1	0.0	0.0	-0.4
7702 Other property services	-0.1	-0.1	0.0	-0.5	-0.5	-0.4	-0.2	-0.1	-1.0
7801 Scientific research, technical and computer services	0.0	0.1	0.0	1.7	0.1	0.1	0.3	0.2	1.1
7802 Legal accounting, marketing and business management services	0.0	-0.3	0.0	-0.5	-0.3	-0.4	-0.2	-0.1	-1.5
7803 Other business services	0.1	0.2	0.0	0.2	0.2	0.3	0.5	0.2	1.1
8101 Government administration	-0.2	-0.6	-0.1	-0.3	-0.4	-0.7	-0.5	-0.3	-2.1
8201 Defence	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8401 Education	0.1	0.5	0.0	0.2	0.1	0.4	0.5	0.4	0.6
8601 Health services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8701 Community services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9101 Motion picture, radio & television serv.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
9201 Libraries, museums and the arts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9301 Sport, gambling & recreational services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9501 Personal services	0.0	-0.1	0.0	-0.2	-0.1	-0.1	-0.2	-0.1	-0.3
<b>Total</b>	-0.9	-2.1	-0.4	-3.8	-4.0	-4.5	-3.1	-1.4	-10.8
Per cent change of total regional employment	-1.6	-1.5	-1.2	-1.7	-2.6	-2.3	-1.2	-0.9	-2.7

**Table 12.3 Impact of e-commerce service industries by region – degree of impact 0.0500 (continued)**

	Northern NSW	Northern Tasmania	Nth QLD	Outer South West Sydney	Outer West Sydney	Ovens - Hume VIC	Pilbara - Kimberley WA	South East NSW	South East SA
<b>Input/Output 1996</b>									
4501 Wholesale trade	0.3	0.3	0.5	0.2	0.3	0.2	0.1	0.3	0.1
5101 Retail Trade	-1.4	-1.1	-1.9	-1.6	-1.9	-0.7	-0.4	-1.4	-0.6
6101 Road transport	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.0
6401 Air and space transport	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6601 Services to transport; storage	-0.1	-0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0
7101 Communication services	0.3	0.2	0.4	0.3	0.3	0.2	0.1	0.4	0.1
7301 Banking	-0.5	-0.3	-0.6	-0.4	-0.5	-0.2	-0.1	-0.4	-0.2
7302 Non-bank finance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7303 Financial asset investors	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7401 Insurance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7501 Services to finance, investment and insurance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7702 Other property services	-0.1	-0.1	-0.1	-0.1	-0.2	0.0	0.0	-0.1	0.0
7801 Scientific research, technical and computer services	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.2	0.0
7802 Legal accounting, marketing and business management services	-0.1	-0.1	-0.2	-0.1	-0.2	-0.1	0.0	-0.1	0.0
7803 Other business services	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.1
8101 Government administration	-0.5	-0.2	-0.5	-0.2	-0.3	-0.2	-0.1	-0.6	-0.1
8201 Defence	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8401 Education	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1
8601 Health services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8701 Community services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9101 Motion picture, radio & television serv.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9201 Libraries, museums and the arts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9301 Sport, gambling & recreational services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9501 Personal services	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	-0.1	0.0
<b>Total</b>	-1.7	-1.3	-2.1	-1.6	-2.1	-0.7	-0.5	-1.8	-0.6
Per cent change of total regional employment	-1.9	-2.1	-1.8	-2.1	-2.1	-1.4	-1.3	-2.0	-1.7

**Table 12.3 Impact of e-commerce service industries by region – degree of impact 0.0500 (continued)**

	South Eastern WA	Southern Adelaide	Southern Melbourne	Southern NT	Southern Perth	Southern Sydney	Southern WA	Sydney Production Region	West Melbourne
<b>Input/Output 1996</b>									
4501 Wholesale trade	0.1	0.3	1.0	0.0	1.7	0.6	0.3	4.2	1.0
5101 Retail Trade	-0.4	-2.3	-2.3	-0.3	-4.5	-2.8	-1.8	-8.5	-3.3
6101 Road transport	0.0	0.0	0.1	0.0	0.3	0.0	0.1	0.5	0.2
6401 Air and space transport	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6601 Services to transport; storage	0.0	-0.1	0.0	-0.1	0.1	-0.2	-0.1	0.4	0.3
7101 Communication services	0.1	0.4	1.0	0.1	1.2	0.8	0.4	4.2	0.9
7301 Banking	-0.1	-0.6	-0.7	-0.1	-1.1	-1.5	-0.6	-3.3	-0.9
7302 Non-bank finance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0
7303 Financial asset investors	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0
7401 Insurance	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	-0.4	0.0
7501 Services to finance, investment and insurance	0.0	0.0	-0.1	0.0	-0.1	-0.1	0.0	-0.2	0.0
7702 Other property services	0.0	-0.2	-0.2	0.0	-0.5	-0.3	-0.2	-0.6	-0.2
7801 Scientific research, technical and computer services	0.0	0.2	0.5	0.0	0.4	0.4	0.1	0.7	0.2
7802 Legal accounting, marketing and business management services	0.0	-0.1	-0.2	0.0	-0.2	-0.3	-0.1	-0.8	-0.2
7803 Other business services	0.1	0.1	0.2	0.0	0.5	0.1	0.2	1.5	0.4
8101 Government administration	-0.1	-0.2	-0.2	-0.1	-0.7	-0.4	-0.4	-1.6	-0.5
8201 Defence	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8401 Education	0.0	0.1	0.2	0.0	0.3	0.2	0.1	1.0	0.5
8601 Health services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8701 Community services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9101 Motion picture, radio & television serv.	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	-0.1	-0.1
9201 Libraries, museums and the arts	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9301 Sport, gambling & recreational services	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.1	0.0
9501 Personal services	0.0	-0.1	-0.1	0.0	-0.2	-0.1	-0.1	-0.3	-0.1
<b>Total</b>	-0.3	-2.4	-1.2	-0.5	-3.0	-3.6	-2.3	-3.4	-1.9
Per cent change of total regional employment	-1.0	-2.1	-0.8	-3.1	-1.1	-2.7	-1.9	-0.6	-1.0

**Table 12.3 Impact of e-commerce service industries by region – degree of impact 0.0500 (continued)**

	Western Victoria	Westernport VIC	Wide-Bay Burnett QLD	North West QLD	Total
<b>Input/Output 1996</b>					
4501 Wholesale trade	0.2	1.1	0.3	0.1	41.7
5101 Retail Trade	-0.9	-4.4	-1.6	-0.3	-150.6
6101 Road transport	0.0	0.2	0.1	0.0	5.2
6401 Air and space transport	0.0	0.0	0.0	0.0	0.0
6601 Services to transport; storage	0.0	0.0	-0.1	0.0	-9.1
7101 Communication services	0.2	0.9	0.3	0.1	46.1
7301 Banking	-0.3	-1.2	-0.5	-0.1	-70.1
7302 Non-bank finance	0.0	0.0	0.0	0.0	-2.8
7303 Financial asset investors	0.0	0.0	0.0	0.0	-1.1
7401 Insurance	0.0	-0.1	0.0	0.0	-7.9
7501 Services to finance, investment and insurance	0.0	-0.1	0.0	0.0	-5.5
7702 Other property services	0.0	-0.3	-0.2	0.0	-14.6
7801 Scientific research, technical and computer services	0.0	0.3	0.0	0.0	24.3
7802 Legal accounting, marketing and business management services	-0.1	-0.3	-0.1	0.0	-26.4
7803 Other business services	0.1	0.5	0.1	0.0	19.4
8101 Government administration	-0.2	-0.6	-0.4	-0.2	-40.9
8201 Defence	0.0	0.0	0.0	0.0	0.0
8401 Education	0.1	0.3	0.2	0.0	13.8
8601 Health services	0.0	0.0	0.0	0.0	0.0
8701 Community services	0.0	0.0	0.0	0.0	0.0
9101 Motion picture, radio & television serv.	0.0	0.0	0.0	0.0	-2.7
9201 Libraries, museums and the arts	0.0	0.0	0.0	0.0	-0.7
9301 Sport, gambling & recreational services	0.0	0.0	0.0	0.0	0.5
9501 Personal services	0.0	-0.1	-0.1	0.0	-6.1
<b>Total</b>	-1.0	-4.0	-2.2	-0.5	-187.5
Per cent change of total regional employment	-1.8	-1.7	-2.2	-2.1	-2.0

Source: NIEIR's LGA YourPlace database.

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## **13. Australian regions: the strength of the industry supply chains**

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The issue of the implications of the business-to-business e-commerce centres around the strengths and weaknesses of the regional industry supply chain. The first part of this section will examine the indicators that can be derived to measure the relative strength of the supply chain. This will be followed by an analysis of what the indicators show for strengths and weaknesses of industry structures in Australian regions.

### **13.1 Indicators of supply chain strength**

The discussion in the previous sections of this study suggests that the following are indicators of the actual or potential supply chain strength in a region:

- (i) the local complexity of the supply chain;
- (ii) the local level of skill input into the supply chain; and
- (iii) the life-time learning commitment by the region.

#### **13.1.1 Forward and backward capture ratios**

The level of complexity of the supply chain is measured by the forward and backward capture ratios. Appendix 13.1 explains the methodology of how these ratios are measured, which involves extensive input-output analysis.

In conceptual terms, however, the two concepts are straight forward. The backward capture ratio for an industry measures how much other industries in a region benefit from activity in the region of the industry. Thus, for example, if the capture ratio for an industry is 40 per cent then it means that for every \$1 million of output other industries in the region capture additional total output of \$0.4 million.

The forward capture ratio measures the same concept except from the point of view of sales from an industry to other industries in the region. Thus, for example, if the forward capture ratio for an industry is 20 per cent, it means that for a \$1 million increase in output for the other industries in the region, which the industry supplies goods or services to, the output for the industry would increase by \$0.20 million.

The implication of these definitions is that the higher both the forward and backward linkages the greater will be the complexity of the supply chain within the region. That is, the greater will be the involvement of industries in the region in supporting a given industry's activity levels.

The greater the level of complexity the greater the potential benefits of proximity in the knowledge economy. Alternatively, the greater the level of complexity of the local supply, then the greater the economic damage that will be inflicted on the region if the supply chain does not transform itself into a competitive integrated chain.

### **13.1.2 Skill input**

Corresponding to the forward and backward capture ratios are forward and backward skill input ratios. These ratios are measured in terms of skill input per \$million of output and Appendix 13.1 outlines how they are constructed. In simple terms the backward skill input ratio measures the total level of skill input brought to bear by the industry and by other industries in the region in producing the industry's output. The level of skill available indirectly, or directly, to an industry is calculated by using skill intensity ratios for each of the 340 ASCO four-digit occupation levels used by an industry.

The higher the backward skill ratio, the greater the level of skill available to an industry, both in terms of its own resources and from industries which supply goods and services to the industry.

The forward skill ratio measures the level of skill available in terms of customers for an industry's product within a region.

The higher the backward and forward skill input ratios, the higher the innovative potential of the supply chain, and the more likely the industry can be more securely anchored in a local knowledge economy.

### **13.1.3 Life-time learning**

The other indicator of a knowledge economy is the life-time learning commitment of the region's population. This is taken from the YourPlace indicators and is measured by the part of the population aged over 18 undertaking post-secondary school education and training.

## **13.2 The indicator of supply chain strength**

The indicator of supply chain strength used in this study is a weighted average of the forward and backward capture ratios, the forward and backward skill inputs and the life-time learning commitment indicator. The index is calculated with a mean at near zero. Sixty per cent of the weights are given to backward capture and skills, 30 per cent of the weights are given to forward capture and skills, while the remaining 15 per cent of weight is given to life-time learning commitment.

## **13.3 A guide to the data sets**

As described in the Appendix to this chapter, the extensive data analysis undertaken to calculate the regional supply chain strength indicators involved the estimation of input-output tables by region, the estimation of occupation by industry of employment tables and the estimation of the full set of consumption expenditure, investment expenditure, exports, imports, output and government current expenditure by industry by region. The source of this data was the YourPlace database by LGA, including the new input and output table estimation module.

The database and input-output relationships are estimated at the 106 industry category level of the Australian Bureau of Statistics (ABS) input and output tables. For presentation purposes the 106 industries are aggregated into 22 industry groups, which correspond to the traditional concept of industry clusters. The industry groups are:

- agriculture;
- mining;
- food;

- textiles and clothing;
- wood products;
- paper products;
- printing and multi-media products;
- basic metals;
- high value chemicals;
- non-metallic minerals;
- basic and fabricated metals;
- transport and other machinery;
- other manufacturing;
- energy and water;
- construction;
- wholesale and retail;
- accommodation and restaurants;
- transport and communications;
- finance;
- business services;
- government and community services; and
- entertainment.

Tables A13.1 to A13.22 in the Appendix list the:

- forward capture;
- backward capture;
- backward skills input;
- forward skills input;
- industry share in regional output;
- industry share in national output;
- life-time learning commitment; and
- supply chain strength index,

for each of the 22 industry groups by the 58 SOR regions. Table 13.1 presents the simple average results for these industries by regional groupings.

As a guide to the data, the food industry group will be used as an example. For the backward capture the rural region average for food is 53 per cent. This means that on average for every \$1 million of output in food products, there is \$0.5 million of output created by the food sector in other industries. The backward capture sectors for the food industry in rural regions is higher than for any other regional category. The Core Metro and Production Zone average of 33 per cent backward capture ratio reflects the lack of a large scale agricultural sector within regional boundaries.



In general the forward capture ratio for food products is low, reflecting the fact that the bulk of sales from the food product sector represents exports out of the region rather than sales to other industries within the region. The highest forward capture ratio for food products is for the rural regions with a capture ratio of 16 per cent. That is, 16 per cent of sales of food products in the rural regions goes to industries within rural regions.

The national total backward or forward ratio is the estimate derived from the national ABS tables, with direct allocation of imports. The national ratios are greater than the regional ratios because regions trade with one another within the national boundaries. The national backward capture ratio is 123 per cent for food products. If an LGA/SOR did source from other regions and, therefore, duplicated the national sourcing structure within its own boundaries, then its backward capture ratio would be around 123 per cent.

The national maximum ratio for food industries is 144 per cent. This is derived from the national tables with indirect allocation of imports. It therefore represents what the national food backward capture ratio would be if there was no international sourcing of goods and services into the food industry.

The use of the national maximum backward linkage ratio is not presented to suggest that Australia's competitiveness would be enhanced by autarky. It would not, as total sourcing from Australian regions would be uncompetitive as Australian regions cannot supply the food industry's total requirements at world best practice competitiveness. Rather what the national actual and national maximum ratios should be used for is to indicate the additional competitiveness generated by large foreign regions with a good integrated food industry supply chain. It therefore represents a hurdle over which Australian regions have to offset. What is depressing about the results across all industries is that the regional backward capture ratios are in general less than a quarter of the national maximum ratio. This gives some indication of the obstacles facing Australian regions in competing with overseas global regions.

In terms of skill input, for backward skill input the Core Metro regions supply 2.9 skilled employees per \$ million of total output created by the food sector. The total output created by the food sector is the output of the food sector plus the flow-on increase in output of industries which support the food industry.

For rural regions skilled labour input is 2.3 persons per \$ million of total output created by the food sector. For Core Metro regions food product is, on average, 4 per cent of total regional production, while the food industries in Core Metro regions comprise one quarter of national output. The food sector in the rural regions generates 32 per cent of national output.

The average life-time learning index value for Metro regions is 85 compared to 55 for rural regions. A minus sign for the supply chain strength index means that the index is below average, while a plus sign indicates that it is above average. Given the variation in other industries, the supply chain strength index across regional categories is fairly uniform. This is because the higher skill input and life-time learning commitment of Core Metro regions is offset in rural regions by more integrated supply chains.

The performance of each of the 58 SOR regions in statistical terms is given in the Appendix tables. Tables 13.2 to 13.23 summarise this data in a more readily interpretable form.

Again, the food sector (Table 13.4) will be taken as an example. The data in Table 13.4 is presented in terms of answers to queries applied to the Appendix tables. Thus, if the share of output for an industry is greater than 20 per cent of the average output share, a Yes is applied to the question "Is the industry of regional significance?". Thus, for North Coastal NSW the industry is of regional significance.

An industry in a region is given a Yes to the answer to the question “Is the industry in the region of national significance?”, if the industry’s share in national output is greater than 2.5 per cent. Thus, the North Coast NSW food industry is classified as also being of national importance.

An industry in a region is assigned an arrow pointing upwards, meaning an industry with potential resilience, if its supply chain strength index is greater than 10. An industry is assigned an arrow pointing downwards, implying a potentially vulnerable region, if its supply chain strength index is less than -10. A value of the supply chain strength between -10 and +10 receives a question-mark, implying the industry in the region could be vulnerable or possibly, with restructure, generate the opportunities for strong growth.

The last three columns in the table are aids to explaining why an industry is resilient, vulnerable or faces uncertain prospects. A plus indicates that the average of the forward and backward capture ratios are 10 per cent above the average of the backward/forward linkages across all industries. A negative sign indicates that the average of the forward/backward capture ratio is less than 90 per cent of the average across all regions. A star indicates that the average forward/backward capture ratio is within plus or minus 10 per cent of the average.

The same interpretation applies to skill strength and life-time learning. Thus, for example from Table 13.4, the food industry for Brisbane City is classified as resilient because its linkage strength falls near the average, while its skill strength and life-time learning strength are above average. On the other hand, the Gold Coast region is classified as vulnerable because its skill strength is near average, while its linkage strength and life-time learning commitment is below average.

The food industry in the Western Port region of Victoria is unknown because in this case the indicators are near average.

### **13.4 The interpretations of resilience/vulnerability**

Given the discussion in earlier sections of this report the meaning of a resilience description is that, given the requirements of success in a global economy and e-commerce, and the need for anchoring an industry in an innovative knowledge-based regional supply chain, then a resilience nomination indicates that the industry *prima facie* should do better than the average Australian industry performance in coping with the challenges over the next few years. This does not necessarily imply that national industry performance will be satisfactory, especially if foreign regions which supply import competing products increase their relative competitiveness by a superior adaption to the opportunities offered by e-commerce and the knowledge economy.

In this case a superior relative performance by a potentially resilient industry in a region may still represent a poor overall performance.

In terms of policy, those industries that are both potentially resilient and have national and/or regional significance should be the target of aggressive industry development policies.

At the very least, such industries should be constantly monitored so that early warning signs are given of potential not being realised which will trigger responses to identify and remedy problems.

A description of a vulnerable rating means, *prima facie*, the industry in the region may not have the capacity to form an integrated supply chain, either within the region or with other industries in Australia, or especially with international based supply chains. Unless there are natural barriers to protection there is, *prima facie*, warning that the supply chain in the region may be reduced or eliminated by increased competition from more competitive regions in Australia or from foreign regions. If such supply chains are significant from the national or regional perspective, the industries in the regions should be evaluated for policies focused on at minimising the consequences of e-

commerce and globalisation. Significant national or regional industries with uncertain prospects should be similarly treated.

Again, it remains to stress that the indicators only suggest a *prima facie* case. A thorough investigation may indicate that the conclusions are not warranted. However, at the very least the indicators in the tables provide a map of where to look and what to look for.

Given these comments, each industry group will be analysed in turn.

## **13.5 An analysis of supply chain strength by industry and region**

### **13.5.1 The agricultural sector**

For the agricultural sector the only regional category of significance are the rural regions. This is because, from Table 13.1, this regional group supplies 72 per cent of national agricultural output. That is, the agricultural sectors in the other regions are generally too small to be of significance.

For the rural regions the backward capture for the agricultural sector is 25 per cent, whilst forward capture is 34 per cent. The high forward capture rate reflects the high proportion of agricultural product that is processed through the food sector before being exported from the region.

The skill input for rural agricultural industries on average, from Table 13.1, is relatively high at 2.6 employed per \$ million of output. This largely reflects the high weight given to farmers as symbolic analysts in determining the skill content for agricultural industries.

The total national capture of 70 per cent (Table 13.1) indicates that the majority of purchases by rural industries for goods and services comes from other regions in the national economy, or from overseas.

Table 13.2 indicates that those rural regions with a vulnerable rating for the agricultural sector are generally the more remote rural regions, such as Eyre and York in South Australia, the Far West of New South Wales, etc.

### **13.5.2 The mining sector**

From Table 13.1, the backward capture for the mining industry in resource based regions is 20 per cent. This is well below the national actual of 62 per cent, indicating that once imports are taken into account that resource based regions are only capturing between one quarter and one third of the potential created by mining activity in their regions. The forward capture of the mining industry in resource based regions is 15 per cent, indicating that the bulk of production is exported from the regions.

It should be noted, from Table 13.1, that although resource based regions supply just under 40 per cent of total national mining output, rural regions supply 36 per cent of national output. The difference is, of course, that in resource based regions mining output makes up on average a third of total regional output, whereas in rural based regions it makes up just 9 per cent of total regional output.

The performance indicators for mining in rural based regions is similar to that for resource based regions with the exception that a greater proportion of output in rural regions of mining are processed within the region by downstream industries.

Of some significance, from Table 13.1, is the fact that Core Metro regions generate 5 per cent of national mining output. This mainly represents head office functions or mining services that are located in Core Metro regions and also the fact that fly-in/fly-out workers live not only in Core Metro regions, but also in Lifestyle and Dispersed Metro regions. For evaluation purposes the services provided by head office, business services and fly-in/fly-out workers is valued at business service output per employee ratios. The significance of this is due to the fact that the supply chain strength of functions undertaken in Core Metro regions is significantly greater than that for the resource based regions, or the rural regions. It is significant because with technological change and e-commerce information technology more and more of the functions in support of mining activity in resource based rural industries will be able to be undertaken by human resources based in Core Metro and Dispersed Metropolitan regions. Thus, from Table 13.1, the strong supply chain strength for Core Metro mining is indicative of the fact that a greater share of mining activity is likely to be allocated to these regions at the expense of resource based and rural regions.

The impact of this feature can be seen from Table 13.3 where the Core Metro regions with mining activity are generally classified as resilient, while the mining activity in resource based and rural industries, in the majority of cases, is classified as vulnerable.

### **13.5.3 The food industries**

The structural features from the indicator set for the food industries have been discussed above. It remains to be pointed out, from Table 13.4, that the food industries with a resilience rating, and also of national significance, are the food industries in Brisbane City, Global Sydney, Inner Melbourne, Darling Downs and South West Queensland, Goulburn, Murray-Murrumbidgee and Western Victoria. Most of the remaining industries of national significance have a question mark against their prospects.

### **13.5.4 The textile, clothing and footwear industries**

From Table 13.1, just over 40 per cent of the output of the textile, clothing and footwear industry is located in the Core Metro regions, while just under a quarter of national production comes from the Production Zone regions. For those regions with a significant textile, clothing and footwear production the backward capture ratio is around 30 per cent, while the forward capture ratio is approximately 25 per cent.

The skill structure, in terms of the backward skills input, varies considerably across the regions. However, for those regions with significant textile, clothing and footwear output the highest backward skill input is for the Core Metro region with 4.3 skilled persons of input per \$ million of output. For the Production Zone the backward skills input is 3.1. For these two regions the forward skill input is slightly less than their corresponding backward skill input.

In terms of supply chain strength the Core Metro regions have the highest average index value of 17, while for other regions the supply chain strength index value is less than the average.

From Table 13.5, those textile and clothing industries of national significance which also have a resilience rating are the regions of East Melbourne, Global Sydney, Inner Melbourne, West Melbourne, North Melbourne and the Golden Region of Victoria. Those industries which have a national significance rating and also have a vulnerable rating are in Central Adelaide. Central Adelaide is let down by its skill strength input, both in terms of its backward and forward skill inputs.

### **13.5.5 The wood products industry**

The wood products industry is reasonably well distributed over the various regional categories in terms of generating national output. The exception is the resource based regions which only, in total, generate 3 per cent of wood products output. The highest wood products output is generated by the rural regions which a 37 per cent share of total national production.

The striking feature from the backward capture ratios in Table 13.1 for the wood products sector is the relatively high backward capture ratio. For life-style regions the backward capture ratio is 45 per cent followed by 42 per cent for rural regions. That is, the wood products industry is significant in creating backward linkages in non-metropolitan regions.

In addition, the forward capture rates are also high. For the lifestyle regions the forward capture rate is 80 per cent, while it is 64 per cent for rural industries. For the Core Metro and Dispersed Metro regions the forward capture rate is between 90 and 95 per cent.

The skills input structure varies considerably, with the Core Metro regions having a backward skill input of 5.3 persons per \$ million output, while for the rural regions its 2.8 persons. The forward skills input is 7.9 for Core Metro regions and 3.4 for rural regions. Given the life-time learning commitment superiority for Core Metro and Dispersed Metro regions it is not surprising that these two regions have the highest average supply chain strength index.

From Table 13.6, those regions that generate a national significant output for wood products, and which have a resilient rating, are in Brisbane City, East Melbourne, North Brisbane and North Coastal NSW. Those wood products industries which generate a significant national output, but have a vulnerable rating, are in Outer West Sydney, Murray-Murrumbidgee, Northern Tasmania, South East SA and Southern WA. The main reason for a vulnerability rating for these regions is less than average linkage strength and low skill input strength across the backward and forward linkages.

### **13.5.6 The paper products industry**

The backward capture ratio for the paper products industry across the regional categories, from Table 13.1, varies from 17 per cent for the rural regions to 26 per cent for the Dispersed Metro regions, while the forward capture ratio is around 86 per cent for the Core Metro and Dispersed Metro regions. The lifestyle regions have a higher forward capture ratio, however, their share of national output for paper products is insignificant and, therefore, this can be disregarded. For the Production Zone regions, the resource based regions and the rural regions the forward capture ratio is less than 50 per cent. These differences in forward capture ratios reflects the fact that the paper industries in the Core Metro and Dispersed Metro regions are more fully integrated in terms of producing both basic paper products and refined paper products, whereas in the other regions the predominate share of activity is in first and second stage paper production.

Integration of the paper industry in the Core Metro regions is indicated by the high backward and forward skill inputs compared to the other regions. For the Core Metro region, backward skill input is 2.3 persons per \$ million of output, compared to 0.8 persons for the paper industry in the rural regions. The comparable figures for the forward skills input are 5.3 for the Core Metro region and 1.6 for rural regions.

Not surprisingly, given the strength of the paper products industry in the Core Metro regions, the supply chain strength index is an average of 26. This is considerably in excess of the average values for the other regions.

From Table 13.7, those paper products industries of national significance, with a resilience rating, are in Brisbane City, Central Adelaide, East Melbourne and Global Sydney, along with Ovens-Hume in Victoria. At the other polar extreme, those paper products industries with national significance but with a vulnerable rating are in Illawarra in NSW and Mercy-Lyell in Tasmania. For Mercy-Lyell the linkage strength, skill strength and life-time learning strength of the region were all well below average.

### **13.5.7 The printing and multi-media products industry**

From Table 13.1, in general, the backward capture ratio for the printing and multi-media products industry across the regional categories is between 20 and 30 per cent, while the forward capture ratio is between 50 and 60 per cent. The high forward capture ratio reflects the relatively low contribution multi-media products makes to the industry in Australia, and the fact that for printed products the majority of output is allocated to industries within the region of production.

The Core Metro region dominates in terms of a contribution to national output, with 55 per cent of national printing and multi-media production generated. The skill input level for the Core Metro regions is, in general, significantly higher than for other regions with 8 skilled persons per \$ million of output being supplied in terms of the backward skills input and 10 persons in terms of the forward skills input. For the Production Zone regions, the corresponding skill inputs are 5.8 and 7.3 respectively. Not surprisingly, therefore, is the high supply chain average strength index for the Core Metro regions compared to the other regions. However, what is worth noting is the fact that the average supply chain strength of the other regions is generally close to zero.

From Table 13.8, those printing and multi-media product industries in regions of national significance which are given a resilience rating are in Brisbane City, Central Adelaide, Global Sydney, Inner Melbourne and North and Central Perth. One region which has a printing and multi-media products industry of national significance, but which is given a vulnerability rating, is in the Central Coast of NSW where lower skill strength and life-time learning commitment cause this result.

### **13.5.8 The basic chemicals industry**

The backward capture ratio for the basic chemicals industry, from Table 13.1, varies from 25 per cent for lifestyle regions to 46 per cent for resource based regions. The high backward capture ratio for basic chemicals in the resource based regions reflects the greater integration of the basic chemicals industry in these regions with the mining industry, which is located within the regional boundaries. The forward capture for the basic chemicals industry is around 50 per cent, which is fairly uniform across the regions.

Those regional categories which produce a significant level of basic chemicals output, namely the Core Metro, Dispersed Metro and Production Zone regions, also have a similar skill input structure. The average skill input is about 2.8 for these three regional categories. It is not surprising therefore, from Table 13.1, that the supply chain strength index is very similar for these three regional categories.

From Table 13.9, those regions with a national significant basic chemicals production which also have a resilience rating are East Melbourne, Global Sydney, Inner Melbourne, West Melbourne and Westernport. Those regions with a significant national basic chemicals production with a vulnerable rating are Southern Sydney, Sydney Production Region and the Goulburn region in Victoria. The reasons for the vulnerable rating for these regions are below average linkage strength and below average skill strength.

### **13.5.9 The high value chemicals industry**

From Table 13.1, the backward capture ratio for the high value chemicals industry varies from a low of 15 per cent for resource based regions to a high of 36 per cent for Dispersed Metro regions. The forward capture ratio is stable across the regional categories with the ratio being between 20 and 30 per cent. This reflects the fact that the majority of high value chemical products is either sold into the household sector as consumer goods, or exported from the region. The highest contribution to national output for the high value chemicals comes from the Dispersed Metropolitan regions with a share in national output of 37 per cent. The Production Zone regions follow with a share in national output of 30 per cent. Typically the high value chemicals sector's share of regional output is in the vicinity of 2 to 3 per cent.

The skill input ratio is highest in the Core Metro regions and lowest in the Production Zone, when consideration is only given to those regions with a significant share of national output.

The supply chain strength index is highest in the Core Metro regions and lowest for those regions such as lifestyle regions and resource based regions which only have a small share of national output.

Given the outcome in Table 13.1, it is not surprising that those regions from Table 13.10 which produce a significant share of national output and which also receive a resilience classification are in the Core Metro regions or the Dispersed Metro regions. All regions in the table that produce a significant share of national output receive a resilience rating. This indicates that the high value chemicals industry will grow in metropolitan regions as these regions are close to skills and markets.

### **13.5.10 The non-metallic minerals sector**

From Table 13.1, the backward capture ratio for the non-metallic minerals sector varies from a high of 42 per cent for rural regions to a low of 32 per cent for Core Metro regions. The forward capture ratio varies between a low of 59 per cent for the Production Zone regions to a high of 74 per cent for lifestyle regions. This indicates that the non-metallic minerals industry is basically a regional based industry to serve regional requirements for construction and industrial production. In general the share in national output of the non-metallic minerals sector varies with the size of gross regional product with the share of the industry in total regional output varying by between 1 and 2 per cent.

Given the fact that the non-metallic minerals sector is basically a regional based industry, depending on regional demands for product characteristics, a supply chain strength evaluation is not particularly relevant.

### **13.5.11 The basic metals and fabricated metals industry**

For the basic metals and fabricated metals industry the backward capture ratio varies from a low of 29 per cent for Core Metro regions to a high of 40 per cent for Production Zone regions, while the forward capture ratio varies from a low of 49 per cent for rural regions to a high of 66 per cent for lifestyle based regions. If the lifestyle regions are excluded, because of their low contribution to national basic metals and fabricated metals production, the highest forward capture ratio for a region with a significant basic metals and fabricated metals production is for the Production Zone and Dispersed Metro regions where the forward capture ratio is 57 per cent. It may be thought that the forward capture ratio is, perhaps, too high. However, it must be kept in mind that the forward capture ratio is a weighted average of a significantly greater disaggregated analysis and, therefore, reflects the flows between the basic metals industry in a region and the fabricated metals industry in the same region.

The Core Metro regions generate 14 per cent of national basic metals and fabricated metals output with the highest contribution coming from the Production Zone with 33 per cent of national output. The rural regions produced 28 per cent of national output.

The variation in skills falls across those regions which produce a significant proportion of national basic and fabricated metal output is around 1 person per \$ million of output, with the highest backward skill input being in the Core Metro regions and the highest forward skill input being in the Dispersed Metro regions. As can also be seen from Table 13.1, the Core Metro, Dispersed Metro and Production Zone regions have a supply chain strength greater than average.

From Table 13.12, those regions with a significant national share of basic and fabricated metals output and which also receive a resilience rating are Brisbane City, East Melbourne, Westernport and the Sydney Production Region. The significance of this rating, however, for this industry is somewhat weakened by the fact of the importance of energy and raw material supply in determining the basic metals production competitiveness. A more meaningful analysis for this industry would rely on separating basic metals from fabricated metals where the latter industry's prospects within a region would be more likely to depend on skills and linkages than what would be the case for basic metals.

### **13.5.12 The transport and other machinery industries**

This is a very important industry in that it cover many of the emerging high technology manufacturing industries. In terms of backward capture the industry varies from a low of 17 per cent for resource based regions to a high of 39 per cent for Production Zone regions, while the forward capture ratio is between 12 and 16 per cent, reflecting the fact that most of the output of this industry is sold into final demand, either as consumer goods, such as appliances and motor vehicles, or as investment goods.

The Core Metro regions generate 30 per cent of national output which is the highest of the regional groupings and is slightly ahead of the 29 per cent of national output generated by the Production Zone. The skill gap between the Core Metro and the Production Zone regions is 1.7 persons per \$ million of output for backward skills input and 1.4 persons for forward skills input. The Dispersed Metro regions also have no advantage over skill inputs compared to the Production Zone regions. Again, not surprisingly, the supply chain strength index for the Core Metro regions for the transport and other machinery industries is the highest at 24, followed by an average of 8 for the Dispersed Metro regions.

From Table 13.13, the regions which possess transport and other machinery industries which generate a significant proportion of national output are either in the Core Metro, Dispersed Metro or Production Zone regions. In all cases, with the exception of Northern Adelaide, these industries are all assigned a resilience rating. In the case of Northern Adelaide a question mark is assigned next to the region. Northern Adelaide, although it has above average linkage strength, it is let down by below average skill input strength and a relatively low level of commitment by the region to life-time learning.

The high national maximum in backward linkage ratio, relative to the regional average, gives an indication of the scale of the problems faced by local supply chains.



### **13.5.13 Other manufacturing**

From Table 13.1, the other manufacturing backward capture ratio is generally relatively high for a manufacturing sector, varying between a low of 22 per cent for resource based regions to a high of 37 per cent for Production Zone regions. The forward capture ratio is low with a value of less than 10 per cent achieved across all regional categories. The skills input ratio varies significantly across the regions from a high of 6.6 skilled persons per \$ million of output in terms of backward skills input for the Core Metro regions, to a low of 2 for the resource based regions. The supply chain strength index is the highest for the Core Metro regions.

From Table 13.14, the Core Metro regions dominate in terms of producing regions which make a significant contribution to national output and which also receive a resilience rating.

### **13.5.14 The service industries**

The service industries will be considered as a block in that what is important here is the variation in the indicators across industry groups, rather than the variation in the indicators for the same industry across regional groups.

The energy and water industry produces the lowest backward capture ratio of around 13 per cent, while the forward capture ratio is approximately 60 per cent. The low backward capture ratio reflects the low levels of purchases by the industry from local suppliers, whether that be in terms of energy and primary energy inputs into electricity production, or water for the water supply industry.

The construction sector has an average backward capture ratio of 30 per cent across the regions and a forward capture ratio of 10 per cent or less, reflecting that most construction output is sold directly into construction investment formation.

The wholesale/retail trade sector has similar backward and forward capture ratios of between 20 and 25 per cent on average, and a skill input ratio which is higher than for both the construction and energy sectors. The average contribution to regional output from the wholesale/retail sector is an average of 13 per cent compared to 7 per cent for the construction sector and 3 per cent for the energy and water sector.

The accommodation and restaurant sector produces reasonably high levels of backward capture ratio of around 30 per cent with a forward capture ratio of 10 per cent on average across the regions. Again this reflects the fact that the accommodation and restaurant industry sells most of its output into the household sector, either in terms of meals or accommodation. The contribution of the accommodation and restaurant sector to regional output is, on average, 3 per cent.

The transport and communication industries and the finance industries are generally regional based industries with high forward capture ratios. For the finance sector the forward capture ratio is 55 per cent, while for the transport and communication industries it is 38 per cent. The corresponding backward capture ratios are an average of 22 per cent for transport and communication and 18 per cent for the finance sector.

The business services sector has a high forward capture ratio of between 70 and 90 per cent, while the backward capture ratio is on par with the transport and accommodation and restaurant sector. The backward and forward skill input for the business service sector is higher than for all the preceding service sector and also higher than the government and community services sector and the entertainment sector. Forward skills input for the business service sector is particularly high at an average of 11.7 per \$ million of output. In terms of the contribution to regional output the finance sector's average contribution is 4 per cent, while the business services' average contribution is 12 per cent. It is worth noting that the contribution of the finance sector to regional output in the Core Metro

regions is significantly greater than for the other regions with the same outcome also true for the business services sector and the government and community services sector.

The contribution of the entertainment sector to regional output varies from 3 per cent for Production Zone regions to 6 per cent for Core Metro regions.

### **13.6 The regional concentration of supply chain strength**

Table 13.24 reproduces the average of supply chain strength by industry across the regional categories. The conclusion from the table is strong. Those industries which have the highest probability of forming integrated supply chains are likely to be in the Core Metro regions. Next in order of probability of forming an integrated supply chain are industries in the Dispersed Metro region, followed by the Production Zone regions.

The conclusion is that e-commerce and the flow-on effects of globalisation over the next few years is likely to continue the inequalities of growth and employment opportunities between Australian regions that has occurred over the previous decade if national, state and local policy action is not taken to give regions a greater chance of prospering in the global economy.

### **13.7 The special case of the farm sector**

One sector that clearly stands out as having good prospects to leverage substantial gain from e-commerce is the farm sector.

Value added enhancement for the farmer using the information technology can come from:

- (i) improving the customer's knowledge of the quality of the product; and
- (ii) clawing back functions and activities which up until now have been carried out by institutions which the farmer either directly or indirectly pays for.

Since World War II structural change in agriculture has succeeded in rendering farms bigger, more capital intensive and, in some cases, more specialised. The farm now forms part of a complex agri-business, consisting of a combination of companies and institutions that make up a co-ordinated supply chain which:

- supplies stock, seed and other inputs to the primary producer;
- distributes produce to down-stream processors; and
- processes, markets and distributes the final product to wholesalers, retailers and consumers.

These supply chains were specialised and efficient. In many agricultural industries a private or public company or marketing board gained increasing control of the supply chain. This trend was driven not only by the desire to maximise efficiency, but also to provide countervailing power in dealing with large customers such as retailers and foreign buyers who operated on a national basis.

Unfortunately, strengthening the agri-business supply chain around the farmer meant the farmer became locked in. Radical change options that by-passed existing supply chains became less and less feasible. This loss of effective decision making power is reflected in the loss of farmer margin extracted from the supply chain.

The new information technologies are offering farmers opportunities to break out of the formal agri-business structures, to capture more of the marketing and distribution value added, and to increase their range of potential production options.

One reason for this is that the new information technologies are also enabling a high degree of segmentation in previously bulk commodity or crudely segmented markets. The new technologies are allowing consumers to become better informed in relation to what is, or could be, made available and side step the agri-business chains to connect directly to the actual or potential producers. Traditional advantages of access to flows through formal agri-business chains will diminish.

For the same reasons exotic or niche agricultural markets that previously were suppressed, because sales did not justify the establishment of a supply chain, are opening up.

The new technologies are allowing farmers to re-establish, sometimes informally, more effective co-operation models than the formal models of the mid-20<sup>th</sup> Century. The typical 20<sup>th</sup> Century farmers' co-operative tended to be geographically constrained with an inefficient/ineffective management structure that, in general, could not compete with private sector entities in the establishment of efficient supply chains. The new technologies allow farmers to establish new, less formal co-operatives with membership unconstrained by geographical boundaries. The new technologies also enable farmers to take the lead in establishing vertically integrated supply chains that they design, co-ordinate and control.

It is not only in formal niche markets, such as for ostriches, that farmer-controlled supply chains can be set up. It can also occur in bulk or service bulk commodity markets. For example, a specialised supply chain in 23 micron wool could be set up to enable direct interaction between consumers and producers. This would allow producers to respond quickly to consumers' quality, scheduling, and volume requirements. Because this segment accounts for a relatively small part of the overall wool market, such niche customer targeting strategies would not have been considered in the traditional bulk wool supply chain.

The new co-operatives can expand demand where restricted/uncertain/unstable supply is suppressing demand. Farmers can identify this suppressed demand by directly connecting with consumers and then use the new technologies to build the required critical mass in supply potential. Farmer production decisions can then be co-ordinated to ensure supply stability and, therefore, offset the effects of region-specific weather, disease and production switching effects.

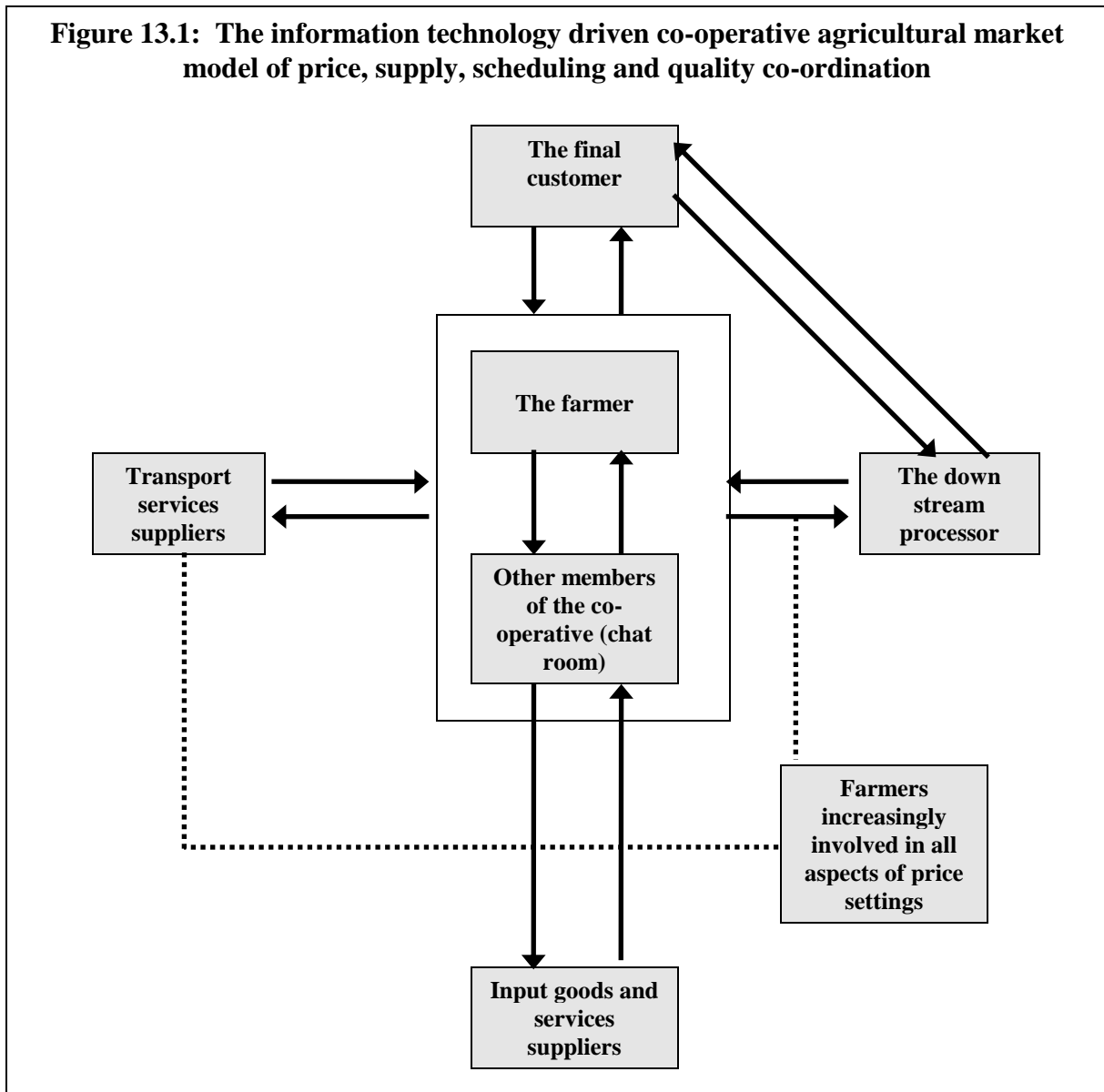
Figures 13.1 and 13.2 outline the new and old agribusiness supply chains. In the new supply network, depicted in Figure 13.1, the farmer is at the centre with much greater flexibility in deciding whether to outsource or reclaim farm functions that up until now have been carried out off-farm.

Change will not occur unless the farmer is ready, willing and able to seize the opportunities created by the new technologies. Until challenged, the established interest in the traditional supply chain will be more than willing to maintain the status quo.

In order to capture more of the value added, the Internet based co-operatives may have to function on at least a semi-formal basis if they are to achieve their objective of removing risk to the consumer. The co-operatives will have to:

- (i) set minimum quality standards;
- (ii) set supply scheduling;
- (iii) prescribe production technologies and flock management practices; and
- (iv) oversee accreditation of formal or informal training programs.

**Figure 13.1: The information technology driven co-operative agricultural market model of price, supply, scheduling and quality co-ordination**



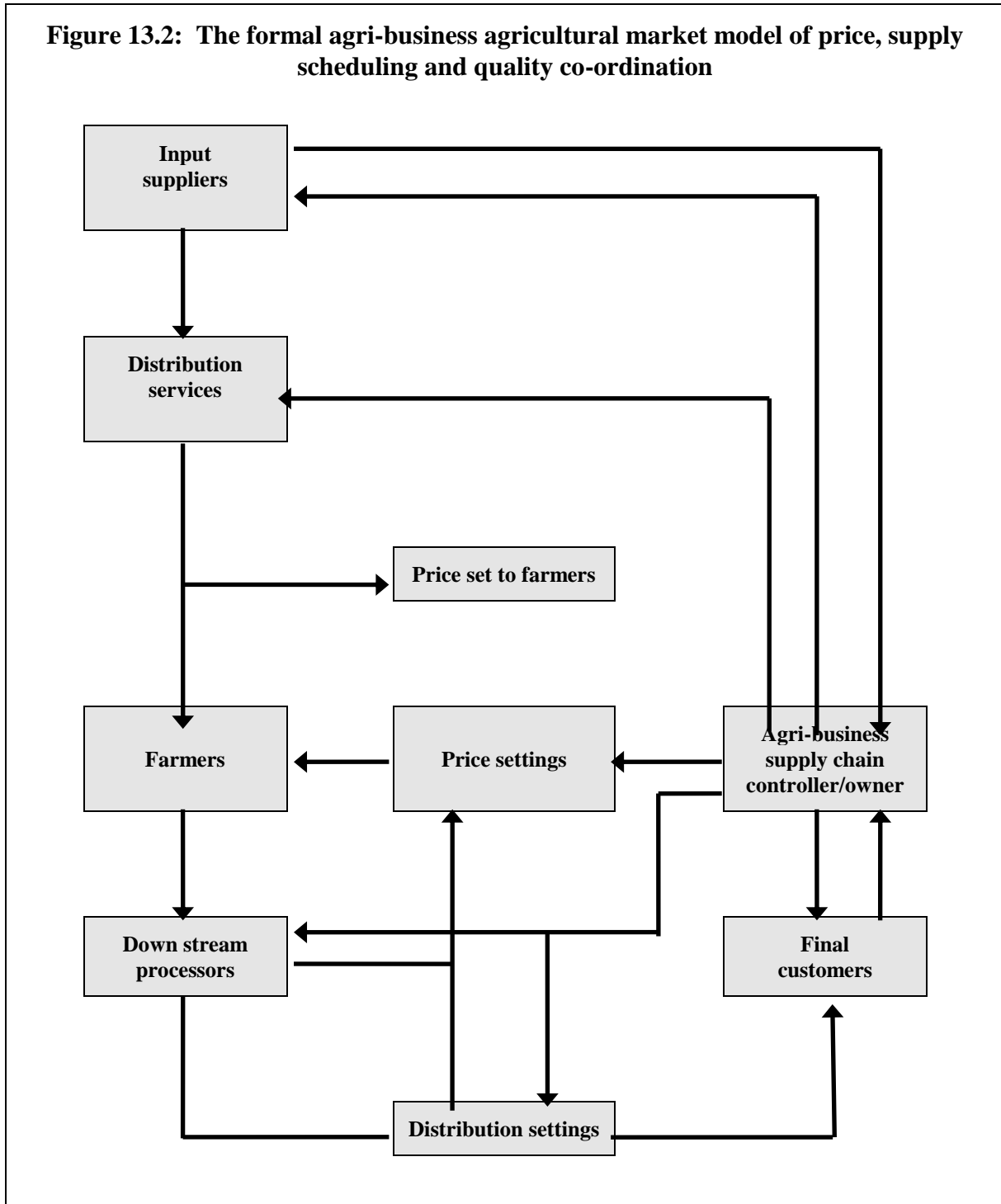
***Information technologies: the productivity impact***

The new technologies can also be used directly to increase farm productivity. Regional maps generated by global positioning satellites (GPS) will be important here. The process is inter-active in that information from soil samples taken from paddocks is fed back to complement the information gained from the satellite to provide a detailed profile of the land.

By constant evaluation of this information farmers will be able to optimise:

- fertiliser/chemical usage;
- moisture content;
- crop selection;
- grazing pasture; and
- carcass weight.

**Figure 13.2: The formal agri-business agricultural market model of price, supply scheduling and quality co-ordination**



This technology is known as precision agriculture. It is in its early stages and can be expected to improve. Down the track sensors will be placed at strategic points on the property and directly linked to computers in the homestead. The sensors, measuring aspects such as tissue swelling, temperature and moisture content, will be integrated with the process preparing the satellite maps.

Precision agriculture will not only improve yields and productivity, but will enable niche corporations (which may be no more than a chat room) to more accurately estimate supply and take compensating measures to ensure customer requirements are met.

New information technologies may also allow diversification into organic farming, by assisting with the timing of production and its marketing in order to maximise the price premium.

### ***New information technologies and cost reduction***

The Internet will enable a much more rapid take-up of cost reduction measures and yield increasing innovations. A company which has just brought a new disease resistant crop variety onto the market can simply place the relevant information on those websites used by relevant farming segments. Orders which in the past would take years to secure, or may never have been placed if commercial interests controlling the formal agri-business supply chain had a vested interest in blocking it, can be filled in days.

Increasingly farm inputs will be traded on-line and increasingly by on-line auction. This will enable the farmer to reduce his costs by at least the margin of the distributor in the formal agri-business supply chain. On-line trading will extend from transactions such as seed, livestock and equipment purchases to the farmer placing his financial package requirements out to tender.

### ***Information technologies: lifetime learning***

The information technologies enable the farmer to transfer the value added previously generated by suppliers and distributors back to themselves. The ability to do this depends on the individual's ability to apply the technology. This demands lifetime learning to:

- (i) keep abreast of new application developments;
- (ii) become proficient in applying this technology;
- (iii) manage the increasing information base across the entire agricultural sector; and
- (iv) understand the technical conditions of the land, its capabilities, its environmental constraints and the technical requirements for maximising yields on a sustainable basis.

The gain is not only a greater share of the distribution in value added, but it also enables the farmer to increase the value of the product to the consumer, thereby increasing unit revenue.

Some of these gains will represent productivity gains from the land. However, a substantial part of the real income gain to farmers will take the form of cost reduction in terms of local purchases of farm inputs as well as a redistribution of post-production from value added from downstream agri-business, such as marketing and distribution boards. That is, it will represent a redistribution of income between regions and within regions. The ironic aspect of this is that the farmers' gain will be at the expense of breaking up integrated supply chains.

For an analysis of how e-commerce can radically assist in changing farm profitability in an otherwise depressed farm region, see National Economics, "*Necessary conditions and options for socio-economic advancement: a prospective and perspective analysis of the Western Catchment Management Area of New South Wales*". A report for the Western Catchment Management Committee.

The conclusions here are in direct contrast to the conclusions of the NIOE study in relation to e-commerce and the implication for the agricultural sector. This is to be expected due to the superficial nature of the study.

## 13.8 Actions to enhance supply chain strength

The three attached panels describe current actions to strength national and regional supply chains with the focus on innovation. To break the strong grip the well endowed regions have an exploiting growth opportunity similar actions again will have to be duplicated on a large scale throughout Australia over the next few year. However, to be successful many will require substantial assistance resources.

### **The wine industry: International success based on regional identity**

*If you are fortunate enough to dine in New York's La Cirque restaurant, you could select a 1991 Penfold's Grange Hermitage Bin 95 from the Barossa for \$710.00 or, if the budget is stretched, try a Cape Mentelle Cabernet Sauvignon 95 from the Margaret River region at \$38. The Australian wine industry is an international success story based on quality and regional identity.*

*How it achieved this success is the subject of a report commissioned by the Australian Business Foundation and entitled Australia's Wine Industry: Collaboration and Learning as Causes of Competitive Success, by Ian Marsh and Brendan Shaw. The industry's success is centred on export and a commitment to research and development.*

*Collaboration does not mean that there isn't rivalry between industry members. But collaboration, inspired by several visionary industry leaders and active industry associations, underpinned an international marketing drive. Between 1990 and 1997 Australia's share of the UK wine imports increased from 2 to 10 per cent, from 1 to 4 per cent of Europe's wine imports and from 1 to 5 per cent of the US wine import market. The weakened Australian dollar strengthened Australia's competitive edge and the industry's strategic-collaborative approach allowed the producers to take full advantage of the opportunity.*

*The industry plans together. In 1996 the industry launched Strategy 2025. The industry has nominated growth targets for investment, acreage, water, processing, storage capacity and, of course, skilled people – 25,000 over 30 years.*

*Regions have benefited from a high commitment to research and development. Commencing with the 1999 harvest, the R&D levy was increased from \$3 per ton to \$5. In 1996-97 the private sector funded \$4.3 million of R&D. Government also invested nearly four times that amount through matching levies and direct research grants to research organisations and universities. Australia's major volume brands are now produced largely from grapes grown in the irrigation areas of Riverina, Riverland and Sunraysia. These regions use innovative irrigation techniques such as regulated deficit irrigation, using moisture probes to gauge when irrigation should be applied. Partial root drying switches irrigation drippers to increase fruiting by 40 per cent at the expense of foliage development.*

*The wine industry shows what can be achieved by collaborating as well as competing.*

## Central Queensland: The triple bottom line

*The Central Queensland University, Rockhampton doesn't aim to be a little Harvard or a mini-Cambridge. Rather it has set its sights on being a world leader in regional development through the Institute for Sustainable Regional Development.*

*The Institute focuses on a triple bottom line – economic, social and environmental – for training, research and decision-making. The Institute, established in 1997, works closely with community stakeholders, including business and government. It is involved in natural resource management through the Fitzroy Basin Association, and obtains half its funds through the Queensland Government as part of its commitment to ecologically sustainable development. It is also working with the Mackay Whitsunday Economic Development Corporation to develop a vision for Mackay's future development focusing on a unique identity for Mackay and co-operation between industry sectors.*

*Professor Geoff Lawrence, Director of the Institute, says that the Institute does not carry on its research in isolation from the community. Rather its researchers go into the community to discover where they should concentrate their research efforts. Then they look for funding and work with the community to solve the problem.*

*The Fitzroy Basin is twice the area of Tasmania. "We don't have the salinity problems of the Murray-Darling Basin, so we can work on prevention and on providing innovative approaches to sustainable regional development," says Professor Lawrence. The Institute is working with the Queensland Environmental Protection Authority and regional businesses to identify potential cost savings in energy and natural resource use. The project involves eco-efficiency audits of 30 businesses in the shires of Fitzroy, Mt Morgan, Livingstone and Rockhampton City Council. The project is also developing a regional partnership between industries, the community, government and educational institutions.*

*Another project examines the potential to increase jobs associated with organic production in the beef, cropping, sugar and horticultural sectors - extending to Mackay in the north, Bundaberg in the South and west to the Northern Territory border.*

*This year the Institute has its first 10 students enrolled in a Masters of Sustainable Development. A world-first, the course can be studied via the internet. Already 2 of its students are studying from Kenya and Tanzania.*

*The Institute is an example of university best practice for the new millennium. It engages with community, and puts the resources of the university behind one fundamental aim - to develop a more sustainable regional Australia. It ensures that the lessons for sustainable development learned at the regional level are distributed across the world as part of the courses in sustainable development.*



## South Australia: A recipe for economic development

*Playford City Council in Northern Adelaide is playing a pivotal role in inter-regional co-operation. For the first time, six councils have come together to plan infrastructure development. The councils – Barossa, Light, Mallela, Playford, Gawler and Salsibury - have put together a submission to gain funding for \$30 million worth of road development.*

*Playford is also encouraging industries to view themselves as situated within a cluster and to cooperate in development. Playford, a council in Northern Adelaide, undertook an industry audit with 100 local companies to assess the region's speed, innovation, flexibility and best practice. As a result of industry consultation and a whole of government approach there are now five reports and action plans to guide future economic development.*

*Roden Genoff, industry strategist at Playford, believes the next 12 months will produce an exciting growth in intra-industry collaboration. A gourmet food cluster in the Barossa is now networking its marketing locally, interstate and internationally. A network of five agricultural produce exporters recently visited Japan, Malaysia and Singapore to test the market for their products. Three of the producers are considering co-operation on branding, marketing and exporting.*

*The food industry cluster covers a much wider area than the City of Playford, a Northern Adelaide council. It extends to the wine regions of Clare Valley and the Barossa, the Adelaide Hills and Riverland, home to canneries and food processing.*

*On the research front, a bio-security project worth \$500,000 made up of a cocktail of sources will investigate water sterilisation and recycling in the potato industry. The aim is to improve the region's credentials as a clean, green producer and processor. And on the Adelaide Plains, the Virginia horticultural industry is working a plan to establish a reputation for best practice in food growing and production.*

*Roden Genoff says that food has been seen as a low technology industry. To the contrary, he says, testing, trialing and prototyping are all required if the industry is to remain competitive in the knowledge economy.*

**Table 13.1 Supply chain strength by state of region industries – simple average**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%) <sup>(a)</sup>	Lifetime learning commitment	Supply chain strength
<b>Agriculture</b>	Core Metro	5	3	0.6	0.6	0%	1%	85	3
	Dispersed Metro	25	16	2.4	2.4	2%	6%	65	6
	Lifestyle region	42	23	3.7	3.7	7%	8%	44	2
	Production zone	36	15	2.4	2.3	2%	3%	65	5
	Resource based	20	16	2.1	2.2	4%	6%	58	-17
	Rural	34	25	2.6	2.8	16%	72%	55	-8
	National weighted average	32	23	2.6	2.7	13%	100%		
	National Total	98	70	4.8	5.0	4%	100%		
	National Max				89				
<b>Mining</b>	Core Metro	25	21	2.5	3.4	1%	5%	85	56
	Dispersed Metro	16	8	0.9	1.0	2%	6%	65	2
	Lifestyle region	40	20	2.0	1.9	4%	4%	44	-15
	Production zone	20	6	0.9	0.8	3%	8%	65	-13
	Resource based	15	20	1.0	1.5	33%	39%	58	-31
	Rural	34	18	1.1	1.3	9%	36%	55	-9
	National weighted average	23	17	1.1	1.5	17%	100%		
	National Total	96	62	4.0	4.2	5%	100%		
	National Max				78				
<b>Food</b>	Core Metro	13	33	2.0	2.9	4%	25%	85	6
	Dispersed Metro	11	34	1.3	2.2	5%	16%	65	-12
	Lifestyle region	13	43	1.5	2.6	8%	8%	44	-6
	Production zone	11	33	1.4	2.3	6%	17%	65	-12
	Resource based	8	48	1.5	2.4	5%	3%	58	-4
	Rural	16	53	1.2	2.3	9%	32%	55	2
	National weighted average	13	40	1.6	2.5	7%	100%		
	National Total	31	123	2.3	5.5	5%	100%		
	National Max				144				
<b>Textiles and clothing</b>	Core Metro	22	31	3.9	4.3	2%	43%	85	17
	Dispersed Metro	24	31	3.4	3.6	1%	17%	65	-2
	Lifestyle region	14	27	4.2	4.6	1%	2%	44	-5
	Production zone	24	32	2.8	3.1	2%	24%	65	-9
	Resource based	8	15	0.3	0.5	0%	1%	58	-8
	Rural	26	41	1.9	2.6	1%	12%	55	1
	National weighted average	23	32	3.3	3.7	2%	100%		
	National Total	54	86	5.4	6.2	1%	100%		
	National Max				150				

Note: (a) Cumulative total in national output for each category.

**Table 13.1 Supply chain strength by state of region industries – simple average (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%) <sup>(a)</sup>	Lifetime learning commitment	Supply chain strength
<b>Wood products</b>	Core metro	95	33	7.9	5.3	0%	15%	85	20
	Dispersed Metro	90	35	5.9	4.0	1%	19%	65	2
	Lifestyle region	80	45	5.9	4.7	1%	10%	44	7
	Production zone	83	37	5.4	3.9	1%	16%	65	-0
	Resource based	72	25	3.4	2.1	0%	3%	58	-17
	Rural	64	42	3.4	2.8	2%	37%	55	-7
	National weighted average	78	39	5.1	3.8	1%	100%		
	National Total	127	103	7.3	6.4	1%	100%		
	National Max		139						
<b>Paper products</b>	Core Metro	86	24	5.3	2.3	1%	27%	85	26
	Dispersed Metro	87	26	3.7	1.3	1%	15%	65	-3
	Lifestyle region	100	23	4.5	1.4	0%	2%	44	-9
	Production zone	45	23	2.1	1.6	1%	34%	65	-3
	Resource based	38	12	1.6	0.6	0%	3%	58	-8
	Rural	48	17	1.6	0.8	1%	19%	55	-5
	National weighted average	64	22	3.2	1.6	1%	100%		
	National Total	169	77	7.7	3.7	1%	100%		
	National Max		111						
<b>Printing and multi-media products</b>	Core Metro	61	29	10.1	8.0	2%	55%	85	19
	Dispersed Metro	61	26	7.7	6.0	2%	16%	65	-2
	Lifestyle region	55	22	9.4	7.8	1%	4%	44	-2
	Production zone	58	27	7.3	5.8	1%	16%	65	-2
	Resource based	52	19	7.3	5.8	0%	1%	58	-1
	Rural	59	24	7.6	6.2	1%	9%	55	-6
	National weighted average	60	27	8.9	7.1	2%	100%		
	National Total	130	63	11.9	7.5	2%	100%		
	National Max		101						
<b>Basic chemicals</b>	Core Metro	46	29	3.0	2.5	1%	30%	85	23
	Dispersed Metro	46	27	3.3	2.8	3%	36%	65	10
	Lifestyle region	51	25	2.9	2.0	0%	1%	44	-7
	Production zone	48	33	2.8	2.6	1%	19%	65	14
	Resource based	48	46	1.6	0.8	0%	1%	58	6
	Rural	48	29	1.8	1.4	1%	12%	55	-16
	National weighted average	46	29	2.7	2.3	2%	100%		
	National Total	146	77	6.9	4.3	2%	100%		
	National Max		129						

Note: (a) Cumulative total in national output for each category.

**Table 13.1 Supply chain strength by state of region industries – simple average (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%) <sup>(a)</sup>	Lifetime learning commitment	Supply chain strength
<b>High value chemicals</b>	Core Metro	27	35	3.4	4.1	1%	23%	85	31
	Dispersed Metro	27	36	2.7	3.3	4%	37%	65	8
	Lifestyle region	23	24	2.1	2.5	1%	2%	44	-21
	Production zone	31	35	2.5	3.0	3%	30%	65	5
	Resource based	21	15	0.9	0.9	0%	1%	58	-20
	Rural	28	26	2.1	2.4	1%	6%	55	-12
	National weighted average	28	34	2.9	3.4	3%	100%		
	National Total	110	87	6.2	5.5	2%	100%		
	National Max		143						
<b>Non-metallic minerals</b>	Core Metro	72	32	5.6	3.9	1%	19%	85	24
	Dispersed Metro	61	33	4.5	3.6	2%	24%	65	9
	Lifestyle region	74	41	4.3	2.8	1%	7%	44	3
	Production zone	59	38	3.1	2.4	3%	30%	65	-6
	Resource based	72	41	2.3	1.2	1%	3%	58	-18
	Rural	69	42	3.0	2.0	1%	17%	55	-8
	National weighted average	65	36	3.9	2.8	2%	100%		
	National Total	133	97	6.6	5.2	1%	100%		
	National Max		118						
<b>Basic and fabricated metals</b>	Core Metro	52	29	3.8	3.2	2%	14%	85	20
	Dispersed Metro	57	32	3.5	2.9	5%	20%	65	5
	Lifestyle region	66	35	4.2	3.3	2%	3%	44	12
	Production zone	57	40	2.8	2.5	11%	33%	65	5
	Resource based	53	31	2.3	1.9	4%	2%	58	-16
	Rural	49	36	2.5	2.2	6%	28%	55	-9
	National weighted average	54	35	3.1	2.7	7%	100%		
	National Total	125	112	5.5	4.8	5%	100%		
	National Max		140						
<b>Transport and other machinery</b>	Core Metro	12	29	3.8	4.7	4%	30%	85	24
	Dispersed Metro	12	32	2.8	3.5	8%	28%	65	8
	Lifestyle region	14	25	3.3	3.9	2%	2%	44	2
	Production zone	16	39	2.4	3.0	9%	29%	65	12
	Resource based	12	17	2.1	2.4	1%	1%	58	-25
	Rural	12	25	2.2	2.7	3%	10%	55	-15
	National weighted average	13	32	3.1	3.7	7%	100%		
	National Total	64	80	5.7	6.0	5%	100%		
	National Max		139						

Note: (a) Cumulative total in national output for each category.

**Table 13.1 Supply chain strength by state of region industries – simple average (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%) <sup>(a)</sup>	Lifetime learning commitment	Supply chain strength
<b>Other manufacturing</b>	Core Metro	7	29	5.7	6.6	1%	30%	85	27
	Dispersed Metro	5	33	4.0	4.8	1%	29%	65	2
	Lifestyle region	5	35	4.7	5.7	1%	7%	44	7
	Production zone	6	37	3.5	4.4	1%	24%	65	4
	Resource based	4	22	1.5	2.0	0%	1%	58	-25
	Rural	5	35	2.8	3.6	0%	9%	55	-10
	National weighted average	6	33	4.4	5.2	1%	100%		
	National Total	27	94	5.9	7.8	1%	100%		
	National Max								136
<b>Energy and water</b>	Core Metro	67	12	6.0	2.6	2%	34%	85	17
	Dispersed Metro	65	11	4.6	2.3	2%	12%	65	2
	Lifestyle region	54	12	4.0	1.9	3%	6%	44	-11
	Production zone	60	14	4.2	2.4	2%	14%	65	7
	Resource based	61	15	3.0	1.6	3%	8%	58	-8
	Rural	57	13	3.1	1.9	3%	27%	55	-9
	National weighted average	62	13	4.5	2.3	3%	100%		
	National Total	122	37	7.7	3.8	2%	100%		
	National Max								46
<b>Construction</b>	Core Metro	6	28	4.6	5.7	7%	30%	85	9
	Dispersed Metro	4	30	3.7	4.6	10%	25%	65	-5
	Lifestyle region	5	31	3.9	4.9	10%	8%	44	-4
	Production zone	6	33	3.9	4.8	7%	17%	65	3
	Resource based	10	24	3.5	3.9	6%	4%	58	-10
	Rural	10	29	3.7	4.3	5%	16%	55	-2
	National weighted average	6	30	4.1	5.0	8%	100%		
	National Total	7	86	3.7	6.6	7%	100%		
	National Max								109
<b>Wholesale and retail</b>	Core Metro	21	30	6.4	7.4	13%	35%	85	28
	Dispersed Metro	18	23	4.8	5.5	15%	22%	65	-2
	Lifestyle region	17	22	4.8	5.6	15%	6%	44	-9
	Production zone	23	23	4.9	5.4	12%	17%	65	1
	Resource based	21	19	4.0	4.5	9%	3%	58	-15
	Rural	24	20	4.6	5.1	11%	17%	55	-7
	National weighted average	21	25	5.3	6.1	13%	100%		
	National Total	54	64	8.3	9.3	13%	100%		
	National Max								77

Note: (a) Cumulative total in national output for each category.

**Table 13.1 Supply chain strength by state of region industries – simple average (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%) <sup>(a)</sup>	Lifetime learning commitment	Supply chain strength
<b>Accommodation and restaurants</b>	Core Metro	13	30	4.7	6.0	3%	39%	85	14
	Dispersed Metro	9	26	4.2	5.2	3%	17%	65	-4
	Lifestyle region	7	29	4.1	5.3	5%	10%	44	-9
	Production zone	12	28	4.3	5.1	2%	12%	65	0
	Resource based	10	23	3.7	4.3	3%	4%	58	-14
	Rural	14	29	4.3	5.0	2%	18%	55	0
	National weighted average	11	29	4.4	5.4	3%	100%		
	National Total	31	82	4.9	7.0	3%	100%		
	National Max		98						
<b>Transport &amp; communication</b>	Core Metro	35	23	4.8	4.1	10%	51%	85	16
	Dispersed Metro	38	20	4.0	3.5	6%	13%	65	1
	Lifestyle region	33	23	3.6	3.7	9%	5%	44	-1
	Production zone	37	20	3.3	3.1	7%	14%	65	-5
	Resource based	56	21	3.0	2.9	8%	3%	58	-4
	Rural	47	19	3.5	3.0	6%	13%	55	-8
	National weighted average	38	22	4.2	3.7	9%	100%		
	National Total	88	51	6.8	5.1	9%	100%		
	National Max		63						
<b>Finance</b>	Core Metro	48	19	8.6	7.0	5%	63%	85	22
	Dispersed Metro	62	16	6.9	5.1	2%	11%	65	-1
	Lifestyle region	65	17	7.0	5.2	2%	4%	44	-1
	Production zone	68	16	8.0	5.9	2%	11%	65	8
	Resource based	57	12	5.1	3.8	1%	2%	58	-7
	Rural	71	15	6.1	4.7	2%	10%	55	-5
	National weighted average	55	18	8.0	6.3	4%	100%		
	National Total	102	38	9.4	6.8	4%	100%		
	National Max		42						
<b>Business services</b>	Core Metro	60	30	12.2	10.8	15%	59%	85	16
	Dispersed Metro	77	27	11.1	9.2	9%	16%	65	2
	Lifestyle region	79	21	12.2	10.2	8%	4%	44	-4
	Production zone	88	22	11.5	9.4	7%	11%	65	0
	Resource based	91	20	9.5	7.9	6%	2%	58	-11
	Rural	93	21	11.2	9.1	5%	9%	55	-4
	National weighted average	70	27	11.7	10.1	12%	100%		
	National Total	145	61	13.9	10.0	11%	100%		
	National Max		73						

Note: (a) Cumulative total in national output for each category.

**Table 13.1 Supply chain strength by state of region industries – simple average (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%) <sup>(a)</sup>	Lifetime learning commitment	Supply chain strength
<b>Government and community services</b>	Core Metro	10	27	8.9	10.0	19%	44%	85	28
	Dispersed Metro	6	17	7.9	8.5	12%	16%	65	-6
	Lifestyle region	7	18	8.1	8.7	14%	5%	44	-5
	Production zone	6	20	8.0	8.7	12%	13%	65	-0
	Resource based	8	18	8.2	8.7	11%	3%	58	-0
	Rural	7	18	7.2	7.8	12%	18%	55	-8
	National weighted average	8	22	8.2	9.0	15%	100%		
	National Total	13	55	8.3	10.2	13%	100%		
	National Max								
		69							
<b>Entertainment</b>	Core Metro	18	27	8.6	9.1	6%	47%	85	28
	Dispersed Metro	15	22	6.0	6.5	5%	17%	65	-2
	Lifestyle region	15	22	6.4	6.9	5%	6%	44	-5
	Production zone	19	22	6.0	6.3	3%	12%	65	-0
	Resource based	17	19	5.5	5.7	4%	3%	58	-12
	Rural	18	20	5.7	5.9	3%	14%	55	-8
	National weighted average	17	24	7.2	7.6	5%	100%		
	National Total	40	60	8.2	9.0	5%	100%		
	National Max								
		81							

Note: (a) Cumulative total in national output for each category.

Source: NIEIR's LGA YourPlace database.

**Table 13.2 Supply chain strength by state of region industries – Agriculture**

	Regional significance 15 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT			Insignificant industry			
Brisbane City			Insignificant industry			
Central Adelaide			Insignificant industry			
East Melbourne			Insignificant industry			
Global Sydney			Insignificant industry			
Hobart & Southern TAS	No	No	↗	*	+	-
Inner Melbourne VIC			Insignificant industry			
Inner West Sydney			Insignificant industry			
Northern and Central Perth			Insignificant industry			
<b>Dispersed Metro</b>						
Central Coast NSW	No	No	↘	*	-	-
N.N. West Sydney			Insignificant industry			
North Brisbane	No	No	↗	*	+	-
Outer South West Sydney	No	No	?	-	+	-
Outer West Sydney	No	No	↗	*	+	*
Southern Adelaide	No	No	?	*	+	+
Southern Melbourne			Insignificant industry			
Southern Perth	No	No	↗	+	+	*
Southern Sydney			Insignificant industry			
West Melbourne			Insignificant industry			
Westernport VIC	No	No	↗	+	+	*
<b>Lifestyle region</b>						
Far North QLD	No	No	↘	-	-	-
Gold Coast and Hinterlands	No	No	↗	+	+	-
North Coastal NSW	No	No	↗	+	+	-
Wide-Bay Burnett QLD	No	No	?	-	*	-
<b>Production zone</b>						
Hunter NSW	No	No	↗	+	+	*
Illawarra NSW	No	No	?	*	-	*
Ipswich QLD	No	No	?	*	+	-
North Melbourne			Insignificant industry			
Northern Adelaide	No	No	↗	+	+	-
Sydney Production Region			Insignificant industry			
<b>Resource based</b>						
Darwin Top End	No	No	?	-	+	+
Gippsland VIC	No	Yes	?	*	*	*
Mackay QLD	No	No	↘	*	-	-
Pilbara – Kimberley WA	No	No	↘	-	-	-
Southern NT			Insignificant industry			
North West QLD	No	No	↘	-	-	-



**Table 13.2 Supply chain strength by state of region industries – Agriculture (continued)**

	Regional significance 15 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD	No	No	?	*	–	+
Central Western NSW	No	Yes	?	*	*	*
Darling Downs & SW QLD	Yes	Yes	?	*	–	–
Eyre and Yorke SA	Yes	Yes	↘	–	–	–
Far and North Western NSW	Yes	Yes	↘	*	–	–
Golden Region VIC	No	No	↗	+	*	+
Goulburn VIC	Yes	Yes	?	+	*	*
Loddon VIC	No	No	↗	+	*	+
Mallee – Wimmera VIC	Yes	Yes	↘	–	–	*
Mercy–Lyell TAS	No	No	?	+	*	–
Midlands and Central WA	Yes	Yes	↘	–	–	–
Murray – Murrumbidgee NSW	Yes	Yes	?	*	–	*
Murraylands SA	Yes	Yes	↘	–	–	–
Northern NSW	Yes	Yes	↘	*	–	*
Northern Tasmania	No	No	?	+	*	*
Nth QLD	No	No	↘	–	–	+
Ovens – Hume VIC	No	No	↗	+	+	+
South East NSW	No	No	↗	+	+	–
South East SA	Yes	No	?	*	*	–
South Eastern WA	No	No	↘	–	–	–
Southern WA	Yes	Yes	↘	–	–	–
Western Victoria	Yes	Yes	?	*	*	–

*Note:* ↗ = Potentially resilient; ↘ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; – = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.3 Supply chain strength by state of region industries – Mining**

	Regional significance 20 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT			Insignificant industry			
Brisbane City	No	No	↗	+	+	+
Central Adelaide	No	No	↗	+	+	+
East Melbourne			Insignificant industry			
Global Sydney			Insignificant industry			
Hobart & Southern TAS			Insignificant industry			
Inner Melbourne VIC	No	Yes	↗	+	+	+
Inner West Sydney			Insignificant industry			
Northern and Central Perth	No	No	↗	+	+	*
<b>Dispersed Metro</b>						
Central Coast NSW	No	No	↘	–	–	–
N.N. West Sydney			Insignificant industry			
North Brisbane			Insignificant industry			
Outer South West Sydney	No	No	↘	–	–	–
Outer West Sydney			Insignificant industry			
Southern Adelaide	No	No	↗	+	+	+
Southern Melbourne			Insignificant industry			
Southern Perth	No	Yes	↗	+	+	*
Southern Sydney			Insignificant industry			
West Melbourne			Insignificant industry			
Westernport VIC			Insignificant industry			
<b>Lifestyle region</b>						
Far North QLD	No	No	↘	–	–	–
Gold Coast and Hinterlands	No	No	↘	–	–	–
North Coastal NSW	No	No	?	+	*	–
Wide-Bay Burnett QLD	No	No	↘	*	–	–
<b>Production zone</b>						
Hunter NSW	No	Yes	↘	–	–	*
Illawarra NSW	No	No	↘	*	–	*
Ipswich QLD	No	No	↘	–	–	–
North Melbourne			Insignificant industry			
Northern Adelaide			Insignificant industry			
Sydney Production Region			Insignificant industry			
<b>Resource based</b>						
Darwin Top End	No	No	↗	*	+	+
Gippsland VIC	Yes	Yes	↘	–	–	*
Mackay QLD	Yes	Yes	↘	–	–	–
Pilbara – Kimberley WA	Yes	Yes	↘	–	–	–
Southern NT	No	No	?	+	–	–
North West QLD	Yes	Yes	↘	–	–	–

**Table 13.3 Supply chain strength by state of region industries – Mining (continued)**

	Regional significance 20 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD	No	Yes	⬇	–	–	+
Central Western NSW	No	Yes	⬇	–	–	*
Darling Downs & SW QLD	No	No	⬇	–	–	–
Eyre and Yorke SA	No	No	⬇	+	–	–
Far and North Western NSW	No	Yes	?	*	–	–
Golden Region VIC	No	No	↗	+	+	+
Goulburn VIC			Insignificant industry			
Loddon VIC	No	No	⬇	*	–	+
Mallee – Wimmera VIC	No	No	⬇	*	–	*
Mercy–Lyell TAS	No	No	⬇	–	–	–
Midlands and Central WA	Yes	Yes	⬇	–	–	–
Murray – Murrumbidgee NSW			Insignificant industry			
Murraylands SA			Insignificant industry			
Northern NSW	No	No	?	*	*	*
Northern Tasmania	No	No	⬇	+	–	*
Nth QLD	No	No	↗	+	–	+
Ovens – Hume VIC			Insignificant industry			
South East NSW	No	No	?	*	*	–
South East SA			Insignificant industry			
South Eastern WA	Yes	Yes	?	*	–	–
Southern WA	No	Yes	⬇	+	–	–
Western Victoria			Insignificant industry			

*Note:* ↗ = Potentially resilient; ⬇ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; – = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.4 Supply chain strength by state of region industries – Food**

	Regional significance 8 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT			Industry insignificant			
Brisbane City	No	Yes	↗	*	+	+
Central Adelaide	No	Yes	?	–	+	+
East Melbourne	No	Yes	?	–	*	+
Global Sydney	No	Yes	↗	–	+	+
Hobart & Southern TAS	No	No	↘	–	*	–
Inner Melbourne VIC	No	Yes	↗	*	+	+
Inner West Sydney	No	No	?	–	*	+
Northern and Central Perth	No	No	?	–	+	*
<b>Dispersed Metro</b>						
Central Coast NSW	No	No	↘	–	–	–
N.N. West Sydney	No	No	↘	–	*	+
North Brisbane	No	No	?	*	*	–
Outer South West Sydney	No	No	↘	–	–	*
Outer West Sydney	No	No	↘	–	–	*
Southern Adelaide	No	No	?	–	*	+
Southern Melbourne	No	No	?	–	*	+
Southern Perth	No	Yes	?	–	*	*
Southern Sydney	No	No	↘	–	–	+
West Melbourne	No	Yes	↘	–	–	+
Westernport VIC	No	Yes	?	*	*	*
<b>Lifestyle region</b>						
Far North QLD	Yes	No	?	*	*	–
Gold Coast and Hinterlands	No	No	↘	–	*	–
North Coastal NSW	Yes	Yes	?	+	+	–
Wide-Bay Burnett QLD	Yes	No	?	*	*	–
<b>Production zone</b>						
Hunter NSW	No	No	?	*	*	*
Illawarra NSW	No	No	↘	*	–	*
Ipswich QLD	Yes	No	↘	–	–	*
North Melbourne	No	No	?	–	*	+
Northern Adelaide	No	No	?	–	*	*
Sydney Production Region	No	Yes	?	*	*	*
<b>Resource based</b>						
Darwin Top End	No	No	?	–	*	+
Gippsland VIC	No	No	↗	+	*	*
Mackay QLD	Yes	No	?	*	*	–
Pilbara – Kimberley WA			Industry insignificant			
Southern NT			Industry insignificant			
North West QLD			Industry insignificant			

**Table 13.4 Supply chain strength by state of region industries – Food (continued)**

	Regional significance 8 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD	No	No	?	+	*	*
Central Western NSW	Yes	No	?	*	—	*
Darling Downs & SW QLD	Yes	No	↗	+	*	—
Eyre and Yorke SA	No	No	↘	*	—	—
Far and North Western NSW	No	No	?	+	—	—
Golden Region VIC	No	No	?	*	*	*
Goulburn VIC	Yes	Yes	↗	+	*	*
Loddon VIC	Yes	No	?	*	*	+
Mallee – Wimmera VIC	Yes	No	?	+	—	*
Mercy–Lyell TAS	Yes	No	?	+	*	—
Midlands and Central WA	No	No	?	+	—	—
Murray – Murrumbidgee NSW	Yes	Yes	↗	+	*	*
Murraylands SA	Yes	No	↘	*	—	—
Northern NSW	No	No	↗	+	*	*
Northern Tasmania	No	No	?	*	*	*
Nth QLD	Yes	No	?	*	—	+
Ovens – Hume VIC	Yes	No	?	*	*	+
South East NSW	No	No	↗	+	+	—
South East SA	Yes	No	?	+	*	—
South Eastern WA	No	No	↘	*	—	—
Southern WA	No	No	?	+	*	—
Western Victoria	Yes	No	↗	+	*	*

*Note:* ↗ = Potentially resilient; ↘ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; — = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.5 Supply chain strength by state of region industries – Textiles and clothing**

	Regional significance 2 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT			Insignificant industry			
Brisbane City	No	No	↗	–	+	+
Central Adelaide	Yes	Yes	↘	*	–	+
East Melbourne	No	Yes	↗	+	+	+
Global Sydney	No	Yes	↗	–	+	+
Hobart & Southern TAS	No	No	?	+	–	–
Inner Melbourne VIC	No	Yes	↗	*	+	+
Inner West Sydney	No	No	?	–	+	+
Northern and Central Perth	No	No	↗	–	+	*
<b>Dispersed Metro</b>						
Central Coast NSW	No	No	?	*	*	–
N.N. West Sydney	No	No	?	–	+	+
North Brisbane	No	No	?	*	*	–
Outer South West Sydney	No	No	↘	–	–	–
Outer West Sydney	No	No	↘	–	–	*
Southern Adelaide	No	No	?	–	*	+
Southern Melbourne	No	No	?	–	*	+
Southern Perth	No	No	↗	+	+	*
Southern Sydney	No	No	↘	–	–	+
West Melbourne	Yes	Yes	↗	+	+	+
Westernport VIC	No	Yes	?	–	+	*
<b>Lifestyle region</b>						
Far North QLD	No	No	↘	–	*	–
Gold Coast and Hinterlands	No	No	↗	–	+	–
North Coastal NSW	No	No	?	–	+	–
Wide-Bay Burnett QLD	No	No	↘	–	*	–
<b>Production zone</b>						
Hunter NSW	No	No	?	+	*	*
Illawarra NSW	No	No	↘	–	–	*
Ipswich QLD	No	No	↘	–	–	–
North Melbourne	Yes	Yes	↗	+	+	+
Northern Adelaide	Yes	Yes	?	+	–	–
Sydney Production Region	Yes	Yes	?	–	+	+
<b>Resource based</b>						
Darwin Top End			Insignificant industry			
Gippsland VIC	No	No	?	+	–	*
Mackay QLD			Insignificant industry			
Pilbara – Kimberley WA			Insignificant industry			
Southern NT			Insignificant industry			
North West QLD	No	No	↘	–	–	–

**Table 13.5 Supply chain strength by state of region industries – Textiles and clothing (continued)**

	Regional significance 2 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD			Insignificant industry			
Central Western NSW	No	No	↗	+	–	*
Darling Downs & SW QLD	No	No	↗	+	*	–
Eyre and Yorke SA	No	No	↘	*	–	–
Far and North Western NSW	No	No	↘	*	–	–
Golden Region VIC	Yes	Yes	↗	+	+	+
Goulburn VIC	No	No	?	+	*	*
Loddon VIC	Yes	No	↗	+	+	+
Mallee – Wimmera VIC	No	No	↗	+	*	*
Mercy–Lyell TAS	No	No	↗	+	*	–
Midlands and Central WA			Insignificant industry			
Murray – Murrumbidgee NSW	No	No	↗	+	–	*
Murraylands SA	No	No	↘	–	–	–
Northern NSW	No	No	?	+	–	*
Northern Tasmania	No	No	↗	+	*	*
Nth QLD	No	No	↘	–	*	+
Ovens – Hume VIC	Yes	No	↗	+	+	+
South East NSW	No	No	↗	+	+	–
South East SA	No	No	↘	+	–	–
South Eastern WA			Insignificant industry			
Southern WA	No	No	↘	*	–	–
Western Victoria	No	No	?	+	–	–

*Note:* ↗ = Potentially resilient; ↘ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; – = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.6 Supply chain strength by state of region industries – Wood products**

	Regional significance 1 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT	No	No	↗	–	+	+
Brisbane City	No	Yes	↗	+	+	+
Central Adelaide	No	No	↗	*	+	+
East Melbourne	No	Yes	↗	*	+	+
Global Sydney	No	No	↗	*	+	+
Hobart & Southern TAS	Yes	No	?	*	–	–
Inner Melbourne VIC	No	No	↗	*	+	+
Inner West Sydney	No	No	?	*	+	+
Northern and Central Perth	No	No	↗	*	+	*
<b>Dispersed Metro</b>						
Central Coast NSW	Yes	No	?	*	*	–
N.N. West Sydney	No	No	↗	*	+	+
North Brisbane	Yes	Yes	↗	+	+	–
Outer South West Sydney	No	No	↘	*	–	–
Outer West Sydney	Yes	Yes	↘	–	–	*
Southern Adelaide	No	No	?	*	+	+
Southern Melbourne	No	No	↗	*	+	+
Southern Perth	No	No	?	+	+	*
Southern Sydney	No	No	?	*	*	+
West Melbourne	No	No	?	+	*	+
Westernport VIC	No	Yes	?	+	+	*
<b>Lifestyle region</b>						
Far North QLD	No	No	?	+	*	–
Gold Coast and Hinterlands	No	No	↗	*	+	–
North Coastal NSW	Yes	Yes	↗	+	+	–
Wide-Bay Burnett QLD	Yes	Yes	?	*	–	–
<b>Production zone</b>						
Hunter NSW	No	Yes	?	+	*	*
Illawarra NSW	No	No	?	*	*	*
Ipswich QLD	Yes	No	↘	–	–	–
North Melbourne	No	No	?	*	*	+
Northern Adelaide	No	No	?	*	+	–
Sydney Production Region	No	Yes	?	*	+	+
<b>Resource based</b>						
Darwin Top End	No	No	?	*	*	+
Gippsland VIC	No	No	?	*	*	*
Mackay QLD	No	No	↘	*	*	–
Pilbara – Kimberley WA	Insignificant industry					
Southern NT	No	No	↘	–	–	–
North West QLD	No	No	↘	–	–	–



**Table 13.6 Supply chain strength by state of region industries – Wood products (continued)**

	Regional significance 1 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD	No	No	?	*	–	+
Central Western NSW	No	No	?	*	*	*
Darling Downs & SW QLD	No	No	?	*	*	–
Eyre and Yorke SA	No	No	⬇	*	–	–
Far and North Western NSW	No	No	?	+	–	–
Golden Region VIC	Yes	Yes	?	*	–	+
Goulburn VIC	No	No	?	*	*	*
Loddon VIC	No	No	?	*	–	+
Mallee – Wimmera VIC	No	No	?	*	–	*
Mercy–Lyell TAS	Yes	No	⬇	–	–	–
Midlands and Central WA			Insignificant industry			
Murray – Murrumbidgee NSW	Yes	Yes	⬇	*	–	*
Murraylands SA	No	No	⬇	+	–	–
Northern NSW	No	No	↗	+	+	*
Northern Tasmania	Yes	Yes	⬇	–	–	*
Nth QLD	No	No	?	*	*	+
Ovens – Hume VIC	Yes	No	?	*	–	+
South East NSW	No	No	?	+	*	–
South East SA	Yes	Yes	⬇	–	–	–
South Eastern WA			Insignificant industry			
Southern WA	Yes	Yes	⬇	*	–	–
Western Victoria	No	No	?	*	–	–

*Note:* ↗ = Potentially resilient; ⬇ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; – = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.7 Supply chain strength by state of region industries – Paper products**

	Regional significance 1 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT			Insignificant industry			
Brisbane City	No	Yes	↗	*	+	+
Central Adelaide	No	Yes	↗	–	+	+
East Melbourne	Yes	Yes	↗	–	+	+
Global Sydney	No	Yes	↗	+	+	+
Hobart & Southern TAS	Yes	Yes	?	–	–	–
Inner Melbourne VIC	No	No	↗	+	+	+
Inner West Sydney	No	No	↗	*	+	+
Northern and Central Perth	No	No	↗	+	+	*
<b>Dispersed Metro</b>						
Central Coast NSW	No	No	↘	+	–	–
N.N. West Sydney	No	No	?	+	+	+
North Brisbane	No	No	?	*	*	–
Outer South West Sydney	No	No	?	+	–	–
Outer West Sydney	No	No	↘	–	–	*
Southern Adelaide	No	No	↘	–	–	+
Southern Melbourne	No	No	↗	*	+	+
Southern Perth	No	Yes	?	+	–	*
Southern Sydney	No	No	↘	+	–	+
West Melbourne	No	No	?	+	*	+
Westernport VIC	No	Yes	?	*	*	*
<b>Lifestyle region</b>						
Far North QLD	No	No	?	+	+	–
Gold Coast and Hinterlands	No	No	?	–	+	–
North Coastal NSW	No	No	↘	*	–	–
Wide-Bay Burnett QLD	No	No	?	+	*	–
<b>Production zone</b>						
Hunter NSW			Insignificant industry			
Illawarra NSW	Yes	Yes	↘	–	–	*
Ipswich QLD	Yes	No	↘	–	–	–
North Melbourne	Yes	Yes	?	*	–	+
Northern Adelaide	No	No	?	*	+	–
Sydney Production Region	Yes	Yes	↗	*	*	+
<b>Resource based</b>						
Darwin Top End	No	No	?	*	*	+
Gippsland VIC	Yes	Yes	?	–	–	*
Mackay QLD			Insignificant industry			
Pilbara – Kimberley WA			Insignificant industry			
Southern NT			Insignificant industry			
North West QLD	No	No	↘	*	–	–

**Table 13.7 Supply chain strength by state of region industries – Paper products (continued)**

	Regional significance 1 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD	No	No	⬇	*	–	+
Central Western NSW	No	No	⬇	+	–	*
Darling Downs & SW QLD			Insignificant industry			
Eyre and Yorke SA			Insignificant industry			
Far and North Western NSW			Insignificant industry			
Golden Region VIC	No	No	⬇	+	–	+
Goulburn VIC	No	No	?	–	–	*
Loddon VIC	No	No	?	+	–	+
Mallee – Wimmera VIC	No	No	?	+	–	*
Mercy–Lyell TAS	Yes	Yes	⬇	–	–	–
Midlands and Central WA			Insignificant industry			
Murray – Murrumbidgee NSW	Yes	No	?	*	–	*
Murraylands SA	No	No	⬇	*	–	–
Northern NSW			Insignificant industry			
Northern Tasmania	No	No	⬇	–	–	*
Nth QLD	No	No	?	*	*	+
Ovens – Hume VIC	Yes	Yes	↗	–	–	+
South East NSW			Insignificant industry			
South East SA	Yes	Yes	?	–	*	–
South Eastern WA			Insignificant industry			
Southern WA			Insignificant industry			
Western Victoria			Insignificant industry			

*Note:* ↗ = Potentially resilient; ⬇ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; – = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.8 Supply chain strength by state of region industries – Printing and multi-media products**

	Regional significance 2 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT	No	No	↗	*	+	+
Brisbane City	No	Yes	↗	+	+	+
Central Adelaide	No	Yes	↗	+	+	+
East Melbourne	Yes	Yes	?	*	–	+
Global Sydney	Yes	Yes	↗	*	+	+
Hobart & Southern TAS	No	No	↗	+	+	–
Inner Melbourne VIC	Yes	Yes	↗	+	+	+
Inner West Sydney	Yes	No	?	–	–	+
Northern and Central Perth	No	Yes	↗	*	+	*
<b>Dispersed Metro</b>						
Central Coast NSW	Yes	No	↘	*	–	–
N.N. West Sydney	Yes	Yes	?	*	*	+
North Brisbane	No	No	↗	+	+	–
Outer South West Sydney	No	No	?	*	–	–
Outer West Sydney	No	No	↘	*	–	*
Southern Adelaide	No	No	?	–	+	+
Southern Melbourne	Yes	Yes	?	–	–	+
Southern Perth	No	No	↗	+	+	*
Southern Sydney	No	No	?	*	–	+
West Melbourne	No	No	?	+	–	+
Westernport VIC	No	No	?	*	–	*
<b>Lifestyle region</b>						
Far North QLD	No	No	?	*	+	–
Gold Coast and Hinterlands	No	No	?	*	+	–
North Coastal NSW	No	No	?	*	*	–
Wide-Bay Burnett QLD	No	No	↘	–	*	–
<b>Production zone</b>						
Hunter NSW	No	No	?	*	*	*
Illawarra NSW	No	No	?	+	*	*
Ipswich QLD	No	No	?	–	*	–
North Melbourne	No	Yes	?	+	–	+
Northern Adelaide	No	No	↘	*	–	–
Sydney Production Region	Yes	Yes	?	*	–	+
<b>Resource based</b>						
Darwin Top End	No	No	↗	*	+	+
Gippsland VIC	No	No	?	+	–	*
Mackay QLD	No	No	?	*	*	–
Pilbara – Kimberley WA			Insignificant industry			
Southern NT	No	No	↗	*	+	–
North West QLD	No	No	↘	–	–	–

**Table 13.8 Supply chain strength by state of region industries – Printing and multi-media products (continued)**

	Regional significance 2 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD	No	No	?	–	*	+
Central Western NSW	No	No	⬇	*	–	*
Darling Downs & SW QLD	No	No	?	–	+	–
Eyre and Yorke SA	No	No	⬇	–	–	–
Far and North Western NSW	No	No	⬇	–	–	–
Golden Region VIC	No	No	?	*	*	+
Goulburn VIC	No	No	?	+	*	*
Loddon VIC	No	No	⬇	–	–	+
Mallee – Wimmera VIC	No	No	?	+	–	*
Mercy–Lyell TAS	No	No	?	+	*	–
Midlands and Central WA	No	No	⬇	–	*	–
Murray – Murrumbidgee NSW	No	No	↗	+	*	*
Murraylands SA	No	No	⬇	–	*	–
Northern NSW	No	No	?	–	*	*
Northern Tasmania	No	No	?	*	+	*
Nth QLD	No	No	?	*	*	+
Ovens – Hume VIC	No	No	↗	+	–	+
South East NSW	No	No	?	*	*	–
South East SA	No	No	?	*	*	–
South Eastern WA	No	No	⬇	*	–	–
Southern WA	No	No	⬇	–	*	–
Western Victoria	No	No	⬇	–	*	–

*Note:* ↗ = Potentially resilient; ⬇ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; – = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.9 Supply chain strength by state of region industries – Basic chemicals**

	Regional significance 2 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT			Insignificant industry			
Brisbane City	Yes	Yes	?	–	*	+
Central Adelaide	No	No	↗	–	+	+
East Melbourne	No	Yes	↗	–	+	+
Global Sydney	No	Yes	↗	*	+	+
Hobart & Southern TAS	No	No	?	*	*	–
Inner Melbourne VIC	No	Yes	↗	+	+	+
Inner West Sydney	No	No	↗	*	*	+
Northern and Central Perth	No	No	?	*	+	*
<b>Dispersed Metro</b>						
Central Coast NSW	No	No	↘	*	–	–
N.N. West Sydney	No	No	?	–	+	+
North Brisbane	No	No	?	–	+	–
Outer South West Sydney	No	No	↘	*	–	–
Outer West Sydney	No	No	↘	–	–	*
Southern Adelaide	No	No	↗	–	+	+
Southern Melbourne	Yes	No	↗	*	+	+
Southern Perth	Yes	Yes	?	+	–	*
Southern Sydney	Yes	Yes	↘	–	–	+
West Melbourne	Yes	Yes	↗	+	*	+
Westernport VIC	Yes	Yes	↗	*	+	*
<b>Lifestyle region</b>						
Far North QLD	No	No	?	–	+	–
Gold Coast and Hinterlands	No	No	?	*	+	–
North Coastal NSW	No	No	↘	–	–	–
Wide-Bay Burnett QLD	No	No	?	*	+	–
<b>Production zone</b>						
Hunter NSW	No	No	↗	+	+	*
Illawarra NSW	No	No	?	*	*	*
Ipswich QLD	No	No	?	*	*	–
North Melbourne	No	No	↗	*	+	+
Northern Adelaide	No	No	↗	*	+	–
Sydney Production Region	Yes	Yes	↘	–	–	+
<b>Resource based</b>						
Darwin Top End	No	No	↗	+	*	+
Gippsland VIC	No	No	↗	+	–	*
Mackay QLD	No	No	?	+	–	–
Pilbara – Kimberley WA	No	No	?	+	–	–
Southern NT	No	No	?	+	–	–
North West QLD			Insignificant industry			

**Table 13.9 Supply chain strength by state of region industries – Basic chemicals (continued)**

	Regional significance 2 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD	No	No	↗	+	+	+
Central Western NSW	No	No	↗	+	-	*
Darling Downs & SW QLD	No	No	?	+	-	-
Eyre and Yorke SA	No	No	?	*	+	-
Far and North Western NSW	No	No	↘	-	-	-
Golden Region VIC	Yes	Yes	↘	-	-	+
Goulburn VIC	No	No	↘	-	-	*
Loddon VIC	No	No	↘	-	-	+
Mallee – Wimmera VIC	No	No	↘	*	-	*
Mercy–Lyell TAS	No	No	↘	-	-	-
Midlands and Central WA	No	No	↘	-	-	-
Murray – Murrumbidgee NSW	No	No	↘	-	-	*
Murraylands SA	No	No	↘	-	-	-
Northern NSW	No	No	?	+	-	*
Northern Tasmania	No	No	?	*	-	*
Nth QLD	No	No	?	+	-	+
Ovens – Hume VIC	No	No	?	*	*	+
South East NSW	No	No	↘	-	-	-
South East SA	No	No	↘	-	-	-
South Eastern WA	No	No	↘	*	-	-
Southern WA	Yes	No	?	+	-	-
Western Victoria	No	No	?	-	+	-

*Note:* ↗ = Potentially resilient; ↘ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; - = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.10 Supply chain strength by state of region industries – High value chemicals**

	Regional significance 3 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT			Insignificant industry			
Brisbane City	No	Yes	↗	+	+	+
Central Adelaide	No	No	↗	*	+	+
East Melbourne	Yes	Yes	↗	+	+	+
Global Sydney	No	Yes	↗	+	+	+
Hobart & Southern TAS	No	No	↘	*	–	–
Inner Melbourne VIC	No	Yes	↗	+	+	+
Inner West Sydney	No	No	↗	+	+	+
Northern and Central Perth	No	No	↗	*	+	*
<b>Dispersed Metro</b>						
Central Coast NSW	No	No	↘	–	–	–
N.N. West Sydney	Yes	Yes	↗	*	+	+
North Brisbane	No	No	↘	*	*	–
Outer South West Sydney	Yes	No	↘	*	–	–
Outer West Sydney	No	No	?	*	–	*
Southern Adelaide	No	No	?	–	+	+
Southern Melbourne	Yes	Yes	↗	+	+	+
Southern Perth	No	Yes	↗	+	+	*
Southern Sydney	Yes	Yes	↗	+	+	+
West Melbourne	Yes	Yes	↗	+	*	+
Westernport VIC	Yes	Yes	↗	+	+	*
<b>Lifestyle region</b>						
Far North QLD	No	No	↘	–	–	–
Gold Coast and Hinterlands	No	No	?	–	+	–
North Coastal NSW	No	No	↘	–	*	–
Wide-Bay Burnett QLD	No	No	↘	–	–	–
<b>Production zone</b>						
Hunter NSW	No	No	?	+	–	*
Illawarra NSW	No	No	?	*	*	*
Ipswich QLD	Yes	No	↘	–	–	–
North Melbourne	Yes	Yes	↗	+	*	+
Northern Adelaide	No	No	↗	+	+	–
Sydney Production Region	Yes	Yes	↗	+	+	+
<b>Resource based</b>						
Darwin Top End	No	No	↘	–	–	+
Gippsland VIC	No	No	↘	*	–	*
Mackay QLD	No	No	↘	*	–	–
Pilbara – Kimberley WA			Insignificant industry			
Southern NT			Insignificant industry			
North West QLD	No	No	↘	–	–	–



**Table 13.10 Supply chain strength by state of region industries – High value chemicals (continued)**

	Regional significance 3 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD	No	No	⬇	*	–	+
Central Western NSW	No	No	⬇	–	–	*
Darling Downs & SW QLD	No	No	↗	–	+	–
Eyre and Yorke SA			Insignificant industry			
Far and North Western NSW	No	No	⬇	–	–	–
Golden Region VIC	No	No	?	*	–	+
Goulburn VIC	No	No	⬇	–	–	*
Loddon VIC	No	No	↗	*	+	+
Mallee – Wimmera VIC	No	No	⬇	*	–	*
Mercy–Lyell TAS	No	No	⬇	*	–	–
Midlands and Central WA	No	No	⬇	–	–	–
Murray – Murrumbidgee NSW	No	No	?	*	–	*
Murraylands SA	No	No	⬇	–	–	–
Northern NSW	No	No	⬇	–	–	*
Northern Tasmania	No	No	↗	*	+	*
Nth QLD	No	No	?	*	*	+
Ovens – Hume VIC	No	No	?	*	–	+
South East NSW	No	No	⬇	–	–	–
South East SA	No	No	⬇	–	–	–
South Eastern WA	No	No	⬇	–	–	–
Southern WA	No	No	⬇	*	*	–
Western Victoria	No	No	↗	*	+	–

*Note:* ↗ = Potentially resilient; ⬇ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; – = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.11 Supply chain strength by state of region industries – Non-metallic minerals**

	Regional significance 2 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT	No	No	?	*	*	+
Brisbane City	No	Yes	↗	*	+	+
Central Adelaide	No	No	↗	*	+	+
East Melbourne	No	Yes	↗	*	+	+
Global Sydney	No	No	↗	–	+	+
Hobart & Southern TAS	No	No	↘	–	*	–
Inner Melbourne VIC	No	No	↗	*	+	+
Inner West Sydney	No	No	?	–	*	+
Northern and Central Perth	No	Yes	↗	*	+	*
<b>Dispersed Metro</b>						
Central Coast NSW	No	No	?	*	*	–
N.N. West Sydney	No	No	?	–	+	+
North Brisbane	Yes	No	?	*	*	–
Outer South West Sydney	Yes	No	?	*	+	–
Outer West Sydney	Yes	Yes	↘	–	–	*
Southern Adelaide	No	No	↗	–	+	+
Southern Melbourne	No	No	↗	–	+	+
Southern Perth	Yes	Yes	↗	*	+	*
Southern Sydney	No	No	↘	–	*	+
West Melbourne	No	Yes	?	–	*	+
Westernport VIC	Yes	Yes	↗	–	+	*
<b>Lifestyle region</b>						
Far North QLD	No	No	?	+	*	–
Gold Coast and Hinterlands	No	No	↗	+	+	–
North Coastal NSW	No	No	?	*	+	–
Wide-Bay Burnett QLD	No	No	?	*	*	–
<b>Production zone</b>						
Hunter NSW	No	Yes	?	+	*	*
Illawarra NSW	No	No	?	*	–	*
Ipswich QLD	Yes	No	↘	–	–	–
North Melbourne	No	Yes	?	*	+	+
Northern Adelaide	Yes	Yes	↘	–	–	–
Sydney Production Region	No	Yes	?	*	+	+
<b>Resource based</b>						
Darwin Top End	No	No	?	*	–	+
Gippsland VIC	No	No	?	+	–	*
Mackay QLD	No	No	↘	*	–	–
Pilbara – Kimberley WA	No	No	↘	+	–	–
Southern NT	No	No	↘	+	–	–
North West QLD	No	No	↘	–	–	–

**Table 13.11 Supply chain strength by state of region industries – Non-metallic minerals (continued)**

	Regional significance 2 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD	No	No	?	*	–	+
Central Western NSW	No	No	?	+	*	*
Darling Downs & SW QLD	No	No	?	+	*	–
Eyre and Yorke SA	No	No	⬇	+	–	–
Far and North Western NSW	No	No	⬇	+	–	–
Golden Region VIC	No	No	↗	*	+	+
Goulburn VIC	No	No	⬇	*	–	*
Loddon VIC	No	No	?	*	*	+
Mallee – Wimmera VIC	No	No	⬇	*	–	*
Mercy–Lyell TAS	Yes	No	⬇	*	–	–
Midlands and Central WA	No	No	⬇	*	–	–
Murray – Murrumbidgee NSW	No	No	?	*	–	*
Murraylands SA	No	No	⬇	*	–	–
Northern NSW	No	No	?	*	–	*
Northern Tasmania	No	No	?	*	*	*
Nth QLD	No	No	?	+	*	+
Ovens – Hume VIC	No	No	?	*	–	+
South East NSW	No	No	?	*	*	–
South East SA	No	No	⬇	+	–	–
South Eastern WA	No	No	⬇	+	–	–
Southern WA	No	No	?	+	*	–
Western Victoria	No	No	⬇	*	–	–

*Note:* ↗ = Potentially resilient; ⬇ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; – = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.12 Supply chain strength by state of region industries – Basic and fabricated metals**

	Regional significance 8 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT			Insignificant industry			
Brisbane City	No	Yes	↗	+	+	+
Central Adelaide	No	No	↗	*	+	+
East Melbourne	No	Yes	↗	*	+	+
Global Sydney	No	No	↗	*	+	+
Hobart & Southern TAS	No	No	↘	–	–	–
Inner Melbourne VIC	No	No	↗	*	+	+
Inner West Sydney	No	No	?	*	+	+
Northern and Central Perth	No	No	↗	*	+	*
<b>Dispersed Metro</b>						
Central Coast NSW	No	No	?	*	+	–
N.N. West Sydney	No	No	↗	–	+	+
North Brisbane	No	No	?	*	+	–
Outer South West Sydney	No	No	↘	–	–	–
Outer West Sydney	Yes	No	↘	–	–	*
Southern Adelaide	No	No	↗	–	+	+
Southern Melbourne	No	No	↗	+	+	+
Southern Perth	Yes	Yes	?	+	–	*
Southern Sydney	No	No	?	–	+	+
West Melbourne	No	No	?	+	*	+
Westernport VIC	Yes	Yes	↗	+	*	*
<b>Lifestyle region</b>						
Far North QLD	No	No	↗	+	+	–
Gold Coast and Hinterlands	No	No	↗	*	+	–
North Coastal NSW	No	No	↗	*	+	–
Wide-Bay Burnett QLD	No	No	?	+	*	–
<b>Production zone</b>						
Hunter NSW	Yes	Yes	?	+	–	*
Illawarra NSW	Yes	Yes	?	+	–	*
Ipswich QLD	No	No	?	*	*	–
North Melbourne	No	Yes	?	*	*	+
Northern Adelaide	No	No	?	*	*	–
Sydney Production Region	No	Yes	↗	+	+	+
<b>Resource based</b>						
Darwin Top End	No	No	?	+	–	+
Gippsland VIC	No	No	?	*	–	*
Mackay QLD	No	No	?	*	–	–
Pilbara – Kimberley WA	No	No	↘	–	*	–
Southern NT	No	No	↘	–	–	–
North West QLD	Yes	No	↘	*	–	–

**Table 13.12 Supply chain strength by state of region industries – Basic and fabricated metals (continued)**

	Regional significance 8 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD	Yes	Yes	⬇	–	–	+
Central Western NSW	No	No	?	+	*	*
Darling Downs & SW QLD	No	No	?	–	+	–
Eyre and Yorke SA	Yes	Yes	?	+	–	–
Far and North Western NSW	No	No	⬇	*	–	–
Golden Region VIC	Yes	Yes	?	*	–	+
Goulburn VIC	No	No	?	+	*	*
Loddon VIC	No	No	?	*	+	+
Mallee – Wimmera VIC	No	No	?	*	*	*
Mercy–Lyell TAS	No	No	⬇	–	–	–
Midlands and Central WA	No	No	?	*	*	–
Murray – Murrumbidgee NSW	No	No	↗	*	+	*
Murraylands SA	No	No	⬇	–	–	–
Northern NSW	No	No	?	*	+	*
Northern Tasmania	Yes	No	⬇	–	–	*
Nth QLD	Yes	Yes	?	+	–	+
Ovens – Hume VIC	No	No	?	–	*	+
South East NSW	No	No	?	*	+	–
South East SA	No	No	⬇	–	–	–
South Eastern WA	No	No	⬇	+	–	–
Southern WA	Yes	Yes	⬇	+	–	–
Western Victoria	Yes	No	⬇	–	–	–

*Note:* ↗ = Potentially resilient; ⬇ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; – = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.13 Supply chain strength by state of region industries – Transport and other machinery**

	Regional significance 8 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT	No	No	↗	–	+	+
Brisbane City	No	Yes	↗	+	+	+
Central Adelaide	Yes	Yes	↗	+	*	+
East Melbourne	Yes	Yes	↗	+	+	+
Global Sydney	No	Yes	↗	*	+	+
Hobart & Southern TAS	No	No	?	–	*	–
Inner Melbourne VIC	No	Yes	↗	+	+	+
Inner West Sydney	No	No	↗	*	+	+
Northern and Central Perth	No	No	↗	–	+	*
<b>Dispersed Metro</b>						
Central Coast NSW	No	No	?	–	+	–
N.N. West Sydney	No	No	↗	*	+	+
North Brisbane	No	No	?	–	+	–
Outer South West Sydney	No	No	?	+	–	–
Outer West Sydney	No	No	?	–	*	*
Southern Adelaide	Yes	Yes	↗	+	–	+
Southern Melbourne	Yes	Yes	↗	+	+	+
Southern Perth	No	No	↗	*	+	*
Southern Sydney	No	No	?	*	*	+
West Melbourne	Yes	Yes	↗	+	–	+
Westernport VIC	Yes	Yes	↗	+	*	*
<b>Lifestyle region</b>						
Far North QLD	No	No	↗	*	+	–
Gold Coast and Hinterlands	No	No	?	–	+	–
North Coastal NSW	No	No	?	–	+	–
Wide–Bay Burnett QLD	No	No	?	*	*	–
<b>Production zone</b>						
Hunter NSW	No	No	↗	+	*	*
Illawarra NSW	No	No	?	+	–	*
Ipswich QLD	No	No	?	+	–	–
North Melbourne	Yes	Yes	↗	+	–	+
Northern Adelaide	Yes	Yes	?	+	–	–
Sydney Production Region	No	Yes	↗	+	+	+
<b>Resource based</b>						
Darwin Top End	No	No	↗	–	+	+
Gippsland VIC	No	No	↘	–	–	*
Mackay QLD	No	No	↘	–	–	–
Pilbara – Kimberley WA	No	No	?	–	+	–
Southern NT	No	No	↘	–	–	–
North West QLD	No	No	↘	–	–	–

**Table 13.13 Supply chain strength by state of region industries – Transport and other machinery (continued)**

	Regional significance 8 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD	No	No	↗	+	*	+
Central Western NSW	No	No	↘	–	–	*
Darling Downs & SW QLD	No	No	↘	–	*	–
Eyre and Yorke SA	No	No	↘	+	–	–
Far and North Western NSW	No	No	↘	–	–	–
Golden Region VIC	Yes	Yes	↗	+	–	+
Goulburn VIC	No	No	↘	*	–	*
Loddon VIC	No	No	?	*	+	+
Mallee – Wimmera VIC	No	No	↘	–	–	*
Mercy–Lyell TAS	No	No	↘	–	–	–
Midlands and Central WA	No	No	↘	–	*	–
Murray – Murrumbidgee NSW	No	No	?	–	*	*
Murraylands SA	No	No	↘	–	–	–
Northern NSW	No	No	↘	–	–	*
Northern Tasmania	No	No	↗	+	+	*
Nth QLD	No	No	↗	+	*	+
Ovens – Hume VIC	No	No	?	+	*	+
South East NSW	No	No	↘	–	*	–
South East SA	No	No	↘	–	–	–
South Eastern WA	No	No	↘	–	–	–
Southern WA	No	No	↘	–	*	–
Western Victoria	No	No	↘	–	–	–

*Note:* ↗ = Potentially resilient; ↘ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; – = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.14 Supply chain strength by state of region industries – Other manufacturing**

	Regional significance 1 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT	No	No	?	–	+	+
Brisbane City	No	Yes	↗	+	+	+
Central Adelaide	No	Yes	↗	*	+	+
East Melbourne	Yes	Yes	↗	*	+	+
Global Sydney	No	Yes	↗	–	+	+
Hobart & Southern TAS	No	No	?	*	+	–
Inner Melbourne VIC	No	Yes	↗	*	+	+
Inner West Sydney	No	No	?	–	+	+
Northern and Central Perth	No	Yes	↗	–	+	*
<b>Dispersed Metro</b>						
Central Coast NSW	No	No	?	*	+	–
N.N. West Sydney	No	Yes	?	–	+	+
North Brisbane	Yes	No	?	*	+	–
Outer South West Sydney	Yes	No	↘	*	–	–
Outer West Sydney	Yes	No	?	*	*	*
Southern Adelaide	Yes	No	↗	–	+	+
Southern Melbourne	Yes	Yes	↗	*	+	+
Southern Perth	No	Yes	↗	+	+	*
Southern Sydney	Yes	Yes	↘	–	*	+
West Melbourne	No	Yes	?	*	*	+
Westernport VIC	Yes	Yes	↗	+	+	*
<b>Lifestyle region</b>						
Far North QLD	No	No	?	*	+	–
Gold Coast and Hinterlands	Yes	Yes	?	*	+	–
North Coastal NSW	No	No	↗	+	+	–
Wide–Bay Burnett QLD	No	No	?	+	*	–
<b>Production zone</b>						
Hunter NSW	No	No	↗	+	*	*
Illawarra NSW	No	No	?	*	–	*
Ipswich QLD	Yes	No	?	*	–	–
North Melbourne	Yes	Yes	?	*	*	+
Northern Adelaide	Yes	Yes	?	*	–	–
Sydney Production Region	Yes	Yes	↗	+	+	+
<b>Resource based</b>						
Darwin Top End	No	No	?	–	–	+
Gippsland VIC	No	No	?	+	–	*
Mackay QLD	No	No	↘	–	–	–
Pilbara – Kimberley WA			Insignificant industry			
Southern NT	No	No	↘	–	–	–
North West QLD	No	No	↘	–	–	–



**Table 13.14 Supply chain strength by state of region industries – Other manufacturing (continued)**

	Regional significance 1 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD	No	No	?	*	*	+
Central Western NSW	No	No	?	+	-	*
Darling Downs & SW QLD	No	No	?	*	+	-
Eyre and Yorke SA	No	No	⬇	+	-	-
Far and North Western NSW	No	No	⬇	*	-	-
Golden Region VIC	No	No	↗	+	*	+
Goulburn VIC	No	No	?	+	*	*
Loddon VIC	No	No	?	*	*	+
Mallee – Wimmera VIC	No	No	⬇	*	-	*
Mercy–Lyell TAS	No	No	⬇	*	-	-
Midlands and Central WA	No	No	⬇	-	-	-
Murray – Murrumbidgee NSW	No	No	?	+	*	*
Murraylands SA	No	No	⬇	-	-	-
Northern NSW	No	No	?	+	-	*
Northern Tasmania	No	No	↗	+	+	*
Nth QLD	No	No	?	*	-	+
Ovens – Hume VIC	No	No	?	+	-	+
South East NSW	No	No	?	+	+	-
South East SA	No	No	⬇	*	-	-
South Eastern WA	No	No	⬇	-	-	-
Southern WA	No	No	?	*	*	-
Western Victoria	No	No	⬇	*	-	-

*Note:* ↗ = Potentially resilient; ⬇ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; - = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.15 Supply chain strength by state of region industries – Energy and water**

	Regional significance 3 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT	No	No	?	*	+	+
Brisbane City	No	Yes	↗	+	+	+
Central Adelaide	No	Yes	↗	+	+	+
East Melbourne	No	Yes	↗	*	+	+
Global Sydney	No	Yes	↗	+	+	+
Hobart & Southern TAS	Yes	No	↘	–	–	–
Inner Melbourne VIC	No	Yes	↗	+	+	+
Inner West Sydney	No	No	↗	*	+	+
Northern and Central Perth	No	Yes	↗	*	+	*
<b>Dispersed Metro</b>						
Central Coast NSW	Yes	No	?	–	*	–
N.N. West Sydney	No	No	?	*	+	+
North Brisbane	No	No	↘	–	*	–
Outer South West Sydney	No	No	?	+	*	–
Outer West Sydney	No	No	?	*	*	*
Southern Adelaide	No	No	?	–	+	+
Southern Melbourne	No	No	↗	+	+	+
Southern Perth	No	No	?	+	+	*
Southern Sydney	No	No	?	*	*	+
West Melbourne	No	No	?	+	*	+
Westernport VIC	No	No	?	*	*	*
<b>Lifestyle region</b>						
Far North QLD	No	No	↘	*	*	–
Gold Coast and Hinterlands	No	No	?	*	+	–
North Coastal NSW	No	No	↘	–	*	–
Wide–Bay Burnett QLD	Yes	No	↘	–	–	–
<b>Production zone</b>						
Hunter NSW	Yes	Yes	↗	*	–	*
Illawarra NSW	No	No	↗	+	*	*
Ipswich QLD	Yes	No	?	–	–	–
North Melbourne	No	No	?	*	*	+
Northern Adelaide	No	No	↗	*	+	–
Sydney Production Region	No	Yes	↗	+	+	+
<b>Resource based</b>						
Darwin Top End	No	No	↗	+	+	+
Gippsland VIC	Yes	Yes	?	–	–	*
Mackay QLD	No	No	?	+	–	–
Pilbara – Kimberley WA	No	No	↘	+	–	–
Southern NT	Yes	No	?	*	–	–
North West QLD	No	No	↘	*	–	–

**Table 13.15 Supply chain strength by state of region industries – Energy and water (continued)**

	Regional significance 3 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD	Yes	Yes	?	–	–	+
Central Western NSW	Yes	No	?	–	–	*
Darling Downs & SW QLD	No	No	?	*	–	–
Eyre and Yorke SA	No	No	?	+	*	–
Far and North Western NSW	No	No	?	*	*	–
Golden Region VIC	No	No	?	*	–	+
Goulburn VIC	Yes	No	↘	–	–	*
Loddon VIC	Yes	No	↘	–	–	+
Mallee – Wimmera VIC	Yes	No	↘	–	–	*
Mercy–Lyell TAS	Yes	No	↘	–	–	–
Midlands and Central WA	No	No	↘	*	–	–
Murray – Murrumbidgee NSW	Yes	No	?	–	*	*
Murraylands SA	No	No	?	*	+	–
Northern NSW	No	No	?	*	*	*
Northern Tasmania	No	No	↘	*	–	*
Nth QLD	Yes	No	?	*	–	+
Ovens – Hume VIC	Yes	No	↘	–	–	+
South East NSW	Yes	No	?	–	*	–
South East SA	No	No	↘	*	*	–
South Eastern WA	No	No	↘	+	–	–
Southern WA	Yes	No	?	*	–	–
Western Victoria	No	No	↘	+	–	–

*Note:* ↗ = Potentially resilient; ↘ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; – = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.16 Supply chain strength by state of region industries – Construction**

	Regional significance 9 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT	No	No	?	–	*	+
Brisbane City	No	Yes	↗	+	+	+
Central Adelaide	No	Yes	?	*	*	+
East Melbourne	No	Yes	↗	*	+	+
Global Sydney	No	Yes	↗	–	+	+
Hobart & Southern TAS	No	No	?	–	+	–
Inner Melbourne VIC	No	Yes	↗	*	+	+
Inner West Sydney	No	No	?	–	*	+
Northern and Central Perth	Yes	Yes	?	*	*	*
<b>Dispersed Metro</b>						
Central Coast NSW	Yes	No	↘	*	–	–
N.N. West Sydney	Yes	Yes	?	–	*	+
North Brisbane	Yes	Yes	?	*	*	–
Outer South West Sydney	Yes	No	?	*	–	–
Outer West Sydney	Yes	No	?	*	–	*
Southern Adelaide	No	No	↘	–	–	+
Southern Melbourne	No	No	?	*	+	+
Southern Perth	No	Yes	?	+	*	*
Southern Sydney	Yes	No	?	–	*	+
West Melbourne	No	No	?	*	+	+
Westernport VIC	No	Yes	?	+	*	*
<b>Lifestyle region</b>						
Far North QLD	No	No	↘	*	*	–
Gold Coast and Hinterlands	Yes	Yes	?	*	+	–
North Coastal NSW	Yes	No	?	+	*	–
Wide–Bay Burnett QLD	No	No	?	+	*	–
<b>Production zone</b>						
Hunter NSW	No	Yes	?	+	*	*
Illawarra NSW	No	No	?	*	–	*
Ipswich QLD	No	No	↗	+	*	–
North Melbourne	No	Yes	?	*	+	+
Northern Adelaide	No	No	?	*	*	–
Sydney Production Region	No	Yes	↗	+	+	+
<b>Resource based</b>						
Darwin Top End	Yes	No	?	*	–	+
Gippsland VIC	No	No	?	*	*	*
Mackay QLD	No	No	↘	–	–	–
Pilbara – Kimberley WA	No	No	↘	–	–	–
Southern NT	Yes	No	↘	*	–	–
North West QLD	No	No	?	–	–	–

**Table 13.16 Supply chain strength by state of region industries – Construction (continued)**

	Regional significance 9 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD	No	No	?	*	*	+
Central Western NSW	No	No	?	*	*	*
Darling Downs & SW QLD	No	No	?	*	*	–
Eyre and Yorke SA	No	No	↘	–	–	–
Far and North Western NSW	No	No	?	*	*	–
Golden Region VIC	No	No	?	+	*	+
Goulburn VIC	No	No	↗	+	*	*
Loddon VIC	No	No	?	*	*	+
Mallee – Wimmera VIC	No	No	?	*	*	*
Mercy–Lyell TAS	No	No	?	*	*	–
Midlands and Central WA	No	No	↘	–	–	–
Murray – Murrumbidgee NSW	No	No	↗	+	*	*
Murraylands SA	No	No	↘	–	–	–
Northern NSW	No	No	?	+	*	*
Northern Tasmania	No	No	?	*	*	*
Nth QLD	No	No	↗	*	*	+
Ovens – Hume VIC	No	No	↗	+	+	+
South East NSW	No	No	?	+	*	–
South East SA	No	No	↘	*	–	–
South Eastern WA	No	No	↘	–	–	–
Southern WA	No	No	↘	*	–	–
Western Victoria	No	No	?	+	*	–

*Note:* ↗ = Potentially resilient; ↘ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; – = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.17 Supply chain strength by state of region industries – Wholesale and retail**

	Regional significance 16 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT	No	No	↗	*	+	+
Brisbane City	No	Yes	↗	+	+	+
Central Adelaide	No	No	↗	+	+	+
East Melbourne	Yes	Yes	↗	+	+	+
Global Sydney	No	Yes	↗	+	+	+
Hobart & Southern TAS	No	No	?	*	*	–
Inner Melbourne VIC	No	Yes	↗	+	+	+
Inner West Sydney	Yes	No	↗	+	+	+
Northern and Central Perth	No	Yes	↗	+	+	*
<b>Dispersed Metro</b>						
Central Coast NSW	Yes	No	↘	–	*	–
N.N. West Sydney	Yes	Yes	?	*	*	+
North Brisbane	Yes	No	?	–	*	–
Outer South West Sydney	No	No	↘	–	–	–
Outer West Sydney	No	No	↘	–	–	*
Southern Adelaide	No	No	?	–	+	+
Southern Melbourne	Yes	No	↗	+	+	+
Southern Perth	Yes	Yes	?	*	*	*
Southern Sydney	Yes	No	?	*	*	+
West Melbourne	No	No	?	+	*	+
Westernport VIC	No	Yes	?	*	*	*
<b>Lifestyle region</b>						
Far North QLD	No	No	↘	*	*	–
Gold Coast and Hinterlands	Yes	Yes	?	–	*	–
North Coastal NSW	No	No	?	*	*	–
Wide–Bay Burnett QLD	No	No	↘	–	*	–
<b>Production zone</b>						
Hunter NSW	No	Yes	?	*	–	*
Illawarra NSW	No	No	?	*	–	*
Ipswich QLD	No	No	↘	–	–	–
North Melbourne	No	Yes	↗	+	*	+
Northern Adelaide	No	No	↗	*	+	–
Sydney Production Region	Yes	Yes	↗	+	*	+
<b>Resource based</b>						
Darwin Top End	No	No	?	*	–	+
Gippsland VIC	No	No	?	*	*	*
Mackay QLD	No	No	↘	*	–	–
Pilbara – Kimberley WA	No	No	↘	–	–	–
Southern NT	No	No	?	*	–	–
North West QLD	No	No	↘	–	–	–

**Table 13.17 Supply chain strength by state of region industries – Wholesale and retail (continued)**

	Regional significance 16 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD	No	No	?	*	–	+
Central Western NSW	No	No	⬇	*	–	*
Darling Downs & SW QLD	No	No	?	–	*	–
Eyre and Yorke SA	No	No	⬇	–	*	–
Far and North Western NSW	No	No	⬇	*	–	–
Golden Region VIC	No	No	?	+	*	+
Goulburn VIC	No	No	?	*	*	*
Loddon VIC	No	No	?	*	*	+
Mallee – Wimmera VIC	No	No	?	*	*	*
Mercy–Lyell TAS	No	No	⬇	*	–	–
Midlands and Central WA	No	No	⬇	*	–	–
Murray – Murrumbidgee NSW	No	No	?	*	*	*
Murraylands SA	No	No	?	*	*	–
Northern NSW	No	No	?	*	*	*
Northern Tasmania	No	No	?	*	*	*
Nth QLD	No	No	?	*	–	+
Ovens – Hume VIC	No	No	?	+	*	+
South East NSW	No	No	?	*	*	–
South East SA	No	No	?	*	+	–
South Eastern WA	No	No	⬇	–	–	–
Southern WA	No	No	⬇	*	–	–
Western Victoria	No	No	?	*	–	–

*Note:* ⬆ = Potentially resilient; ⬇ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; – = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.18 Supply chain strength by state of region industries – Accommodation and restaurants**

	Regional significance 3 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT	No	No	?	–	+	+
Brisbane City	No	Yes	↗	+	*	+
Central Adelaide	No	Yes	↗	+	+	+
East Melbourne	No	No	↗	*	+	+
Global Sydney	No	Yes	↗	+	*	+
Hobart & Southern TAS	Yes	No	?	*	*	–
Inner Melbourne VIC	No	Yes	↗	+	+	+
Inner West Sydney	No	No	?	*	*	+
Northern and Central Perth	No	Yes	↗	+	+	*
<b>Dispersed Metro</b>						
Central Coast NSW	Yes	No	↘	*	–	–
N.N. West Sydney	No	Yes	?	–	–	+
North Brisbane	Yes	No	?	*	+	–
Outer South West Sydney	No	No	↘	–	–	–
Outer West Sydney	Yes	No	↘	–	–	*
Southern Adelaide	No	No	?	–	+	+
Southern Melbourne	No	No	↗	*	+	+
Southern Perth	No	No	↗	+	+	*
Southern Sydney	No	No	↘	–	–	+
West Melbourne	No	No	↗	*	+	+
Westernport VIC	No	No	?	*	*	*
<b>Lifestyle region</b>						
Far North QLD	Yes	No	↘	*	*	–
Gold Coast and Hinterlands	Yes	Yes	?	–	+	–
North Coastal NSW	Yes	Yes	?	*	*	–
Wide–Bay Burnett QLD	No	No	↘	*	*	–
<b>Production zone</b>						
Hunter NSW	No	Yes	?	*	–	*
Illawarra NSW	Yes	No	↘	*	–	*
Ipswich QLD	No	No	↘	–	–	–
North Melbourne	No	No	↗	*	+	+
Northern Adelaide	No	No	?	*	+	–
Sydney Production Region	No	Yes	?	+	*	+
<b>Resource based</b>						
Darwin Top End	Yes	No	?	*	–	+
Gippsland VIC	No	No	?	*	+	*
Mackay QLD	Yes	No	↘	*	–	–
Pilbara – Kimberley WA	No	No	↘	–	–	–
Southern NT	Yes	No	↘	–	–	–
North West QLD	No	No	↘	–	–	–



**Table 13.18 Supply chain strength by state of region industries – Accommodation and restaurants (continued)**

	Regional significance 3 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD	No	No	?	*	–	+
Central Western NSW	No	No	?	*	–	*
Darling Downs & SW QLD	No	No	?	*	*	–
Eyre and Yorke SA	No	No	↘	–	*	–
Far and North Western NSW	No	No	↘	*	–	–
Golden Region VIC	No	No	?	+	*	+
Goulburn VIC	No	No	↗	+	+	*
Loddon VIC	No	No	?	+	*	+
Mallee – Wimmera VIC	No	No	↗	+	+	*
Mercy–Lyell TAS	No	No	↘	*	–	–
Midlands and Central WA	No	No	?	*	*	–
Murray – Murrumbidgee NSW	No	No	?	+	–	*
Murraylands SA	No	No	?	*	+	–
Northern NSW	No	No	?	*	–	*
Northern Tasmania	No	No	?	*	–	*
Nth QLD	No	No	?	*	–	+
Ovens – Hume VIC	No	No	↗	+	+	+
South East NSW	Yes	No	?	+	*	–
South East SA	No	No	?	*	+	–
South Eastern WA	No	No	?	*	–	–
Southern WA	No	No	?	*	*	–
Western Victoria	No	No	?	*	*	–

*Note:* ↗ = Potentially resilient; ↘ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; – = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.19 Supply chain strength by state of region industries – Transport and communications**

	Regional significance 10 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT	No	No	↗	*	+	+
Brisbane City	Yes	Yes	↗	*	*	+
Central Adelaide	Yes	Yes	?	–	*	+
East Melbourne	No	Yes	↗	*	+	+
Global Sydney	Yes	Yes	↗	*	+	+
Hobart & Southern TAS	No	No	?	*	+	–
Inner Melbourne VIC	Yes	Yes	↗	+	+	+
Inner West Sydney	Yes	No	↗	–	+	+
Northern and Central Perth	No	Yes	↗	*	+	*
<b>Dispersed Metro</b>						
Central Coast NSW	No	No	↘	–	*	–
N.N. West Sydney	No	No	↗	*	+	+
North Brisbane	No	No	?	*	+	–
Outer South West Sydney	No	No	↘	–	*	–
Outer West Sydney	No	No	?	*	*	*
Southern Adelaide	No	No	?	–	*	+
Southern Melbourne	No	No	↗	*	+	+
Southern Perth	No	Yes	?	*	–	*
Southern Sydney	No	No	?	*	*	+
West Melbourne	No	No	?	*	–	+
Westernport VIC	No	No	?	*	+	*
<b>Lifestyle region</b>						
Far North QLD	Yes	No	?	*	*	–
Gold Coast and Hinterlands	No	No	?	*	+	–
North Coastal NSW	No	No	?	*	+	–
Wide–Bay Burnett QLD	No	No	↘	*	–	–
<b>Production zone</b>						
Hunter NSW	No	No	?	*	*	*
Illawarra NSW	No	No	?	*	*	*
Ipswich QLD	No	No	↘	–	–	–
North Melbourne	Yes	Yes	↘	–	–	+
Northern Adelaide	Yes	No	↘	–	–	–
Sydney Production Region	No	Yes	↗	*	+	+
<b>Resource based</b>						
Darwin Top End	No	No	↗	+	*	+
Gippsland VIC	No	No	?	+	*	*
Mackay QLD	Yes	No	↘	–	–	–
Pilbara – Kimberley WA	No	No	↘	–	–	–
Southern NT	Yes	No	?	–	*	–
North West QLD	No	No	↘	–	–	–

**Table 13.19 Supply chain strength by state of region industries – Transport and communications (continued)**

	Regional significance 10 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD	No	No	?	–	–	+
Central Western NSW	No	No	?	*	*	*
Darling Downs & SW QLD	No	No	⬇	*	*	–
Eyre and Yorke SA	No	No	⬇	–	–	–
Far and North Western NSW	No	No	⬇	*	–	–
Golden Region VIC	No	No	↗	+	*	+
Goulburn VIC	No	No	?	+	*	*
Loddon VIC	No	No	?	*	*	+
Mallee – Wimmera VIC	No	No	?	*	–	*
Mercy–Lyell TAS	No	No	?	*	*	–
Midlands and Central WA	No	No	⬇	*	–	–
Murray – Murrumbidgee NSW	No	No	?	+	*	*
Murraylands SA	No	No	⬇	*	–	–
Northern NSW	No	No	?	*	*	*
Northern Tasmania	No	No	?	*	*	*
Nth QLD	No	No	?	*	–	+
Ovens – Hume VIC	No	No	?	+	*	+
South East NSW	No	No	?	*	+	–
South East SA	No	No	⬇	–	–	–
South Eastern WA	No	No	⬇	*	–	–
Southern WA	No	No	⬇	+	–	–
Western Victoria	No	No	?	+	–	–

*Note:* ↗ = Potentially resilient; ⬇ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; – = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.20 Supply chain strength by state of region industries – Finance**

	Regional significance 5 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT	No	No	?	–	+	+
Brisbane City	No	Yes	↗	*	+	+
Central Adelaide	No	No	↗	*	+	+
East Melbourne	No	Yes	?	*	*	+
Global Sydney	Yes	Yes	↗	–	+	+
Hobart & Southern TAS	No	No	?	–	*	–
Inner Melbourne VIC	Yes	Yes	↗	–	+	+
Inner West Sydney	No	No	?	–	*	+
Northern and Central Perth	No	Yes	↗	*	+	*
<b>Dispersed Metro</b>						
Central Coast NSW	No	No	↘	*	–	–
N.N. West Sydney	No	No	?	*	*	+
North Brisbane	No	No	?	*	+	–
Outer South West Sydney	No	No	↘	*	–	–
Outer West Sydney	No	No	↘	–	–	*
Southern Adelaide	No	No	↗	*	+	+
Southern Melbourne	No	No	?	*	–	+
Southern Perth	No	No	↗	+	+	*
Southern Sydney	Yes	No	?	–	*	+
West Melbourne	No	No	?	*	–	+
Westernport VIC	No	No	↘	–	–	*
<b>Lifestyle region</b>						
Far North QLD	No	No	?	+	*	–
Gold Coast and Hinterlands	No	No	↗	*	+	–
North Coastal NSW	No	No	?	*	–	–
Wide–Bay Burnett QLD	No	No	↘	*	*	–
<b>Production zone</b>						
Hunter NSW	No	No	?	*	–	*
Illawarra NSW	No	No	?	*	–	*
Ipswich QLD	No	No	?	*	+	–
North Melbourne	No	No	?	*	–	+
Northern Adelaide	No	No	↗	+	+	–
Sydney Production Region	No	Yes	?	*	–	+
<b>Resource based</b>						
Darwin Top End	No	No	↗	*	+	+
Gippsland VIC	No	No	↘	–	–	*
Mackay QLD	No	No	?	+	*	–
Pilbara – Kimberley WA	Insignificant industry					
Southern NT	No	No	?	*	–	–
North West QLD	No	No	↘	–	–	–

**Table 13.20 Supply chain strength by state of region industries – Finance (continued)**

	Regional significance 5 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD	No	No	?	+	*	+
Central Western NSW	No	No	⬇	*	–	*
Darling Downs & SW QLD	No	No	?	+	+	–
Eyre and Yorke SA	No	No	↗	*	+	–
Far and North Western NSW	No	No	⬇	*	–	–
Golden Region VIC	No	No	?	*	–	+
Goulburn VIC	No	No	?	*	–	*
Loddon VIC	No	No	⬇	*	–	+
Mallee – Wimmera VIC	No	No	⬇	*	–	*
Mercy–Lyell TAS	No	No	?	+	–	–
Midlands and Central WA	No	No	⬇	+	*	–
Murray – Murrumbidgee NSW	No	No	?	*	–	*
Murraylands SA	No	No	?	+	+	–
Northern NSW	No	No	?	*	–	*
Northern Tasmania	No	No	?	*	–	*
Nth QLD	No	No	?	+	*	+
Ovens – Hume VIC	No	No	?	*	–	+
South East NSW	No	No	?	*	–	–
South East SA	No	No	↗	+	+	–
South Eastern WA	No	No	⬇	+	–	–
Southern WA	No	No	?	+	*	–
Western Victoria	No	No	⬇	*	–	–

*Note:* ↗ = Potentially resilient; ⬇ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; – = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.21 Supply chain strength by state of region industries – Business services**

	Regional significance 14 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT	No	No	↗	–	+	+
Brisbane City	No	Yes	↗	*	+	+
Central Adelaide	No	Yes	↗	*	+	+
East Melbourne	Yes	Yes	?	–	*	+
Global Sydney	Yes	Yes	↗	–	*	+
Hobart & Southern TAS	No	No	↗	*	+	–
Inner Melbourne VIC	Yes	Yes	↗	–	*	+
Inner West Sydney	Yes	No	?	–	–	+
Northern and Central Perth	Yes	Yes	↗	*	+	*
<b>Dispersed Metro</b>						
Central Coast NSW	No	No	↘	*	–	–
N.N. West Sydney	Yes	Yes	?	–	–	+
North Brisbane	No	No	?	–	+	–
Outer South West Sydney	No	No	↘	–	–	–
Outer West Sydney	No	No	?	*	–	*
Southern Adelaide	No	No	↗	*	+	+
Southern Melbourne	No	No	?	*	*	+
Southern Perth	No	Yes	?	*	*	*
Southern Sydney	No	No	↗	+	–	+
West Melbourne	No	No	?	*	*	+
Westernport VIC	No	No	?	*	*	*
<b>Lifestyle region</b>						
Far North QLD	No	No	?	*	+	–
Gold Coast and Hinterlands	No	No	?	–	+	–
North Coastal NSW	No	No	?	*	*	–
Wide–Bay Burnett QLD	No	No	↘	*	*	–
<b>Production zone</b>						
Hunter NSW	No	No	?	*	–	*
Illawarra NSW	No	No	?	*	–	*
Ipswich QLD	No	No	?	*	+	–
North Melbourne	No	No	?	*	*	+
Northern Adelaide	No	No	↗	*	+	–
Sydney Production Region	No	Yes	?	*	*	+
<b>Resource based</b>						
Darwin Top End	No	No	?	*	*	+
Gippsland VIC	No	No	?	*	*	*
Mackay QLD	No	No	?	*	*	–
Pilbara – Kimberley WA	No	No	↘	*	–	–
Southern NT	No	No	?	*	*	–
North West QLD	No	No	↘	*	–	–

**Table 13.21 Supply chain strength by state of region industries – Business services (continued)**

	Regional significance 14 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD	No	No	?	*	*	+
Central Western NSW	No	No	?	*	–	*
Darling Downs & SW QLD	No	No	?	*	+	–
Eyre and Yorke SA	No	No	↘	–	*	–
Far and North Western NSW	No	No	↘	*	–	–
Golden Region VIC	No	No	?	*	*	+
Goulburn VIC	No	No	?	*	*	*
Loddon VIC	No	No	?	*	–	+
Mallee – Wimmera VIC	No	No	?	*	*	*
Mercy–Lyell TAS	No	No	?	*	*	–
Midlands and Central WA	No	No	↘	*	*	–
Murray – Murrumbidgee NSW	No	No	?	*	*	*
Murraylands SA	No	No	↘	*	*	–
Northern NSW	No	No	?	*	*	*
Northern Tasmania	No	No	↗	*	+	*
Nth QLD	No	No	?	+	+	+
Ovens – Hume VIC	No	No	?	*	*	+
South East NSW	No	No	?	*	*	–
South East SA	No	No	?	*	+	–
South Eastern WA	No	No	↘	*	–	–
Southern WA	No	No	↘	*	*	–
Western Victoria	No	No	?	*	*	–

*Note:* ↗ = Potentially resilient; ↘ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; – = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.22 Supply chain strength by state of region industries – Government and community services**

	Regional significance 18 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT	Yes	Yes	↗	+	*	+
Brisbane City	No	Yes	↗	+	+	+
Central Adelaide	No	Yes	↗	+	+	+
East Melbourne	No	Yes	?	*	*	+
Global Sydney	No	Yes	↗	+	+	+
Hobart & Southern TAS	Yes	No	↗	+	*	–
Inner Melbourne VIC	No	Yes	↗	+	+	+
Inner West Sydney	No	No	↗	*	+	+
Northern and Central Perth	No	Yes	↗	+	+	*
<b>Dispersed Metro</b>						
Central Coast NSW	No	No	↘	–	*	–
N.N. West Sydney	No	No	?	–	+	+
North Brisbane	No	No	↘	–	*	–
Outer South West Sydney	No	No	↘	–	*	–
Outer West Sydney	Yes	No	?	*	–	*
Southern Adelaide	No	No	↘	–	+	+
Southern Melbourne	No	No	?	*	*	+
Southern Perth	No	No	?	*	*	*
Southern Sydney	No	No	?	*	*	+
West Melbourne	No	No	?	+	*	+
Westernport VIC	No	No	?	*	–	*
<b>Lifestyle region</b>						
Far North QLD	No	No	?	+	*	–
Gold Coast and Hinterlands	No	No	?	–	+	–
North Coastal NSW	No	No	?	*	*	–
Wide-Bay Burnett QLD	No	No	↘	–	*	–
<b>Production zone</b>						
Hunter NSW	No	Yes	?	+	*	*
Illawarra NSW	No	No	?	*	*	*
Ipswich QLD	Yes	No	↘	–	*	–
North Melbourne	No	No	?	–	*	+
Northern Adelaide	No	No	?	–	+	–
Sydney Production Region	No	Yes	↗	+	*	+
<b>Resource based</b>						
Darwin Top End	Yes	No	↗	+	+	+
Gippsland VIC	No	No	?	*	–	*
Mackay QLD	No	No	?	*	*	–
Pilbara – Kimberley WA	No	No	↘	–	*	–
Southern NT	Yes	No	?	*	+	–
North West QLD	No	No	?	–	*	–



**Table 13.22 Supply chain strength by state of region industries – Government and community services (continued)**

	Regional significance 18 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD	No	No	?	*	*	+
Central Western NSW	No	No	?	*	–	*
Darling Downs & SW QLD	No	No	?	*	*	–
Eyre and Yorke SA	No	No	⬇	–	*	–
Far and North Western NSW	No	No	?	*	–	–
Golden Region VIC	No	No	?	*	–	+
Goulburn VIC	No	No	⬇	*	–	*
Loddon VIC	No	No	?	–	–	+
Mallee – Wimmera VIC	No	No	⬇	*	–	*
Mercy–Lyell TAS	No	No	⬇	–	*	–
Midlands and Central WA	No	No	⬇	–	*	–
Murray – Murrumbidgee NSW	No	No	?	+	*	*
Murraylands SA	No	No	⬇	–	*	–
Northern NSW	No	No	?	*	*	*
Northern Tasmania	No	No	⬇	–	*	*
Nth QLD	No	No	?	+	–	+
Ovens – Hume VIC	Yes	No	?	+	–	+
South East NSW	Yes	No	↗	+	*	–
South East SA	No	No	⬇	–	*	–
South Eastern WA	No	No	⬇	–	*	–
Southern WA	No	No	⬇	–	*	–
Western Victoria	No	No	⬇	–	–	–

*Note:* ↗ = Potentially resilient; ⬇ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; – = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.23 Supply chain strength by state of region industries – Entertainment**

	Regional significance 6 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Core Metro</b>						
ACT	Yes	Yes	↗	–	+	+
Brisbane City	No	Yes	↗	+	+	+
Central Adelaide	Yes	Yes	↗	+	+	+
East Melbourne	No	Yes	↗	+	+	+
Global Sydney	Yes	Yes	↗	+	+	+
Hobart & Southern TAS	No	No	↗	*	+	–
Inner Melbourne VIC	Yes	Yes	↗	+	+	+
Inner West Sydney	Yes	No	↗	+	+	+
Northern and Central Perth	Yes	Yes	↗	+	+	*
<b>Dispersed Metro</b>						
Central Coast NSW	No	No	↘	*	–	–
N.N. West Sydney	No	Yes	↗	*	+	+
North Brisbane	No	No	?	*	+	–
Outer South West Sydney	No	No	↘	–	–	–
Outer West Sydney	No	No	↘	–	–	*
Southern Adelaide	No	No	↘	–	*	+
Southern Melbourne	No	No	↗	+	+	+
Southern Perth	No	Yes	?	*	*	*
Southern Sydney	Yes	No	?	*	–	+
West Melbourne	No	No	?	+	–	+
Westernport VIC	No	No	?	*	–	*
<b>Lifestyle region</b>						
Far North QLD	No	No	?	*	*	–
Gold Coast and Hinterlands	Yes	Yes	?	*	*	–
North Coastal NSW	No	No	?	*	*	–
Wide–Bay Burnett QLD	No	No	?	–	*	–
<b>Production zone</b>						
Hunter NSW	No	No	?	*	*	*
Illawarra NSW	No	No	?	*	*	*
Ipswich QLD	No	No	↘	–	–	–
North Melbourne	No	No	?	*	*	+
Northern Adelaide	No	No	?	*	*	–
Sydney Production Region	No	Yes	↗	+	*	+
<b>Resource based</b>						
Darwin Top End	Yes	No	?	*	*	+
Gippsland VIC	No	No	↘	*	–	*
Mackay QLD	No	No	?	*	*	–
Pilbara – Kimberley WA	No	No	↘	–	–	–
Southern NT	Yes	No	?	*	–	–
North West QLD	No	No	↘	–	–	–

**Table 13.23 Supply chain strength by state of region industries – Entertainment (continued)**

	Regional significance 6 per cent	National significance 3 per cent	Resilience	Linkage strength	Skill strength	Lifetime learning strength
<b>Rural</b>						
Central QLD	No	No	?	*	*	+
Central Western NSW	No	No	⬇	*	–	*
Darling Downs & SW QLD	No	No	?	*	*	–
Eyre and Yorke SA	No	No	⬇	–	–	–
Far and North Western NSW	No	No	⬇	–	–	–
Golden Region VIC	No	No	?	+	–	+
Goulburn VIC	No	No	?	*	–	*
Loddon VIC	No	No	?	*	–	+
Mallee – Wimmera VIC	No	No	?	*	–	*
Mercy–Lyell TAS	No	No	?	*	*	–
Midlands and Central WA	No	No	⬇	–	–	–
Murray – Murrumbidgee NSW	No	No	?	+	*	*
Murraylands SA	No	No	⬇	–	–	–
Northern NSW	No	No	?	*	*	*
Northern Tasmania	No	No	↗	*	+	*
Nth QLD	No	No	?	*	–	+
Ovens – Hume VIC	No	No	?	+	–	+
South East NSW	No	No	?	*	*	–
South East SA	No	No	⬇	–	–	–
South Eastern WA	No	No	⬇	–	–	–
Southern WA	No	No	⬇	–	–	–
Western Victoria	No	No	⬇	*	–	–

*Note:* ↗ = Potentially resilient; ⬇ = Vulnerable; ? = Warning of possible future problems or potential to rebuild;  
\* = Near average; – = Significantly below average; + = significantly above average.

*Source:* NIEIR's LGA YourPlace database.

**Table 13.24 Average supply chain strength by industry and regional group**

	Core Metro	Dispersed Metro	Lifestyle Region	Production Zone	Resource Based	Rural
Food	6	-12	-6	-12	-4	2
Textiles and clothing	17	-2	-5	-9	-8	1
Wood products	20	2	7	-0	-17	-7
Paper products	26	-3	-9	-3	-8	-5
Printing & multi-media products	19	-2	-2	-2	-1	-6
Basic chemicals	23	10	-7	14	6	-16
High value chemicals	31	8	-21	5	-20	-12
Non-metallic minerals	24	9	3	-6	-18	-8
Basic and fabricated metals	20	5	12	5	-16	-9
Transport and machinery	24	8	2	12	-25	-15
Other manufacturing	27	2	7	4	-25	-10
Energy and water	17	2	-11	7	-8	-9
Construction	9	-5	-4	3	-10	-2
Wholesale and retail trade	28	-2	-9	1	-15	-7
Accommodation and restaurants	14	-4	-9	0	-14	0
Transport and communication	16	1	-1	-5	-4	-8
Finance	22	-1	-1	8	-7	-5
Business services	16	2	-4	0	-11	-4
Government and community services	28	-6	-5	0	0	-8
Entertainment	28	-2	-5	0	-12	-8

Source: NIEIR's LGA YourPlace database.

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## Appendix A13. The measurement of the indicators for supply chain strength

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The indicator values given in Tables A13.1 to A13.22 are derived from:

- (i) estimation of input-output tables for each region;
- (ii) estimation of industry by occupation matrix for each region; and
- (iii) the YourPlace database.

In order to explain the tables the food industry (Table A13.3) will be used as the example. Every other table is identical in data and concepts.

### A13.1 The estimation of input-output tables

The input-output tables are estimated using the new YourPlace module YourPlace-IO. YourPlace-IO uses the YourPlace data estimates for each LGA for:

- private consumption expenditure for 400 categories;
- construction expenditure;
- equipment expenditure;
- government consumption expenditure; and
- industry output,

to estimate final demands for the 106 industries in the national input-output tables prepared by the Australian Bureau of Statistics (ABS). The ABS tables have 107 industries. However, data limitations forced aggregation of two: the agriculture and livestock industries.

YourPlace-IO estimates:

- (i) exports by 106 industries; and
- (ii) imports by 106 industries,

and then calculates input-output relationships based on the indirect allocation of imports by the ABS methodology.

To measure the strength of the supply chain, however, the indirect allocation tables have to be converted to tables based on the direct allocation of imports into the LGA. Such tables show the inter-relationships between industries operating within each LGA boundary or, in the case of the SOR regions, industries operating within each SOR boundary.

Such tables are estimated from:

- (i) the LGA/SOR indirect import allocation tables; and
- (ii) the national direct import allocation tables,

by RAS estimation techniques. The RAS technique is the technique used by the ABS to estimate the national input-output tables. To distinguish these tables from the LGA/SOR technological tables, these will be designated the IO-DM input-output tables.

## A13.2 Forward and backward capture

Within a region one measure of the backward linkage strength is the Type I multiplier. The Type I multipliers are derived by calculating:

$$(I - A)^{-1}$$

and summing the columns. It is the 106 \* 106 matrix with  $I$  on the diagonal and zeros elsewhere. The  $A$  matrix is the 106 \* 106 IO-DM matrix of inter-industry flows within the LGA/SOR converted to a coefficient matrix by dividing the elements in each column by the total LGA/SOR output for the industry represented by the column. The  $-I$  sign represents the inverse of the matrix.

Again, to aid explanation, a specific example will be used. This will be the meat industry. Suppose for an LGA/SOR it is found for the meat industry in the  $(I - A)^{-1}$  that the column sum is 1.41. This means that for each \$1 million of demand for the meat industry in an LGA/SOR that \$0.41 million of additional output is generated by other industries in the LGA/SOR. Thus the backward linkage capture is 41 per cent. The increase in the output of other industries will represent the supply from the:

- agriculture;
- business services;
- energy;
- transport; and
- other manufacturing,

industries into the next industry to enable the meat industry to function.

The more the meat industry sources its supplies of goods and services from outside the region, the smaller will be the Type I multiplier and hence the lower the backward capture.

The forward capture is calculated the same way with the exception that:

- (i) the coefficient matrix is derived by dividing each row by the total industry output for the industry of the row; and
- (ii) the Type I forward linkage multiplier is the sum of the inverse of the matrix.

A forward multiplier of 1.25 for the meat industry means that if all industries to which the meat industry sells output to increases by \$million (including the meat industry), then the output of the meat industry will increase by \$1.25 million. This means that the forward capture of the meat industry from LGA/SOR industry activity in non-meat industries is \$0.21 million, or a forward capture rate of 21 per cent.

The less the meat industry sells to other industries in the LGA/SOR, the lower will be the perceived capture ratio. Typically the forward capture ratio is less than the backward linkage capture ratio. This is because, in general, industries will sell a large proportion of output to households, or for exports, compared to inter-industry sales. The greater the sales of exports from the region, the less will be the forward linkage ratio. What is important here, however, is that the data for the industry is the same across the LGA/SORs. It is the variation not the level of forward capture ratio for the same industry across the region that is important for maximising the supply chain strength.

For this report the 106 industries were aggregated into 22 industries. Thus, the meat industry is included in the food industry (Table A13.3). The forward and enhanced capture ratios are weight average if the forward and backward capture ratios for all industries is the food sector in the input-output tables.

From Table A13.3, the simple average of backward capture for the food industries in the Core Metro group is 33 per cent. The simple average for the Rural SOR regions is 53 per cent. The reason why the rural regions have a larger multiplier for the food industry group is because they source products from the local agricultural industry. Core Metro regions do not possess significant agricultural industries.

Some regions have high backward linkage ratios. The Western Victorian rural region has a backward linkage capture of 70 per cent, while not far behind is Gippsland which has a backward linkage capture of 68 per cent. At the other end of the scale is Ipswich which has a backward linkage capture ratio of 9 per cent. This means that the food industry in Ipswich sources most of its goods and services production requirement from outside the industry.

The forward capture ratio for the food industry is low compared to the backward capture ratio, reflecting the fact that food products for most regions are exported from the region rather than sold to other industries within the region. Nevertheless, Western Victoria and Midlands and Central WA have forward capture ratios of 27 per cent.

The national total backward or forward ratio is the estimate derived from the national ABS tables, with direct allocation of imports. The national ratios are greater than the regional ratios because regions trade with one another within the national boundaries. The national backward capture ratio is 123 per cent for food products. If an LGA/SOR did source from other regions and, therefore, duplicated the national sourcing structure within its own boundaries, then its backward capture ratio would be around 123 per cent.

The national maximum ratio for food industries is 144 per cent. This is derived from the national tables with indirect allocation of imports. It therefore represents what the national food backward capture ratio would be if there was no international sourcing of goods and services into the food industry.

The use of the national maximum backward linkage ratio is not presented to suggest that Australia's competitiveness would be enhanced by autarky. It would not, as total sourcing from Australian regions would be uncompetitive as Australian regions cannot supply the food industry's total requirements at world best practice competitiveness. Rather what the national actual and national maximum ratios should be used for is to indicate the additional competitiveness generated by large foreign regions with a good integrated food industry supply chain. It therefore represents a hurdle over which Australian regions have to offset.

### **A13.3 Skill labour input**

The skill input is derived by estimating the occupational structure for each of the 106 input-output industries in each LGA/SOR region. This is done by taking the state, city, country three-digit ANZSIC industry by four-digit ASCO occupational tables supplied by the ABS and using the RAS procedure to estimate the occupational structure for each LGA/SOR region.

The skilled labour input into each of the 106 input-output industries in each region is obtained by assigning to each four-digit ASCO occupation the following category designation.

The first step in determining the level of skilled labour input is to classify each occupation into the following categories:

1.	Symbolic analysts	(0.8)
2.	In person service workers	(0.0)
3.	Routine process workers	(0.2)
4.	Global knowledge workers	(0.9)
5.	Low skilled clerical	(-0.1)

The numbers in parenthesis indicate the weight assigned to each category in terms of skill level.

The next step is to divide symbolic analysts and global knowledge workers into low and high skill. If the symbolic analyst is considered high skill, an additional 0.4 is added to the weight. The same is true for global knowledge workers. Global knowledge workers include scientists, engineers, technical managers, etc.

The total skill and labour input by occupation is then summed to obtain the total. The total is then divided by total industry output for the region to give skilled labour per \$ million of output.

The backward skills input is derived by multiplying the column elements of the  $(I - A)$  inverse by the corresponding industry skilled labour input per \$ million of output and summing the result. Thus, from Table A13.3 for the food industry, the weighted average result for Western Victoria for the backward skills input is 2.5.

What the 2.5 means is as follows. For Western Victoria in Table A13.3, the total backward linkage multiplier is 1.70. This means that for every \$1 million of output generated by the food industry in Western Victoria, \$0.58 million comes from the food industry and \$0.42 million from the output of industries which supply the food industry. From this combined regional total of \$1 million, 2.5 skilled labour input is sourced from the region.

In terms of backward linkage skilled labour input, Inner Melbourne has the highest skilled labour input per \$ million of output. South Eastern WA has the lowest skill labour input of 1.2.

The forward linkage ratio is calculated in a similar manner with the exception that the row result for the  $(I - A^f)$  incursion is used.

## **A13.4 Industry structure**

The industry share in regional output is self-explanatory as is the industry share of the region in total national output. Thus, the food industry in the ACT make sup 5 per cent of total ACT gross output across all industries, while the food industry in the ACT makes up 6 per cent of total national food industry output.

From Table A13.3, 25 per cent of national food industry output comes from Core Metro regions, while 32 per cent of national food industry output comes from rural industries.

At the SOR regional level, the average share of food industry output is 7 per cent.



### **A13.5 Life-time learning**

The life-time learning indicator given in the table represents the YourPlace LGA indicator aggregated into SOR regions. The indicator measures the per cent of people over 18 year of age undertaking post-school education.

### **A13.6 Supply chain strength**

The index of supply chain strength is calculated by forming an index for the forward capture, backward capture, forward skills, backward skills and life-time learning commitment by deriving a simple average for all regions. The indexes are then weighted by:

- (i) 0.1 each for forward capture and forward skills;
- (ii) 0.3 each for backward capture and backward skills; and
- (iii) 0.15 each for life-time learning.

The result is then multiplied by 100 and 100 then subtracted. The resulting supply chain strength index for Inner Melbourne is relatively high at 27. This is the result of high skill input and high life-time learning. In general there is little trend across the regional categories, reflecting the low simple average for each group, with the exception being for the Dispersed Metro category which registers low regional supply chain strengths. Thus, for the rural regional group, Darling Downs and South West Queensland have an index value of 17, while Eyre and York has a value of -17. The uniformity in outcomes for regional segments reflects offsetting factors. That is, the higher backward linkages for the rural regions offsets the high skill content and life-time learning commitment for Core Metro regions.

The reason for the Dispersed Metro's low regional strength reflects the absence of high forward and backward linkages and moderate commitment to life-time learning.

**Table A13.1 Supply chain strength by state of region industries – Agriculture**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT				Industry insignificant				
Core Metro	Brisbane City				Industry insignificant				
Core Metro	Central Adelaide				Industry insignificant				
Core Metro	East Melbourne				Industry insignificant				
Core Metro	Global Sydney				Industry insignificant				
Core Metro	Hobart and Southern Tasmania	40	24	5.0	5.1	4%	1%	53	24
Core Metro	Inner Melbourne VIC				Industry insignificant				
Core Metro	Inner West Sydney				Industry insignificant				
Core Metro	Northern and Central Perth				Industry insignificant				
<b>Core Metro</b>	<b>Simple average*</b>	<b>4.5</b>	<b>2.7</b>	<b>0.6</b>	<b>0.6</b>	<b>0%</b>	<b>1%</b>	<b>84.8</b>	<b>2.6</b>
Dispersed Metro	Central Coast NSW	32	28	2.4	2.7	2%	0%	38	-11
Dispersed Metro	N.N. West Sydney				Industry insignificant				
Dispersed Metro	North Brisbane	40	24	4.3	4.4	4%	1%	46	12
Dispersed Metro	Outer South West Sydney	23	25	3.3	3.7	3%	1%	54	-2
Dispersed Metro	Outer West Sydney	36	22	4.2	4.3	1%	0%	65	11
Dispersed Metro	Southern Adelaide	46	19	3.6	3.7	3%	1%	71	6
Dispersed Metro	Southern Melbourne				Industry insignificant				
Dispersed Metro	Southern Perth	48	33	4.5	4.4	1%	1%	67	32
Dispersed Metro	Southern Sydney				Industry insignificant				
Dispersed Metro	West Melbourne				Industry insignificant				
Dispersed Metro	Westernport VIC	49	29	3.5	3.6	3%	2%	59	13
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>24.8</b>	<b>16.4</b>	<b>2.4</b>	<b>2.4</b>	<b>2%</b>	<b>6%</b>	<b>64.5</b>	<b>6.3</b>
Lifestyle region	Far North QLD	32	20	2.7	2.8	10%	2%	37	-19
Lifestyle region	Gold Coast and Hinterlands	51	24	3.9	3.8	2%	1%	52	10
Lifestyle region	North Coastal NSW	54	27	4.7	4.6	6%	2%	50	25
Lifestyle region	Wide-Bay Burnett QLD	30	22	3.3	3.5	12%	2%	38	-7
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>41.8</b>	<b>23.3</b>	<b>3.7</b>	<b>3.7</b>	<b>7%</b>	<b>8%</b>	<b>44.3</b>	<b>2.2</b>
Production zone	Hunter NSW	56	28	4.2	4.1	2%	1%	63	23
Production zone	Illawarra NSW	40	21	2.7	2.8	1%	0%	66	-8
Production zone	Ipswich QLD	47	19	3.7	3.7	5%	1%	54	2
Production zone	North Melbourne				Industry insignificant				
Production zone	Northern Adelaide	71	22	3.9	3.4	2%	1%	56	11
Production zone	Sydney Production Region				Industry insignificant				
<b>Production zone</b>	<b>Simple average*</b>	<b>35.6</b>	<b>14.9</b>	<b>2.4</b>	<b>2.3</b>	<b>2%</b>	<b>3%</b>	<b>64.7</b>	<b>4.7</b>

Note: \* Simple average row is cumulative total.

**Table A13.1 Supply chain strength by state of region industries – Agriculture (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End	30	21	4.2	4.0	1%	0%	78	8
Resource based	Gippsland VIC	30	25	2.7	3.0	10%	3%	65	-5
Resource based	Mackay QLD	42	21	2.3	2.3	7%	2%	51	-17
Resource based	Pilbara - Kimberley WA	12	18	2.3	2.5	1%	0%	57	-27
Resource based	Southern NT				Industry insignificant				
Resource based	North West QLD	6	12	1.3	1.5	7%	1%	25	-57
<b>Resource based</b>	<b>Simple average*</b>	<b>19.9</b>	<b>16.2</b>	<b>2.1</b>	<b>2.2</b>	<b>4%</b>	<b>6%</b>	<b>58.0</b>	<b>-16.6</b>
Rural	Central QLD	37	26	2.5	2.9	7%	2%	69	-2
Rural	Central Western NSW	39	25	3.2	3.3	11%	3%	65	3
Rural	Darling Downs & SW QLD	35	28	2.4	2.7	22%	6%	52	-6
Rural	Eyre and Yorke SA	11	20	1.8	2.3	21%	5%	36	-35
Rural	Far and North Western NSW	23	27	2.1	2.4	20%	3%	53	-15
Rural	Golden Region VIC	51	30	3.2	3.3	5%	2%	71	15
Rural	Goulburn VIC	51	27	3.0	3.2	16%	4%	57	5
Rural	Loddon VIC	51	30	3.1	3.1	7%	1%	73	13
Rural	Mallee - Wimmera VIC	15	23	1.9	2.3	30%	6%	57	-24
Rural	Mercy-Lyell TAS	61	24	3.2	3.1	8%	1%	41	2
Rural	Midlands and Central WA	10	22	1.4	1.9	37%	7%	30	-39
Rural	Murray - Murrumbidgee NSW	32	25	2.5	2.8	19%	7%	68	-6
Rural	Murraylands SA	24	21	1.9	2.2	31%	3%	27	-31
Rural	Northern NSW	23	29	1.9	2.3	29%	6%	60	-13
Rural	Northern Tasmania	44	26	3.4	3.5	7%	1%	60	7
Rural	Nth QLD	35	20	2.1	2.2	7%	2%	73	-17
Rural	Ovens - Hume VIC	65	26	4.2	3.9	6%	1%	88	27
Rural	South East NSW	36	29	4.0	4.3	9%	2%	46	15
Rural	South East SA	38	23	2.8	3.1	21%	2%	47	-8
Rural	South Eastern WA	16	21	1.7	2.0	5%	1%	39	-34
Rural	Southern WA	22	26	2.1	2.6	17%	6%	34	-20
Rural	Western Victoria	32	29	2.7	3.1	21%	3%	56	-1
<b>Rural</b>	<b>Simple average*</b>	<b>34.2</b>	<b>25.3</b>	<b>2.6</b>	<b>2.8</b>	<b>16%</b>	<b>72%</b>	<b>55</b>	<b>-7.5</b>
<b>National weighted average</b>		<b>32</b>	<b>23</b>	<b>2.6</b>	<b>2.7</b>	<b>13%</b>	<b>100%</b>		
<b>National Total</b>		<b>98</b>	<b>70</b>	<b>4.8</b>	<b>5.0</b>	<b>4%</b>	<b>100%</b>		
<b>National Max</b>			89						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

**Table A13.2 Supply chain strength by state of region industries – Mining**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT							95	0
Core Metro	Brisbane City	39	62	3.3	7.8	1%	1%	97	132
Core Metro	Central Adelaide	79	41	6.2	7.3	0%	0%	86	128
Core Metro	East Melbourne				Industry insignificant				
Core Metro	Global Sydney				Industry insignificant				
Core Metro	Hobart and Southern Tasmania				Industry insignificant				
Core Metro	Inner Melbourne VIC	70	30	3.7	3.6	2%	3%	98	53
Core Metro	Inner West Sydney				Industry insignificant				
Core Metro	Northern and Central Perth	36	53	8.8	11.4	2%	1%	66	191
<b>Core Metro</b>	<b>Simple average*</b>	<b>24.9</b>	<b>20.7</b>	<b>2.5</b>	<b>3.4</b>	<b>1%</b>	<b>5%</b>	<b>84.8</b>	<b>55.9</b>
Dispersed Metro	Central Coast NSW	20	11	1.7	1.6	5%	1%	38	-41
Dispersed Metro	N.N. West Sydney				Industry insignificant				
Dispersed Metro	North Brisbane				Industry insignificant				
Dispersed Metro	Outer South West Sydney	11	10	1.4	1.5	10%	2%	54	-44
Dispersed Metro	Outer West Sydney				Industry insignificant				
Dispersed Metro	Southern Adelaide	79	20	4.5	3.4	0%	0%	71	41
Dispersed Metro	Southern Melbourne				Industry insignificant				
Dispersed Metro	Southern Perth	64	47	2.0	4.4	5%	3%	67	65
Dispersed Metro	Southern Sydney				Industry insignificant				
Dispersed Metro	West Melbourne				Industry insignificant				
Dispersed Metro	Westernport VIC				Industry insignificant				
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>15.8</b>	<b>8.0</b>	<b>0.9</b>	<b>1.0</b>	<b>2%</b>	<b>6%</b>	<b>64.5</b>	<b>2.4</b>
Lifestyle region	Far North QLD	13	20	1.3	1.8	8%	2%	37	-31
Lifestyle region	Gold Coast and Hinterlands	29	19	1.7	1.8	2%	1%	52	-21
Lifestyle region	North Coastal NSW	84	16	3.7	2.0	1%	0%	50	8
Lifestyle region	Wide-Bay Burnett QLD	34	24	1.3	1.9	5%	1%	38	-18
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>39.9</b>	<b>19.9</b>	<b>2.0</b>	<b>1.9</b>	<b>4%</b>	<b>4%</b>	<b>44.3</b>	<b>-15.4</b>
Production zone	Hunter NSW	31	18	1.7	1.9	10%	6%	63	-17
Production zone	Illawarra NSW	59	10	2.1	1.6	3%	1%	66	-20
Production zone	Ipswich QLD	31	10	1.5	1.3	4%	1%	54	-39
Production zone	North Melbourne				Industry insignificant				
Production zone	Northern Adelaide				Industry insignificant				
Production zone	Sydney Production Region				Industry insignificant				
<b>Production zone</b>	<b>Simple average*</b>	<b>20.1</b>	<b>6.3</b>	<b>0.9</b>	<b>0.8</b>	<b>3%</b>	<b>8%</b>	<b>64.7</b>	<b>-12.7</b>

Note: \* Simple average row is cumulative total.

**Table A13.2 Supply chain strength by state of region industries – Mining (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End	25	30	2.2	3.1	8%	1%	78	17
Resource based	Gippsland VIC	10	13	0.2	0.5	35%	11%	65	-58
Resource based	Mackay QLD	5	10	0.9	1.2	29%	6%	51	-54
Resource based	Pilbara - Kimberley WA	6	10	0.2	0.4	72%	18%	57	-65
Resource based	Southern NT	27	35	1.2	2.4	9%	0%	72	8
Resource based	North West QLD	15	19	1.3	1.6	47%	4%	25	-37
<b>Resource based</b>	<b>Simple average*</b>	<b>14.8</b>	<b>19.5</b>	<b>1.0</b>	<b>1.5</b>	<b>33%</b>	<b>39%</b>	<b>58.0</b>	<b>-31.4</b>
Rural	Central QLD	13	11	1.0	1.3	19%	6%	69	-44
Rural	Central Western NSW	16	27	1.1	2.0	18%	4%	65	-13
Rural	Darling Downs & SW QLD	44	15	1.3	1.3	3%	1%	52	-30
Rural	Eyre and Yorke SA	49	23	1.2	1.3	11%	2%	36	-23
Rural	Far and North Western NSW	18	32	1.2	1.9	19%	3%	53	-8
Rural	Golden Region VIC	105	26	3.2	2.4	1%	0%	71	34
Rural	Goulburn VIC					Industry insignificant			
Rural	Loddon VIC	15	31	0.7	1.7	6%	1%	73	-12
Rural	Mallee - Wimmera VIC	28	27	1.1	1.6	3%	0%	57	-17
Rural	Mercy-Lyell TAS	15	24	1.2	1.7	10%	1%	41	-25
Rural	Midlands and Central WA	8	18	1.2	1.6	20%	3%	30	-40
Rural	Murray - Murrumbidgee NSW					Industry insignificant			
Rural	Murraylands SA					Industry insignificant			
Rural	Northern NSW	54	19	2.4	2.2	2%	0%	60	-2
Rural	Northern Tasmania	70	17	1.8	1.5	2%	0%	60	-11
Rural	Nth QLD	66	35	1.4	2.5	7%	2%	73	23
Rural	Ovens - Hume VIC					Industry insignificant			
Rural	South East NSW	30	31	1.7	2.6	2%	0%	46	3
Rural	South East SA					Industry insignificant			
Rural	South Eastern WA	21	31	1.4	2.1	53%	8%	39	-9
Rural	Southern WA	54	25	1.3	1.8	13%	4%	34	-12
Rural	Western Victoria					Industry insignificant			
<b>Rural</b>	<b>Simple average*</b>	<b>33.7</b>	<b>17.8</b>	<b>1.1</b>	<b>1.3</b>	<b>9%</b>	<b>36%</b>	<b>55</b>	<b>-8.5</b>
	<b>National weighted average</b>	<b>23</b>	<b>17</b>	<b>1.1</b>	<b>1.5</b>	<b>17%</b>	<b>100%</b>		
	<b>National Total</b>	<b>96</b>	<b>62</b>	<b>4.0</b>	<b>4.2</b>	<b>5%</b>	<b>100%</b>		
	National Max		78						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

**Table A13.3 Supply chain strength by state of region industries – Food**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT					Industry insignificant			
Core Metro	Brisbane City	16	37	2.0	3.0	5%	6%	97	15
Core Metro	Central Adelaide	11	33	1.9	3.3	5%	3%	86	8
Core Metro	East Melbourne	13	33	1.9	2.7	4%	3%	86	2
Core Metro	Global Sydney	16	32	2.7	3.6	2%	4%	92	23
Core Metro	Hobart and Southern Tasmania	11	33	1.4	2.5	6%	1%	53	-14
Core Metro	Inner Melbourne VIC	25	33	2.7	3.0	3%	4%	98	27
Core Metro	Inner West Sydney	13	31	1.3	2.1	6%	1%	90	-9
Core Metro	Northern and Central Perth	13	31	2.0	2.8	4%	2%	66	-1
<b>Core Metro</b>	<b>Simple average*</b>	<b>13.0</b>	<b>32.9</b>	<b>2.0</b>	<b>2.9</b>	<b>4%</b>	<b>25%</b>	<b>84.8</b>	<b>6</b>
Dispersed Metro	Central Coast NSW	11	28	1.3	2.0	6%	1%	38	-27
Dispersed Metro	N.N. West Sydney	9	25	1.6	2.4	3%	1%	84	-13
Dispersed Metro	North Brisbane	15	41	1.4	2.6	4%	1%	46	-5
Dispersed Metro	Outer South West Sydney	12	35	1.1	2.2	3%	0%	54	-16
Dispersed Metro	Outer West Sydney	13	31	0.9	1.5	3%	0%	65	-25
Dispersed Metro	Southern Adelaide	9	36	1.4	2.6	5%	1%	71	-5
Dispersed Metro	Southern Melbourne	8	36	1.8	2.8	8%	2%	78	-3
Dispersed Metro	Southern Perth	13	36	1.5	2.3	5%	3%	67	-8
Dispersed Metro	Southern Sydney	10	25	1.2	1.7	3%	1%	74	-25
Dispersed Metro	West Melbourne	14	34	1.2	1.9	6%	3%	74	-14
Dispersed Metro	Westernport VIC	12	44	1.4	2.6	7%	3%	59	-2
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>11.4</b>	<b>33.7</b>	<b>1.3</b>	<b>2.2</b>	<b>5%</b>	<b>16%</b>	<b>64.5</b>	<b>-11.5</b>
Lifestyle region	Far North QLD	14	45	1.6	2.6	9%	2%	37	-4
Lifestyle region	Gold Coast and Hinterlands	10	32	1.4	2.4	5%	2%	52	-16
Lifestyle region	North Coastal NSW	16	50	1.6	3.0	9%	3%	50	10
Lifestyle region	Wide-Bay Burnett QLD	12	45	1.2	2.5	9%	1%	38	-9
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>12.9</b>	<b>43.2</b>	<b>1.5</b>	<b>2.6</b>	<b>8%</b>	<b>8%</b>	<b>44.3</b>	<b>-6</b>
Production zone	Hunter NSW	12	42	1.6	2.8	4%	2%	63	2
Production zone	Illawarra NSW	15	36	1.1	1.8	2%	1%	66	-16
Production zone	Ipswich QLD	5	9	0.9	2.0	12%	1%	54	-45
Production zone	North Melbourne	11	34	1.5	2.2	4%	2%	78	-9
Production zone	Northern Adelaide	9	36	1.7	2.7	7%	2%	56	-7
Production zone	Sydney Production Region	13	38	1.6	2.5	7%	8%	71	-1
<b>Production zone</b>	<b>Simple average*</b>	<b>10.8</b>	<b>32.5</b>	<b>1.4</b>	<b>2.3</b>	<b>6%</b>	<b>17%</b>	<b>64.7</b>	<b>-12</b>

Note: \* Simple average row is cumulative total.

**Table A13.3 Supply chain strength by state of region industries – Food (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End	14	31	2.1	2.5	1%	0%	78	0
Resource based	Gippsland VIC	20	68	1.2	2.4	4%	1%	65	19
Resource based	Mackay QLD	11	45	1.4	2.3	10%	2%	51	-8
Resource based	Pilbara - Kimberley WA					Industry insignificant			
Resource based	Southern NT					Industry insignificant			
Resource based	North West QLD					Industry insignificant			
<b>Resource based</b>	<b>Simple average*</b>	<b>7.6</b>	<b>48.2</b>	<b>1.5</b>	<b>2.4</b>	<b>5%</b>	<b>3%</b>	<b>58.0</b>	<b>-4</b>
Rural	Central QLD	8	59	1.0	2.5	4%	1%	69	3
Rural	Central Western NSW	13	50	1.0	2.1	11%	2%	65	-5
Rural	Darling Downs & SW QLD	14	66	1.3	3.0	11%	2%	52	17
Rural	Eyre and Yorke SA	13	39	1.3	2.0	4%	1%	36	-17
Rural	Far and North Western NSW	15	57	1.0	2.0	5%	1%	53	-1
Rural	Golden Region VIC	14	50	1.3	2.4	7%	2%	71	4
Rural	Goulburn VIC	19	62	1.2	2.5	22%	4%	57	13
Rural	Loddon VIC	13	44	1.4	2.3	11%	1%	73	-1
Rural	Mallee - Wimmera VIC	16	52	1.2	2.1	9%	1%	57	0
Rural	Mercy-Lyell TAS	16	53	1.2	2.3	14%	1%	41	-1
Rural	Midlands and Central WA	27	48	1.1	1.8	3%	0%	30	-5
Rural	Murray - Murrumbidgee NSW	15	56	1.4	2.6	13%	3%	68	12
Rural	Murraylands SA	13	46	1.1	1.9	21%	1%	27	-18
Rural	Northern NSW	18	62	1.5	2.8	7%	1%	60	19
Rural	Northern Tasmania	13	47	1.4	2.7	6%	1%	60	1
Rural	Nth QLD	10	44	1.2	2.2	9%	2%	73	-7
Rural	Ovens - Hume VIC	13	44	1.3	2.3	15%	2%	88	1
Rural	South East NSW	18	58	1.6	3.0	5%	1%	46	16
Rural	South East SA	14	57	1.3	2.6	13%	1%	47	4
Rural	South Eastern WA	21	46	0.8	1.2	1%	0%	39	-19
Rural	Southern WA	15	56	1.6	2.7	5%	1%	34	6
Rural	Western Victoria	27	70	1.2	2.5	12%	1%	56	27
<b>Rural</b>	<b>Simple average*</b>	<b>16</b>	<b>53</b>	<b>1.2</b>	<b>2.3</b>	<b>9%</b>	<b>32%</b>	<b>55</b>	<b>2</b>
	<b>National weighted average</b>	<b>13</b>	<b>40</b>	<b>1.6</b>	<b>2.5</b>	<b>7%</b>	<b>100%</b>		
	<b>National Total</b>	<b>31</b>	<b>123</b>	<b>2.3</b>	<b>5.5</b>	<b>5%</b>	<b>100%</b>		
	National Max		144						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

**Table A13.4 Supply chain strength by state of region industries – Textiles and clothing**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT					Industry insignificant			
Core Metro	Brisbane City	25	31	6.8	6.8	0%	2%	97	46
Core Metro	Central Adelaide	25	40	0.6	1.6	10%	20%	86	-19
Core Metro	East Melbourne	35	40	4.8	4.9	2%	4%	86	31
Core Metro	Global Sydney	20	29	4.6	5.1	1%	7%	92	17
Core Metro	Hobart and Southern Tasmania	28	45	2.4	3.3	1%	1%	53	1
Core Metro	Inner Melbourne VIC	32	39	6.5	6.5	1%	7%	98	52
Core Metro	Inner West Sydney	15	30	3.8	4.4	1%	1%	90	5
Core Metro	Northern and Central Perth	17	25	5.7	6.1	1%	1%	66	20
<b>Core Metro</b>	<b>Simple average*</b>	<b>22.0</b>	<b>30.9</b>	<b>3.9</b>	<b>4.3</b>	<b>2%</b>	<b>43%</b>	<b>84.8</b>	<b>17.2</b>
Dispersed Metro	Central Coast NSW	34	39	3.5	3.7	1%	1%	38	4
Dispersed Metro	N.N. West Sydney	16	21	3.8	4.0	1%	1%	84	-5
Dispersed Metro	North Brisbane	18	43	3.2	4.0	1%	1%	46	2
Dispersed Metro	Outer South West Sydney	17	21	2.8	3.0	1%	0%	54	-25
Dispersed Metro	Outer West Sydney	10	16	2.1	2.2	1%	1%	65	-39
Dispersed Metro	Southern Adelaide	25	26	3.3	3.4	1%	0%	71	-6
Dispersed Metro	Southern Melbourne	27	31	3.5	3.6	2%	2%	78	2
Dispersed Metro	Southern Perth	40	41	4.7	4.8	1%	1%	67	29
Dispersed Metro	Southern Sydney	18	26	2.5	2.7	1%	1%	74	-19
Dispersed Metro	West Melbourne	37	47	3.6	3.9	4%	6%	74	22
Dispersed Metro	Westernport VIC	25	27	3.9	4.0	2%	3%	59	-2
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>24.3</b>	<b>30.9</b>	<b>3.4</b>	<b>3.6</b>	<b>1%</b>	<b>17%</b>	<b>64.5</b>	<b>-2.4</b>
Lifestyle region	Far North QLD	17	25	3.2	3.4	0%	0%	37	-21
Lifestyle region	Gold Coast and Hinterlands	11	18	6.5	6.8	1%	1%	52	17
Lifestyle region	North Coastal NSW	14	29	4.3	4.7	1%	1%	50	0
Lifestyle region	Wide-Bay Burnett QLD	12	34	2.8	3.5	0%	0%	38	-16
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>13.6</b>	<b>26.5</b>	<b>4.2</b>	<b>4.6</b>	<b>1%</b>	<b>2%</b>	<b>44.3</b>	<b>-4.9</b>
Production zone	Hunter NSW	32	42	3.2	3.7	1%	1%	63	10
Production zone	Illawarra NSW	14	20	2.2	2.4	1%	1%	66	-32
Production zone	Ipswich QLD	6	14	2.3	2.6	0%	0%	54	-41
Production zone	North Melbourne	32	41	4.0	4.1	5%	9%	78	19
Production zone	Northern Adelaide	38	47	1.4	1.8	4%	4%	56	-9
Production zone	Sydney Production Region	24	29	3.8	4.0	2%	9%	71	2
<b>Production zone</b>	<b>Simple average*</b>	<b>24.3</b>	<b>32.3</b>	<b>2.8</b>	<b>3.1</b>	<b>2%</b>	<b>24%</b>	<b>64.7</b>	<b>-8.6</b>

Note: \* Simple average row is cumulative total.



**Table A13.4 Supply chain strength by state of region industries – Textiles and clothing (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End								
Resource based	Gippsland VIC	32	56	2.0	2.8	1%	1%	65	8
Resource based	Mackay QLD								
Resource based	Pilbara - Kimberley WA								
Resource based	Southern NT								
Resource based	North West QLD	15	34	0.1	0.4	0%	0%	25	-56
<b>Resource based</b>	<b>Simple average*</b>	<b>7.8</b>	<b>15.0</b>	<b>0.3</b>	<b>0.5</b>	<b>0%</b>	<b>1%</b>	<b>58.0</b>	<b>-8.0</b>
Rural	Central QLD							69	0
Rural	Central Western NSW	30	58	2.5	3.3	1%	1%	65	15
Rural	Darling Downs & SW QLD	28	64	2.9	3.9	1%	1%	52	23
Rural	Eyre and Yorke SA	29	33	0.5	1.0	0%	0%	36	-40
Rural	Far and North Western NSW	27	33	0.6	0.9	0%	0%	53	-37
Rural	Golden Region VIC	29	49	3.3	4.0	3%	4%	71	18
Rural	Goulburn VIC	33	44	2.8	3.3	1%	1%	57	5
Rural	Loddon VIC	33	55	3.5	4.3	2%	1%	73	29
Rural	Mallee - Wimmera VIC	34	50	2.8	3.8	1%	0%	57	14
Rural	Mercy-Lyell TAS	42	48	3.2	3.4	1%	1%	41	11
Rural	Midlands and Central WA								
Rural	Murray - Murrumbidgee NSW	34	63	1.9	3.0	1%	1%	68	17
Rural	Murraylands SA	12	17	0.2	0.5	0%	0%	27	-69
Rural	Northern NSW	26	66	1.4	2.6	0%	0%	60	8
Rural	Northern Tasmania	33	62	2.3	3.5	1%	1%	60	19
Rural	Nth QLD	19	20	3.1	3.2	0%	0%	73	-18
Rural	Ovens - Hume VIC	33	51	3.4	4.2	3%	1%	88	28
Rural	South East NSW	33	54	3.6	4.7	1%	1%	46	26
Rural	South East SA	33	55	0.9	1.7	1%	0%	47	-10
Rural	South Eastern WA								
Rural	Southern WA	24	38	1.9	2.3	0%	0%	34	-22
Rural	Western Victoria	31	47	1.8	2.6	1%	0%	56	-5
<b>Rural</b>	<b>Simple average*</b>	<b>25.6</b>	<b>41.2</b>	<b>1.9</b>	<b>2.6</b>	<b>1%</b>	<b>12%</b>	<b>55</b>	<b>0.6</b>
	<b>National weighted average</b>	<b>23</b>	<b>32</b>	<b>3.3</b>	<b>3.7</b>	<b>2%</b>	<b>100%</b>		
	<b>National Total</b>	<b>54</b>	<b>86</b>	<b>5.4</b>	<b>6.2</b>	<b>1%</b>	<b>100%</b>		
	National Max		150						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

**Table A13.5 Supply chain strength by state of region industries – Wood products**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT	99	21	8.7	5.7	0%	1%	95	19
Core Metro	Brisbane City	101	40	8.1	5.2	0%	3%	97	28
Core Metro	Central Adelaide	95	32	6.8	4.5	0%	2%	86	10
Core Metro	East Melbourne	83	35	7.6	5.3	1%	3%	86	20
Core Metro	Global Sydney	108	27	10.1	6.4	0%	2%	92	33
Core Metro	Hobart and Southern Tasmania	58	53	3.5	3.9	2%	2%	53	0
Core Metro	Inner Melbourne VIC	110	29	9.8	5.9	0%	1%	98	32
Core Metro	Inner West Sydney	101	29	7.1	4.3	0%	0%	90	9
Core Metro	Northern and Central Perth	102	30	9.3	6.6	0%	1%	66	27
<b>Core Metro</b>	<b>Simple average*</b>	<b>95.1</b>	<b>32.9</b>	<b>7.9</b>	<b>5.3</b>	<b>0%</b>	<b>15%</b>	<b>84.8</b>	<b>19.9</b>
Dispersed Metro	Central Coast NSW	76	38	5.3	3.9	1%	2%	38	-8
Dispersed Metro	N.N. West Sydney	102	28	7.3	4.7	0%	1%	84	11
Dispersed Metro	North Brisbane	89	46	6.5	4.9	2%	3%	46	14
Dispersed Metro	Outer South West Sydney	80	33	4.7	3.1	1%	1%	54	-14
Dispersed Metro	Outer West Sydney	48	36	3.1	2.5	2%	3%	65	-23
Dispersed Metro	Southern Adelaide	98	26	7.2	5.0	1%	1%	71	9
Dispersed Metro	Southern Melbourne	95	35	6.8	4.6	0%	1%	78	12
Dispersed Metro	Southern Perth	101	42	6.0	4.1	1%	2%	67	10
Dispersed Metro	Southern Sydney	93	28	5.6	3.5	1%	1%	74	-7
Dispersed Metro	West Melbourne	107	36	6.2	3.9	0%	1%	74	6
Dispersed Metro	Westernport VIC	98	42	6.2	4.2	1%	3%	59	9
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>89.9</b>	<b>35.3</b>	<b>5.9</b>	<b>4.0</b>	<b>1%</b>	<b>19%</b>	<b>64.5</b>	<b>1.9</b>
Lifestyle region	Far North QLD	107	40	6.0	4.0	0%	1%	37	1
Lifestyle region	Gold Coast and Hinterlands	95	32	8.2	5.5	1%	2%	52	14
Lifestyle region	North Coastal NSW	72	54	5.9	5.3	2%	4%	50	19
Lifestyle region	Wide-Bay Burnett QLD	47	52	3.6	3.9	3%	4%	38	-5
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>80.3</b>	<b>44.6</b>	<b>5.9</b>	<b>4.7</b>	<b>1%</b>	<b>10%</b>	<b>44.3</b>	<b>7.3</b>
Production zone	Hunter NSW	96	48	5.2	3.7	1%	3%	63	7
Production zone	Illawarra NSW	92	29	5.6	3.7	0%	1%	66	-5
Production zone	Ipswich QLD	48	41	3.2	2.9	3%	2%	54	-19
Production zone	North Melbourne	88	34	5.9	3.9	1%	2%	78	3
Production zone	Northern Adelaide	100	32	6.5	4.7	1%	1%	56	5
Production zone	Sydney Production Region	76	41	5.9	4.4	1%	6%	71	8
<b>Production zone</b>	<b>Simple average*</b>	<b>83.4</b>	<b>37.4</b>	<b>5.4</b>	<b>3.9</b>	<b>1%</b>	<b>16%</b>	<b>64.7</b>	<b>-0.2</b>

Note: \* Simple average row is cumulative total.

**Table A13.5 Supply chain strength by state of region industries – Wood products (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End	97	26	6.2	3.8	0%	0%	78	-2
Resource based	Gippsland VIC	48	51	3.9	4.2	1%	2%	65	4
Resource based	Mackay QLD	105	30	5.2	3.2	0%	0%	51	-12
Resource based	Pilbara - Kimberley WA				Industry insignificant				
Resource based	Southern NT	92	24	3.3	1.1	0%	0%	72	-34
Resource based	North West QLD	90	19	2.0	0.3	0%	0%	25	-60
<b>Resource based</b>	<b>Simple average*</b>	<b>72.0</b>	<b>25.0</b>	<b>3.4</b>	<b>2.1</b>	<b>0%</b>	<b>3%</b>	<b>58.0</b>	<b>-17.4</b>
Rural	Central QLD	89	41	4.3	2.9	0%	1%	69	-6
Rural	Central Western NSW	66	51	4.3	3.7	1%	2%	65	3
Rural	Darling Downs & SW QLD	66	54	4.8	4.2	1%	2%	52	8
Rural	Eyre and Yorke SA	99	31	3.4	1.6	0%	0%	36	-32
Rural	Far and North Western NSW	89	45	4.1	2.6	0%	0%	53	-9
Rural	Golden Region VIC	63	50	3.7	3.2	2%	4%	71	-2
Rural	Goulburn VIC	66	50	4.3	3.8	1%	1%	57	2
Rural	Loddon VIC	100	38	5.1	2.7	0%	0%	73	-5
Rural	Mallee - Wimmera VIC	98	35	5.3	3.1	0%	0%	57	-8
Rural	Mercy-Lyell TAS	46	48	2.2	2.3	2%	2%	41	-24
Rural	Midlands and Central WA				Industry insignificant				
Rural	Murray - Murrumbidgee NSW	47	54	2.1	2.5	3%	5%	68	-10
Rural	Murraylands SA	104	37	2.5	0.9	0%	0%	27	-36
Rural	Northern NSW	80	52	5.3	4.5	1%	1%	60	14
Rural	Northern Tasmania	31	56	1.9	2.7	6%	5%	60	-13
Rural	Nth QLD	105	34	6.0	3.6	0%	0%	73	2
Rural	Ovens - Hume VIC	51	48	3.6	3.4	2%	1%	88	0
Rural	South East NSW	70	56	4.6	4.2	1%	2%	46	8
Rural	South East SA	27	49	1.5	2.4	13%	7%	47	-25
Rural	South Eastern WA				Industry insignificant				
Rural	Southern WA	50	52	2.9	3.1	2%	4%	34	-13
Rural	Western Victoria	58	50	3.7	3.5	1%	1%	56	-4
<b>Rural</b>	<b>Simple average*</b>	<b>63.9</b>	<b>42.4</b>	<b>3.4</b>	<b>2.8</b>	<b>2%</b>	<b>37%</b>	<b>55</b>	<b>-6.9</b>
<b>National weighted average</b>		<b>78</b>	<b>39</b>	<b>5.1</b>	<b>3.8</b>	<b>1%</b>	<b>100%</b>		
<b>National Total</b>		<b>127</b>	<b>103</b>	<b>7.3</b>	<b>6.4</b>	<b>1%</b>	<b>100%</b>		
National Max			139						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

**Table A13.6 Supply chain strength by state of region industries – Paper products**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT					Industry insignificant			
Core Metro	Brisbane City	92	29	5.6	3.0	0%	4%	97	41
Core Metro	Central Adelaide	64	23	3.9	3.0	1%	3%	86	22
Core Metro	East Melbourne	60	29	3.9	2.6	2%	9%	86	21
Core Metro	Global Sydney	139	23	9.2	2.8	0%	4%	92	50
Core Metro	Hobart and Southern Tasmania	40	39	2.0	2.0	2%	3%	53	6
Core Metro	Inner Melbourne VIC	154	26	10.3	2.8	0%	2%	98	59
Core Metro	Inner West Sydney	100	21	4.7	2.1	0%	1%	90	13
Core Metro	Northern and Central Perth	126	22	7.8	1.9	0%	0%	66	19
<b>Core Metro</b>	<b>Simple average*</b>	<b>86.1</b>	<b>23.5</b>	<b>5.3</b>	<b>2.3</b>	<b>1%</b>	<b>27%</b>	<b>84.8</b>	<b>25.6</b>
Dispersed Metro	Central Coast NSW	116	23	3.8	0.7	0%	0%	38	-21
Dispersed Metro	N.N. West Sydney	121	21	5.6	1.5	0%	0%	84	6
Dispersed Metro	North Brisbane	51	37	3.0	2.1	1%	2%	46	8
Dispersed Metro	Outer South West Sydney	93	31	3.0	1.0	1%	1%	54	-10
Dispersed Metro	Outer West Sydney	1	19	3.3	0.5	0%	0%	65	-42
Dispersed Metro	Southern Adelaide	90	14	2.8	0.7	0%	0%	71	-31
Dispersed Metro	Southern Melbourne	93	28	4.1	2.1	1%	2%	78	14
Dispersed Metro	Southern Perth	81	35	3.2	1.7	1%	4%	67	8
Dispersed Metro	Southern Sydney	132	19	5.0	0.6	0%	0%	74	-13
Dispersed Metro	West Melbourne	104	31	3.5	1.6	1%	2%	74	9
Dispersed Metro	Westernport VIC	78	31	3.4	2.2	1%	3%	59	10
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>87.3</b>	<b>26.1</b>	<b>3.7</b>	<b>1.3</b>	<b>1%</b>	<b>15%</b>	<b>64.5</b>	<b>-3.3</b>
Lifestyle region	Far North QLD	115	24	5.1	1.5	0%	0%	37	-3
Lifestyle region	Gold Coast and Hinterlands	69	21	4.2	2.3	1%	1%	52	1
Lifestyle region	North Coastal NSW	98	19	3.4	0.7	0%	0%	50	-28
Lifestyle region	Wide-Bay Burnett QLD	117	28	5.4	0.9	0%	0%	38	-8
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>99.9</b>	<b>22.9</b>	<b>4.5</b>	<b>1.4</b>	<b>0%</b>	<b>2%</b>	<b>44.3</b>	<b>-9.2</b>
Production zone	Hunter NSW							63	0
Production zone	Illawarra NSW	31	30	1.5	1.3	1%	3%	66	-17
Production zone	Ipswich QLD	29	19	1.9	1.8	2%	2%	54	-24
Production zone	North Melbourne	58	33	2.6	1.9	2%	10%	78	7
Production zone	Northern Adelaide	94	22	3.7	2.3	1%	1%	56	4
Production zone	Sydney Production Region	58	33	2.9	2.1	2%	18%	71	10
<b>Production zone</b>	<b>Simple average*</b>	<b>45.2</b>	<b>22.8</b>	<b>2.1</b>	<b>1.6</b>	<b>1%</b>	<b>34%</b>	<b>64.7</b>	<b>-3.1</b>

Note: \* Simple average row is cumulative total.

**Table A13.6 Supply chain strength by state of region industries – Paper products (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End	92	16	4.6	1.4	0%	0%	78	-9
Resource based	Gippsland VIC	28	40	1.8	2.1	2%	3%	65	8
Resource based	Mackay QLD				Industry insignificant				
Resource based	Pilbara - Kimberley WA				Industry insignificant				
Resource based	Southern NT				Industry insignificant				
Resource based	North West QLD	110	16	3.3	0.2	0%	0%	25	-46
<b>Resource based</b>	<b>Simple average*</b>	<b>38.4</b>	<b>11.9</b>	<b>1.6</b>	<b>0.6</b>	<b>0%</b>	<b>3%</b>	<b>58.0</b>	<b>-7.9</b>
Rural	Central QLD	108	20	3.4	0.6	0%	0%	69	-21
Rural	Central Western NSW	118	26	3.1	0.7	0%	0%	65	-14
Rural	Darling Downs & SW QLD				Industry insignificant				
Rural	Eyre and Yorke SA				Industry insignificant				
Rural	Far and North Western NSW				Industry insignificant				
Rural	Golden Region VIC	125	25	3.9	0.7	0%	0%	71	-10
Rural	Goulburn VIC	51	35	2.5	1.9	1%	1%	57	3
Rural	Loddon VIC	135	27	4.8	0.6	0%	0%	73	-5
Rural	Mallee - Wimmera VIC	114	34	3.3	1.0	0%	0%	57	-2
Rural	Mercy-Lyell TAS	21	36	1.2	1.6	9%	8%	41	-14
Rural	Midlands and Central WA				Industry insignificant				
Rural	Murray - Murrumbidgee NSW	51	39	2.2	1.8	1%	2%	68	8
Rural	Murraylands SA	103	13	1.5	0.6	0%	0%	27	-48
Rural	Northern NSW				Industry insignificant				
Rural	Northern Tasmania	46	24	1.8	1.4	1%	1%	60	-21
Rural	Nth QLD	93	21	3.5	1.8	0%	1%	73	-1
Rural	Ovens - Hume VIC	44	38	2.2	2.2	3%	3%	88	17
Rural	South East NSW				Industry insignificant				
Rural	South East SA	35	34	2.2	2.6	5%	3%	47	8
Rural	South Eastern WA				Industry insignificant				
Rural	Southern WA				Industry insignificant				
Rural	Western Victoria				Industry insignificant				
<b>Rural</b>	<b>Simple average*</b>	<b>47.5</b>	<b>16.9</b>	<b>1.6</b>	<b>0.8</b>	<b>1%</b>	<b>19%</b>	<b>55</b>	<b>-4.6</b>
	<b>National weighted average</b>	<b>64</b>	<b>22</b>	<b>3.2</b>	<b>1.6</b>	<b>1%</b>	<b>100%</b>		
	<b>National Total</b>	<b>169</b>	<b>77</b>	<b>7.7</b>	<b>3.7</b>	<b>1%</b>	<b>100%</b>		
	National Max		111						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

**Table A13.7 Supply chain strength by state of region industries – Printing and multi-media products**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT	66	19	11.4	8.4	1%	2%	95	15
Core Metro	Brisbane City	75	28	11.9	9.0	1%	5%	97	32
Core Metro	Central Adelaide	69	26	11.7	9.2	2%	3%	86	26
Core Metro	East Melbourne	43	28	6.8	5.7	4%	9%	86	0
Core Metro	Global Sydney	49	34	9.3	8.1	4%	20%	92	24
Core Metro	Hobart and Southern Tasmania	69	38	10.7	8.5	1%	1%	53	28
Core Metro	Inner Melbourne VIC	64	35	10.5	8.4	3%	10%	98	33
Core Metro	Inner West Sydney	46	23	7.3	5.9	3%	2%	90	-3
Core Metro	Northern and Central Perth	64	27	11.0	8.5	2%	4%	66	17
<b>Core Metro</b>	<b>Simple average*</b>	<b>60.8</b>	<b>28.9</b>	<b>10.1</b>	<b>8.0</b>	<b>2%</b>	<b>55%</b>	<b>84.8</b>	<b>19.2</b>
Dispersed Metro	Central Coast NSW	47	26	5.7	4.8	2%	1%	38	-20
Dispersed Metro	N.N. West Sydney	56	23	7.9	6.2	2%	3%	84	-1
Dispersed Metro	North Brisbane	58	34	10.1	8.3	1%	1%	46	17
Dispersed Metro	Outer South West Sydney	59	29	6.4	4.8	1%	0%	54	-9
Dispersed Metro	Outer West Sydney	56	22	7.1	5.5	2%	1%	65	-10
Dispersed Metro	Southern Adelaide	66	14	11.8	9.7	0%	0%	71	9
Dispersed Metro	Southern Melbourne	38	26	6.0	5.3	4%	3%	78	-9
Dispersed Metro	Southern Perth	85	32	9.7	6.8	1%	1%	67	18
Dispersed Metro	Southern Sydney	58	24	6.8	5.0	2%	1%	74	-8
Dispersed Metro	West Melbourne	81	29	6.8	4.6	1%	1%	74	0
Dispersed Metro	Westernport VIC	64	27	6.7	5.0	1%	2%	59	-8
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>60.7</b>	<b>25.8</b>	<b>7.7</b>	<b>6.0</b>	<b>2%</b>	<b>16%</b>	<b>64.5</b>	<b>-2.1</b>
Lifestyle region	Far North QLD	63	24	10.5	8.6	1%	0%	37	6
Lifestyle region	Gold Coast and Hinterlands	59	21	11.0	8.9	1%	1%	52	8
Lifestyle region	North Coastal NSW	54	22	8.1	6.7	1%	1%	50	-7
Lifestyle region	Wide-Bay Burnett QLD	44	19	8.2	7.1	1%	0%	38	-14
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>54.9</b>	<b>21.6</b>	<b>9.4</b>	<b>7.8</b>	<b>1%</b>	<b>4%</b>	<b>44.3</b>	<b>-1.8</b>
Production zone	Hunter NSW	62	24	7.7	6.2	1%	1%	63	-4
Production zone	Illawarra NSW	56	34	7.7	6.5	1%	1%	66	9
Production zone	Ipswich QLD	47	18	8.6	7.3	1%	0%	54	-10
Production zone	North Melbourne	50	36	5.3	4.2	2%	3%	78	-1
Production zone	Northern Adelaide	76	19	7.9	5.5	1%	1%	56	-11
Production zone	Sydney Production Region	55	32	6.7	5.4	3%	9%	71	2
<b>Production zone</b>	<b>Simple average*</b>	<b>57.9</b>	<b>26.9</b>	<b>7.3</b>	<b>5.8</b>	<b>1%</b>	<b>16%</b>	<b>64.7</b>	<b>-2.4</b>

Note: \* Simple average row is cumulative total.

**Table A13.7 Supply chain strength by state of region industries – Printing and multi-media products (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End	71	20	13.2	10.4	1%	0%	78	25
Resource based	Gippsland VIC	63	37	6.3	4.8	1%	1%	65	5
Resource based	Mackay QLD	67	21	8.0	6.4	1%	0%	51	-7
Resource based	Pilbara - Kimberley WA				Industry insignificant				
Resource based	Southern NT	65	18	11.4	9.1	0%	0%	72	12
Resource based	North West QLD	45	17	4.9	3.8	0%	0%	25	-40
<b>Resource based</b>	<b>Simple average*</b>	<b>51.8</b>	<b>18.8</b>	<b>7.3</b>	<b>5.8</b>	<b>0%</b>	<b>1%</b>	<b>58.0</b>	<b>-1.0</b>
Rural	Central QLD	53	22	8.1	7.0	0%	0%	69	-1
Rural	Central Western NSW	63	21	6.8	5.2	1%	0%	65	-13
Rural	Darling Downs & SW QLD	56	19	9.2	7.6	1%	1%	52	-4
Rural	Eyre and Yorke SA	33	17	6.5	6.0	0%	0%	36	-27
Rural	Far and North Western NSW	60	17	7.2	5.6	1%	0%	53	-18
Rural	Golden Region VIC	65	25	7.7	6.1	1%	1%	71	0
Rural	Goulburn VIC	66	34	7.5	6.0	1%	0%	57	7
Rural	Loddon VIC	46	22	5.8	4.6	2%	1%	73	-17
Rural	Mallee - Wimmera VIC	67	30	7.2	5.5	1%	0%	57	0
Rural	Mercy-Lyell TAS	65	32	8.7	7.3	1%	0%	41	9
Rural	Midlands and Central WA	56	19	7.4	6.0	0%	0%	30	-20
Rural	Murray - Murrumbidgee NSW	64	35	7.7	6.1	1%	1%	68	12
Rural	Murraylands SA	59	17	8.1	6.7	0%	0%	27	-18
Rural	Northern NSW	59	20	7.9	6.2	1%	0%	60	-9
Rural	Northern Tasmania	64	23	9.3	7.5	1%	0%	60	4
Rural	Nth QLD	65	23	8.4	6.6	1%	0%	73	1
Rural	Ovens - Hume VIC	66	39	6.0	4.5	2%	1%	88	11
Rural	South East NSW	60	24	8.9	7.0	1%	1%	46	-2
Rural	South East SA	47	27	7.9	7.2	1%	0%	47	-2
Rural	South Eastern WA	66	16	6.8	5.3	0%	0%	39	-23
Rural	Southern WA	53	20	7.8	6.6	1%	0%	34	-14
Rural	Western Victoria	56	20	7.4	6.0	1%	0%	56	-12
<b>Rural</b>	<b>Simple average*</b>	<b>58.5</b>	<b>23.8</b>	<b>7.6</b>	<b>6.2</b>	<b>1%</b>	<b>9%</b>	<b>55</b>	<b>-6.2</b>
<b>National weighted average</b>		<b>60</b>	<b>27</b>	<b>8.9</b>	<b>7.1</b>	<b>2%</b>	<b>100%</b>		
<b>National Total</b>		<b>130</b>	<b>63</b>	<b>11.9</b>	<b>7.5</b>	<b>2%</b>	<b>100%</b>		
National Max			101						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

**Table A13.8 Supply chain strength by state of region industries – Basic chemicals**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT					Industry insignificant			
Core Metro	Brisbane City	49	23	2.7	1.9	4%	13%	97	1
Core Metro	Central Adelaide	50	25	5.5	5.3	0%	0%	86	69
Core Metro	East Melbourne	37	26	3.6	3.3	1%	3%	86	26
Core Metro	Global Sydney	53	35	3.5	3.0	1%	7%	92	34
Core Metro	Hobart and Southern Tasmania	42	35	2.2	2.2	1%	0%	53	3
Core Metro	Inner Melbourne VIC	81	60	4.1	2.1	1%	3%	98	55
Core Metro	Inner West Sydney	43	37	2.4	2.2	1%	1%	90	14
Core Metro	Northern and Central Perth	55	23	3.5	2.0	1%	2%	66	2
<b>Core Metro</b>	<b>Simple average*</b>	<b>45.6</b>	<b>29.3</b>	<b>3.0</b>	<b>2.5</b>	<b>1%</b>	<b>30%</b>	<b>84.8</b>	<b>22.6</b>
Dispersed Metro	Central Coast NSW	46	30	1.7	1.3	0%	0%	38	-22
Dispersed Metro	N.N. West Sydney	52	20	3.0	2.0	1%	1%	84	-2
Dispersed Metro	North Brisbane	49	21	3.0	2.3	1%	0%	46	-5
Dispersed Metro	Outer South West Sydney	48	31	1.9	1.4	0%	0%	54	-13
Dispersed Metro	Outer West Sydney	50	18	1.9	1.0	1%	1%	65	-28
Dispersed Metro	Southern Adelaide	51	8	13.8	13.0	0%	0%	71	202
Dispersed Metro	Southern Melbourne	43	30	2.7	2.6	2%	2%	78	13
Dispersed Metro	Southern Perth	47	42	2.0	1.6	5%	9%	67	4
Dispersed Metro	Southern Sydney	28	16	0.9	0.6	7%	6%	74	-46
Dispersed Metro	West Melbourne	43	41	2.0	2.1	11%	14%	74	11
Dispersed Metro	Westernport VIC	47	34	2.8	2.7	2%	3%	59	15
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>45.8</b>	<b>26.5</b>	<b>3.3</b>	<b>2.8</b>	<b>3%</b>	<b>36%</b>	<b>64.5</b>	<b>9.8</b>
Lifestyle region	Far North QLD	50	24	3.1	2.5	0%	0%	37	0
Lifestyle region	Gold Coast and Hinterlands	61	21	3.5	1.9	1%	1%	52	-4
Lifestyle region	North Coastal NSW	55	17	2.3	0.9	1%	1%	50	-32
Lifestyle region	Wide-Bay Burnett QLD	38	36	2.9	2.6	0%	0%	38	8
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>50.9</b>	<b>24.5</b>	<b>2.9</b>	<b>2.0</b>	<b>0%</b>	<b>1%</b>	<b>44.3</b>	<b>-6.9</b>
Production zone	Hunter NSW	46	51	2.8	2.8	1%	2%	63	34
Production zone	Illawarra NSW	45	39	2.2	2.1	1%	1%	66	8
Production zone	Ipswich QLD	50	33	2.3	1.8	0%	0%	54	-3
Production zone	North Melbourne	45	30	3.1	3.0	1%	2%	78	22
Production zone	Northern Adelaide	59	23	4.3	4.1	1%	1%	56	38
Production zone	Sydney Production Region	42	23	2.1	1.6	4%	14%	71	-14
<b>Production zone</b>	<b>Simple average*</b>	<b>47.8</b>	<b>33.2</b>	<b>2.8</b>	<b>2.6</b>	<b>1%</b>	<b>19%</b>	<b>64.7</b>	<b>14.1</b>

Note: \* Simple average row is cumulative total.



**Table A13.8 Supply chain strength by state of region industries – Basic chemicals (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End	64	54	2.9	1.4	0%	0%	78	23
Resource based	Gippsland VIC	51	58	1.9	1.2	1%	1%	65	12
Resource based	Mackay QLD	45	40	1.5	1.5	1%	0%	51	-7
Resource based	Pilbara - Kimberley WA	67	61	1.3	0.4	1%	0%	57	1
Resource based	Southern NT	63	61	1.9	0.4	1%	0%	72	7
Resource based	North West QLD								
<b>Resource based</b>	<b>Simple average*</b>	<b>48.4</b>	<b>45.8</b>	<b>1.6</b>	<b>0.8</b>	<b>0%</b>	<b>1%</b>	<b>58.0</b>	<b>6.0</b>
Rural	Central QLD	45	40	3.3	3.4	1%	1%	69	37
Rural	Central Western NSW	62	54	1.6	1.3	0%	0%	65	12
Rural	Darling Downs & SW QLD	64	51	2.0	0.9	0%	0%	52	3
Rural	Eyre and Yorke SA	35	35	2.4	2.5	1%	1%	36	3
Rural	Far and North Western NSW	41	28	1.5	1.4	0%	0%	53	-20
Rural	Golden Region VIC	37	21	1.8	1.4	5%	5%	71	-23
Rural	Goulburn VIC	66	3	1.6	0.7	0%	0%	57	-47
Rural	Loddon VIC	56	16	1.5	0.5	0%	0%	73	-38
Rural	Mallee - Wimmera VIC	49	28	1.6	1.1	1%	0%	57	-22
Rural	Mercy-Lyell TAS	34	32	1.0	1.2	1%	0%	41	-27
Rural	Midlands and Central WA	30	23	1.5	1.7	0%	0%	30	-29
Rural	Murray - Murrumbidgee NSW	57	16	2.0	1.1	0%	0%	68	-26
Rural	Murraylands SA	34	20	1.1	1.1	0%	0%	27	-43
Rural	Northern NSW	58	44	2.1	1.6	1%	0%	60	6
Rural	Northern Tasmania	38	35	1.7	1.8	1%	0%	60	-6
Rural	Nth QLD	68	32	2.4	1.5	1%	0%	73	2
Rural	Ovens - Hume VIC	42	31	2.1	2.0	1%	0%	88	4
Rural	South East NSW	57	11	2.1	0.5	0%	0%	46	-46
Rural	South East SA	43	17	0.9	0.6	0%	0%	47	-48
Rural	South Eastern WA	57	32	1.3	0.8	0%	0%	39	-26
Rural	Southern WA	39	45	1.6	1.8	3%	2%	34	-4
Rural	Western Victoria	42	26	2.4	2.3	1%	0%	56	-3
<b>Rural</b>	<b>Simple average*</b>	<b>48.0</b>	<b>29.2</b>	<b>1.8</b>	<b>1.4</b>	<b>1%</b>	<b>12%</b>	<b>55</b>	<b>-15.5</b>
	<b>National weighted average</b>	<b>46</b>	<b>29</b>	<b>2.7</b>	<b>2.3</b>	<b>2%</b>	<b>100%</b>		
	<b>National Total</b>	<b>146</b>	<b>77</b>	<b>6.9</b>	<b>4.3</b>	<b>2%</b>	<b>100%</b>		
	National Max		129						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

**Table A13.9 Supply chain strength by state of region industries – High value chemicals**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT					Industry insignificant			
Core Metro	Brisbane City	33	39	4.1	4.8	1%	4%	97	42
Core Metro	Central Adelaide	39	29	5.4	5.9	1%	1%	86	49
Core Metro	East Melbourne	29	43	3.6	4.4	4%	8%	86	35
Core Metro	Global Sydney	28	49	4.1	5.3	1%	5%	92	54
Core Metro	Hobart and Southern Tasmania	24	30	1.8	2.4	0%	0%	53	-16
Core Metro	Inner Melbourne VIC	34	49	4.6	5.6	1%	3%	98	63
Core Metro	Inner West Sydney	24	42	2.7	3.6	1%	1%	90	21
Core Metro	Northern and Central Perth	31	33	4.7	4.9	1%	1%	66	32
<b>Core Metro</b>	<b>Simple average*</b>	<b>26.9</b>	<b>34.8</b>	<b>3.4</b>	<b>4.1</b>	<b>1%</b>	<b>23%</b>	<b>84.8</b>	<b>31.2</b>
Dispersed Metro	Central Coast NSW	15	31	1.6	2.5	3%	1%	38	-21
Dispersed Metro	N.N. West Sydney	20	40	2.7	3.7	7%	8%	84	17
Dispersed Metro	North Brisbane	29	28	2.5	2.8	2%	1%	46	-10
Dispersed Metro	Outer South West Sydney	24	29	2.2	2.6	4%	1%	54	-12
Dispersed Metro	Outer West Sydney	24	32	2.2	2.6	2%	1%	65	-6
Dispersed Metro	Southern Adelaide	33	16	3.4	3.6	1%	1%	71	-1
Dispersed Metro	Southern Melbourne	32	41	3.1	3.7	9%	7%	78	24
Dispersed Metro	Southern Perth	29	45	2.8	3.7	2%	3%	67	22
Dispersed Metro	Southern Sydney	27	40	2.7	3.5	4%	3%	74	16
Dispersed Metro	West Melbourne	36	49	2.4	3.1	5%	6%	74	23
Dispersed Metro	Westernport VIC	32	42	3.5	4.1	4%	5%	59	27
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>27.3</b>	<b>35.7</b>	<b>2.7</b>	<b>3.3</b>	<b>4%</b>	<b>37%</b>	<b>64.5</b>	<b>8.1</b>
Lifestyle region	Far North QLD	31	20	1.5	1.5	0%	0%	37	-36
Lifestyle region	Gold Coast and Hinterlands	22	26	3.1	3.6	1%	1%	52	-2
Lifestyle region	North Coastal NSW	21	26	2.6	2.9	1%	1%	50	-12
Lifestyle region	Wide-Bay Burnett QLD	17	25	1.2	1.9	1%	0%	38	-34
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>22.9</b>	<b>24.4</b>	<b>2.1</b>	<b>2.5</b>	<b>1%</b>	<b>2%</b>	<b>44.3</b>	<b>-21.0</b>
Production zone	Hunter NSW	31	40	2.1	2.4	1%	1%	63	1
Production zone	Illawarra NSW	32	29	2.6	2.8	0%	0%	66	-2
Production zone	Ipswich QLD	15	28	1.7	2.2	6%	2%	54	-24
Production zone	North Melbourne	36	37	2.8	3.3	5%	7%	78	16
Production zone	Northern Adelaide	42	29	3.4	3.8	2%	2%	56	14
Production zone	Sydney Production Region	31	48	2.7	3.6	6%	17%	71	26
<b>Production zone</b>	<b>Simple average*</b>	<b>31.1</b>	<b>35.4</b>	<b>2.5</b>	<b>3.0</b>	<b>3%</b>	<b>30%</b>	<b>64.7</b>	<b>5.1</b>

Note: \* Simple average row is cumulative total.

**Table A13.9 Supply chain strength by state of region industries – High value chemicals (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End	30	21	2.5	2.1	0%	0%	78	-15
Resource based	Gippsland VIC	34	27	1.7	2.0	1%	0%	65	-16
Resource based	Mackay QLD	33	29	1.0	1.2	1%	0%	51	-30
Resource based	Pilbara - Kimberley WA				Industry insignificant				
Resource based	Southern NT				Industry insignificant				
Resource based	North West QLD	30	15	0.4	0.3	1%	0%	25	-62
<b>Resource based</b>	<b>Simple average*</b>	<b>21.1</b>	<b>15.3</b>	<b>0.9</b>	<b>0.9</b>	<b>0%</b>	<b>1%</b>	<b>58.0</b>	<b>-20.4</b>
Rural	Central QLD	32	29	1.2	1.4	1%	1%	69	-22
Rural	Central Western NSW	26	24	1.4	1.5	1%	0%	65	-29
Rural	Darling Downs & SW QLD	29	24	5.5	5.7	1%	0%	52	31
Rural	Eyre and Yorke SA				Industry insignificant				
Rural	Far and North Western NSW	27	23	0.6	0.9	0%	0%	53	-42
Rural	Golden Region VIC	29	33	1.7	2.3	0%	0%	71	-8
Rural	Goulburn VIC	23	27	1.8	2.1	1%	0%	57	-22
Rural	Loddon VIC	27	36	3.2	4.0	2%	0%	73	18
Rural	Mallee - Wimmera VIC	32	28	1.7	2.0	1%	0%	57	-17
Rural	Mercy-Lyell TAS	32	27	2.2	2.5	1%	0%	41	-14
Rural	Midlands and Central WA	28	20	1.6	2.0	0%	0%	30	-34
Rural	Murray - Murrumbidgee NSW	31	27	2.3	2.7	1%	1%	68	-6
Rural	Murraylands SA	36	19	1.9	2.0	1%	0%	27	-30
Rural	Northern NSW	27	24	1.9	2.3	0%	0%	60	-18
Rural	Northern Tasmania	25	35	3.2	4.2	1%	0%	60	16
Rural	Nth QLD	36	25	2.9	2.9	0%	0%	73	0
Rural	Ovens - Hume VIC	35	31	2.0	2.2	1%	0%	88	-3
Rural	South East NSW	27	25	2.4	2.5	1%	0%	46	-17
Rural	South East SA	28	21	0.6	1.2	0%	0%	47	-42
Rural	South Eastern WA	25	20	1.6	1.6	2%	1%	39	-38
Rural	Southern WA	28	29	2.4	2.9	0%	0%	34	-11
Rural	Western Victoria	30	35	3.6	4.3	1%	0%	56	20
<b>Rural</b>	<b>Simple average*</b>	<b>27.8</b>	<b>25.5</b>	<b>2.1</b>	<b>2.4</b>	<b>1%</b>	<b>6%</b>	<b>55</b>	<b>-12.2</b>
	<b>National weighted average</b>	<b>28</b>	<b>34</b>	<b>2.9</b>	<b>3.4</b>	<b>3%</b>	<b>100%</b>		
	<b>National Total</b>	<b>110</b>	<b>87</b>	<b>6.2</b>	<b>5.5</b>	<b>2%</b>	<b>100%</b>		
	National Max		143						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

**Table A13.10 Supply chain strength by state of region industries – Non-metallic minerals**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT	83	26	4.2	2.2	0%	1%	95	-2
Core Metro	Brisbane City	71	40	5.5	4.1	1%	6%	97	34
Core Metro	Central Adelaide	74	37	6.7	5.5	1%	1%	86	51
Core Metro	East Melbourne	74	31	5.8	3.9	1%	4%	86	24
Core Metro	Global Sydney	73	28	7.5	5.5	0%	1%	92	46
Core Metro	Hobart and Southern Tasmania	57	32	3.4	2.4	1%	1%	53	-12
Core Metro	Inner Melbourne VIC	78	34	6.9	4.4	0%	1%	98	39
Core Metro	Inner West Sydney	70	26	3.9	2.2	0%	0%	90	-6
Core Metro	Northern and Central Perth	72	33	6.4	5.3	1%	3%	66	39
<b>Core Metro</b>	<b>Simple average*</b>	<b>72.3</b>	<b>32.1</b>	<b>5.6</b>	<b>3.9</b>	<b>1%</b>	<b>19%</b>	<b>84.8</b>	<b>23.7</b>
Dispersed Metro	Central Coast NSW	65	37	3.6	2.6	2%	1%	38	-7
Dispersed Metro	N.N. West Sydney	71	19	5.2	3.5	0%	1%	84	6
Dispersed Metro	North Brisbane	72	36	3.9	2.5	2%	2%	46	-5
Dispersed Metro	Outer South West Sydney	56	39	3.8	3.1	3%	2%	54	3
Dispersed Metro	Outer West Sydney	49	33	2.8	2.4	3%	3%	65	-12
Dispersed Metro	Southern Adelaide	60	24	10.3	9.4	1%	1%	71	90
Dispersed Metro	Southern Melbourne	63	31	4.7	3.7	1%	2%	78	13
Dispersed Metro	Southern Perth	57	48	3.6	3.1	2%	5%	67	12
Dispersed Metro	Southern Sydney	66	23	3.9	2.5	0%	1%	74	-11
Dispersed Metro	West Melbourne	48	35	3.3	2.8	2%	3%	74	-2
Dispersed Metro	Westernport VIC	57	36	4.5	3.9	2%	4%	59	13
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>60.5</b>	<b>32.8</b>	<b>4.5</b>	<b>3.6</b>	<b>2%</b>	<b>24%</b>	<b>64.5</b>	<b>8.5</b>
Lifestyle region	Far North QLD	79	41	3.9	2.4	1%	1%	37	-3
Lifestyle region	Gold Coast and Hinterlands	81	39	5.5	3.4	1%	2%	52	16
Lifestyle region	North Coastal NSW	72	40	4.2	2.9	2%	2%	50	5
Lifestyle region	Wide-Bay Burnett QLD	65	43	3.5	2.4	2%	1%	38	-5
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>74.2</b>	<b>40.8</b>	<b>4.3</b>	<b>2.8</b>	<b>1%</b>	<b>7%</b>	<b>44.3</b>	<b>3.0</b>
Production zone	Hunter NSW	84	46	3.5	2.3	1%	3%	63	5
Production zone	Illawarra NSW	82	35	2.9	2.1	1%	2%	66	-7
Production zone	Ipswich QLD	41	40	2.7	2.3	3%	2%	54	-13
Production zone	North Melbourne	67	32	4.3	3.0	1%	3%	78	6
Production zone	Northern Adelaide	21	38	0.8	1.3	7%	11%	56	-35
Production zone	Sydney Production Region	60	35	4.2	3.3	2%	9%	71	7
<b>Production zone</b>	<b>Simple average*</b>	<b>59.2</b>	<b>37.7</b>	<b>3.1</b>	<b>2.4</b>	<b>3%</b>	<b>30%</b>	<b>64.7</b>	<b>-6.1</b>

Note: \* Simple average row is cumulative total.

**Table A13.10 Supply chain strength by state of region industries – Non-metallic minerals (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End	65	46	2.7	1.7	1%	1%	78	-4
Resource based	Gippsland VIC	76	45	3.3	1.9	1%	1%	65	-2
Resource based	Mackay QLD	61	42	2.5	1.7	1%	1%	51	-16
Resource based	Pilbara - Kimberley WA	81	41	2.4	1.2	0%	0%	57	-18
Resource based	Southern NT	75	48	1.9	0.7	1%	0%	72	-17
Resource based	North West QLD	74	27	1.4	0.3	0%	0%	25	-52
<b>Resource based</b>	<b>Simple average*</b>	<b>71.8</b>	<b>41.3</b>	<b>2.3</b>	<b>1.2</b>	<b>1%</b>	<b>3%</b>	<b>58.0</b>	<b>-18.1</b>
Rural	Central QLD	55	50	2.8	2.3	1%	2%	69	2
Rural	Central Western NSW	68	47	3.7	2.7	1%	1%	65	9
Rural	Darling Downs & SW QLD	68	47	3.5	2.5	1%	1%	52	3
Rural	Eyre and Yorke SA	74	45	2.6	1.5	1%	0%	36	-16
Rural	Far and North Western NSW	81	42	3.0	1.6	1%	0%	53	-10
Rural	Golden Region VIC	62	38	4.9	4.1	2%	2%	71	23
Rural	Goulburn VIC	56	42	2.6	1.9	1%	1%	57	-12
Rural	Loddon VIC	62	38	3.6	2.5	2%	1%	73	0
Rural	Mallee - Wimmera VIC	79	37	3.1	1.5	1%	0%	57	-15
Rural	Mercy-Lyell TAS	40	47	1.6	1.5	2%	1%	41	-23
Rural	Midlands and Central WA	83	37	3.2	1.9	0%	0%	30	-15
Rural	Murray - Murrumbidgee NSW	79	38	3.4	2.2	1%	1%	68	-3
Rural	Murraylands SA	56	40	1.2	0.5	1%	0%	27	-42
Rural	Northern NSW	66	43	3.1	2.1	1%	1%	60	-6
Rural	Northern Tasmania	65	41	3.4	2.5	1%	1%	60	-1
Rural	Nth QLD	78	44	3.6	2.2	1%	1%	73	5
Rural	Ovens - Hume VIC	67	37	2.9	1.6	1%	0%	88	-9
Rural	South East NSW	68	44	3.9	2.8	1%	1%	46	4
Rural	South East SA	77	44	2.2	1.1	1%	0%	47	-19
Rural	South Eastern WA	85	41	1.7	0.6	0%	0%	39	-30
Rural	Southern WA	78	41	3.7	2.6	1%	1%	34	-3
Rural	Western Victoria	78	39	2.6	1.1	1%	0%	56	-19
<b>Rural</b>	<b>Simple average*</b>	<b>69.4</b>	<b>41.9</b>	<b>3.0</b>	<b>2.0</b>	<b>1%</b>	<b>17%</b>	<b>55</b>	<b>-8.0</b>
	<b>National weighted average</b>	<b>65</b>	<b>36</b>	<b>3.9</b>	<b>2.8</b>	<b>2%</b>	<b>100%</b>		
	<b>National Total</b>	<b>133</b>	<b>97</b>	<b>6.6</b>	<b>5.2</b>	<b>1%</b>	<b>100%</b>		
	National Max		118						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

**Table A13.11 Supply chain strength by state of region industries – Basic and fabricated metals**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT					Industry insignificant			
Core Metro	Brisbane City	68	44	4.6	4.1	4%	5%	97	43
Core Metro	Central Adelaide	68	32	3.8	3.3	2%	1%	86	18
Core Metro	East Melbourne	63	35	4.7	3.7	4%	3%	86	27
Core Metro	Global Sydney	63	27	5.9	4.6	0%	1%	92	38
Core Metro	Hobart and Southern Tasmania	28	31	1.4	1.7	5%	1%	53	-28
Core Metro	Inner Melbourne VIC	61	30	4.8	4.1	1%	1%	98	31
Core Metro	Inner West Sydney	60	30	3.8	2.8	2%	1%	90	10
Core Metro	Northern and Central Perth	59	35	5.5	4.9	2%	1%	66	39
<b>Core Metro</b>	<b>Simple average*</b>	<b>52.1</b>	<b>29.4</b>	<b>3.8</b>	<b>3.2</b>	<b>2%</b>	<b>14%</b>	<b>84.8</b>	<b>19.7</b>
Dispersed Metro	Central Coast NSW	62	29	4.1	3.2	3%	0%	38	4
Dispersed Metro	N.N. West Sydney	59	22	4.7	3.6	2%	1%	84	13
Dispersed Metro	North Brisbane	61	28	4.1	3.1	3%	1%	46	3
Dispersed Metro	Outer South West Sydney	43	33	1.6	1.4	8%	1%	54	-25
Dispersed Metro	Outer West Sydney	43	30	2.0	1.7	8%	2%	65	-20
Dispersed Metro	Southern Adelaide	66	21	4.8	4.2	3%	1%	71	20
Dispersed Metro	Southern Melbourne	66	35	4.3	3.5	5%	2%	78	23
Dispersed Metro	Southern Perth	40	49	2.1	2.3	9%	5%	67	4
Dispersed Metro	Southern Sydney	52	28	4.0	3.4	3%	1%	74	9
Dispersed Metro	West Melbourne	67	35	3.1	2.6	5%	2%	74	7
Dispersed Metro	Westernport VIC	64	44	3.3	2.8	8%	4%	59	14
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>56.7</b>	<b>32.3</b>	<b>3.5</b>	<b>2.9</b>	<b>5%</b>	<b>20%</b>	<b>64.5</b>	<b>5.4</b>
Lifestyle region	Far North QLD	68	38	4.0	3.2	2%	0%	37	11
Lifestyle region	Gold Coast and Hinterlands	63	33	4.8	3.8	3%	1%	52	19
Lifestyle region	North Coastal NSW	64	34	4.5	3.5	2%	1%	50	16
Lifestyle region	Wide-Bay Burnett QLD	68	37	3.5	2.7	2%	0%	38	3
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>65.7</b>	<b>35.4</b>	<b>4.2</b>	<b>3.3</b>	<b>2%</b>	<b>3%</b>	<b>44.3</b>	<b>12.2</b>
Production zone	Hunter NSW	45	57	1.6	1.9	17%	10%	63	4
Production zone	Illawarra NSW	38	54	1.4	1.9	30%	10%	66	1
Production zone	Ipswich QLD	68	31	3.1	2.5	4%	1%	54	-2
Production zone	North Melbourne	63	31	3.4	2.9	5%	3%	78	8
Production zone	Northern Adelaide	60	26	3.3	2.9	4%	1%	56	-3
Production zone	Sydney Production Region	69	42	3.9	3.1	6%	8%	71	21
<b>Production zone</b>	<b>Simple average*</b>	<b>57.3</b>	<b>40.1</b>	<b>2.8</b>	<b>2.5</b>	<b>11%</b>	<b>33%</b>	<b>64.7</b>	<b>4.8</b>

Note: \* Simple average row is cumulative total.

**Table A13.11 Supply chain strength by state of region industries – Basic and fabricated metals (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End	61	39	2.7	1.9	3%	0%	78	0
Resource based	Gippsland VIC	64	31	2.9	2.3	1%	0%	65	-4
Resource based	Mackay QLD	63	30	2.8	2.3	2%	0%	51	-9
Resource based	Pilbara - Kimberley WA	54	15	3.2	2.6	0%	0%	57	-18
Resource based	Southern NT	52	22	2.1	1.4	2%	0%	72	-27
Resource based	North West QLD	22	48	0.3	0.7	14%	1%	25	-38
<b>Resource based</b>	<b>Simple average*</b>	<b>52.5</b>	<b>30.8</b>	<b>2.3</b>	<b>1.9</b>	<b>4%</b>	<b>2%</b>	<b>58.0</b>	<b>-16.0</b>
Rural	Central QLD	22	38	0.9	1.3	16%	5%	69	-26
Rural	Central Western NSW	63	37	3.1	2.6	2%	0%	65	6
Rural	Darling Downs & SW QLD	59	24	4.0	3.2	1%	0%	52	0
Rural	Eyre and Yorke SA	36	59	1.8	2.1	17%	3%	36	1
Rural	Far and North Western NSW	61	28	2.8	2.2	1%	0%	53	-12
Rural	Golden Region VIC	43	39	2.0	2.0	8%	3%	71	-8
Rural	Goulburn VIC	66	36	3.2	2.7	3%	1%	57	5
Rural	Loddon VIC	56	30	3.7	3.1	2%	0%	73	7
Rural	Mallee - Wimmera VIC	64	30	3.2	2.4	1%	0%	57	-4
Rural	Mercy-Lyell TAS	60	25	2.8	2.2	1%	0%	41	-18
Rural	Midlands and Central WA	60	29	3.2	2.7	1%	0%	30	-10
Rural	Murray - Murrumbidgee NSW	63	33	3.9	3.2	2%	1%	68	13
Rural	Murraylands SA	64	22	1.7	1.0	1%	0%	27	-41
Rural	Northern NSW	62	31	3.7	2.9	1%	0%	60	4
Rural	Northern Tasmania	30	39	2.0	2.2	12%	1%	60	-10
Rural	Nth QLD	25	56	0.8	1.4	13%	4%	73	-9
Rural	Ovens - Hume VIC	55	28	3.1	2.5	2%	0%	88	-1
Rural	South East NSW	63	32	4.1	3.0	1%	0%	46	5
Rural	South East SA	61	23	1.9	1.4	1%	0%	47	-31
Rural	South Eastern WA	22	58	0.5	1.0	6%	1%	39	-21
Rural	Southern WA	21	59	0.9	1.6	16%	5%	34	-13
Rural	Western Victoria	22	30	0.7	0.9	16%	2%	56	-42
<b>Rural</b>	<b>Simple average*</b>	<b>49.0</b>	<b>35.6</b>	<b>2.5</b>	<b>2.2</b>	<b>6%</b>	<b>28%</b>	<b>55</b>	<b>-9.3</b>
	<b>National weighted average</b>	<b>54</b>	<b>35</b>	<b>3.1</b>	<b>2.7</b>	<b>7%</b>	<b>100%</b>		
	<b>National Total</b>	<b>125</b>	<b>112</b>	<b>5.5</b>	<b>4.8</b>	<b>5%</b>	<b>100%</b>		
	National Max		140						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

**Table A13.12 Supply chain strength by state of region industries – Transport and other machinery**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT	19	16	5.1	5.0	1%	0%	95	28
Core Metro	Brisbane City	9	35	4.0	5.2	3%	4%	97	36
Core Metro	Central Adelaide	19	37	2.3	3.6	10%	6%	86	23
Core Metro	East Melbourne	11	36	3.7	4.7	8%	6%	86	31
Core Metro	Global Sydney	14	29	4.5	5.4	3%	6%	92	36
Core Metro	Hobart and Southern Tasmania	7	25	2.8	3.5	3%	0%	53	-8
Core Metro	Inner Melbourne VIC	11	33	2.8	4.1	4%	5%	98	19
Core Metro	Inner West Sydney	12	27	3.3	4.0	3%	1%	90	15
Core Metro	Northern and Central Perth	8	25	5.9	6.7	2%	1%	66	39
<b>Core Metro</b>	<b>Simple average*</b>	<b>12.3</b>	<b>29.4</b>	<b>3.8</b>	<b>4.7</b>	<b>4%</b>	<b>30%</b>	<b>84.8</b>	<b>24.2</b>
Dispersed Metro	Central Coast NSW	10	24	3.2	3.7	3%	1%	38	-7
Dispersed Metro	N.N. West Sydney	13	27	3.8	4.3	4%	2%	84	19
Dispersed Metro	North Brisbane	8	22	3.1	3.8	3%	1%	46	-8
Dispersed Metro	Outer South West Sydney	15	34	2.1	2.4	7%	1%	54	-3
Dispersed Metro	Outer West Sydney	7	26	2.9	3.4	4%	1%	65	-5
Dispersed Metro	Southern Adelaide	27	37	1.5	2.3	35%	8%	71	13
Dispersed Metro	Southern Melbourne	10	36	3.2	4.2	9%	3%	78	21
Dispersed Metro	Southern Perth	8	31	3.5	4.3	4%	2%	67	13
Dispersed Metro	Southern Sydney	10	27	3.0	3.6	4%	1%	74	2
Dispersed Metro	West Melbourne	15	44	1.7	2.6	12%	5%	74	11
Dispersed Metro	Westernport VIC	13	41	2.6	3.5	9%	4%	59	15
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>12.4</b>	<b>31.8</b>	<b>2.8</b>	<b>3.5</b>	<b>8%</b>	<b>28%</b>	<b>64.5</b>	<b>7.6</b>
Lifestyle region	Far North QLD	25	23	3.6	4.0	1%	0%	37	12
Lifestyle region	Gold Coast and Hinterlands	9	24	3.9	4.6	2%	1%	52	7
Lifestyle region	North Coastal NSW	9	25	3.1	3.7	2%	1%	50	-4
Lifestyle region	Wide-Bay Burnett QLD	11	28	2.7	3.2	3%	1%	38	-9
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>13.7</b>	<b>25.0</b>	<b>3.3</b>	<b>3.9</b>	<b>2%</b>	<b>2%</b>	<b>44.3</b>	<b>1.6</b>
Production zone	Hunter NSW	17	44	2.8	3.2	3%	2%	63	22
Production zone	Illawarra NSW	13	34	2.4	2.8	2%	1%	66	2
Production zone	Ipswich QLD	15	34	2.2	2.7	5%	1%	54	-1
Production zone	North Melbourne	17	41	2.1	3.0	17%	9%	78	16
Production zone	Northern Adelaide	24	37	1.6	2.4	22%	8%	56	7
Production zone	Sydney Production Region	12	41	3.2	4.1	7%	9%	71	25
<b>Production zone</b>	<b>Simple average*</b>	<b>16.3</b>	<b>38.6</b>	<b>2.4</b>	<b>3.0</b>	<b>9%</b>	<b>29%</b>	<b>64.7</b>	<b>11.9</b>

Note: \* Simple average row is cumulative total.



**Table A13.12 Supply chain strength by state of region industries – Transport and other machinery (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End	16	22	4.4	4.3	1%	0%	78	17
Resource based	Gippsland VIC	8	20	1.8	2.2	1%	0%	65	-27
Resource based	Mackay QLD	14	20	2.1	2.5	2%	0%	51	-20
Resource based	Pilbara - Kimberley WA	14	10	4.0	4.2	1%	0%	57	-5
Resource based	Southern NT	8	16	0.3	0.6	1%	0%	72	-52
Resource based	North West QLD	12	15	0.4	0.5	1%	0%	25	-60
<b>Resource based</b>	<b>Simple average*</b>	<b>11.8</b>	<b>17.3</b>	<b>2.1</b>	<b>2.4</b>	<b>1%</b>	<b>1%</b>	<b>58.0</b>	<b>-24.6</b>
Rural	Central QLD	23	30	2.9	3.3	1%	0%	69	15
Rural	Central Western NSW	10	22	1.5	1.8	4%	1%	65	-28
Rural	Darling Downs & SW QLD	8	19	2.6	3.1	3%	1%	52	-19
Rural	Eyre and Yorke SA	13	32	1.2	1.7	2%	0%	36	-23
Rural	Far and North Western NSW	9	19	1.9	2.2	1%	0%	53	-29
Rural	Golden Region VIC	19	44	1.8	2.7	11%	4%	71	16
Rural	Goulburn VIC	8	27	2.2	2.7	1%	0%	57	-15
Rural	Loddon VIC	10	27	3.1	3.7	4%	0%	73	4
Rural	Mallee - Wimmera VIC	7	23	2.0	2.4	1%	0%	57	-23
Rural	Mercy-Lyell TAS	13	16	2.5	2.7	2%	0%	41	-24
Rural	Midlands and Central WA	15	19	2.7	3.0	1%	0%	30	-19
Rural	Murray - Murrumbidgee NSW	8	26	2.4	3.1	2%	1%	68	-9
Rural	Murraylands SA	17	21	1.9	2.1	4%	0%	27	-26
Rural	Northern NSW	8	25	2.0	2.6	2%	0%	60	-18
Rural	Northern Tasmania	10	33	3.0	4.1	2%	0%	60	10
Rural	Nth QLD	19	34	3.0	3.5	2%	0%	73	19
Rural	Ovens - Hume VIC	11	32	2.4	3.1	6%	1%	88	6
Rural	South East NSW	10	22	2.8	3.2	1%	0%	46	-14
Rural	South East SA	11	19	0.5	1.0	2%	0%	47	-47
Rural	South Eastern WA	11	13	2.2	2.3	1%	0%	39	-35
Rural	Southern WA	9	18	2.7	3.1	1%	0%	34	-23
Rural	Western Victoria	7	21	1.2	1.6	1%	0%	56	-37
<b>Rural</b>	<b>Simple average*</b>	<b>11.6</b>	<b>24.6</b>	<b>2.2</b>	<b>2.7</b>	<b>3%</b>	<b>10%</b>	<b>55</b>	<b>-14.5</b>
	<b>National weighted average</b>	<b>13</b>	<b>32</b>	<b>3.1</b>	<b>3.7</b>	<b>7%</b>	<b>100%</b>		
	<b>National Total</b>	<b>64</b>	<b>80</b>	<b>5.7</b>	<b>6.0</b>	<b>5%</b>	<b>100%</b>		
	National Max		139						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

**Table A13.13 Supply chain strength by state of region industries – Other manufacturing**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT	8	17	5.1	5.5	0%	1%	95	9
Core Metro	Brisbane City	5	39	5.4	6.8	1%	7%	97	34
Core Metro	Central Adelaide	9	31	5.9	7.1	1%	3%	86	38
Core Metro	East Melbourne	4	35	4.9	6.1	1%	7%	86	20
Core Metro	Global Sydney	10	25	7.5	8.3	0%	4%	92	49
Core Metro	Hobart and Southern Tasmania	3	36	4.6	5.7	0%	1%	53	7
Core Metro	Inner Melbourne VIC	16	28	7.5	8.2	0%	3%	98	67
Core Metro	Inner West Sydney	4	25	4.7	5.4	0%	1%	90	7
Core Metro	Northern and Central Perth	3	29	5.4	6.7	1%	5%	66	12
<b>Core Metro</b>	<b>Simple average*</b>	<b>7.1</b>	<b>29.4</b>	<b>5.7</b>	<b>6.6</b>	<b>1%</b>	<b>30%</b>	<b>84.8</b>	<b>26.9</b>
Dispersed Metro	Central Coast NSW	4	32	4.4	5.1	1%	1%	38	-3
Dispersed Metro	N.N. West Sydney	4	23	5.1	5.9	1%	3%	84	7
Dispersed Metro	North Brisbane	3	35	4.4	5.6	1%	2%	46	2
Dispersed Metro	Outer South West Sydney	2	32	2.9	3.7	1%	1%	54	-18
Dispersed Metro	Outer West Sydney	3	32	3.4	4.1	1%	2%	65	-9
Dispersed Metro	Southern Adelaide	10	23	4.2	5.0	1%	2%	71	10
Dispersed Metro	Southern Melbourne	5	35	4.1	5.1	2%	4%	78	11
Dispersed Metro	Southern Perth	5	40	4.1	5.2	1%	4%	67	12
Dispersed Metro	Southern Sydney	2	28	3.3	4.1	2%	3%	74	-14
Dispersed Metro	West Melbourne	6	36	3.4	4.3	1%	3%	74	4
Dispersed Metro	Westernport VIC	4	42	4.1	5.2	1%	4%	59	11
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>4.5</b>	<b>32.5</b>	<b>4.0</b>	<b>4.8</b>	<b>1%</b>	<b>29%</b>	<b>64.5</b>	<b>1.8</b>
Lifestyle region	Far North QLD	6	32	4.4	5.2	0%	1%	37	1
Lifestyle region	Gold Coast and Hinterlands	3	31	5.4	6.5	1%	4%	52	9
Lifestyle region	North Coastal NSW	6	38	5.5	6.5	1%	1%	50	23
Lifestyle region	Wide-Bay Burnett QLD	3	39	3.6	4.6	0%	0%	38	-4
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>4.6</b>	<b>35.1</b>	<b>4.7</b>	<b>5.7</b>	<b>1%</b>	<b>7%</b>	<b>44.3</b>	<b>7.2</b>
Production zone	Hunter NSW	6	49	3.6	4.5	0%	1%	63	16
Production zone	Illawarra NSW	5	34	3.2	3.9	0%	1%	66	-6
Production zone	Ipswich QLD	4	34	3.3	4.0	1%	1%	54	-8
Production zone	North Melbourne	7	34	3.7	4.6	1%	6%	78	9
Production zone	Northern Adelaide	9	30	3.1	4.0	1%	3%	56	-2
Production zone	Sydney Production Region	5	39	4.3	5.4	1%	12%	71	14
<b>Production zone</b>	<b>Simple average*</b>	<b>5.9</b>	<b>36.5</b>	<b>3.5</b>	<b>4.4</b>	<b>1%</b>	<b>24%</b>	<b>64.7</b>	<b>3.7</b>

Note: \* Simple average row is cumulative total.

**Table A13.13 Supply chain strength by state of region industries – Other manufacturing (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End	7	28	2.9	3.5	0%	0%	78	-8
Resource based	Gippsland VIC	7	39	3.0	3.8	0%	1%	65	2
Resource based	Mackay QLD	5	25	3.1	3.6	0%	0%	51	-19
Resource based	Pilbara - Kimberley WA					Industry insignificant			
Resource based	Southern NT	2	17	0.1	0.6	0%	0%	72	-59
Resource based	North West QLD	3	20	0.1	0.3	0%	0%	25	-67
<b>Resource based</b>	<b>Simple average*</b>	<b>3.9</b>	<b>21.6</b>	<b>1.5</b>	<b>2.0</b>	<b>0%</b>	<b>1%</b>	<b>58.0</b>	<b>-24.9</b>
Rural	Central QLD	3	32	3.5	4.2	0%	0%	69	-6
Rural	Central Western NSW	4	39	3.2	4.0	0%	1%	65	-3
Rural	Darling Downs & SW QLD	3	35	4.1	5.2	0%	0%	52	-1
Rural	Eyre and Yorke SA	9	38	1.8	2.5	0%	0%	36	-14
Rural	Far and North Western NSW	6	33	2.3	2.9	0%	0%	53	-17
Rural	Golden Region VIC	7	42	4.0	4.9	0%	1%	71	19
Rural	Goulburn VIC	5	42	3.3	4.3	0%	1%	57	4
Rural	Loddon VIC	5	34	3.3	4.0	1%	1%	73	-2
Rural	Mallee - Wimmera VIC	4	32	2.3	3.0	0%	0%	57	-21
Rural	Mercy-Lyell TAS	3	37	2.8	3.5	0%	0%	41	-16
Rural	Midlands and Central WA	6	20	2.1	2.5	0%	0%	30	-37
Rural	Murray - Murrumbidgee NSW	5	44	3.6	4.5	0%	1%	68	9
Rural	Murraylands SA	5	25	0.5	0.9	0%	0%	27	-51
Rural	Northern NSW	4	38	2.6	3.6	0%	0%	60	-10
Rural	Northern Tasmania	3	48	5.3	6.7	1%	0%	60	27
Rural	Nth QLD	7	32	3.2	3.8	0%	1%	73	-1
Rural	Ovens - Hume VIC	8	36	3.1	3.8	0%	0%	88	8
Rural	South East NSW	6	38	4.3	5.1	1%	1%	46	9
Rural	South East SA	7	35	1.0	1.7	0%	0%	47	-27
Rural	South Eastern WA	7	17	0.1	0.3	0%	0%	39	-58
Rural	Southern WA	4	37	3.9	4.7	0%	1%	34	-5
Rural	Western Victoria	5	36	1.9	2.7	0%	0%	56	-17
<b>Rural</b>	<b>Simple average*</b>	<b>5.2</b>	<b>35.0</b>	<b>2.8</b>	<b>3.6</b>	<b>0%</b>	<b>9%</b>	<b>55</b>	<b>-9.6</b>
<b>National weighted average</b>		<b>6</b>	<b>33</b>	<b>4.4</b>	<b>5.2</b>	<b>1%</b>	<b>100%</b>		
<b>National Total</b>		<b>27</b>	<b>94</b>	<b>5.9</b>	<b>7.8</b>	<b>1%</b>	<b>100%</b>		
National Max			136						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

**Table A13.14 Supply chain strength by state of region industries – Energy and water**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT	72	7	6.2	1.7	2%	1%	95	-3
Core Metro	Brisbane City	72	13	6.2	2.5	2%	5%	97	23
Core Metro	Central Adelaide	73	12	8.0	4.0	2%	3%	86	44
Core Metro	East Melbourne	71	10	5.7	2.5	2%	3%	86	12
Core Metro	Global Sydney	78	12	7.4	3.3	2%	8%	92	36
Core Metro	Hobart and Southern Tasmania	48	9	3.0	0.9	4%	2%	53	-34
Core Metro	Inner Melbourne VIC	71	19	6.1	2.5	2%	5%	98	38
Core Metro	Inner West Sydney	58	12	5.5	3.2	2%	1%	90	22
Core Metro	Northern and Central Perth	61	12	6.2	3.0	3%	5%	66	17
<b>Core Metro</b>	<b>Simple average*</b>	<b>67.0</b>	<b>11.9</b>	<b>6.0</b>	<b>2.6</b>	<b>2%</b>	<b>34%</b>	<b>84.8</b>	<b>17.1</b>
Dispersed Metro	Central Coast NSW	30	18	3.2	2.5	4%	1%	38	2
Dispersed Metro	N.N. West Sydney	75	8	5.9	2.6	1%	1%	84	8
Dispersed Metro	North Brisbane	56	8	4.3	1.7	2%	1%	46	-21
Dispersed Metro	Outer South West Sydney	68	15	3.9	2.1	1%	0%	54	4
Dispersed Metro	Outer West Sydney	70	9	4.6	2.2	1%	1%	65	-5
Dispersed Metro	Southern Adelaide	62	5	6.0	3.3	1%	0%	71	8.1
Dispersed Metro	Southern Melbourne	75	11	5.2	2.4	2%	1%	78	10
Dispersed Metro	Southern Perth	73	13	4.6	2.4	2%	2%	67	8
Dispersed Metro	Southern Sydney	65	10	4.7	2.2	1%	1%	74	-2
Dispersed Metro	West Melbourne	73	12	4.5	2.2	2%	2%	74	4
Dispersed Metro	Westernport VIC	64	10	4.0	2.0	2%	2%	59	-10
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>64.6</b>	<b>10.8</b>	<b>4.6</b>	<b>2.3</b>	<b>2%</b>	<b>12%</b>	<b>64.5</b>	<b>1.5</b>
Lifestyle region	Far North QLD	70	11	4.2	1.7	2%	1%	37	-13
Lifestyle region	Gold Coast and Hinterlands	66	8	5.3	2.1	1%	1%	52	-9
Lifestyle region	North Coastal NSW	46	10	3.8	2.2	3%	2%	50	-11
Lifestyle region	Wide-Bay Burnett QLD	34	17	2.6	1.7	5%	2%	38	-11
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>54.0</b>	<b>11.9</b>	<b>4.0</b>	<b>1.9</b>	<b>3%</b>	<b>6%</b>	<b>44.3</b>	<b>-11.1</b>
Production zone	Hunter NSW	46	21	3.1	2.2	4%	5%	63	13
Production zone	Illawarra NSW	66	17	4.0	2.4	2%	2%	66	14
Production zone	Ipswich QLD	33	17	2.8	1.9	4%	1%	54	-4
Production zone	North Melbourne	67	9	3.9	1.8	1%	2%	78	-10
Production zone	Northern Adelaide	75	9	5.9	3.4	1%	1%	56	14
Production zone	Sydney Production Region	73	12	5.4	2.8	2%	4%	71	16
<b>Production zone</b>	<b>Simple average*</b>	<b>60.1</b>	<b>14.1</b>	<b>4.2</b>	<b>2.4</b>	<b>2%</b>	<b>14%</b>	<b>64.7</b>	<b>7.2</b>

Note: \* Simple average row is cumulative total.

**Table A13.14 Supply chain strength by state of region industries – Energy and water (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End	75	15	5.6	2.4	2%	0%	78	19
Resource based	Gippsland VIC	21	19	1.8	1.5	9%	5%	65	-9
Resource based	Mackay QLD	64	18	2.9	1.5	2%	1%	51	-3
Resource based	Pilbara - Kimberley WA	80	12	2.6	1.4	1%	0%	57	-15
Resource based	Southern NT	45	18	3.6	1.9	4%	0%	72	7
Resource based	North West QLD	82	6	1.9	0.8	2%	0%	25	-46
<b>Resource based</b>	<b>Simple average*</b>	<b>61.3</b>	<b>14.6</b>	<b>3.0</b>	<b>1.6</b>	<b>3%</b>	<b>8%</b>	<b>58.0</b>	<b>-7.6</b>
Rural	Central QLD	37	20	2.3	1.8	6%	4%	69	2
Rural	Central Western NSW	34	19	2.7	2.1	4%	2%	65	5
Rural	Darling Downs & SW QLD	47	18	3.2	1.8	3%	1%	52	-1
Rural	Eyre and Yorke SA	64	15	3.6	2.4	2%	1%	36	2
Rural	Far and North Western NSW	58	17	3.4	2.1	3%	1%	53	4
Rural	Golden Region VIC	62	12	3.6	1.9	3%	2%	71	-4
Rural	Goulburn VIC	47	11	3.1	2.0	3%	1%	57	-13
Rural	Loddon VIC	49	11	3.1	1.9	4%	1%	73	-11
Rural	Mallee - Wimmera VIC	46	12	2.7	1.9	3%	1%	57	-14
Rural	Mercy-Lyell TAS	42	10	1.5	0.7	5%	1%	41	-45
Rural	Midlands and Central WA	65	14	3.1	1.8	2%	1%	30	-11
Rural	Murray - Murrumbidgee NSW	49	11	3.8	2.5	4%	2%	68	-2
Rural	Murraylands SA	66	9	4.2	2.9	2%	0%	27	-7
Rural	Northern NSW	48	17	3.7	2.5	3%	1%	60	9
Rural	Northern Tasmania	66	12	2.5	0.8	2%	1%	60	-25
Rural	Nth QLD	62	14	3.0	1.6	3%	2%	73	-4
Rural	Ovens - Hume VIC	55	10	3.2	1.7	3%	1%	88	-10
Rural	South East NSW	38	10	3.9	2.6	5%	2%	46	-9
Rural	South East SA	77	7	4.0	1.8	1%	0%	47	-19
Rural	South Eastern WA	107	12	2.9	1.2	1%	0%	39	-15
Rural	Southern WA	62	16	2.7	1.7	3%	2%	34	-9
Rural	Western Victoria	83	9	2.8	1.3	2%	0%	56	-22
<b>Rural</b>	<b>Simple average*</b>	<b>57.4</b>	<b>13.0</b>	<b>3.1</b>	<b>1.9</b>	<b>3%</b>	<b>27%</b>	<b>55</b>	<b>-9.1</b>
	<b>National weighted average</b>	<b>62</b>	<b>13</b>	<b>4.5</b>	<b>2.3</b>	<b>3%</b>	<b>100%</b>		
	<b>National Total</b>	<b>122</b>	<b>37</b>	<b>7.7</b>	<b>3.8</b>	<b>2%</b>	<b>100%</b>		
	National Max		46						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

**Table A13.15 Supply chain strength by state of region industries – Construction**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT	10	20	3.9	4.4	7%	2%	95	0
Core Metro	Brisbane City	5	37	5.1	6.5	6%	5%	97	27
Core Metro	Central Adelaide	4	30	3.8	5.4	6%	3%	86	4
Core Metro	East Melbourne	4	34	4.9	6.1	7%	4%	86	16
Core Metro	Global Sydney	8	25	5.2	6.3	4%	5%	92	18
Core Metro	Hobart and Southern Tasmania	4	26	4.2	5.2	8%	1%	53	-6
Core Metro	Inner Melbourne VIC	8	26	6.2	7.3	3%	3%	98	29
Core Metro	Inner West Sydney	4	23	4.1	5.1	8%	1%	90	-3
Core Metro	Northern and Central Perth	3	30	3.8	5.3	10%	6%	66	-2
<b>Core Metro</b>	<b>Simple average*</b>	<b>5.5</b>	<b>27.8</b>	<b>4.6</b>	<b>5.7</b>	<b>7%</b>	<b>30%</b>	<b>84.8</b>	<b>9.2</b>
Dispersed Metro	Central Coast NSW	4	31	3.3	4.2	12%	1%	38	-16
Dispersed Metro	N.N. West Sydney	4	23	3.7	4.7	12%	4%	84	-9
Dispersed Metro	North Brisbane	3	33	4.0	5.2	15%	3%	46	-5
Dispersed Metro	Outer South West Sydney	5	33	3.3	4.1	10%	1%	54	-9
Dispersed Metro	Outer West Sydney	7	30	3.4	4.1	12%	2%	65	-4
Dispersed Metro	Southern Adelaide	4	21	3.1	3.9	9%	1%	71	-20
Dispersed Metro	Southern Melbourne	3	32	4.4	5.5	7%	2%	78	6
Dispersed Metro	Southern Perth	4	35	3.6	4.6	9%	4%	67	0
Dispersed Metro	Southern Sydney	4	26	3.6	4.5	10%	2%	74	-8
Dispersed Metro	West Melbourne	6	30	4.5	5.3	6%	2%	74	7
Dispersed Metro	Westernport VIC	5	34	3.9	4.9	9%	3%	59	2
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>4.4</b>	<b>29.8</b>	<b>3.7</b>	<b>4.6</b>	<b>10%</b>	<b>25%</b>	<b>64.5</b>	<b>-4.7</b>
Lifestyle region	Far North QLD	7	27	3.7	4.4	8%	1%	37	-11
Lifestyle region	Gold Coast and Hinterlands	4	29	4.3	5.5	14%	4%	52	-3
Lifestyle region	North Coastal NSW	5	35	3.8	4.9	9%	2%	50	-1
Lifestyle region	Wide-Bay Burnett QLD	7	33	4.0	4.9	7%	1%	38	-2
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>5.4</b>	<b>31.0</b>	<b>3.9</b>	<b>4.9</b>	<b>10%</b>	<b>8%</b>	<b>44.3</b>	<b>-4.4</b>
Production zone	Hunter NSW	6	38	3.5	4.3	7%	3%	63	3
Production zone	Illawarra NSW	4	31	3.3	4.1	9%	2%	66	-9
Production zone	Ipswich QLD	13	32	4.5	5.0	6%	1%	54	14
Production zone	North Melbourne	5	32	4.5	5.4	6%	3%	78	8
Production zone	Northern Adelaide	6	30	3.7	4.4	7%	2%	56	-6
Production zone	Sydney Production Region	4	38	4.2	5.3	8%	7%	71	10
<b>Production zone</b>	<b>Simple average*</b>	<b>6.3</b>	<b>33.3</b>	<b>3.9</b>	<b>4.8</b>	<b>7%</b>	<b>17%</b>	<b>64.7</b>	<b>3.2</b>

Note: \* Simple average row is cumulative total.

**Table A13.15 Supply chain strength by state of region industries – Construction (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End	8	29	3.7	4.1	10%	1%	78	-1
Resource based	Gippsland VIC	9	30	4.2	4.8	4%	1%	65	5
Resource based	Mackay QLD	6	26	3.3	3.8	6%	1%	51	-16
Resource based	Pilbara - Kimberley WA	6	16	2.6	2.9	4%	1%	57	-33
Resource based	Southern NT	5	28	3.2	3.7	9%	0%	72	-12
Resource based	North West QLD	25	13	3.9	3.8	3%	0%	25	-1
<b>Resource based</b>	<b>Simple average*</b>	<b>9.7</b>	<b>23.9</b>	<b>3.5</b>	<b>3.9</b>	<b>6%</b>	<b>4%</b>	<b>58.0</b>	<b>-9.5</b>
Rural	Central QLD	7	29	3.7	4.3	5%	1%	69	-3
Rural	Central Western NSW	8	29	3.8	4.4	5%	1%	65	-1
Rural	Darling Downs & SW QLD	10	31	4.1	4.8	6%	1%	52	4
Rural	Eyre and Yorke SA	11	23	3.2	3.5	5%	1%	36	-17
Rural	Far and North Western NSW	11	26	3.9	4.4	5%	1%	53	-2
Rural	Golden Region VIC	5	36	3.9	4.9	6%	1%	71	7
Rural	Goulburn VIC	12	34	4.5	5.1	5%	1%	57	15
Rural	Loddon VIC	7	32	4.1	4.9	6%	1%	73	6
Rural	Mallee - Wimmera VIC	10	28	4.2	4.7	4%	0%	57	2
Rural	Mercy-Lyell TAS	8	28	3.8	4.3	5%	0%	41	-7
Rural	Midlands and Central WA	12	19	3.0	3.3	5%	1%	30	-22
Rural	Murray - Murrumbidgee NSW	12	34	3.9	4.5	5%	1%	68	12
Rural	Murraylands SA	8	24	3.1	3.5	5%	0%	27	-22
Rural	Northern NSW	9	33	4.1	4.8	5%	1%	60	6
Rural	Northern Tasmania	5	32	3.9	5.0	7%	1%	60	0
Rural	Nth QLD	14	28	4.0	4.5	5%	1%	73	11
Rural	Ovens - Hume VIC	17	32	4.8	5.0	4%	0%	88	30
Rural	South East NSW	8	34	4.0	4.8	8%	1%	46	2
Rural	South East SA	6	27	2.9	3.6	6%	0%	47	-18
Rural	South Eastern WA	13	16	2.8	3.0	5%	1%	39	-25
Rural	Southern WA	7	28	2.8	3.5	7%	2%	34	-19
Rural	Western Victoria	11	31	4.1	4.6	4%	0%	56	7
<b>Rural</b>	<b>Simple average*</b>	<b>9.6</b>	<b>28.8</b>	<b>3.7</b>	<b>4.3</b>	<b>5%</b>	<b>16%</b>	<b>55</b>	<b>-1.5</b>
	<b>National weighted average</b>	<b>6</b>	<b>30</b>	<b>4.1</b>	<b>5.0</b>	<b>8%</b>	<b>100%</b>		
	<b>National Total</b>	<b>7</b>	<b>86</b>	<b>3.7</b>	<b>6.6</b>	<b>7%</b>	<b>100%</b>		
	National Max		109						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

**Table A13.16 Supply chain strength by state of region industries – Wholesale and retail**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT	20	23	7.7	8.2	8%	1%	95	29
Core Metro	Brisbane City	19	32	5.9	7.2	14%	7%	97	30
Core Metro	Central Adelaide	27	31	7.3	8.8	10%	2%	86	44
Core Metro	East Melbourne	18	30	5.7	6.6	18%	5%	86	21
Core Metro	Global Sydney	24	35	7.2	8.2	10%	8%	92	44
Core Metro	Hobart and Southern Tasmania	20	24	5.1	6.0	12%	1%	53	1
Core Metro	Inner Melbourne VIC	25	36	7.1	8.0	10%	5%	98	47
Core Metro	Inner West Sydney	17	28	5.6	6.5	16%	1%	90	18
Core Metro	Northern and Central Perth	17	30	5.8	6.9	15%	4%	66	17
<b>Core Metro</b>	<b>Simple average*</b>	<b>20.9</b>	<b>29.8</b>	<b>6.4</b>	<b>7.4</b>	<b>13%</b>	<b>35%</b>	<b>84.8</b>	<b>27.9</b>
Dispersed Metro	Central Coast NSW	15	22	4.3	5.1	16%	1%	38	-15
Dispersed Metro	N.N. West Sydney	14	26	5.2	6.1	21%	4%	84	8
Dispersed Metro	North Brisbane	14	22	4.7	5.7	18%	2%	46	-10
Dispersed Metro	Outer South West Sydney	15	21	4.1	4.6	13%	1%	54	-15
Dispersed Metro	Outer West Sydney	16	20	4.1	4.6	15%	1%	65	-13
Dispersed Metro	Southern Adelaide	21	18	5.9	6.6	11%	1%	71	3
Dispersed Metro	Southern Melbourne	20	29	5.4	6.2	16%	2%	78	16
Dispersed Metro	Southern Perth	18	25	4.8	5.5	16%	4%	67	1
Dispersed Metro	Southern Sydney	15	25	4.5	5.2	16%	2%	74	-1
Dispersed Metro	West Melbourne	25	25	4.9	5.4	13%	2%	74	7
Dispersed Metro	Westernport VIC	20	24	4.7	5.3	15%	3%	59	-2
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>17.7</b>	<b>23.3</b>	<b>4.8</b>	<b>5.5</b>	<b>15%</b>	<b>22%</b>	<b>64.5</b>	<b>-1.7</b>
Lifestyle region	Far North QLD	21	20	4.8	5.5	12%	1%	37	-11
Lifestyle region	Gold Coast and Hinterlands	14	23	5.1	6.2	18%	3%	52	-3
Lifestyle region	North Coastal NSW	17	24	4.8	5.6	16%	2%	50	-4
Lifestyle region	Wide-Bay Burnett QLD	17	19	4.5	5.3	13%	1%	38	-16
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>17.2</b>	<b>21.5</b>	<b>4.8</b>	<b>5.6</b>	<b>15%</b>	<b>6%</b>	<b>44.3</b>	<b>-8.5</b>
Production zone	Hunter NSW	19	24	4.0	4.6	12%	3%	63	-7
Production zone	Illawarra NSW	20	23	4.1	4.6	11%	1%	66	-6
Production zone	Ipswich QLD	18	16	4.4	4.9	10%	0%	54	-18
Production zone	North Melbourne	27	26	5.2	5.6	12%	3%	78	12
Production zone	Northern Adelaide	30	20	6.3	6.8	11%	2%	56	10
Production zone	Sydney Production Region	20	29	5.3	6.0	17%	8%	71	13
<b>Production zone</b>	<b>Simple average*</b>	<b>22.6</b>	<b>23.0</b>	<b>4.9</b>	<b>5.4</b>	<b>12%</b>	<b>17%</b>	<b>64.7</b>	<b>0.8</b>

Note: \* Simple average row is cumulative total.



**Table A13.16 Supply chain strength by state of region industries – Wholesale and retail (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End	17	24	4.3	5.0	14%	1%	78	-2
Resource based	Gippsland VIC	22	21	4.5	5.0	8%	1%	65	-6
Resource based	Mackay QLD	23	20	4.2	4.7	10%	1%	51	-13
Resource based	Pilbara - Kimberley WA	23	14	3.7	3.8	3%	0%	57	-25
Resource based	Southern NT	15	22	3.9	4.6	14%	0%	72	-10
Resource based	North West QLD	22	11	3.5	3.6	6%	0%	25	-38
<b>Resource based</b>	<b>Simple average*</b>	<b>20.5</b>	<b>18.6</b>	<b>4.0</b>	<b>4.5</b>	<b>9%</b>	<b>3%</b>	<b>58.0</b>	<b>-15.3</b>
Rural	Central QLD	21	21	4.3	5.0	9%	1%	69	-5
Rural	Central Western NSW	24	19	4.1	4.4	10%	1%	65	-10
Rural	Darling Downs & SW QLD	21	19	4.6	5.4	13%	1%	52	-9
Rural	Eyre and Yorke SA	23	14	5.1	5.5	8%	1%	36	-17
Rural	Far and North Western NSW	21	19	4.3	4.7	12%	1%	53	-13
Rural	Golden Region VIC	24	27	4.7	5.3	11%	1%	71	7
Rural	Goulburn VIC	26	22	4.7	5.2	12%	1%	57	-2
Rural	Loddon VIC	20	24	4.7	5.3	12%	1%	73	1
Rural	Mallee - Wimmera VIC	23	22	4.5	5.0	13%	1%	57	-5
Rural	Mercy-Lyell TAS	23	19	4.3	4.8	11%	0%	41	-15
Rural	Midlands and Central WA	33	17	4.2	4.5	9%	1%	30	-16
Rural	Murray - Murrumbidgee NSW	24	24	4.5	5.2	13%	1%	68	1
Rural	Murraylands SA	29	16	5.6	5.9	10%	0%	27	-9
Rural	Northern NSW	21	23	4.5	5.2	13%	1%	60	-3
Rural	Northern Tasmania	19	22	4.6	5.5	15%	1%	60	-3
Rural	Nth QLD	23	21	4.3	5.0	11%	1%	73	-4
Rural	Ovens - Hume VIC	29	23	4.9	5.3	10%	0%	88	9
Rural	South East NSW	19	24	5.2	5.9	13%	1%	46	0
Rural	South East SA	29	17	5.5	6.2	10%	0%	47	-2
Rural	South Eastern WA	21	16	3.4	3.7	7%	0%	39	-29
Rural	Southern WA	27	19	4.3	4.8	9%	1%	34	-14
Rural	Western Victoria	26	20	4.5	4.9	10%	0%	56	-7
<b>Rural</b>	<b>Simple average*</b>	<b>23.9</b>	<b>20.3</b>	<b>4.6</b>	<b>5.1</b>	<b>11%</b>	<b>17%</b>	<b>55</b>	<b>-6.7</b>
	<b>National weighted average</b>	<b>21</b>	<b>25</b>	<b>5.3</b>	<b>6.1</b>	<b>13%</b>	<b>100%</b>		
	<b>National Total</b>	<b>54</b>	<b>64</b>	<b>8.3</b>	<b>9.3</b>	<b>13%</b>	<b>100%</b>		
	National Max		77						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

**Table A13.17 Supply chain strength by state of region industries – Accommodation and restaurants**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT	12	20	5.4	6.2	3%	2%	95	9
Core Metro	Brisbane City	13	34	4.1	5.7	3%	7%	97	18
Core Metro	Central Adelaide	15	30	5.3	7.0	2%	3%	86	25
Core Metro	East Melbourne	13	29	4.9	5.9	2%	2%	86	13
Core Metro	Global Sydney	16	31	4.4	5.6	3%	12%	92	16
Core Metro	Hobart and Southern Tasmania	8	30	3.8	5.3	4%	1%	53	-5
Core Metro	Inner Melbourne VIC	17	32	5.4	6.4	3%	7%	98	28
Core Metro	Inner West Sydney	9	30	3.7	4.8	3%	1%	90	1
Core Metro	Northern and Central Perth	11	33	5.5	6.9	3%	4%	66	18
<b>Core Metro</b>	<b>Simple average*</b>	<b>12.6</b>	<b>29.8</b>	<b>4.7</b>	<b>6.0</b>	<b>3%</b>	<b>39%</b>	<b>84.8</b>	<b>13.6</b>
Dispersed Metro	Central Coast NSW	6	28	3.3	4.3	4%	1%	38	-20
Dispersed Metro	N.N. West Sydney	7	25	3.5	4.5	3%	3%	84	-10
Dispersed Metro	North Brisbane	5	29	4.7	6.3	5%	2%	46	-2
Dispersed Metro	Outer South West Sydney	6	25	3.6	4.4	3%	1%	54	-18
Dispersed Metro	Outer West Sydney	6	22	3.5	4.4	4%	2%	65	-19
Dispersed Metro	Southern Adelaide	7	20	4.6	5.7	2%	1%	71	-8
Dispersed Metro	Southern Melbourne	13	29	4.9	5.8	2%	1%	78	11
Dispersed Metro	Southern Perth	15	31	5.4	6.3	2%	2%	67	18
Dispersed Metro	Southern Sydney	7	24	3.5	4.5	3%	2%	74	-13
Dispersed Metro	West Melbourne	15	28	4.9	5.7	1%	1%	74	11
Dispersed Metro	Westernport VIC	11	29	4.3	5.2	2%	2%	59	0
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>8.9</b>	<b>26.4</b>	<b>4.2</b>	<b>5.2</b>	<b>3%</b>	<b>17%</b>	<b>64.5</b>	<b>-4.4</b>
Lifestyle region	Far North QLD	8	29	4.0	5.0	6%	2%	37	-11
Lifestyle region	Gold Coast and Hinterlands	5	28	4.6	6.1	6%	4%	52	-4
Lifestyle region	North Coastal NSW	7	33	3.8	5.0	5%	3%	50	-6
Lifestyle region	Wide-Bay Burnett QLD	7	27	3.9	4.9	3%	1%	38	-15
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>6.7</b>	<b>29.1</b>	<b>4.1</b>	<b>5.3</b>	<b>5%</b>	<b>10%</b>	<b>44.3</b>	<b>-8.9</b>
Production zone	Hunter NSW	9	33	3.6	4.6	3%	3%	63	-4
Production zone	Illawarra NSW	7	28	3.7	4.6	4%	2%	66	-11
Production zone	Ipswich QLD	10	24	3.8	4.6	2%	0%	54	-14
Production zone	North Melbourne	19	26	5.2	6.0	1%	1%	78	17
Production zone	Northern Adelaide	16	24	5.2	6.0	1%	1%	56	6
Production zone	Sydney Production Region	15	32	4.1	4.9	2%	4%	71	7
<b>Production zone</b>	<b>Simple average*</b>	<b>12.4</b>	<b>27.7</b>	<b>4.3</b>	<b>5.1</b>	<b>2%</b>	<b>12%</b>	<b>64.7</b>	<b>0.1</b>

Note: \* Simple average row is cumulative total.

**Table A13.17 Supply chain strength by state of region industries – Accommodation and restaurants (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End	10	27	3.6	4.4	4%	1%	78	-6
Resource based	Gippsland VIC	12	30	5.0	5.7	2%	1%	65	8
Resource based	Mackay QLD	9	28	3.5	4.3	4%	1%	51	-13
Resource based	Pilbara - Kimberley WA	14	18	4.0	4.3	1%	0%	57	-16
Resource based	Southern NT	8	24	3.4	4.1	5%	0%	72	-15
Resource based	North West QLD	9	13	2.8	2.9	2%	0%	25	-45
<b>Resource based</b>	<b>Simple average*</b>	<b>10.3</b>	<b>23.3</b>	<b>3.7</b>	<b>4.3</b>	<b>3%</b>	<b>4%</b>	<b>58.0</b>	<b>-14.4</b>
Rural	Central QLD	10	30	3.4	4.3	3%	1%	69	-6
Rural	Central Western NSW	12	28	3.3	4.0	3%	1%	65	-9
Rural	Darling Downs & SW QLD	12	29	3.8	4.7	3%	1%	52	-5
Rural	Eyre and Yorke SA	12	22	4.6	5.2	2%	1%	36	-11
Rural	Far and North Western NSW	11	27	3.5	4.1	3%	1%	53	-12
Rural	Golden Region VIC	11	33	4.5	5.4	2%	2%	71	8
Rural	Goulburn VIC	15	32	5.1	5.8	2%	1%	57	13
Rural	Loddon VIC	11	32	4.7	5.5	2%	0%	73	9
Rural	Mallee - Wimmera VIC	18	30	5.1	5.7	2%	1%	57	13
Rural	Mercy-Lyell TAS	11	30	3.3	4.1	3%	1%	41	-14
Rural	Midlands and Central WA	19	24	4.7	5.2	2%	0%	30	-2
Rural	Murray - Murrumbidgee NSW	11	33	3.7	4.6	3%	2%	68	1
Rural	Murraylands SA	19	27	5.3	5.8	2%	0%	27	5
Rural	Northern NSW	12	31	3.7	4.5	3%	1%	60	-3
Rural	Northern Tasmania	9	31	3.4	4.7	3%	1%	60	-6
Rural	Nth QLD	14	29	3.4	4.1	2%	1%	73	-3
Rural	Ovens - Hume VIC	16	31	5.2	5.9	2%	0%	88	20
Rural	South East NSW	8	33	4.3	5.5	5%	1%	46	0
Rural	South East SA	14	29	5.0	5.8	2%	0%	47	5
Rural	South Eastern WA	24	23	4.0	4.2	1%	0%	39	-4
Rural	Southern WA	15	29	4.7	5.5	2%	1%	34	1
Rural	Western Victoria	17	28	4.6	5.1	2%	0%	56	5
<b>Rural</b>	<b>Simple average*</b>	<b>13.7</b>	<b>29.2</b>	<b>4.3</b>	<b>5.0</b>	<b>2%</b>	<b>18%</b>	<b>55</b>	<b>0.2</b>
	<b>National weighted average</b>	<b>11</b>	<b>29</b>	<b>4.4</b>	<b>5.4</b>	<b>3%</b>	<b>100%</b>		
	<b>National Total</b>	<b>31</b>	<b>82</b>	<b>4.9</b>	<b>7.0</b>	<b>3%</b>	<b>100%</b>		
	National Max		98						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

**Table A13.18 Supply chain strength by state of region industries – Transport and communication**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT	48	16	5.8	3.8	6%	1%	95	13
Core Metro	Brisbane City	27	27	3.9	3.8	14%	9%	97	18
Core Metro	Central Adelaide	28	22	3.8	3.7	12%	4%	86	6
Core Metro	East Melbourne	45	22	5.4	4.2	7%	3%	86	21
Core Metro	Global Sydney	24	26	4.6	4.6	16%	17%	92	23
Core Metro	Hobart and Southern Tasmania	41	21	4.8	4.0	7%	1%	53	7
Core Metro	Inner Melbourne VIC	32	31	5.0	4.7	14%	10%	98	36
Core Metro	Inner West Sydney	28	21	4.5	4.1	11%	1%	90	11
Core Metro	Northern and Central Perth	41	22	5.3	4.0	8%	3%	66	13
<b>Core Metro</b>	<b>Simple average*</b>	<b>34.9</b>	<b>23.0</b>	<b>4.8</b>	<b>4.1</b>	<b>10%</b>	<b>51%</b>	<b>84.8</b>	<b>16.4</b>
Dispersed Metro	Central Coast NSW	40	16	4.2	3.5	5%	0%	38	-11
Dispersed Metro	N.N. West Sydney	45	20	5.1	3.8	4%	1%	84	13
Dispersed Metro	North Brisbane	42	20	4.6	3.9	6%	1%	46	3
Dispersed Metro	Outer South West Sydney	38	16	3.9	3.2	5%	0%	54	-12
Dispersed Metro	Outer West Sydney	41	18	3.9	3.1	4%	0%	65	-5
Dispersed Metro	Southern Adelaide	30	20	3.5	3.8	5%	1%	71	1
Dispersed Metro	Southern Melbourne	48	21	5.0	4.0	5%	1%	78	16
Dispersed Metro	Southern Perth	26	26	2.9	2.9	10%	4%	67	-3
Dispersed Metro	Southern Sydney	28	25	3.4	3.1	7%	1%	74	1
Dispersed Metro	West Melbourne	33	22	3.2	3.1	8%	2%	74	-2
Dispersed Metro	Westernport VIC	45	19	4.6	3.9	5%	1%	59	5
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>37.9</b>	<b>20.2</b>	<b>4.0</b>	<b>3.5</b>	<b>6%</b>	<b>13%</b>	<b>64.5</b>	<b>1.2</b>
Lifestyle region	Far North QLD	20	28	2.7	3.8	14%	2%	37	-2
Lifestyle region	Gold Coast and Hinterlands	35	21	4.5	4.1	7%	2%	52	5
Lifestyle region	North Coastal NSW	44	23	4.3	3.8	7%	1%	50	6
Lifestyle region	Wide-Bay Burnett QLD	35	21	3.0	3.0	7%	1%	38	-13
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>33.3</b>	<b>23.2</b>	<b>3.6</b>	<b>3.7</b>	<b>9%</b>	<b>5%</b>	<b>44.3</b>	<b>-1.0</b>
Production zone	Hunter NSW	46	22	3.9	3.3	5%	2%	63	4
Production zone	Illawarra NSW	47	18	4.0	3.4	5%	1%	66	-1
Production zone	Ipswich QLD	40	15	3.1	2.6	5%	0%	54	-20
Production zone	North Melbourne	19	20	2.4	2.6	12%	4%	78	-15
Production zone	Northern Adelaide	26	23	2.0	2.7	11%	2%	56	-14
Production zone	Sydney Production Region	42	23	4.7	4.0	6%	4%	71	15
<b>Production zone</b>	<b>Simple average*</b>	<b>36.8</b>	<b>20.4</b>	<b>3.3</b>	<b>3.1</b>	<b>7%</b>	<b>14%</b>	<b>64.7</b>	<b>-5.2</b>

Note: \* Simple average row is cumulative total.

**Table A13.18 Supply chain strength by state of region industries – Transport and communication (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End	167	22	4.1	3.6	10%	1%	78	46
Resource based	Gippsland VIC	57	20	4.0	3.3	3%	0%	65	5
Resource based	Mackay QLD	20	26	2.1	3.0	11%	1%	51	-10
Resource based	Pilbara - Kimberley WA	25	22	2.3	2.6	5%	1%	57	-16
Resource based	Southern NT	27	21	3.7	3.4	13%	0%	72	-2
Resource based	North West QLD	37	12	2.1	1.8	5%	0%	25	-43
<b>Resource based</b>	<b>Simple average*</b>	<b>55.5</b>	<b>20.5</b>	<b>3.0</b>	<b>2.9</b>	<b>8%</b>	<b>3%</b>	<b>58.0</b>	<b>-3.5</b>
Rural	Central QLD	30	22	2.6	2.9	8%	1%	69	-8
Rural	Central Western NSW	53	17	3.8	3.0	5%	1%	65	-5
Rural	Darling Downs & SW QLD	43	17	3.5	3.0	7%	1%	52	-12
Rural	Eyre and Yorke SA	26	15	2.2	2.3	9%	1%	36	-34
Rural	Far and North Western NSW	53	16	3.6	2.9	5%	0%	53	-10
Rural	Golden Region VIC	50	23	4.3	3.5	5%	1%	71	11
Rural	Goulburn VIC	60	19	4.0	3.2	5%	1%	57	1
Rural	Loddon VIC	47	18	4.2	3.4	6%	0%	73	1
Rural	Mallee - Wimmera VIC	45	19	3.4	3.0	6%	1%	57	-8
Rural	Mercy-Lyell TAS	37	23	2.9	3.3	7%	0%	41	-6
Rural	Midlands and Central WA	47	14	3.2	2.8	5%	0%	30	-23
Rural	Murray - Murrumbidgee NSW	57	19	4.4	3.5	5%	1%	68	6
Rural	Murraylands SA	40	20	2.5	2.7	7%	0%	27	-20
Rural	Northern NSW	49	20	4.3	3.6	6%	1%	60	4
Rural	Northern Tasmania	43	19	4.1	3.7	6%	0%	60	1
Rural	Nth QLD	35	23	2.5	2.6	9%	1%	73	-7
Rural	Ovens - Hume VIC	60	19	4.2	3.2	4%	0%	88	8
Rural	South East NSW	45	19	4.8	3.9	7%	1%	46	3
Rural	South East SA	46	14	2.7	2.4	7%	0%	47	-25
Rural	South Eastern WA	52	15	2.4	1.9	4%	0%	39	-28
Rural	Southern WA	56	18	3.3	2.8	4%	1%	34	-13
Rural	Western Victoria	59	17	3.6	2.8	4%	0%	56	-7
<b>Rural</b>	<b>Simple average*</b>	<b>47.0</b>	<b>18.5</b>	<b>3.5</b>	<b>3.0</b>	<b>6%</b>	<b>13%</b>	<b>55</b>	<b>-7.6</b>
	<b>National weighted average</b>	<b>38</b>	<b>22</b>	<b>4.2</b>	<b>3.7</b>	<b>9%</b>	<b>100%</b>		
	<b>National Total</b>	<b>88</b>	<b>51</b>	<b>6.8</b>	<b>5.1</b>	<b>9%</b>	<b>100%</b>		
	National Max		63						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

**Table A13.19 Supply chain strength by state of region industries – Finance**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT	52	14	8.6	5.7	3%	1%	95	8
Core Metro	Brisbane City	51	18	8.7	6.9	4%	6%	97	24
Core Metro	Central Adelaide	67	19	16.1	13.5	2%	2%	86	78
Core Metro	East Melbourne	57	19	6.6	4.7	3%	3%	86	7
Core Metro	Global Sydney	30	23	7.3	7.0	10%	26%	92	25
Core Metro	Hobart and Southern Tasmania	51	18	7.3	5.3	4%	1%	53	0
Core Metro	Inner Melbourne VIC	29	23	6.8	6.4	10%	17%	98	22
Core Metro	Inner West Sydney	46	16	6.9	5.4	4%	1%	90	5
Core Metro	Northern and Central Perth	51	21	9.5	7.8	5%	5%	66	28
<b>Core Metro</b>	<b>Simple average*</b>	<b>48.2</b>	<b>18.9</b>	<b>8.6</b>	<b>7.0</b>	<b>5%</b>	<b>63%</b>	<b>84.8</b>	<b>22.0</b>
Dispersed Metro	Central Coast NSW	55	17	5.1	3.9	3%	1%	38	-16
Dispersed Metro	N.N. West Sydney	58	18	7.2	5.3	4%	2%	84	10
Dispersed Metro	North Brisbane	63	17	8.4	6.1	2%	1%	46	8
Dispersed Metro	Outer South West Sydney	60	16	5.5	4.0	2%	0%	54	-11
Dispersed Metro	Outer West Sydney	58	14	5.8	4.1	2%	1%	65	-12
Dispersed Metro	Southern Adelaide	69	11	11.3	9.2	1%	0%	71	25
Dispersed Metro	Southern Melbourne	67	18	6.3	4.2	2%	1%	78	2
Dispersed Metro	Southern Perth	80	15	8.7	6.1	1%	1%	67	12
Dispersed Metro	Southern Sydney	45	17	6.0	4.9	5%	2%	74	-2
Dispersed Metro	West Melbourne	70	14	6.6	4.5	2%	1%	74	-4
Dispersed Metro	Westernport VIC	52	14	4.7	3.5	3%	2%	59	-20
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>61.5</b>	<b>15.6</b>	<b>6.9</b>	<b>5.1</b>	<b>2%</b>	<b>11%</b>	<b>64.5</b>	<b>-1.0</b>
Lifestyle region	Far North QLD	77	16	7.3	5.4	2%	0%	37	0
Lifestyle region	Gold Coast and Hinterlands	65	19	8.8	6.5	2%	1%	52	15
Lifestyle region	North Coastal NSW	58	19	5.5	4.1	3%	1%	50	-6
Lifestyle region	Wide-Bay Burnett QLD	59	14	6.2	4.9	2%	0%	38	-12
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>64.5</b>	<b>17.2</b>	<b>7.0</b>	<b>5.2</b>	<b>2%</b>	<b>4%</b>	<b>44.3</b>	<b>-0.7</b>
Production zone	Hunter NSW	57	19	5.8	4.5	3%	2%	63	0
Production zone	Illawarra NSW	60	19	5.9	4.6	2%	1%	66	1
Production zone	Ipswich QLD	69	13	8.9	6.8	1%	0%	54	7
Production zone	North Melbourne	70	15	6.4	4.2	2%	1%	78	-3
Production zone	Northern Adelaide	94	10	14.9	11.0	1%	0%	56	43
Production zone	Sydney Production Region	59	18	6.0	4.3	3%	6%	71	-2
<b>Production zone</b>	<b>Simple average*</b>	<b>68.1</b>	<b>15.7</b>	<b>8.0</b>	<b>5.9</b>	<b>2%</b>	<b>11%</b>	<b>64.7</b>	<b>7.8</b>

Note: \* Simple average row is cumulative total.

**Table A13.19 Supply chain strength by state of region industries – Finance (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End	68	16	8.4	6.1	2%	0%	78	13
Resource based	Gippsland VIC	52	14	5.0	4.0	2%	1%	65	-16
Resource based	Mackay QLD	82	17	6.8	5.4	1%	0%	51	5
Resource based	Pilbara - Kimberley WA				Industry insignificant				
Resource based	Southern NT	69	16	5.9	3.7	2%	0%	72	-7
Resource based	North West QLD	69	8	4.7	3.6	1%	0%	25	-36
<b>Resource based</b>	<b>Simple average*</b>	<b>56.8</b>	<b>11.7</b>	<b>5.1</b>	<b>3.8</b>	<b>1%</b>	<b>2%</b>	<b>58.0</b>	<b>-6.7</b>
Rural	Central QLD	79	16	7.4	5.8	1%	0%	69	10
Rural	Central Western NSW	68	16	5.0	3.4	2%	1%	65	-13
Rural	Darling Downs & SW QLD	73	18	7.6	5.9	2%	1%	52	9
Rural	Eyre and Yorke SA	73	12	10.1	8.7	1%	0%	36	15
Rural	Far and North Western NSW	60	13	4.8	3.6	2%	0%	53	-21
Rural	Golden Region VIC	62	17	5.0	3.7	2%	1%	71	-8
Rural	Goulburn VIC	66	18	5.0	3.7	2%	1%	57	-9
Rural	Loddon VIC	55	17	4.4	3.5	3%	1%	73	-11
Rural	Mallee - Wimmera VIC	61	16	4.0	3.1	3%	1%	57	-18
Rural	Mercy-Lyell TAS	76	17	5.9	4.1	2%	0%	41	-9
Rural	Midlands and Central WA	84	12	6.2	4.7	1%	0%	30	-14
Rural	Murray - Murrumbidgee NSW	67	18	5.5	4.0	2%	1%	68	-3
Rural	Murraylands SA	88	11	7.8	6.2	1%	0%	27	-4
Rural	Northern NSW	63	17	5.3	4.0	3%	1%	60	-8
Rural	Northern Tasmania	56	17	5.8	4.6	3%	0%	60	-5
Rural	Nth QLD	81	16	7.0	5.1	1%	0%	73	6
Rural	Ovens - Hume VIC	69	17	5.3	3.8	2%	0%	88	0
Rural	South East NSW	64	17	6.2	4.2	3%	1%	46	-9
Rural	South East SA	83	15	10.5	8.8	1%	0%	47	26
Rural	South Eastern WA	93	9	5.3	3.8	1%	0%	39	-23
Rural	Southern WA	79	14	6.6	5.2	1%	0%	34	-7
Rural	Western Victoria	64	14	4.1	3.1	2%	0%	56	-22
<b>Rural</b>	<b>Simple average*</b>	<b>71.1</b>	<b>15.3</b>	<b>6.1</b>	<b>4.7</b>	<b>2%</b>	<b>10%</b>	<b>55</b>	<b>-5.4</b>
	<b>National weighted average</b>	<b>55</b>	<b>18</b>	<b>8.0</b>	<b>6.3</b>	<b>4%</b>	<b>100%</b>		
	<b>National Total</b>	<b>102</b>	<b>38</b>	<b>9.4</b>	<b>6.8</b>	<b>4%</b>	<b>100%</b>		
	National Max		42						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

**Table A13.20 Supply chain strength by state of region industries – Business services**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT	66	24	13.4	10.8	12%	2%	95	13
Core Metro	Brisbane City	65	31	13.6	12.1	13%	7%	97	26
Core Metro	Central Adelaide	66	30	15.0	13.5	11%	3%	86	29
Core Metro	East Melbourne	59	29	10.5	9.0	14%	5%	86	6
Core Metro	Global Sydney	44	35	9.7	9.3	23%	20%	92	14
Core Metro	Hobart and Southern Tasmania	87	25	15.7	12.9	7%	1%	53	16
Core Metro	Inner Melbourne VIC	43	35	10.1	9.8	22%	13%	98	18
Core Metro	Inner West Sydney	50	29	9.4	8.5	18%	2%	90	3
Core Metro	Northern and Central Perth	57	31	12.7	11.2	16%	5%	66	14
<b>Core Metro</b>	<b>Simple average*</b>	<b>59.7</b>	<b>29.9</b>	<b>12.2</b>	<b>10.8</b>	<b>15%</b>	<b>59%</b>	<b>84.8</b>	<b>15.5</b>
Dispersed Metro	Central Coast NSW	77	23	10.1	8.3	8%	1%	38	-12
Dispersed Metro	N.N. West Sydney	51	25	9.2	8.0	19%	4%	84	-4
Dispersed Metro	North Brisbane	74	21	14.0	11.6	9%	1%	46	2
Dispersed Metro	Outer South West Sydney	74	19	8.9	7.1	8%	1%	54	-19
Dispersed Metro	Outer West Sydney	80	21	10.2	8.0	7%	1%	65	-9
Dispersed Metro	Southern Adelaide	95	15	16.7	14.3	4%	0%	71	14
Dispersed Metro	Southern Melbourne	70	27	10.4	8.7	11%	2%	78	3
Dispersed Metro	Southern Perth	83	23	11.3	9.4	9%	3%	67	0
Dispersed Metro	Southern Sydney	64	74	9.6	8.1	12%	2%	74	58
Dispersed Metro	West Melbourne	90	23	11.4	9.2	6%	1%	74	3
Dispersed Metro	Westernport VIC	87	22	10.7	8.6	7%	1%	59	-6
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>76.8</b>	<b>26.5</b>	<b>11.1</b>	<b>9.2</b>	<b>9%</b>	<b>16%</b>	<b>64.5</b>	<b>2.2</b>
Lifestyle region	Far North QLD	87	20	12.5	10.6	6%	1%	37	-4
Lifestyle region	Gold Coast and Hinterlands	72	22	13.7	11.6	10%	2%	52	4
Lifestyle region	North Coastal NSW	77	24	10.8	8.8	8%	1%	50	-5
Lifestyle region	Wide-Bay Burnett QLD	81	19	11.6	9.6	6%	0%	38	-10
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>79.2</b>	<b>21.4</b>	<b>12.2</b>	<b>10.2</b>	<b>8%</b>	<b>4%</b>	<b>44.3</b>	<b>-3.9</b>
Production zone	Hunter NSW	82	25	9.4	7.8	8%	2%	63	-5
Production zone	Illawarra NSW	76	24	8.5	7.2	10%	1%	66	-9
Production zone	Ipswich QLD	91	17	14.2	11.4	4%	0%	54	1
Production zone	North Melbourne	90	22	11.2	8.9	6%	2%	78	1
Production zone	Northern Adelaide	107	17	15.6	13.0	4%	1%	56	11
Production zone	Sydney Production Region	79	28	10.3	8.3	8%	5%	71	3
<b>Production zone</b>	<b>Simple average*</b>	<b>87.5</b>	<b>22.4</b>	<b>11.5</b>	<b>9.4</b>	<b>7%</b>	<b>11%</b>	<b>64.7</b>	<b>0.3</b>

Note: \* Simple average row is cumulative total.



**Table A13.20 Supply chain strength by state of region industries – Business services (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End	74	25	10.5	8.5	11%	1%	78	0
Resource based	Gippsland VIC	96	22	10.0	8.4	4%	0%	65	-3
Resource based	Mackay QLD	96	21	10.7	9.2	4%	0%	51	-5
Resource based	Pilbara - Kimberley WA	93	15	6.8	5.7	2%	0%	57	-28
Resource based	Southern NT	72	25	10.7	9.1	10%	0%	72	1
Resource based	North West QLD	113	12	8.5	6.7	2%	0%	25	-31
<b>Resource based</b>	<b>Simple average*</b>	<b>90.8</b>	<b>19.9</b>	<b>9.5</b>	<b>7.9</b>	<b>6%</b>	<b>2%</b>	<b>58.0</b>	<b>-10.9</b>
Rural	Central QLD	92	23	10.9	9.4	5%	1%	69	2
Rural	Central Western NSW	98	20	9.6	7.9	4%	0%	65	-8
Rural	Darling Downs & SW QLD	95	21	14.4	11.8	4%	0%	52	8
Rural	Eyre and Yorke SA	71	15	11.0	8.9	3%	0%	36	-20
Rural	Far and North Western NSW	100	20	9.8	7.8	4%	0%	53	-11
Rural	Golden Region VIC	86	25	10.8	8.9	7%	1%	71	2
Rural	Goulburn VIC	93	24	11.0	8.8	5%	0%	57	-1
Rural	Loddon VIC	87	24	10.0	8.1	6%	0%	73	-2
Rural	Mallee - Wimmera VIC	96	22	10.7	8.5	4%	0%	57	-4
Rural	Mercy-Lyell TAS	96	19	11.4	9.3	4%	0%	41	-9
Rural	Midlands and Central WA	99	19	10.3	8.4	3%	0%	30	-15
Rural	Murray - Murrumbidgee NSW	89	24	10.8	8.8	6%	1%	68	0
Rural	Murraylands SA	98	16	10.7	8.4	3%	0%	27	-19
Rural	Northern NSW	87	24	11.2	9.1	6%	0%	60	0
Rural	Northern Tasmania	95	21	14.5	12.0	5%	0%	60	10
Rural	Nth QLD	99	23	12.4	10.5	5%	1%	73	9
Rural	Ovens - Hume VIC	89	24	11.0	8.8	6%	0%	88	6
Rural	South East NSW	79	26	11.7	9.6	9%	1%	46	0
Rural	South East SA	102	18	15.2	12.5	3%	0%	47	6
Rural	South Eastern WA	111	16	8.0	6.6	5%	0%	39	-24
Rural	Southern WA	97	21	10.2	8.4	5%	1%	34	-12
Rural	Western Victoria	98	21	10.5	8.3	4%	0%	56	-7
<b>Rural</b>	<b>Simple average*</b>	<b>93.4</b>	<b>21.2</b>	<b>11.2</b>	<b>9.1</b>	<b>5%</b>	<b>9%</b>	<b>55</b>	<b>-4.0</b>
	<b>National weighted average</b>	<b>70</b>	<b>27</b>	<b>11.7</b>	<b>10.1</b>	<b>12%</b>	<b>100%</b>		
	<b>National Total</b>	<b>145</b>	<b>61</b>	<b>13.9</b>	<b>10.0</b>	<b>11%</b>	<b>100%</b>		
	National Max		73						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

**Table A13.21 Supply chain strength by state of region industries – Government and community services**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT	11	30	7.6	8.8	49%	8%	95	30
Core Metro	Brisbane City	10	29	9.1	10.4	15%	7%	97	37
Core Metro	Central Adelaide	9	24	10.6	12.0	14%	3%	86	31
Core Metro	East Melbourne	6	19	7.9	8.6	12%	4%	86	2
Core Metro	Global Sydney	14	33	9.9	11.1	11%	8%	92	52
Core Metro	Hobart and Southern Tasmania	10	28	8.2	9.3	23%	2%	53	19
Core Metro	Inner Melbourne VIC	13	35	8.6	9.9	14%	7%	98	49
Core Metro	Inner West Sydney	6	19	9.1	9.8	11%	1%	90	10
Core Metro	Northern and Central Perth	9	26	9.1	10.2	18%	5%	66	20
<b>Core Metro</b>	<b>Simple average*</b>	<b>9.7</b>	<b>27.0</b>	<b>8.9</b>	<b>10.0</b>	<b>19%</b>	<b>44%</b>	<b>84.8</b>	<b>27.8</b>
Dispersed Metro	Central Coast NSW	6	17	7.8	8.3	13%	1%	38	-13
Dispersed Metro	N.N. West Sydney	4	15	9.2	9.7	10%	2%	84	-1
Dispersed Metro	North Brisbane	5	15	8.6	9.2	13%	1%	46	-11
Dispersed Metro	Outer South West Sydney	4	14	8.0	8.5	12%	1%	54	-17
Dispersed Metro	Outer West Sydney	5	20	6.8	7.4	20%	1%	65	-10
Dispersed Metro	Southern Adelaide	2	9	9.4	10.1	12%	1%	71	-14
Dispersed Metro	Southern Melbourne	7	19	7.2	7.8	10%	1%	78	-2
Dispersed Metro	Southern Perth	8	21	8.2	8.9	10%	2%	67	5
Dispersed Metro	Southern Sydney	7	19	8.0	8.6	12%	1%	74	2
Dispersed Metro	West Melbourne	7	22	7.0	7.7	12%	2%	74	3
Dispersed Metro	Westernport VIC	6	19	6.7	7.3	13%	2%	59	-10
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>5.5</b>	<b>17.3</b>	<b>7.9</b>	<b>8.5</b>	<b>12%</b>	<b>16%</b>	<b>64.5</b>	<b>-6.3</b>
Lifestyle region	Far North QLD	10	21	8.3	9.0	13%	1%	37	4
Lifestyle region	Gold Coast and Hinterlands	5	16	9.2	9.9	11%	2%	52	-5
Lifestyle region	North Coastal NSW	7	19	7.2	7.8	16%	2%	50	-8
Lifestyle region	Wide-Bay Burnett QLD	7	16	7.5	8.1	14%	1%	38	-13
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>7.3</b>	<b>18.1</b>	<b>8.1</b>	<b>8.7</b>	<b>14%</b>	<b>5%</b>	<b>44.3</b>	<b>-5.4</b>
Production zone	Hunter NSW	7	23	7.6	8.3	12%	3%	63	3
Production zone	Illawarra NSW	7	20	8.2	8.8	11%	1%	66	2
Production zone	Ipswich QLD	4	18	7.2	7.9	19%	1%	54	-14
Production zone	North Melbourne	5	17	7.4	8.0	11%	2%	78	-6
Production zone	Northern Adelaide	4	18	9.7	10.5	9%	1%	56	0
Production zone	Sydney Production Region	9	24	8.0	8.7	10%	5%	71	12
<b>Production zone</b>	<b>Simple average*</b>	<b>6.0</b>	<b>19.9</b>	<b>8.0</b>	<b>8.7</b>	<b>12%</b>	<b>13%</b>	<b>64.7</b>	<b>-0.4</b>

Note: \* Simple average row is cumulative total.

**Table A13.21 Supply chain strength by state of region industries – Government and community services (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End	8	26	8.9	9.8	23%	1%	78	20
Resource based	Gippsland VIC	7	17	6.8	7.2	9%	1%	65	-10
Resource based	Mackay QLD	10	17	8.1	8.5	6%	0%	51	-2
Resource based	Pilbara - Kimberley WA	7	15	7.7	8.0	5%	0%	57	-12
Resource based	Southern NT	6	21	8.9	9.7	18%	0%	72	9
Resource based	North West QLD	11	15	8.8	9.0	7%	0%	25	-7
<b>Resource based</b>	<b>Simple average*</b>	<b>8.2</b>	<b>18.4</b>	<b>8.2</b>	<b>8.7</b>	<b>11%</b>	<b>3%</b>	<b>58.0</b>	<b>-0.1</b>
Rural	Central QLD	9	19	8.2	8.8	9%	1%	69	5
Rural	Central Western NSW	9	19	7.1	7.5	12%	1%	65	-3
Rural	Darling Downs & SW QLD	7	18	7.8	8.5	15%	1%	52	-5
Rural	Eyre and Yorke SA	4	11	8.3	8.7	9%	1%	36	-22
Rural	Far and North Western NSW	8	17	7.0	7.4	12%	1%	53	-9
Rural	Golden Region VIC	6	18	6.9	7.5	14%	2%	71	-7
Rural	Goulburn VIC	6	20	6.3	6.9	13%	1%	57	-10
Rural	Loddon VIC	5	18	6.8	7.3	15%	1%	73	-10
Rural	Mallee - Wimmera VIC	7	19	6.2	6.7	13%	1%	57	-11
Rural	Mercy-Lyell TAS	6	15	7.5	7.9	10%	0%	41	-16
Rural	Midlands and Central WA	8	16	8.0	8.4	8%	0%	30	-12
Rural	Murray - Murrumbidgee NSW	7	23	7.1	7.8	14%	1%	68	2
Rural	Murraylands SA	8	13	7.9	8.2	8%	0%	27	-19
Rural	Northern NSW	8	19	7.7	8.3	15%	1%	60	-1
Rural	Northern Tasmania	5	16	7.5	8.1	13%	1%	60	-11
Rural	Nth QLD	7	24	6.0	6.9	17%	2%	73	-1
Rural	Ovens - Hume VIC	6	26	5.4	6.3	23%	1%	88	2
Rural	South East NSW	10	28	7.0	7.9	21%	1%	46	10
Rural	South East SA	7	12	8.5	9.0	8%	0%	47	-12
Rural	South Eastern WA	10	12	7.4	7.6	5%	0%	39	-16
Rural	Southern WA	8	16	7.6	8.1	8%	1%	34	-13
Rural	Western Victoria	8	17	6.4	6.8	12%	1%	56	-13
<b>Rural</b>	<b>Simple average*</b>	<b>7.3</b>	<b>18.0</b>	<b>7.2</b>	<b>7.8</b>	<b>12%</b>	<b>18%</b>	<b>55</b>	<b>-7.9</b>
	<b>National weighted average</b>	<b>8</b>	<b>22</b>	<b>8.2</b>	<b>9.0</b>	<b>15%</b>	<b>100%</b>		
	<b>National Total</b>	<b>13</b>	<b>55</b>	<b>8.3</b>	<b>10.2</b>	<b>13%</b>	<b>100%</b>		
	National Max		69						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

**Table A13.22 Supply chain strength by state of region industries – Entertainment**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Core Metro	ACT	14	20	8.3	8.7	7%	3%	95	16
Core Metro	Brisbane City	20	28	8.7	9.3	5%	6%	97	35
Core Metro	Central Adelaide	17	27	8.7	9.7	6%	4%	86	31
Core Metro	East Melbourne	18	27	7.0	7.5	4%	4%	86	19
Core Metro	Global Sydney	26	32	10.0	10.3	6%	13%	92	51
Core Metro	Hobart and Southern Tasmania	15	22	9.4	10.0	5%	1%	53	18
Core Metro	Inner Melbourne VIC	22	31	8.8	9.4	7%	10%	98	43
Core Metro	Inner West Sydney	17	25	7.4	7.9	6%	2%	90	19
Core Metro	Northern and Central Perth	16	26	8.6	9.2	6%	5%	66	23
<b>Core Metro</b>	<b>Simple average*</b>	<b>18.3</b>	<b>26.5</b>	<b>8.6</b>	<b>9.1</b>	<b>6%</b>	<b>47%</b>	<b>84.8</b>	<b>28.4</b>
Dispersed Metro	Central Coast NSW	15	23	5.2	5.6	5%	1%	38	-13
Dispersed Metro	N.N. West Sydney	19	22	7.9	8.1	5%	3%	84	17
Dispersed Metro	North Brisbane	13	21	8.1	8.7	5%	1%	46	5
Dispersed Metro	Outer South West Sydney	12	19	5.5	5.9	4%	1%	54	-14
Dispersed Metro	Outer West Sydney	13	20	5.5	5.8	5%	1%	65	-10
Dispersed Metro	Southern Adelaide	11	15	5.5	6.2	4%	1%	71	-15
Dispersed Metro	Southern Melbourne	24	27	7.2	7.4	4%	2%	78	22
Dispersed Metro	Southern Perth	12	24	5.8	6.4	4%	3%	67	-2
Dispersed Metro	Southern Sydney	11	23	4.9	5.6	6%	2%	74	-7
Dispersed Metro	West Melbourne	20	24	5.3	5.7	4%	2%	74	2
Dispersed Metro	Westernport VIC	14	23	5.1	5.7	4%	2%	59	-7
<b>Dispersed Metro</b>	<b>Simple average*</b>	<b>15.0</b>	<b>22.1</b>	<b>6.0</b>	<b>6.5</b>	<b>5%</b>	<b>17%</b>	<b>64.5</b>	<b>-1.8</b>
Lifestyle region	Far North QLD	16	20	6.6	7.0	4%	1%	37	-7
Lifestyle region	Gold Coast and Hinterlands	11	24	6.3	7.3	7%	3%	52	-1
Lifestyle region	North Coastal NSW	16	24	6.2	6.6	5%	2%	50	-1
Lifestyle region	Wide-Bay Burnett QLD	16	19	6.6	6.8	3%	1%	38	-9
<b>Lifestyle region</b>	<b>Simple average*</b>	<b>14.9</b>	<b>21.6</b>	<b>6.4</b>	<b>6.9</b>	<b>5%</b>	<b>6%</b>	<b>44.3</b>	<b>-4.5</b>
Production zone	Hunter NSW	18	23	5.9	6.1	3%	2%	63	0
Production zone	Illawarra NSW	18	22	6.0	6.2	3%	1%	66	0
Production zone	Ipswich QLD	14	17	5.3	5.6	3%	0%	54	-18
Production zone	North Melbourne	18	23	6.1	6.5	3%	2%	78	5
Production zone	Northern Adelaide	19	18	6.4	6.8	3%	1%	56	-4
Production zone	Sydney Production Region	24	28	6.2	6.5	4%	5%	71	15
<b>Production zone</b>	<b>Simple average*</b>	<b>18.7</b>	<b>21.9</b>	<b>6.0</b>	<b>6.3</b>	<b>3%</b>	<b>12%</b>	<b>64.7</b>	<b>-0.2</b>

Note: \* Simple average row is cumulative total.

**Table A13.22 Supply chain strength by state of region industries – Entertainment (continued)**

		Forward capture (%)	Backward capture (%)	Forward skills input (per \$m)	Backward skills input (per \$m)	Industry share in regional output (%)	Industry share in national output (%)	Lifetime learning commitment	Supply chain strength
Resource based	Darwin Top End	15	23	5.7	6.2	7%	1%	78	1
Resource based	Gippsland VIC	16	21	4.9	5.2	3%	1%	65	-11
Resource based	Mackay QLD	23	20	6.2	6.2	2%	0%	51	-3
Resource based	Pilbara - Kimberley WA	17	13	5.7	5.7	1%	0%	57	-19
Resource based	Southern NT	13	24	5.4	5.9	9%	0%	72	-3
Resource based	North West QLD	17	11	5.0	4.9	2%	0%	25	-34
<b>Resource based</b>	<b>Simple average*</b>	<b>16.8</b>	<b>18.6</b>	<b>5.5</b>	<b>5.7</b>	<b>4%</b>	<b>3%</b>	<b>58.0</b>	<b>-11.5</b>
Rural	Central QLD	20	21	6.1	6.3	2%	1%	69	0
Rural	Central Western NSW	18	19	5.2	5.3	3%	1%	65	-11
Rural	Darling Downs & SW QLD	16	20	6.1	6.4	3%	1%	52	-7
Rural	Eyre and Yorke SA	14	14	5.5	5.6	3%	1%	36	-25
Rural	Far and North Western NSW	16	18	5.6	5.7	3%	1%	53	-14
Rural	Golden Region VIC	17	25	5.5	5.9	4%	2%	71	1
Rural	Goulburn VIC	18	23	5.0	5.3	3%	1%	57	-8
Rural	Loddon VIC	16	24	5.2	5.6	5%	1%	73	-3
Rural	Mallee - Wimmera VIC	18	21	5.5	5.7	3%	0%	57	-7
Rural	Mercy-Lyell TAS	21	19	6.5	6.6	2%	0%	41	-6
Rural	Midlands and Central WA	16	15	5.0	5.1	2%	0%	30	-27
Rural	Murray - Murrumbidgee NSW	22	23	6.0	6.2	3%	1%	68	3
Rural	Murraylands SA	17	17	4.9	5.1	3%	0%	27	-25
Rural	Northern NSW	19	22	6.5	6.7	3%	1%	60	2
Rural	Northern Tasmania	16	21	8.5	9.0	4%	1%	60	13
Rural	Nth QLD	16	21	5.6	5.9	4%	1%	73	-5
Rural	Ovens - Hume VIC	21	24	5.4	5.6	3%	0%	88	5
Rural	South East NSW	15	22	6.9	7.2	5%	1%	46	-2
Rural	South East SA	19	17	5.6	5.8	3%	0%	47	-13
Rural	South Eastern WA	21	15	4.6	4.5	2%	0%	39	-26
Rural	Southern WA	16	19	5.6	5.8	3%	1%	34	-16
Rural	Western Victoria	16	21	4.8	5.0	3%	0%	56	-14
<b>Rural</b>	<b>Simple average*</b>	<b>17.5</b>	<b>20.0</b>	<b>5.7</b>	<b>5.9</b>	<b>3%</b>	<b>14%</b>	<b>55</b>	<b>-8.3</b>
	<b>National weighted average</b>	<b>17</b>	<b>24</b>	<b>7.2</b>	<b>7.6</b>	<b>5%</b>	<b>100%</b>		
	<b>National Total</b>	<b>40</b>	<b>60</b>	<b>8.2</b>	<b>9.0</b>	<b>5%</b>	<b>100%</b>		
	National Max		81						

Note: \* Simple average row is cumulative total.

Source: NIEIR's LGA YourPlace database.

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## 14. Flows of funds and the finance of development

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Capital accumulation in the form of investment in equipment and product development is an important pre-requisite for economic growth, both at the national and the regional level. At both levels, for a decade and more, there have been concerns that the rate of investment has been insufficient to sustain growth in incomes and employment. Indeed, the more pessimistic analysts wonder whether the rate is sufficient to sustain existing incomes and employment. Whatever may be the case nationally, it is certainly arguable that in many regions investment is insufficient to sustain existing incomes and prevent declines in employment.

### 14.1 The risk management constraint

Why the insufficiency of investment? In National Economics analysis, the major underlying reason has been failure to control the risk management constraint; that is, failure to generate sufficient projects which, in the judgement of the financial sector, promise an adequate rate of return, adjusted for risk and uncertainty<sup>33</sup>.

Several reasons may be put forward for this failure. On the borrower side, there may be:

- ❑ a lack of financial skills (it is often possible, with skill, to package investments so that they are acceptable to lenders, but in many cases this is not done and the investment is rejected);
- ❑ a lack of more general management skills (investments may be rejected due to failure to control uncertainty even when management has the opportunity of control); and
- ❑ a lack of government support (governments have many opportunities to reduce uncertainties in investment, ranging from guarantees of cost and taxation concessions to assistance in marketing, and including measures to develop industry clusters).

On the lender side, there may be:

- ❑ a failure to investigate unfashionable lending opportunities, including to small medium enterprises and farmers, and to assist with financial packaging (financial intermediaries have been accused of failure to update their knowledge of regional investment opportunities);
- ❑ excess expectations as to returns and a concentration on short-run prospects (this can include bias towards lending which is profitable for single lenders but which in aggregate contributes little to economic development; and a bias towards lending which is profitable in the short-term but risky in the long-term); and
- ❑ tolerance by governments of institutional features in the financial system which encourage these biases.

It has been argued that the two major changes in government policy with regard to the financial sector over the past two decades (bank deregulation and compulsory superannuation) have increased these problems. However, before turning to these effects, we need to consider the general macroeconomic position.

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<sup>33</sup> PJ Brain, *Asian Meltdown – The battle for sustained growth*, Scribe Publications, Melbourne, 1999.

## 14.2 Reliance on overseas saving

In Australia these problems are compounded by macroeconomic imbalances, leading to a heavy reliance on overseas savings. According to the National Accounts, the net savings rate in 1997-98 was 5.2 per cent of national income, as compared with a level of investment (regarded as inadequate) of 10.9 per cent of national income. The difference was nearly all made up from overseas saving: the balance of payments deficit, at 5.1 per cent of national income. This heavy reliance on overseas saving has several consequences:

- ❑ compared to 'save as you go' policies, the accumulating debt is a burden on future generations;
- ❑ management of Australia's resources is conceded to multinational firms which impose the business requirements of their world strategy (but the Australian operations gain access to internal markets and technology);
- ❑ rates of return in Australian financial markets have to be kept in line with rates overseas, plus a premium for exchange-rate uncertainty; and
- ❑ Australian governments also have to meet overseas financier expectations.

Despite these costs, arguments are often heard to the effect that policy should disregard the balance of payments deficit. Two are ideological.

- ❑ The USA also has a deficit. (But the US has the comfort of being too large a borrower to be allowed to fail, and even then it may be storing up trouble for itself and everybody else.)
- ❑ The deficit is the result of private freewill borrowing, and would not be noticed in a boundaryless world. (But the baleful results of over-indebtedness can apply on a regional basis in the absence of boundaries, as well as on a national basis with the complication of separate national currencies.)

The main defence of the deficit is practical. This defence admits that it would be better all round if Australia had an investment rate of (say) 14 per cent of national income, balanced by a savings rate of (say) 16 per cent, with a balance of payments surplus to repay some of the existing debt and expand Australian-owned operations overseas. Unfortunately, an attempt to move to the preferred position would involve a change in the composition of investment, with an increase in long-term product-development and infrastructure projects. The fundamental reason why Australia does not move to the preferred position is that it is stuck with a shortage of long-term and infrastructure investment projects which meet financial sector criteria. The shortage has been worsened by microeconomic reform, which, in the anxiety to avoid wasting funds on unprofitable projects, has narrowed the scope for government investment that disregards financial sector criteria. The only sector where such investment is now possible is roads. National competition policy, whatever its contribution to market efficiency, has also narrowed the scope for private investors to recover returns from infrastructure investments.

Given the lack of viable long-term and infrastructure investment projects, Australia has maintained demand by the expedient of encouraging high consumption levels, which, so long as there is scope for expansion of consumer credit, can be easily done through a lax monetary policy. This avoids the bother of working up sound investment projects. Unfortunately, maintaining demand by high consumption involves sacrificing savings, and also generates demand that spills over into increased imports. The spill increases as the lack of long-term and infrastructure investment reduces the capacity of Australia to supply its own wants and to develop new export trade. Australia accordingly lives with the possibility that its overseas sources of finance will decree that the time has come for fundamental adjustments. The crisis could be precipitated externally, but equally could arise if limits are reached to the expansion of consumer credit.

### **14.3 The flow of funds: National Accounts version**

Against this background, we can now consider the flow of funds for the finance of capital accumulation (that is, for increasing the stock of buildings, plant, equipment, product developments, research in progress and other capital contributions to the value of production).

According to the National Accounts, Australia added approximately \$50 billion to its capital stock in the four quarters ending in March 2000. Accumulation was divided between non-financial corporations and households at \$23 billion each, with government accumulating around \$4 billion and the financial sector \$1 billion. (These estimates exclude financial assets.) More than half of the accumulation was financed from overseas sources; government contributed about a quarter, the household and finance sectors about 14 per cent each, while non-financial corporate business had a negative savings rate after allowance for depreciation. Defenders of the status quo point with pride to the government contribution to national savings; critics are alarmed at the heavy dependence on overseas savings and at the low savings rates of the non-finance corporate sector and the household sector. Sustained economic growth is generally associated with higher levels of saving in both these sectors. There is also a noticeable imbalance when the finance sector saves while the non-finance corporate sector dis-saves. However, this tallies with the difficulty that the non-finance corporate sector is experiencing in producing investment opportunities attractive to the finance sector.

This overall picture is drawn on a net basis; that is, capital accumulation is calculated net of depreciation, and savings are likewise calculated from incomes net of depreciation. One does not have to have much knowledge of accountancy to know that this is hazardous; depreciation is notoriously difficult to estimate. Again, the cash flows that are important to financial markets are generated on a before-depreciation basis. Accordingly it is customary to carry out macroeconomic analysis in gross terms; i.e. in terms of gross domestic product rather than national income, and in terms of gross savings and investment before depreciation. Converting to this basis reduces the apparent significance of overseas finance, since depreciation is added to the domestic sources but not to the overseas.

Non-financial corporate business was responsible for around 30 per cent of Australian gross savings in the four quarters to March 2000, but undertook 50 per cent of gross investment, requiring an infusion of funds of around 20 per cent of total savings/investment. The household/unincorporated business sector also (gross) invested more than it (gross) saved, requiring an infusion of around 10 per cent of total savings/investment. Between them, the financial sector and government supplied 10 per cent, and rest of the world made up the balance of 20 per cent.

### **14.4 The flow of funds: Flow of Funds Accounts version**

The pattern of savings and investment in the National Accounts is broadly confirmed, but in some respects questioned, by the Flow of Funds accounts, which depend on different sources. These Accounts:

- confirm the status of the non-financial corporate sector as major borrowers;
- confirm the status of the rest of the world as the major source of funds; and
- confirm the status of government as a minor source of funds.

However, they reverse the position of the financial and household sectors. According to the Flow of Funds Accounts, the household/unincorporated business sector was a net supplier of funds to financial markets, while the finance sector was a net borrower during the period.



The Flow of Funds Accounts are derived from balance sheets, and do not identify which sector borrowed from which. Rather, they show the net direction of borrowing and lending by financial instrument. The flows are reported in net terms: they are the net result of trades back and forth during a period, and not the gross volume of trade. We will briefly describe the transactions of each of the sectors in the year to March 2000 (the latest available) as identified in the Flow of Funds Accounts.

The net pattern of flows affecting the household/unincorporated business sector is perhaps the simplest. The sector accumulated pension fund assets (\$40 bn) and equity (\$20 bn: it was the period of the Telstra float). These accumulations were very nearly balanced by additional loans received of \$50 bn, leaving the sector a bare net lender or (if the National Accounts are to be believed) a net borrower. The funds which households paid into superannuation funds flowed from the household to the financial sector; likewise the flow of loans into the household/unincorporated business sector can only have come from the financial sector. However, the flow of funds from households into equity investment went mainly to the government and to non-financial corporate business, both of which were vending equity assets during the year.

During the year, Australian governments provided funds to financial markets by repaying bonds and loans, but raised funds by selling equity. Net repayments went largely to the financial sector, but the equity sales were spread around the household, financial and overseas sectors.

Overseas investors purchased equity (the non-finance corporate sector and government were vendors) and made long-term loans (probably mainly to non-finance corporations). The accounts do not distinguish equity in productive enterprises from equity in property. During the year to March 2000 overseas investors were already beginning the withdrawal of short-term funds from the financial system which has since resulted in devaluation of the Australian dollar.

Finally, the finance sector raised funds from money-creation (held largely by non-financial corporate business); the issue of short-term securities (likewise, in the absence of overseas support); from long-term securities (largely redemption of government securities) and from pension fund payments. These accounted for more than half the net funds raised by the sector. The sector used the funds raised to make loans (three quarters of net usage of funds) and to purchase equity. The loans went very largely to the household/unincorporated business sector, though some (perhaps 15-20 per cent) went to non-financial corporate business.

The financial sector is now dominated by two types of intermediary, banks and pension funds. Though in both cases privately owned, both are creatures of the Commonwealth Government. Banks are licensed, and have privileged connections with the Reserve Bank which underlie their raising of funds through money creation. Pension funds are privileged through the taxation system, which gives them a large and guaranteed flow of funds. In the year to March 2000 \$39 billion flowed into the pension funds, whereas the net inter-sectoral flow of funds through the commercial banks was around \$33 billion. The net inter-sectoral flow of funds through all other financial intermediaries combined (a disparate bunch including the central bank, credit unions, building societies, insurance businesses and various others such as venture capital funds) was of similar order to the banks.

The banks contrast with the pension funds in that the former raised their funds from disparate sources and applied them to a single use: loans. The pension funds, on the other hand, raised their funds from a single source, superannuation contributions, and applied them to a wide variety of uses: 60 per cent to purchases of equity, nearly 30 per cent to accumulating cash and short-term securities, and the rest mainly to loans. More than half of the equity purchased was overseas, providing a strong contra-flow to the net flow of funds from the rest of the world to Australia. Overall, roughly 30 per cent of the flow of funds through superfunds was directed overseas and over 60 per cent went to other financial intermediaries, with very little flowing directly to Australian corporate business or governments, and none to households or unincorporated business. By contrast, bank lending went approximately one third to non-financial corporations and two thirds to the household/unincorporated business sector.

Two further points should be made about the flows of funds.

- ❑ They are continually changing, not only in response to changes in the non-financial sectors, but in response to changes in perceived returns, speculative opportunities and the like.
- ❑ They are not at all well documented. Even at the national level, the Flow of Funds Accounts are marred by balancing items and other uncertainties. In the context of regional investment finance, it is noticeable that there is no regional documentation, not even to the state level. It is difficult enough to require business to provide data on flows into and out of Australia, let alone flows between the regions of the country.

Despite the chimerical nature of financial flows, and the lack of regional detail, it is possible to add a few comments on the effect of current financial structures on regional investment finance.

## 14.5 The superfunds

Thanks to the National Superannuation Scheme, superfunds have cornered a large slice of the flow of funds. Very little if any of this reaches the regions directly, though some may arrive after various uncertainty-reduction transformations through other financial intermediaries. As was pointed out in 1995, 'by compulsorily transferring a massive share of national saving to be controlled by one type of financial institution, namely superannuation funds, the scheme creates severe distortions and inefficiencies in business investment and activity. In particular, ...the investment behaviour of superannuation funds tends to divert investment away from small- and medium-sized enterprises and from innovative ventures which may take some considerable time to bear fruit. These traditional characteristics may be able to be modified to some extent, but they are largely inherent.' (Disney 1996 p4). Actual experience has been worse than this prediction. National superannuation has manifestly failed to prevent a decline in the household savings rate; its designers failed to reckon with the policy of maintaining demand by encouraging consumption. In addition, a sizeable flow of funds has been directed overseas. The net effect has scarcely encouraged regional development. The average superfund may be accused of garnisheeing regional household savings to direct funds, through other financial intermediaries into the finance of consumption than capital accumulation, plus directing a sizeable proportion of the take overseas. The sad fact is that, by thus speculating on the depreciation of the Australian dollar, the funds have made considerable short-term capital gains.

Despite these inevitable effects of the requirement that superfund trustees maximise short-run returns though investments regarded as 'safe', some of the funds have been mindful that the maximisation of short-run returns does not necessarily maximise long-run returns; and that a concentration on financial returns rather than the broader health of regional economies is not necessarily in the best interests of their members. These concerns have resulted in some very tentative moves into the venture capital market, and preliminary investigations of participation in regional development strategies.

## 14.6 Banks

Compared to the superfunds, the banks are not obviously disregarding the needs of regional development. However, they have been directing the greater share of their lending to household borrowing. Some of this finances unincorporated business, and some leads to permanent economic benefits through home purchase, but there is a worry that much has been for the finance of short-term consumption and not for capital accumulation; and for property investment rather than investment in product development.

As noted above, as dominant financial sector institutions banks may be accused of failure to investigate the full range of lending opportunities, and of the various other sins of fashionability to which the sector is prone (and which will doubtless be revealed in the next recession). However, they cannot be blamed for the lack of government policies to ensure that viable investment opportunities are generated in regional development, and vindicated by subsequent profitability.

## 14.7 Overseas lending

Finally, what is the effect of the dominance of capital flows originating overseas on the availability of regional development finance in Australia?

For much of the boom now ending Australia depended heavily on short-term overseas loans to the financial sector, but this source of finance for the balance of payments deficit has dried up, and in any case only reached the regional scene following intermediation by banks and others. For the present, overseas investors are still supplying equity and some long-term loan capital, often bypassing the local financial intermediaries. Many regions seek direct foreign investment not only as a substitute for domestic finance, but for the technological skills it often brings. Overseas direct investment can provide markets for local producers and centrepieces for industry clusters. However, it does not provide the direct finance needed to help local firms grow.

## 14.8 Can there be a coherent policy for regional investment finance?

Where, then, are regions to turn? There are several sources of funds.

- The own savings of local businesses and people have always been a primary source. The willingness of local people to work for low pay as they build up their enterprises remains a major but very restricted source of funds, and is currently further restricted by National Superannuation requirements.
- Government finance has long made major contributions to regional development. However, the Commonwealth is not as ready as it has been at some times in the past to underpin regional development, or make funds available to the states to do so.
- This leaves the financial sector.

To what extent is the financial sector failing to provide appropriate investment finance for regional Australia? The sector itself denies any failure. If the sector devotes funds to consumer credit and urban property development, that is because these offer the highest returns, adjusted for uncertainty. It is up to the promoters of regional investments to package the investments so that they are attractive to the financial sector. This involves finding ways to increase the potential returns and reduce uncertainty.

From this point of view, it is important to ensure that projects are costed carefully, and that they are managed to minimise risk. In this context much depends on the quality of local accounting services, and on local capacity to utilise uncertainty-reducing devices, such as the rapid market intelligence now available over the internet.

Developing mutually-supportive projects within a region also helps to create financable investment opportunities, though it is not always possible to persuade the financial sector that uncertainty has indeed been reduced, and in any case realism imposes limits. It may also be possible to off-load uncertainty onto governments. Though they are no longer keen to invest, governments may sometimes be persuaded to accept off-balance-sheet risks. (Inevitably some of the risks will move onto the balance sheet and pose financing problems in the future, but in politics as in finance that's always a long way off.)

Finally, a much-touted benefit of financial deregulation has been increased competition between financial intermediaries. From the point of view of a region facing withdrawal of banking services, this competition may seem a chimera, but it may pay to investigate the financial scene further. Innovations in financial packaging are occurring continuously, and some may offer advantages to regions. A promising area covers venture finance, which promises to develop the packaging of regional investments to the point where the major financial intermediaries may deign to consider investing.

Up to a point, therefore, local initiatives can counter the lack of viable regional long-term and infrastructure investment opportunities, and the indifference of the finance sector towards such opportunities. However, their task is very difficult unless national governments contribute in two ways:

- ❑ countering the risk-management constraint by measures to improve the chances of viability of long-term and infrastructure investment in regional locations; and
- ❑ countering inherent financial sector biases against such investment (though not so as to threaten long-term financial returns).

As discussed in other papers to this conference, Australia falls way behind international best practice in both these respects.

## NSW local authorities: Looking for a super investment

*The Local Government Superannuation Scheme (LGSS) aims to invest \$130 million through the Regional Development Trust in new or developing companies and infrastructure projects over the next 2 years.*

*The trust, managed by Deutsche Asset Management, has a primary objective of earning above-average, risk-adjusted returns for its members. But a secondary objective is to stimulate regional and rural economies while regarding LGSS's respect for environmental standards and economic sustainability.*

*The first investments are likely to be announced early in 2001. Promising prospects include water, telecommunications and gas networks.*

*Already the concept has attracted a number of other superannuation funds that were interested in regional investment but had been limited by their small size. The Trust can invest up to \$200 million with Deutsche possessing the right to set up RDT2 once all the funds are invested. Other potential investors are local councils, business, regional development committees, accountants and solicitors, banks and other financiers, community groups and construction/engineering consortiums.*

*The Trust comprises:*

- a High Performance sub-trust, aiming for a 12-15 per cent average annual return on an investment of \$2 to \$15 million in established businesses;*
- a Growth sub-trust, looking for a 9-11 per cent pa return on an investment of \$5 million to \$20 million in new infrastructure assets, and*
- an Opportunities sub-trust, aiming for a return of 6-8 per cent pa on an investment of \$2 million to \$30 million in projects contributing to regional development or improved services to local communities.*

## **Bendigo: Banking and beyond**

*With 30 community banking branches now open, Bendigo Bank is looking beyond banking services to other community needs.*

*Disenchantment with the major banks laid the groundwork Bendigo Bank's Community Bank concept. In just 2 years communities as diverse as Kulin, 284 kilometres south-west of Perth and East Malvern, set squarely in affluent East Malvern in Melbourne have opened branches.*

*Community banks will continue to open where there is a need and sufficient local support to meet Bendigo Bank's criteria. The next step, Community Banking Stage 2, is now under way. Jason McGovern of Bendigo Bank says this stage involves working with communities to achieve their development objectives. The bank is not a philanthropic enterprise - the aim is strengthen communities which in turn strengthen the community banks. The bank will act as a partner through the all the phases of development from information and needs assessment to tendering and implementation.*

*This is demand-side strategy. Instead of consumers accepting what suppliers can offer them as individuals they band together as a committed buyers group and say "This is what we need, what can you do for us?"*

*Bendigo is hoping to roll out the concept of community telecommunications companies (telcos) throughout the community banking network. The bank is already in the tendering stage in Bendigo.*

*Another project will be to help communities establish web portals. This will help them promote the community and regional businesses and provide them with access to the global market.*

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## 15. The regional economic policy challenge

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### 15.1 Introduction

Regional economic policy is designed to enable regions to attain their economic development potential. Increasingly, this is done within a sustainable development framework – emphasising the integration of economic, social and environmental processes and outcomes. Countries have different reasons for undertaking regional development initiatives. Some of the objectives of regional economic policy include:

- increasing the rate of regional and national economic growth;
- upgrading regional industrial capabilities, skills and infrastructure;
- attracting investment and people;
- minimising employment and income differentials between regions;
- assisting regions undergoing structural change to catch up;
- strengthening economic linkages between and within regions;
- discouraging growth in over-crowded cities;
- decentralising industries to non-metropolitan regions; and
- maintaining social harmony and regional ecological health.

One of the ironies of globalisation is that it reinforces the importance of local and regional economic initiative. The reasons for this are straightforward.

The primary reason is that globalisation accelerates economic growth but tends to concentrate the benefits, particularly in global cities, high growth resource-based and innovative regions. The “globalisation optimists” argue that globalisation generates substantial benefits for regions. Firstly, globalisation – along with the digital revolution and the growth of the knowledge-based economy – accelerates economic growth and new jobs through product and technological innovation, along with increased trade, production, capital and people flows. Secondly, capital and people move from low performing regions to high performing regions, resulting in economic convergence in jobs and living standards between regions.

Over the past decade, the evidence suggests some support for the first argument i.e. global economic reforms accelerated growth. On the other hand, globalisation has been accompanied by increasing economic divergences in the performance of different regions, particularly where there are no counteracting regional policy measures in place. This is a global phenomenon. Global corporates shift production facilities from developed economies to third world countries and/or outsource supplies from everywhere. In the process, high paid jobs are concentrated in global cities, production regions in developed economies lose jobs and third world economies gain low paid jobs with sub-standard working conditions.

Previous SOR reports have measured growing regional disparities in jobs, incomes and skills in Australia. High unemployment rates have a spatial dimension; including in rural and traditional industrial regions as well as a number of high growth lifestyle regions. Real declines in commodity prices have resulted in income and employment loss. The demise of Australian manufacturing, through lack of economies of scale, dependence on branch plants and trade liberalisation and inadequate R&D, has resulted in high unemployment in production regions. A number of globally oriented regions such as global Sydney and inner Melbourne, on the other hand, have virtually

returned to full employment. These regions are attracting investment in new industries, and have high skilled and high paid workforces.

Another reason for the growing importance of regional economic policy is the perceived advantages of strengthening the economic capacity of local and regional enterprises. More emphasis is given to “bottom-up” initiatives – emerging from within regions – compared to “top-down” initiatives – the latter designed and implemented by higher tiers of government, perhaps with some local liaison. Tacit knowledge is important in this process. Local organisations know their area. They are more likely to be able to distinguish between a good local project and a bad project. They are more likely to be able to adapt innovations from outside to meet their unique conditions.

Case studies of successful regions emphasise the importance of local leadership, knowledge and management as critical components. The other side of the coin is that the tight fiscal environment required to support globalisation has resulted in a reduced capacity of higher tiers of government to maintain human and financial resources to support the design and implementation.

Finally, the growing importance of geographically based clusters has re-invigorated regional policy in a number of economies. The success of regions such as Silicon Valley, Route 128 outside of Boston and the Bristol M4 Corridor, Emilia-Romagna in Italy, and more recently Ireland – the Celtic tiger - has demonstrated the advantages of continuous learning and knowledge exchanges at a local and regional level. The improvement in innovation and regional competitiveness is seen as an interaction between firms, researchers, educationalists and entrepreneurs. This has led to new regional policies designed to strengthen interaction between firms, research and educational institutions, councils and other stakeholders as well as strengthening relationships between firms and their suppliers and customers, that may or may not be locally based.

## **15.2 Regional policy: On the margins of economic policy**

Regional policy is not a central tenet of economic policy in Australia. It is more on the margins of mainstream policy, rather than a mechanism to mobilise resources to enhance economic and social development and national growth. Given the forces driving regional change, why is there such widespread scepticism about regional policy directions in Australia? Arguably, the reason is that the dominant economic policy approach in Australia at a national level is inimical to regional development.

Over the past 15-20 years, the Australian economic policy agenda has been dominated by new (or in fact rehashed) approaches to macroeconomic management and microeconomic reform. These models are still unfortunately in vogue and until we rethink the tenets of these approaches, regional policy is likely to remain relatively ineffective. It is also National Economics view that unless we develop a new framework for national economic development including an emphasis on regional development, Australia will become increasingly vulnerable to loss of competitiveness in the global knowledge economy and loss of economic sovereignty.

### **15.2.1 Macroeconomic management**

Macroeconomic policy is concerned with outcomes at the national level: inflation, employment, the exchange rate and investment and savings. Good regional policy requires sound macro-economic policy. Macro instability is invariably bad for all regions.



To understand the impact of macroeconomic policy on regions, it is important to distinguish between two historic models of macroeconomic management. The first model can be termed the market-government partnership approach to macroeconomic policy - which lasted roughly from the mid 1930s to the early 1980s. The second model is the market dominant paradigm – which came to be increasingly implemented from the early 1980s.

The periodic crises of last century – depression, war and underdevelopment – resulted in the implementation of a broad consensus around macroeconomic policy in market economics. This consensus recognised that modern economies could work well in competitive environments. Markets were recognised as a necessary but not sufficient mechanism to produce optimal economic and social outcomes. Producers were free to set prices and production targets, workers could negotiate wages individually or collectively through trade unions, and consumer sovereignty reigned supreme.

This consensus also recognised three fundamental flaws in the market:

- ❑ firstly, economies were subject to wide fluctuations or business cycles characterised falling investment and output and increases in unemployment;
- ❑ secondly, the private sector under-produced in certain key areas, particularly in areas such as infrastructure, education, R&D and technology - where returns may be long term, risks higher, and where others could appropriate the benefits of your investment; and
- ❑ thirdly, the market mechanism tended to concentrate economic benefits. Those with access to capital – including global corporations, those who lived in high-income regions, and those with high skills – tended to be the beneficiaries.

In this model, government policy instruments supplemented the role of markets. When an economy was under-performing the government could stimulate expenditure and investment to shift an economy onto a higher development path. Government invested heavily in education, health and physical infrastructure, supported public and private R&D, and provided incentives for firms to accelerate the take-up of new technology. To ensure equitable outcomes, governments provided uniform social security – pensions, unemployment and sickness benefits, and transferred resources to regions that were falling behind due to structural change and loss of competitiveness.

The emergence of the “market dominant model” was associated with the slowdown global economic growth since the mid 1970’s. Elements of this model include trade liberalisation, a reduction in the role of government in macroeconomic management – particularly the use of government expenditures and revenues to influence macro-economic outcomes, deregulation and privatisation. The big picture is to rely on markets alone to allocate resources. In this model, government participation in the economy is identified as an impediment. The role of government is to keep taxes low and expenditures even lower and to keep budgets in surplus so as not to put pressure on interest rates.

### **15.2.2 Microeconomic reform agenda**

The other tenet of the economic reform agenda is microeconomic reform. This is predominantly concerned with the performance of individual enterprises and sectors of the economy. The main elements are competitive pricing, changing work practices, and increasing productivity through cost reductions. The flagship for microeconomic reform in Australia is National Competition Policy and most of the reforms have been directed at public enterprises. Microeconomic reform provides a rationalisation for privatisation of public assets. In relation to infrastructure services, greater emphasis has been given to user pays principles – prices should reflect the cost of supply, including environmental costs. With the assumption that private enterprises are more efficient than public enterprises, why maintain public ownership of electricity, water, transport and freight and telecommunications providers?

The obsession with deregulation, privatisation and balancing budgets have diverted us from the need to think systematically about the future of regional development. A driving force for regional policy intervention is to ensure that all regions broadly share opportunities and poorer regions don't fall further behind richer regions. A conclusion from the economic reform path of the past decade is that reliance on market mechanisms alone will lead to deterioration in the economic performance of poorer regions.

### 15.3 Australian regional policy

Regional policy is back on the agenda in Australia, driven by growing concern about growing economic disparities between regions, and the political backlash against what is termed "economic rationalism". Early in the last decade, the Labor Federal Government initiated the Regional Development Program, which provided seed funding for regional development organisations across Australia, including for high growth regions. The incoming Coalition Government abolished this program in 1996. At the national level the focus is now on non-metropolitan regions, predominantly rural based regions, with an emphasis on stimulating local level "leadership".

At the state level, there is renewed interest in regional policy. Whereas NSW and Queensland have developed regional policy frameworks to cover metropolitan and non-metropolitan regions; Victoria, Western Australia and South Australia focus more on non-metropolitan regions. Tasmanian policy covers the whole state.

#### 15.3.1 Federal policy

The Federal Coalition Government has responded to growing regional economic disparities and the community backlash in rural Australia with a number of initiatives. In October 1999, the Government held a Regional Australia Summit, under the chairmanship of the Deputy Prime Minister, bringing together representatives from across rural Australia to examine strategies for the future. From this process, a Steering Committee was established to advise the Government on implementation. The final report is due for release. Some attention has been given to upgrading physical infrastructure - a commitment to proceed with the Darwin-Alice Springs rail link and a commitment from the Commonwealth Government to use part of the budget surplus to increase expenditure on rural and outer metropolitan roads.

The Federal Government also provides a number of subsidies for people living in rural and remote areas including the Fuel Sales Grants Scheme and the diesel excise relief for primary producers. The Universal Service Obligation in telecommunications is a mechanism to ensure that all parts of Australia will have universal access to telephone services on a "reasonable and equitable basis".

Regional specific initiatives taken by the Federal Government include the following<sup>34</sup>:

- ❑ the **Regional Solutions Program**, a \$90 million package over four years to "help regional and rural communities develop and implement locally focussed solutions to build their economic and social bases";
- ❑ establishment of a philanthropic **Foundation for Rural and Regional Renewal**, targeted at Regional Australia, involving an injection of funds from the Federal Government (\$14.5 million) and the Sidney Myer Foundation (\$1 million);

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<sup>34</sup> A letter to Regional Australia Summit participants from the Deputy Prime Minister, The Hon John Anderson MP, Deputy Prime Minister, Minister for Transport and Regional Services, Leader National Party of Australia, Parliament House, Canberra, undated. Full details of government initiatives can be found on the DTRS website: [www.dotrs.gov.au](http://www.dotrs.gov.au).

- ❑ the establishment of a **Regional Development Task Force** between Commonwealth, state and local representatives to improve coordination and cooperation between all tiers of government;
- ❑ a regional package “**More Doctors, Better Services**”, designed to attract doctors and provide better services to disadvantaged regional, rural and remote Australia;
- ❑ greater support for farmers through an extension of Agricultural – Advancing Australia package, involving a program “**Skilling Farmers for the Future**” designed to improve skills in business and natural resource management, extension of the Farm Family Restart Scheme, and assistance for farm innovation and diversification; and
- ❑ implementation of the Dairy Regional Assistance Programme to ameliorate the impacts of dairy industry deregulation.

### 15.3.2 State governments

The states have important responsibilities for regional development. This includes responsibility for most transport infrastructure, education and a number of state taxes. Regional policy at the state level, as at national level, tends to go through economic and political cycles. For much of the second half of the last century, state governments were engaged in a bidding war to attract foreign investment. Some say it is continuing. This resulted in a more balanced settlement pattern across Australia, but some fragmentation of what was already a small national market. With some important exceptions, these investments were concentrated in the major cities. In the decades following the Second World War, regional policy was seen as a mechanism to build up population in non-metropolitan regions through encouraging decentralisation of economic activities. Traditional policy instruments included using payroll tax concessions to get firms to relocate to non-metropolitan areas, public infrastructure investment, and subsidies for training.

Given Australia’s long-standing dependence on foreign investment and technology, the states gave higher priority to attracting firms from other states or attracting investment that otherwise might go to another country. More recently, the states have been putting more resources into regional development. Initiatives and priorities vary between states.

Common elements of state regional policy include:

- ❑ development of state regional policy frameworks;
- ❑ appointment of a Minister for Regional Development;
- ❑ creation of a regional development portfolio;
- ❑ establishing and/or strengthening regional agencies; and
- ❑ designing and implementing regional programs around themes such as rural restructuring, regional development strategies, emerging industries, industry networks and main street revitalisation.

### 15.3.3 Queensland

The geography and historic development of Queensland resulted in the early development of a number of provincial cities and regions throughout the state, particularly concentrated around east-west transport networks and ports. The state has a long history of involvement in regional development, particularly through infrastructure investment and community services, and facilitation of small business development.

The responsibility for regional development resides with the Department of State Development. The Department provides a number of regional services throughout the state, including funding regional development agencies, maintaining regional information databases, facilitating new investment and export opportunities, and infrastructure planning and development and co-ordination with other government agencies to ensure a “whole of government approach” to development. One important aspect of regional development in Queensland is that many of the state’s regions are planning for considerable growth. This involves integrating land-use, economic, transport, social and environmental planning. Throughout the state, a number of regional economic and planning initiatives have been undertaken. This includes SEQ2001 and South East Queensland Economic Development Strategy; Wide Bay 2020, WHAM 2015, Townsville Thuringowa Strategy Plan, FNQ2010 and Gulf Regional Development Plan.

In addition to state and regional policy, the Queensland Government also provides a number of programs and initiatives through its Office of Rural Communities (ORC). One of the objectives of the ORC is to encourage people to live in smaller rural communities. It maintains a database on the attributes of 31 rural centres and operates a state-wide network of rural based offices providing information about Government services.

The Government is looking to the development of an infrastructure system that will underpin state and regional development in this millennium. A major priority of the Queensland Government is the State Infrastructure Plan<sup>35</sup>. The aim of the Plan is to:

*“Develop a comprehensive long-term Land Use and Infrastructure Plan which identifies the transport, energy and other service networks needed to allow Queensland regions to achieve their full potential.”*

The challenge for Queensland in infrastructure development is exemplified by the high costs of provision across sparsely populated areas, the state’s relative small population and remoteness from major markets, rapid population growth in South East Queensland and coastal lifestyle regions. The State Infrastructure Plan is still only in draft stage, but is looking at long term infrastructure priorities; the balance between physical, social and knowledge infrastructure, how to finance infrastructure and the regional distribution of infrastructure. The Government has developed tools to assist regional planning include detailed statistical databases on each region, and a regional breakdown of capital works expenditures in the Budget. It supports a number of regional development organisations.

#### **15.3.4 New South Wales**

The NSW Government manages regional development policy and programs through the Department of State and Regional Development, with the regional component responsible to the Minister for Regional Development. With growing regional economic disparities, the NSW Government has become more concerned about regional development. The Hunter and Illawarra regions have a long history of involvement in regional development through regional development agencies.

The Department operates regional offices and regional development boards in 13 regions located in Western Sydney, Hunter and Illawarra, as well as the covering the state’s rural and lifestyle regions. The regional offices have responsibility for managing regional programs and facilitating new regional opportunities. The regional development boards advise the Minister of regional development issues and can access seed funds to undertake strategic projects, such as expanding industry opportunities in areas like forestry and aquaculture and strategic infrastructure projects.

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<sup>35</sup> Coordinator General, Strategic Infrastructure for Queensland’s Growth (Draft report), Queensland Government, 2000.

The Department manages 10 regional programs for non-metropolitan regions:

1. Main Street/Small Towns Program to revitalise and promote rural centres;
2. Regional Business Development Scheme to boost jobs and investment;
3. Agribusiness Alternatives Program to assist agricultural diversification;
4. Business Retention and Expansion Program provides local data;
5. Developing Regional Resources develops best practice in local development;
6. Regional Economic Transition Scheme helps rural communities hit by shocks;
7. Regional Aboriginal Business Advisory Program supports indigenous community enterprises in regional NSW;
8. Townlife Development Program provides funding to help stimulate new economic activity in smaller towns;
9. Country Centres Growth Strategy addresses impediments to economic growth and to support opportunities for development in selected regional areas; and
10. Country Lifestyles Program promotes the benefits of regional centres.

### **15.3.5 Tasmania**

Because of its small size and island location, Tasmania focused more on whole of state development policies. The State Government is focussing attention on overcoming the tyranny of distance through a major upgrade of its telecommunications capacity. In 1997 the Federal Government established *Networking the Nation* – a \$250 million Regional Telecommunications Infrastructure Fund sweetener to the first sale of Telstra shares. In June 1999 the Government announced the sale of a further tranche of Telstra shares. This time the tight Senate vote led to Tasmania collecting \$150 million under the Telstra Social Bonus for telecommunications and electronic delivery projects.

Tasmania now has a raft of projects underway. The Intelligent Island projects are worth \$40 million. The aim is to help develop an internationally competitive IT&T sector. Specific projects include a business incubator, IT training, multimedia and e-commerce centres of excellence and funding to assist the commercialisation of R&D in Tasmania.

Other projects include:

- Connecting Tasmanian Schools – \$48 million.
- Trials in Innovative Government Electronic Regional Services – \$10 million.
- Building Additional Rural networks – \$10 million.
- Local Government Fund – \$6 million.
- Remote and Isolated island Communities – \$10 million.
- Launceston Broadband Project – \$20 million.
- Netalert – \$3 million.
- Expanded Mobile Phone Coverage – \$1 million.
- Television Fund – \$4.8 million.

### **15.3.6 Western Australia**

The Western Australian Government has recently released its Regional Development Policy. The policy was overseen by the Regional Development Council, a peak advisory council reporting to the Minister for Regional Development. The geographical focus of the policy is non-metropolitan WA, an area containing 500,000 people or 27 per cent of the population. Given the metropolitan primacy of Perth, the Government is keen to accelerate growth in what it terms regional, rural and remote regions. The policy seeks to establish a framework for regional development, involving improved co-ordination between government agencies, partnerships with business and community, and space to enable regional organisations and stakeholders to initiate and implement new strategies.

The policy specifies a number of goals underpinned by a number of objectives and strategies. The six goals are: adaptive communities, enriched lifestyles, developing wealth and employment, developing infrastructure, environmental and natural resource management and responsive government. Under each of these goals, the WA Government has announced a number of programs and other initiatives that are incorporated in the 2000-01 state budget.

The Government has allocated \$25 million to nine Regional Development Commissions, each with a board, staff and resources to undertake strategically important projects, as well as with responsibility to prepare regional economic strategies. The RDCs, well-resourced by Australian standards, appear to be given a broad charter to implement regional development initiatives. This includes new industry initiatives such as aquaculture, horticulture, and tourism, facilitating export and investment opportunities, strengthen direct links with Asia, participating in projects to upgrade telecommunications infrastructure and information services, supporting small business development training, indigenous economic development strategies, and promoting education, heritage and cultural facilities.

### **15.3.7 South Australia**

South Australia has a long history of involvement in regional development. The Playford model of industry development – public investment in infrastructure and housing combined with aggressive business attraction policies, was emulated widely in other states. Although the SA Government defines regional development in terms of non-metropolitan areas, where 400,000 or 26.8 per cent of the population resides, it also has a strong focus on regional development within Adelaide itself, as do a number of councils and their associations.

The localities of north and western Adelaide comprise a production region hard hit by the restructuring of Australian manufacturing. These areas have the highest rates of unemployment in metropolitan Australia. An early initiative to set the region onto a new development path was the decision to locate the seriously flawed Multi Function Polis in this region, diverting attention from perhaps more realisable goals. In addition to finding ways to enhance competitiveness of automobile industries, the South Australian Government has attempted to build a new economy base in IT&T industries, offering large subsidies and contracts for global IT&T companies to establish themselves in South Australia. A number of these companies have located in the Technology Park in Salisbury in Northern Adelaide, including Optus, Motorola and EDC. The Technology Park is situated in proximity to the University of South Australia and up-market residential developments. Despite the “success” in attracting these brand names, it is yet to be determined whether their presence will lead to significant spin-offs to the surrounding highly depressed urban areas. Other regional priorities include going after major Defence (e.g. Australian Submarine Corporation) and infrastructure projects such as the recently announced Adelaide-Darwin rail link.

## **Warren Blackwood: Western Australia's regional policy in action**

*The Warren Blackwood region in the south-western corner of Western Australia is suffering the pressures of industry restructuring and the impact of the Regional Forest Agreement quarantining of its old-growth forests.*

*The region has experienced a switch from dairying, cropping and pasture to blue gum plantation forests destined for woodchipping. This change has resulted in depopulation of some localities with resulting social pressures. However the region is also home to the growth industry of viticulture and a new potato processing plant is expected to replace Simplot which recently closed its plant.*

*The region - made up of the shires of Manjimup; Boyup Brook; Nannup and Bridgetown-Greenbushes - is also about to be the first in WA to have its own Action Plan under WA's Regional Development Policy released last May.*

*The whole-of-government scope of the Plan is reflected in the fact that it required a sign-off by more than 20 CEOs of Government Departments.*

*The six goals of the WA's Regional Development Policy are:*

- 1. adaptive communities;*
- 2. enriched lifestyles and livelihoods;*
- 3. developing wealth and employment;*
- 4. developing infrastructure;*
- 5. environment and natural resource management; and*
- 6. responsive government.*

*The aim of the policy is to ensure a balanced approach to economic and social development rather than addressing issues such as social cohesion or employment in a vacuum. The planning process brought together the plans and aspirations of communities, local and state government and business and industry in the Warren Blackwood region.*

*The Action Plan was released in late November for eight weeks of public consultation before it is finalised.*

A number of innovative programs are underway in Adelaide, designed to enhance local and regional outcomes. A government-business partnership, Business Vision 2010, is actively involved in creating and strengthening clusters in water, IT and defence industries. The Department of Education and Training is implementing an innovative program called High Performance Enterprise Communities, designed to assist young people in distressed communities develop greater self-esteem, interest in learning as well as providing practical work place experience and accreditation.

The South Australian Government has recently reviewed its regional development policies in non-metropolitan regions. Following the release of its Regional Development Task Force report<sup>36</sup>, the South Australian Government established an Office for Regional Development (ORD), reporting to the Deputy Premier and Minister for Regional Development. The responsibilities of this agency include advising the Minister on regional development issues; co-ordination of inter-agencies on regional issues and strengthening partnerships to improve regional outcomes. In addition, the SA Government has established a Regional Development Council (RDC) to advise the Government and a Regional Development Issues Group (RDIG) to improve leadership and coordination within the public sector. The priorities to date appear to be concentrating on developing capacity of practitioners in non-metropolitan South Australia. Initiatives include sponsoring a Rural Community Leadership conference, running seminars throughout the state on rural leadership and promoting partnerships and entrepreneurship. These three organisations are working together to prepare a South Australian Economic Development Strategy.

The SA Government has established a Regional Infrastructure Fund with an allocation of \$14.5 million (\$4.5 million this year), with the aim of improving infrastructure development in non-metropolitan South Australia.

### **15.3.8 Victoria**

The unexpected change of government in Victoria has been popularly explained in terms of a reaction to a Melbo-centric view of the previous government. The perception was that regional services were being rationalised, significant public investments were concentrated on Melbourne, and the approach of the regional bureaucracy was to tell regional Victoria “to pull its socks up”. Whether this is accurate or not requires more detailed analysis, but it is certainly true that a voter backlash was experienced in regional Victoria.

The new Government has given attention to a “whole of state development” approach, emphasising metropolitan and non-metropolitan development. The Government is undertaking a new Strategic Plan for Melbourne, which considers investment in ports and airport, local train and tram services and freeway extensions. Most significantly, the Government has established a Regional Infrastructure Development Fund, designed to stimulate economic growth and investment in regional centres. Examples includes industry-oriented infrastructure, tourism related capital works, transport upgrades and information and communications technologies. The Living Regions, Living Suburbs Support Fund is designed to promote renewal in “rural, regional and outer metropolitan communities”. A new program has been established to assist councils and regional development bodies to undertake economic development initiatives. The Connecting Victoria program commits the Government to provide for Public Internet Access in Town Halls and Government Net Access Centres.

Further, the Government has established an Office of Rural Communities and upgraded rural extension services in country areas. The Rural Community Development Program involves upgrading civic infrastructure in rural towns.

One of the core objectives of the Linking Victoria Program is to provide fast rail links between Melbourne and regional centres – Ballarat, Bendigo, Traralgon and Geelong. In addition, the Victorian Government is undertaking a number of feasibility studies to assess the viability of restoring passenger train services to centres where the services were recently shut down.

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<sup>36</sup> South Australian Regional Development Task Force, **Report**, State Government of South Australia, April 1999.



### **15.3.9 The Territories**

The Australian Capital Territory and Northern Territory don't have regional policies per se. The priorities centre around expanding infrastructure and investment opportunities. As a public service town going through a downsizing process, Canberra is seeking to develop new opportunities around tourism and knowledge-based industries, due to the presence of research and higher education institutions. The ACT has also been a strong advocate of the Very Fast Train, a proposed link between Sydney-Canberra that could later be extended to Melbourne.

The Northern Territory sees its future as a link between Australia and Asia, a processor of raw material exports, a popular tourist destination, and a provider of new investment opportunities, including for the Territory's large indigenous population. It has an Office of Regional Development and a series of service co-ordination and access programs and consultative processes. The NT Government has developed an Enterprise Zone around the port, designed to attract investment. The Adelaide-Darwin rail link is likely to bring significant economic benefits to Northern Territory, particularly through increased movement of freight and tourism.

## **15.4 The limits to Australian regional policy**

Despite broad concern, some good initiatives from all tiers of government and a lot of debate about regional development, Australia has a long way to go to develop a coherent regional policy framework. Problems with current regional policy approaches include the following:

### **15.4.1 Regional focus is too narrow**

Although rural-based and remote regions will always be important, we need to develop a more inclusive approach to the definition of regions. Some production regions in the metropolitan cities are at least as bad off as rural regions. Some lifestyle and outer metropolitan regions are experiencing high unemployment rates and infrastructure backlogs. Other rural based regions are doing very well. The typology developed in previous SOR reports provides a useful start to this process. As outlined, different types of regions have different needs. If regional assistance is to be effective, careful thought needs to be given to regional definitions and criteria for regional assistance. Eligibility for program funding may be related to a range of indicators. This needs to be subject to detailed analysis. Options for eligibility might include unemployment rates 3 per cent or more above national average, average household incomes 70 per cent below national average, regions experiencing rapid structural change and regions with population growth of more than 2 per cent per annum.

### **15.4.2 Poor co-ordination between governments**

Co-ordination and co-operation between the three tiers of government remains poor. A Regional Development Task Force was established in March 2000 by Federal and state regional ministers and the ALGA with the aim of improving co-ordination between governments. One outcome was expected to be a statement setting out the principles of governments' shared commitment to regional Australia and an agreed Commonwealth/State approach for collaborative work on regional development, as well as specifying guidelines on the respective roles of the different levels of government.

From a local government perspective, however, nothing has come out of this process to enhance the design and effective delivery of regional policy and programs. Although circumstances require some flexibility, a clearer delineation of responsibilities for local and regional economic development is required. For example, the Federal Government is in the best position to fund regional development policies and programs. Federal and state governments are positioned to use tax policies and capital expenditure programs to impact regional performance. Regional development agencies and local government is best positioned to manage programs and implement initiatives at the local and regional level with other regional partners such as business, farmers community, indigenous organisations and investment organisations.

In many regions, agencies sponsored by different tiers of government work well together, mainly because of the capabilities of people working for these agencies. This includes Federal Area Consultative Committees, state regional development agencies and local economic development committees, as well as regionalised industry associations and national resource management groups. But such co-operation is not mandatory, which results in resources being spread too thinly and organisational duplication.

The NSW LGSA State Assembly has endorsed a proposal that the three tiers of government conclude a **Regional Economic Development Accord** binding the three spheres of government to ongoing co-operation and co-ordination mechanisms in relation to the design and implementation of regional economic development programs and initiatives.

### **15.4.3 Infrastructure investment and its components**

Infrastructure planning and investment has a vital role in regional economic development. It can reduce costs, improve access and mobility, induce new investment and improve liveability through, for example, the availability of well-resourced regional hospitals and schools. Inadequate transport, unreliable telecommunications and high-energy costs all impede regional economic development. High growth lifestyle regions, rural regions and outer metropolitan regions experience backlogs in infrastructure provision and services, some production regions have under-utilised infrastructure and sparsely populated rural and remote regions have inadequate infrastructure because they lack the critical mass to justify investment. Regional policy is not closely linked to infrastructure development. Many regions don't have access to low-cost finance to invest in their regions.

Tele-communications investment is guided by the Universal Service Obligation, which takes into account cost differentials in the provision of infrastructure, but other forms of infrastructure do not. Australia doesn't invest enough in infrastructure, we have difficulty in financing infrastructure, and we are not investing enough in new economy infrastructure in regional Australia. The questions are what type of infrastructure is required to support regions shift into the knowledge-based economy, how much does it cost and who will pay for it. In an economic sense, the most critical infrastructure investments are those that facilitate the movement of goods and people, and those that facilitate information and knowledge flows.

### **15.4.4 Poor integration with other policies**

The major pre-requisites for the knowledge-based economy are strengthening value added industry clusters, upgrading human capabilities and investing in and utilising new ICT infrastructure. The main policy areas relevant to the knowledge-based regions are industry and innovation, research and development and education and environment.

In the past year, two relevant major summits have been held in Australia – the Innovation Summit and the Regional Australia Summit. Unfortunately, there appears to have been little communication between the two processes. The Innovation Summit Implementation Group<sup>37</sup> puts forward a number of recommendations to nurture a more innovative culture, to expand our knowledge infrastructure and capitalise on new ideas. Although there are some good proposals in the report, it could have been strengthened by examining the regional dimension to innovation. World best practice in economic development including the European Union highlights the importance of what are termed regional innovation systems – entailing ongoing interaction between firms, research and education institutions, economic agencies and community-based organisations at the regional level. Regional policy should be concerned with, for example, building regional clusters of producers and firms to promote economies of scale and innovation, promoting ongoing learning and skills development strategies at the community level, and encouraging the diffusion of technologies to firms and communities. The draft of the Regional Summit Working Group raises issues about infrastructure and innovation, but it is not clear on specifics.

National and state education policy and programs tend to favour the metropolitan areas, and increasingly private schools. Non-metropolitan regions are concerned about the drift of young people to the cities for work and higher education. Regional universities are vulnerable to new funding formulas that favour the elite urban-based universities and TAFE has experienced significant funding cuts. The larger cities also have a critical mass of private training and other registered training organisations (RTOs) in the growth areas of computer literacy training.

One of the concerns of regional policy is investment in human capital. Australia is not investing enough to prepare regions for the knowledge-based economy. Further, the differentials in education attainment between regions are widening. A related concern is concerned is to inspire young people to work and receive higher education opportunities in the non-metropolitan regions. Some important regional specific initiatives have been undertaken. Example include: the Coffs Harbour Educational Campus which provides opportunities for secondary, VET and university education of the one campus; Wollongong and Southern Queensland Universities judged as Australia's top universities in IT delivery; and South Australia's High Performance Enterprise Communities programs which involves innovative approaches to learning in urban and regional schools.

Australian authorities are starting to think more clearly about regional ecological health. This is particularly the case in relation to dealing with water and salinity problems in different catchment areas. The Murray-Darling Basin Ministerial Council has released the draft Integrated Catchment Policy Statement and the draft Murray-Darling Basin Salinity Management Strategy. Regional catchment committees will be given responsibility to set targets for water quality, bio-diversity, water sharing and the health of the Basin's eco-systems. The Federal Government also supports environmental initiatives such as Landcare, Bushcare, and the National Heritage Trust.

One area where more work needs to be done is how to shift ecologically sensitive regions onto a sustainable development path. One of the problems is that economic growth and environmental health are seen as conflicting. Catchment committees are beginning to address socio-economic development strategies that would be more compatible with maintaining environmental health and social harmony<sup>38</sup>.

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<sup>37</sup> Innovation Summit Implementation Group, **Innovation – Unlocking the Future**, August 2000.

<sup>38</sup> National Economics, Necessary conditions and options for socio-economic advancement - A prospective and perspective analysis of the Western Catchment Management Area of New South Wales, A report for the Western Catchment Management Committee, 2000.

### **15.4.5 Regional specific policy instruments**

If regional policy is to be effective it requires commitment, resources and the use of policy instruments designed to impact regional economic performance. Market oriented reforms of the past 20 years have backed away from the use of regional specific policy instruments. The basic premise is that this would lead to a misallocation of resources. But the pure “economic rationalist” model has been in vogue for some time and the benefits are not spreading broadly enough across the different types of regions. Market mechanisms alone are not sufficient to increase investment in high growth industries, reduce congestion and pollution in major cities, to improve the quality of infrastructure and to upgrade skills in areas lagging behind.

World best practice regional policy is quite explicit about supporting regions undergoing rapid structural change or experiencing high unemployment in both urban and rural regions (see below). Policies include regional structural funds, tax incentives, establishing regional budgets, creating strong regional agencies, programs to develop new economy industries and cluster them together to gain economies of scale and the benefits of industry networking. If we do not go down this route, regional policy will remain vague, fragmented and under-resourced and on the margins of economic policy. In this case, employment and income disparities between regions and within regions are likely to grow.

## **15.5 Innovative regional policy**

The objective of good regional development policy is to shift regions onto a development path that enables them to attain their economic potential within a framework that builds social cohesion and environmental sustainability. Successful regions have developed common core competencies that enable them to compete in the global economy. In all successful cases without exception, regional specific policy has been used as an instrument. Regional policy has sought to improve the core competencies of poorly performing regions and build on the core competencies of strong regions. These core competencies include competitive firms that operate in clusters and networks, knowledge-based workers continually upgrading skills, good quality lifestyle and collaboration between business, government and community. To support these core competencies, public and private investments are required in regional education, R&D, technology transfer, information communications technologies and physical infrastructure.

Successful regions don't just happen. They involve a combination of vision, partnerships between different stakeholders and resource commitments from public and private sectors. In Silicon Valley, success depended on two factors. Firstly, Stanford Research Institute created a high technology research and production environment. Secondly, the US Government defence procurement spurred demand for electronic and IT products. These were the catalysts for the world's most successful high technology region. In the “third Italy”, local and regional government established industrial estates and training institutes to nurture the growth of networks of small family businesses. In Japan, the Government constructed the Tsukuba Science City, which hosts the largest number of national research organisations, the biggest share of the national research budget and significant number of corporate research and development laboratories.

Globalisation, the digital revolution and the knowledge-based economy have resulted in the emergence of new instruments of regional policy.

The broad features of innovative regional policies are as follows:

Firstly, the focus has shifted from business attraction towards enhancing the competencies of firms, households and organisations within the region. Investment attraction follows successful implementation of strategies.

Secondly, the generation, diffusion and exchange of knowledge have become central to the innovation process.

Thirdly, greater emphasis is given to developing business and community networks and bonds and trust between groups.

Fourthly, government involvement has shifted from a top down approach to a bottom up approach with initiative and direction set from within the region and government partnering with financial and human resource support to projects that lead to positive economic and social outcomes. To meet the challenges confronting regions, regional economic development policy has shifted up the policy agenda in most developed countries.

### **15.5.1 United States**

The United States is rarely seen to be a leader in regional policy. However, a number of trends have resulted in a better distribution of economic activity across regions.

Firstly, American defence policy was important in locating new industries in the south and on the west coast, important in the economic development of Los Angeles, Austin and Silicon Valley. Secondly, much has been written about the decline of the north-eastern rust-belt and the emergence of the sunshine belt and the capturing of new economy industries. Thirdly, state and local governments have a number of powers to raise taxes and be active participants in regional economic development<sup>39</sup>. These policies have been reinforced by national policies giving incentives to investment institutions to invest in regions.

Growing regional inequalities over the past decade resulted in a significant involvement of federal and state governments in the development and implementation of policies that enable regions to restructure and attain their economic potential. The booming US economy, for example, has created economic divergences between regions, leading to a greater commitment to regional development in both poor urban and rural regions. To address this, the US Federal Administration supported the establishment of rural development partnerships in many states, with funding support for collaborative initiatives involving all tiers of government and local stakeholders.

The Clinton Administration implemented a number of major programs and initiatives to support the restructuring of distressed urban and rural communities. The most prominent is the Empowerment Zone and Enterprise Community Initiative (EZ/EC), which provides tax incentives and performance grants and loans to create jobs and expand business opportunities. It also focuses on activities to support people looking for work. Total public and private investment in urban EZ/ECs exceed US\$4 billion. The initiative establishes criteria for eligibility including economic and social disadvantage, commitment by communities to take initiative and develop comprehensive economic programs, involvement of all regional stakeholders in the process of strategy formulation and implementation. Innovations in the program included devolution of resources to regional organisations, co-operation and collaboration were pre-requisites for federal funding, and the program reinvented the relationship between federal government and poorer rural and urban communities.

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<sup>39</sup> Ann Markusen, "Interaction between regional and industrial policies: Evidence from four countries", *International Regional Science Review*, 19, 1&2: 46-77, 1996.

An important element of United States regional policy framework is that you can't do much unless you have got access to capital. Three regional innovations designed to increase capital investment are enterprise zones, community re-investment and community based development funds. Regions with high unemployment rates and low average incomes are eligible to become Enterprise Zones, making them eligible for tax credits. These enterprise zones are not to be confused with third world enterprise zones where health and safety and environmental standards are compromised. Rather they are concerned with providing firms with a tax concession for every dollar invested and job created in distressed regions. The argument for Enterprise Zones has been developed for Australian conditions by the Central Western Regional Organisation of Councils (NSW)<sup>40</sup>, who interpret the EZ mechanism as follows:

*Any company locating to the zone, or an existing company expanding in the zone, receives credits against government taxes and charges for employing target groups of employees (called EZ qualified), for purchasing machinery and equipment made in that state or other actions designated under regulation. For the long-term unemployed, indigenous or other designated target group, the company receives a sliding scale rebate against their company tax liability. The company is able to purchase its equipment free of sales tax if it is manufactured within the state. ....*

*... They can be substantial and they accumulate as a credit until used up by the company to offset its tax liability even after the EZ has finished. For instance in California a company receives a tax rebate in the first year of 50% of the wages of every EZ qualified employee (long term unemployed etc.). In the second year 40%, in the third year 30% and so on. The benefit is also applied to each new EZ qualified employee taken on by the company in successive years as well. The credits are earned each year and deducted from the annual company tax bill or accumulated for five years and used as offsets against company tax until finished.*

In an age of rapid financial capital mobility, there has been a lot of interest in the United States regarding how financial institutions will re-invest the funds of its customers, to ensure that differential privileges are not offered to some social groups and regions. The Community Reinvestment Act is an example of gentle pressure from government to ensure that financial institutions meet their community obligations. Under the Act, banks are required to take into consideration the credit needs of the communities in which they operate, with a particular interest in low-income communities. The CRA doesn't require the banks to make high-risk loans (quite the contrary) and allows these institutions flexibility to meet the needs of communities. The Act requires that banks put forward a strategic plan where it details how it will meet the credit needs of its customers. The plan must be published and enable the public to put forward comments before the bank submits the plan to the Federal Reserve for approval.

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<sup>40</sup> Central Western Regional Organisation of Councils (NSW), Enterprise Zones - the tool for the future of regional development in Australia, 2000.

## 15.5.2 The European model

Europe has made regional development a centrepiece of economic policy<sup>41</sup>. With a population 20 times that of Australia, the European Union (EU) has made a strong commitment to regional development. Over time, commitment to regional development has brought about greater economic convergence between EU nations and regions. Over the past 15 years, it has been found that EU regional policies have contributed to greater economic convergence with the poorest 25 regions narrowing, but not eliminating, the gap between them and the European average<sup>42</sup>.

Policies and programs have been put in place to strengthen economic and social cohesion. Enhancing economic and social opportunities is brought about as a partnership between all tiers of government, business and communities. The reasons are simple.

Firstly, if policies and programs were not implemented to overcome the gap between the fastest growing countries and regions and the slowest growing countries and regions, then there would be no Europe. Spreading opportunities to all member nations and their regions is at the heart of the European project, with the initial treaty requiring “overall harmonious development”. Article 130a of the 1958 treaty stipulates a legal obligation that “the Community shall aim at reducing disparities between various regions and the backwardness of the least-favoured regions”.

Secondly, economic imperatives are driving regional development policy. Less developed regions and those undergoing structural change require significant public and private investment if they are to compete in the knowledge economy. Highly competitive regions also require close attention to regional development. They require continual investment in “new” economy industries, industry clusters, knowledge and physical infrastructure; as well as investments to support social cohesion and high quality environmental outcomes.

The European Community now spends about one third of its annual budget on regional initiatives, a massive proportion of total expenditures, and almost twice the proportion spent on regions in 1988. The aim is to stimulate economic development and employment growth in the poorer regions, though infrastructure development, promoting private sector investment and building industry networks, technology transfer, and education and training. It is recognised that to shift poorer regions on a dynamic development path will take a long time, but the focus is on creating the conditions for growth and not subsidies.

The primary means to support “harmonisation” is through the use of Structural Funds and the European Investment Bank (EIB) supplemented by other EU, national and local initiatives. The four Structural Funds are the European Regional Development Fund, European Social Fund, European Agricultural Guidance and Guarantee Fund and the Financial Instrument for Fisheries Guidance. Under these structural funds, grants and concessional loans are provided to less favoured regions in order to close the gap in living standards, creating efficient communications and energy infrastructure, as well as encouraging new economic activity and environmental protection.

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<sup>41</sup> This section has drawn from a number of sources, particularly Keith Bailey, “The Regional Problem – the European approach”, paper presented to the **NSW State Assembly of Local Government**, Sydney, 24-25 July 2000; European Investment Bank, **The Innovation 2000 Initiative: Framework and Implementation Guidelines**, Document 00/8, 5 June 2000.

<sup>42</sup> European Union, 6<sup>th</sup> Periodic Report on the Economic and Social Situation and the Development of the Regions, 2000.

The major Structural Fund is the European Regional Development Fund, which provides funds to particular types of regions and areas of social need around a number of objectives.

- ❑ Financial assistance to regions where GDP is under 75 per cent of the European average.
- ❑ Support for regions experiencing industrial decline based on three criteria – a higher than average unemployment rate, higher than average industrial employment and a decline in industrial employment.
- ❑ Funds to combat long-term unemployment and improve employment opportunities for the young and socially excluded.
- ❑ Adapting the workforce to industrial change.
- ❑ Modernisation of agriculture and fishing industries.
- ❑ Development and diversification of vulnerable regional economies.
- ❑ Assistance to areas with low population densities.

The European Social Fund (ESF) is concerned with providing opportunities for people in marginalised by changing employment and labour markets. It provides support for vocational education and training for young people including apprentices, expanding basic skills in numeracy and literacy, work placement, job-search assistance, training and support structures<sup>43</sup>. The European Agricultural Guidance and Guarantee Fund (EAGGF) supports development and diversification in rural communities. The fund provides direct support to producers, agricultural processing and marketing, environmental protection and afforestation. Diversification initiatives include projects and programs to attract small businesses, improve rural services, craft based industries, tourism, environment and cultural protection and rural infrastructure.

### 15.5.3 Innovation 2000

The European Council, the governing body of the European Union, has recently adopted the “Lisbon Strategy”, a strategy to mobilise resources and institutions to position all of Europe in the emerging knowledge-based economy. The Lisbon meeting recognises that *“people are Europe’s main asset and thus should be the focal point of the Union’s policies”*.

The Lisbon communiqué states:

*“The Union has today set itself a new strategic goal for the next decade: to become the most competitive and dynamic knowledge economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion”*.

Within this framework, the European Investment Bank (EIB), which is responsible for 5 per cent of aggregate capital investment in Europe, has a special role to play to invest in areas that will enable all of Europe’s regions to make the transformation to the knowledge-based economy. The charter of the EIB stipulates that it makes laws and provides guarantees for projects in developing and less-developed regions. Around two-thirds of the Bank’s financing goes to regions undergoing structural change. It collaborates with private banks and supports around 30,000 projects undertaken by local authorities and SMEs.

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<sup>43</sup> Bailey, *ibid.*



A major initiative **Innovation 2000** is underway designed to finance regional investments in five areas. The initiative requires EIB to provide for a major increase in regional funding; the design of new financing instruments - venture capital, public private partnerships (PPPs) and risk sharing schemes; and a 2-3 year time-frame to get results. Although **Innovation 2000** requires a significant increase in bank financing (around A\$25 billion over three years), more important than this is the shifting role of a financial institution in a knowledge-based economy. The bank itself acknowledges that it requires a new set of skills to support the shift to the knowledge-based economy. This includes expanding projects and skills in risk management and venture capital, industrial finance and financial engineering.

In mobilising the necessary means, EIB has been given responsibility to finance regional knowledge-based investments in five areas: human capital formation, research and development networks, information and communications technology networks, diffusion of technology and development of SMEs and entrepreneurship.

**(i) Human capital formation**

This involves increased investment in schools and higher education, programs to promote digital literacy and lifelong learning, and to improve teacher training. EIB funds will be allocated modernising teaching facilities, cabling and equipment, and new facilities for information and communication technologies.

**(ii) Research and development**

The main objective is to establish a European Research Area designed to increase private sector R&D investment and partnerships, support high technology start-ups and to create a very high speed transeuropean network for electronic scientific communications, linking research institutions and universities, science centres and libraries and schools. EIB initiatives will support these developments through: increasing funds to firms engaged in significant R&D programs, financing information centres that provide services for SMEs, co-financing of public R&D programs, investing in centres of excellence and participating in financing patenting.

**(iii) Information and communication technology networks**

The European Union is setting out to catch up to its North American competitors in relation to E-Commerce and the Internet in provision of low cost, high speed interconnected networks. It is proposed that all European schools will have Internet access by the end of 2001. EIB activities are to be increased in areas of broadband and multimedia infrastructures and innovative communication projects including multimedia optical fibre networks, asymmetric digital subscriber line (ADSL), digital TV broadcasting systems, wireless local loop (WLL) projects and Internet related investments.

**(iv) Diffusion of innovation**

A priority is to ensure that all firms and citizens have access to information and communications technologies, a main vehicle for diffusing ideas, information and innovations. In addition to investing in these supply side ICT investments, EIB is also increasing investments in the demand side, notably hospitals and healthcare (including "healthcare online"), information systems designed and managed by local government, and investment in companies engaged in accelerating technological diffusion. The latter includes investment in Internet companies and helping firm's gear up for E-Commerce applications.

#### (v) **Development of SMEs and entrepreneurship**

Financing start-ups and SMEs are central to the knowledge-based economy. EIB activities in this area include reinforcing its role in venture capital markets - particularly increasing funds for early seed and start-up funds and technology -dedicated investment funds; a focus on less developed regions; and financing science parks and incubators and clusters of firms in advanced technology sectors.

#### **15.5.4 The standard European industry development model**

The standard European industry development strategy is typified by the German approach to bio-medicine. In the late 1980s the German Government felt that German industry was falling behind in bio-medical products. The solution was to:

- set up a US\$1 billion fund for research and development, both through research institutions and companies;
- offer up to a 50 per cent tax write-off for bio-medical product plant construction; and
- set up funds for soft loans and capital grants for strategic investments in the bio-medical sector.

What followed over the 1990 decade was a very fast rate of expansion in factory production for bio-medical production.

#### **15.5.5 The Irish Model**

The Irish Model has proved extremely successful in delivering economic growth to Ireland over the 1990 decade<sup>44</sup>. After decades of low growth of between 2 and 3 per cent, the Irish economy grew at approximately 8 per cent over the 1990 decade with a manufacturing output growth of 11 per cent per annum.

What caused this sudden change in growth prospects was the end result of a 40-year program to build up Irish industry. The strategy is outlined in Figure 15.1. The strategy revolved around:

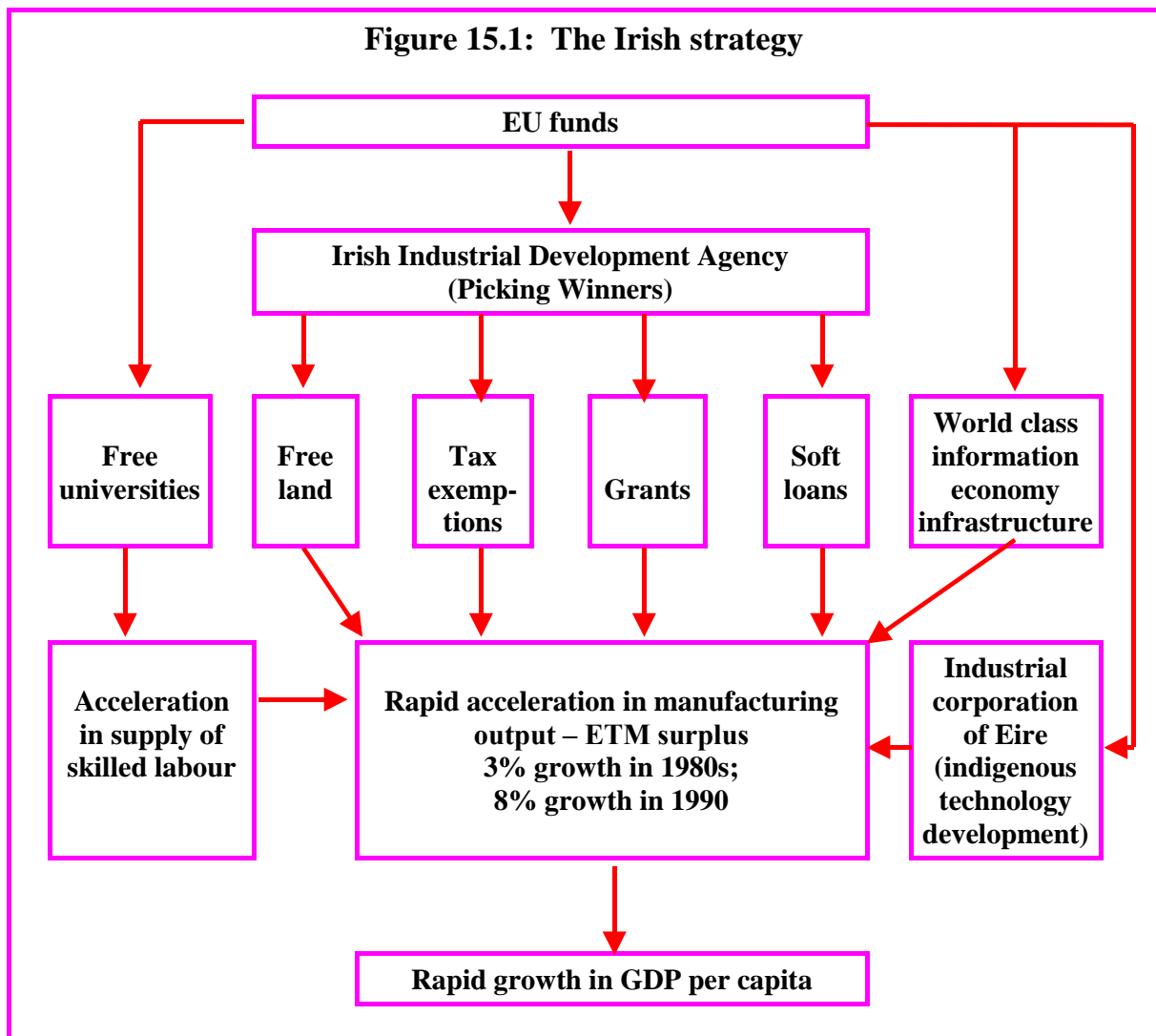
- infrastructure and education;
- the Irish Development Agency using combinations of soft loans, grants and company tax exemptions, both to attract high technology foreign companies and to build up indigenous corporations; and
- the Industrial Corporation of Eire which focuses on developing indigenous technological capacity so as to retain what otherwise would be footloose foreign capital investment.

The success of this policy can be seen from the fact that in 1999 Ireland attracted direct foreign investment equal to 20 per cent of GDP. Australia's share, by contrast, is minuscule.

There is nothing new in the Irish strategy. It is simply the strategy applied by Japan, Korea, Taiwan and most Western European countries since 1950. What is new is that it demonstrates is that the benefits of industrial and regional development policies in the age of the digital economy are much greater than what they were in the past.

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<sup>44</sup> See Roy Green's contribution in Appendix 1.



## 15.6 The recommendations of the Innovation Summit Implementation Group

Australia's response to the digital age was an Innovation Summit held in February 2000.

There are some useful recommendations. Research and development tax concessions may well help some existing supply chains become integrated and to survive, and perhaps prosper, in the digital economy. In terms of embedding new strategic technologies in the Australian economy, such an approach will be severely limited. For research and development tax concessions to work in this regard firms would have to be in Australia applying the technologies on a large scale. They are not.

To embed new technologies in an economy, governments have to allocate significant resources to:

- (i) set up research institutions to specialise in the new technologies;
- (ii) attract foreign companies specialising in the new technologies to set up operations in Australia; and
- (iii) set up indigenous companies (perhaps initially publicly owned) to embed the technologies in the economy.

The Innovation Summit recommendations miss the point that to significantly benefit from technology the economy has to produce something that embodies the new technology. To do this the government has to spend resources and support strategic sectors.

As it stands the Innovation Summit recommendations will simply lead to “Cathedral in the sky” type knowledge regions, where the benefits will accrue to local scientists in that the policies will enable them to obtain \$ million plus jobs in North America or Western Europe, courtesy of the Australian taxpayer.

## **15.7 A regional agenda for Australia**

The elements of a national regional policy agenda are becoming clearer. An agenda would be based on the following:

- inclusive regional vision involving all sections of the community;
- comprehensive regional strategies;
- sustainable development principles incorporating economic, social and ecological;
- partnerships focused on outcomes;
- resource commitment from federal and state governments;
- greater responsibility for local government, regional organisations of councils and regional economic development agencies.
- increasing regional capital investment;
- strengthening competitive industry clusters;
- building the foundations for growth with an emphasis on strengthening transport and communications linkages and strengthening regional knowledge infrastructure.
- regional leadership and empowerment;
- a new charter and resource base for local government; and
- building local and regional capacity in local economic development planning and management.

### **15.7.1 Innovative regional economic strategies**

National expertise in local and regional development has improved significantly over the past decade. A number of outstanding strategies have been prepared and are being implemented across Australia. A bottom-up approach to regional development requires a clear vision about where a region is going. Such a vision requires active participation of all regional stakeholders. To move from vision to action requires a detailed understanding of the current economic structure and the resources required to implement an economic strategy. This requires new tools in economic planning.

This report has emphasised the need to strengthen Integrated Supply Chains at the regional level. The first step in developing a new regional policy agenda is to analyse industry relationships at the regional level. This includes quantifying forward and backward linkages for any given industry, and the state, national and international networks of firms that may be operating within the region.

The next step is to prepare a regional resource budget. This could be undertaken with the support of councils. The regional resource budget which identifies resources coming into the region, as well as outflows from the region. Part of these resources would come from government at the state and national level. The regional resource budget will have two objectives.

- ❑ On a comparative basis, it will enable questions to be asked in regard to the equity and efficiency of resource allocation to the region, vis-à-vis other regions in Australia.
- ❑ It will be a platform from which a regional development vision can be clarified and modified, along with calculations of the resources that will have to be made available to bring the vision to fruition. The vision, of course, has to be anchored within the political constraints currently operating in Australia and, therefore, can be used as an instrument to change policy.

The third step is to form a view of the strategic opportunities in the region. There will be many elements to this, including current strategic backward and forward linkages, which should be protected at all costs, along with strategic potential which, if realised, will unlock growth potential of a high order.

The protection of current strategic interests involves ensuring that the producer and industry clusters involved are moving towards world best practice, efficiency, knowledge and skill and either have, or will have, access to efficient infrastructure support.

The unlocking of strategic potential will require, in many instances, the access to assistance and finance support from national and international companies, public authorities and financial institutions. Good regional governance, resource accounting and stocktake and a development vision can play a key role in assisting private sector initiatives in realising success in financing and assistance.

The development vision has to have, at its core, the notion of a learning dynamic community capable of adapting quickly to change and the skill requirements of the market place. This equally applies to farmers, manufacturing and service workers and entrepreneurs. The objective must be to innovate at world best practice rates.

A further important factor is to define the region in terms of an efficient economic space. That is, a region should be defined in terms of sub-regions that have either actual or potential high levels of economic and social interaction in strategic areas of industry and commerce.

### **15.7.2 The regional development plan**

Innovative regional development plans involve quantification of the following objectives:

- ❑ macro (employment creation, high wage employment creation);
- ❑ industry (strengthening existing supply chain clusters, strategic investment and industrial diversity); and
- ❑ social (education and servicing standards).

The resources needed to achieve the objectives should be calculated and justified in terms of:

- ❑ equity – catch-up to best practice regions; and
- ❑ enhancement – strategic value compared to other regions.

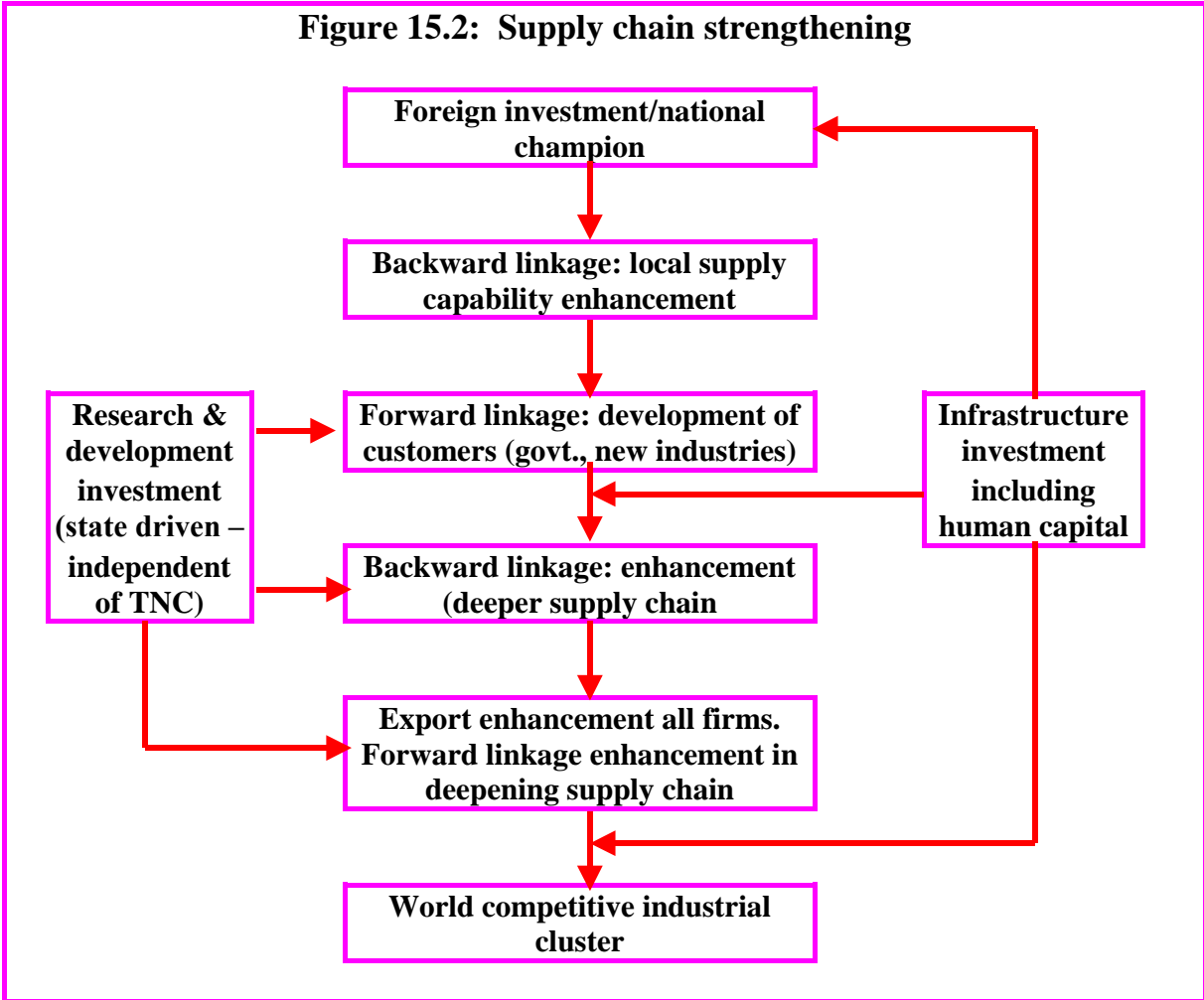
The development plan should detail the strategies to achieve successful outcomes. The strategies will revolve around:

- ❑ company networks;
- ❑ regional branding (icons); and
- ❑ inter-regional competition.

The strategies will also:

- ❑ fully exploit traditional tacit knowledge based craft skills;
- ❑ develop generic skills to use, manage and add value to rapidly evolving knowledge and codified management systems including process management;
- ❑ expand Internet/intranet based supply chains and local forward/backward linkages;
- ❑ use local institutions to disseminate tacit knowledge; and
- ❑ develop skills for industrial diversity as distinct from scale.

The objective of the strategies will be to apply them so that they strengthen all aspects of the supply chain, as outlined in Figure 15.2. The end result will be to develop an integrated supply chain with local producers continually upgrading their status. That is, moving from assembly/original equipment manufacturing all the way through to icon brand manufacturing companies capable of capturing post production value added. If this is achieved the region will possess a secure integrated supply chain anchored in a knowledge region.



### 15.7.3 The strategic role of knowledge infrastructure

The role of the vocational education and training system can be strategic in facilitating and driving enhancements in regional competitiveness. Compared to universities, the VET system has a number of potential advantages. These are:

- ❑ closer to industry;
- ❑ more flexible in developing training programs to meet changing industry needs; and
- ❑ better positioned to help industry modernise and innovate.

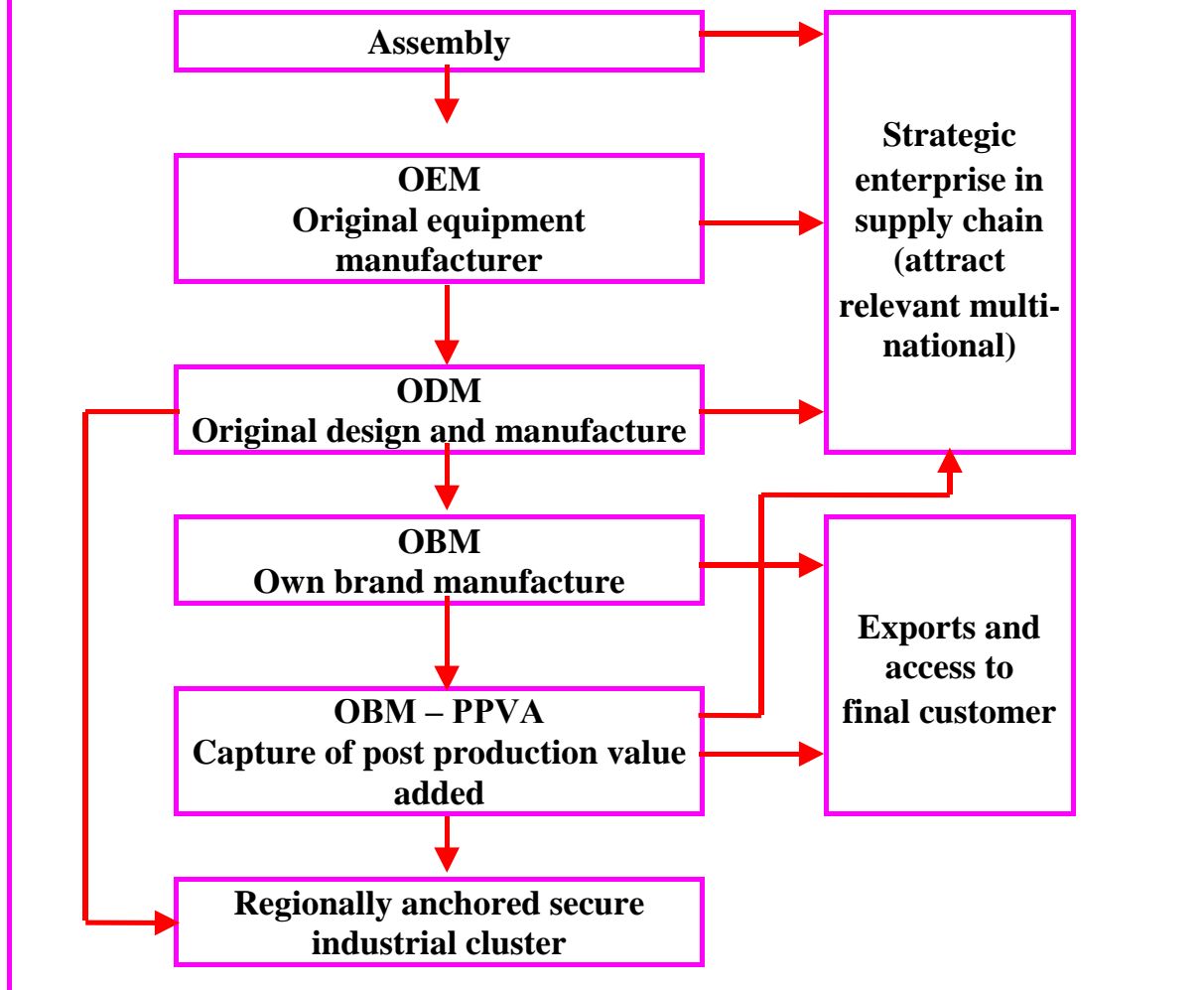
Successful innovation requires the successful training of the workforce to adapt to change. Local knowledge infrastructure must be practical and applied. The VET system can directly support innovation by facilitating interactive learning among the personnel from different organisations. VET providers can connect service providers and clubs, accelerate the rate of technology taken up and facilitate information exchange. To do this effectively VET trainers must be actively engaged with the local business community and information exchange is carried out via training and counselling sessions. The incentive for involvement comes from the potential to enhance local supply chain linkages.

## 15.8 Strategic directions

To conclude, this report reinforces the findings of previous SOR reports – specifically the growing disparities in the performance of Australia’s regions. Although regional development has been acknowledged as an important policy area and some outstanding initiatives are underway at the regional level; more needs to be done if we are to ensure that all regions attain their economic and social potential. Clearly, the three tiers of government, business and communities must act in partnership if solutions are to be found to our growing regional problems. Solutions are possible. Some of the main strategic directions that should be considered include the following:

1. **A new definition of Regional Australia** All Australian governments – Federal, state and local governments – should seek to adopt an inclusive approach to Australia’s regions – whether they be city based and non-city based, recognising the different priorities and needs of different regions.
2. **Convergence targets** Given the evidence of increasing economic and social disparities between Australia’s regions, consideration should be given to the implementation of strategies that promote greater convergence in employment growth and living standards.
3. **Re-populating rural and resource based regions** Reversal of population decline in rural and resource-based regions should be investigated as a matter of national priority. Consider should be given to setting a realistic target for net population growth in these regions over the next 20 years (say 150,000-200,000), paying particular attention to the economic and social potential of innovative rural centres to accommodate population growth.
4. **Strengthening economic development agencies** Given the commitment by most parties to a “bottom-up” approach to regional development, more resources are required to strengthen local and regional economic agencies if they are to be an effective catalyst for accelerated economic development. This may include increased resources for discretionary funding new industry initiatives, supporting local industry networks and clusters, and programs to build the capacity of regional boards in economic development planning and management.

**Figure 15.3: Back to the drawing boards: stages of evolution of firms within a secure supply chain**



5. **Linking industry and regional policy** Strenuous efforts are required to link industry, trade, education and environmental policy with regional policy. With the WTO regulations in force, regional development has become a new form of industry policy in many dynamic countries. The main focus, as outlined in this report, is to implement policy initiatives designed to strengthen integrated supply chains
6. **Understanding regional innovation systems** When preparing local and regional economic strategies, more emphasis should be given to an analysis of regional innovation potential. This may include doing a stock-take of local knowledge infrastructure – schools, TAFE, farmers and industry associations, industry networks and councils. Such strategies should consider how local organisations can collaborate together to accelerate innovative capacity, how can links be strengthened with external organisations to improve information and knowledge flows, and how can an innovative culture be nurtured at the local and/or regional level.



7. **Improved government co-ordination and co-operation** Despite the establishment of the Regional Development Task Force involving the Federal Minister for Transport and Regional Services, state regional development ministers, senior officers and the Australian Local Government Association - co-ordination between the three tiers of government in relation to regional economic development remains fragmented. In relation to regional development programs, co-operation and collaboration between all tiers of government should be mandatory before funds are allocated.
8. **Regional capital investment** Increasing capital investment in the regions should be addressed as a matter of urgency. Regional policy will not be effective unless it is linked to incentives to increased investment in regions. Australia lags behind other developed country in the use of regional financial policy instruments. Three areas need consideration. Firstly, the US Regional Investment Act could be a model for encouraging greater responsibility on behalf of financial institutions. The banks should be able to work with regional communities in the development of strategic plans that set out details of funds raised within the region and strategic areas of investment in the forthcoming period. The latter may include venture capital opportunities, infrastructure projects and development of specialist skills to provide for the financing needs of local firms and farms. Secondly, governments, councils and regional agencies should seek to work closely with super funds to explore ways of creating an environment for more profitable investments in all regions and to address the biases in current investment flows. The establishment of the NSW Regional Development Trust by the NSW Local Government and Shires Association may serve as a useful model for the development of other trusts. Thirdly, the time has come for Australia to explore new incentives such as tax credits to encourage new investment and the creation of jobs in designated development zones in regional Australia. We strongly support the initiative of the Institute of Practising Accountants and the Central Western Regional Organisation of Councils in this regard.
9. **Strategic economic data and information** Councils should give consideration to improving the quality of their strategic economic data bases to enable them to take appropriate action to Support local industry clusters and encourage prospective investors to make informed investment decisions in the region.
10. **Councils as promoters of learning communities** Councils should consider taking a leadership role in the development of learning communities. Activities may include: re-inventing libraries and community centres, partnerships with schools and employers; endeavouring to be best practice employers and trainers, support for industry clusters and community based organisations and organising forums that promote local innovation.
11. **Community economic development** Councils should seek to strengthen their support of community economic development strategies targeted at supporting long term unemployed people and those with disabilities. This involves targeted support for the community sector to implement initiatives associated with training, strengthening links between community organisations, local employers and employment agencies.
12. **Import replacement and procurement** Governments at all levels should look for opportunities to strengthen the state-based Industrial Supplies Offices (ISOs) as a mechanism to increase commercial opportunities for locally based firms. Councils should consider opportunities to develop partnerships with ISOs and look at ways local and regional procurement systems can be strengthened through collaboration between different councils.

13. **Regional budgets** New approaches to regional budgeting should be considered. This would involve initially preparation of flows of funds at the regional level and forecasting of resource requirements to strengthen regional competitiveness in both private and public sectors. This will enable regions to better appreciate the resource requirements for new infrastructure projects and to finance development opportunities in the future. The development of these regional budgets would provide better information to investors and financial markets regarding opportunities at the regional level.
14. **Infrastructure investment** Federal and state governments need to make a greater commitment to investment in regional infrastructure. The Federal Government's commitment on road funding is welcome but the 21<sup>st</sup> Century agenda will be increasingly concerned with increasing investment in knowledge, technology and social infrastructure. This will involve a greater commitment of government investment in regional infrastructure as well as strengthening public-private partnerships (PPPs) to expand resources available for regions.

# Appendix 1

## Regional innovation: The European experience<sup>45</sup>

By

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*A paper presented to the Regional Co-operation and Development Forum, National Convention Centre, Canberra, on 3 December 2000*

The paradox – and salutary lesson – of recent European experience is that progress towards a single market, far from stifling regional innovation and diversity, has mobilised it as a powerful new source of competitive advantage. The contrast with Australian public policy over a similar period could not be greater. Since President Jacques Delors' 1993 White Paper on *Growth, Employment and Competitiveness*, the European Union (EU) has used its Structural Funds and Framework Programmes to build regional capacity in areas such as industry cluster formation, research and education, enterprise adaptability, lifelong learning, infrastructure and cultural development. As a result, instead of being marginalised and disadvantaged by the operation of the single market, the smaller regions on the periphery of Europe have experienced the same if not better economic performance than the large 'core' member states. The most salient and successful example of these regions is Ireland, which is well on the way to becoming one of the first knowledge-based economies of the new millennium.

The focus of this paper is on the transformation of Ireland's economy in the context of national and EU regional development policy, and, more specifically, the emergence of a globally competitive information and communications (ICT) sector which provided the catalyst for transformation. Today, the Republic of Ireland has one of the highest concentrations of ICT activity and employment in the OECD. This activity comprises both electronics hardware manufacturing, such as personal computers (PCs), and software products and services, especially business application products and 'localisation'. While it has largely been driven by foreign direct investment (FDI), recent evidence suggests that an indigenous software industry has also become well established through supply chain operations and new business start-ups and is now growing at a much faster rate than the multinational sector. It is also a major factor in the prodigious rate of high skill, high wage job creation since the early 1990s and comprises a key element of Ireland's 'regional innovation system'.

The paper begins by identifying the main characteristics of the Irish ICT sector, and, as a case study of local transformation, traces the apparently spontaneous emergence of a software cluster in and around the city of Galway, the fastest growing city in Europe. The paper evaluates the respective contributions of public policy and local initiatives to the development of this cluster, and suggests that it is 'boundaryless' in the sense that its global character defies traditional stereotypes of domestic rivalry and collaboration. However, it also finds that this is not inconsistent with Michael Porter's observation that 'the enduring competitive advantages in a global economy lie increasingly in local things – knowledge, relationships, motivation – that distant rivals cannot match' (1998, p 78). Finally, the paper notes that while Ireland is a leading exporter of ICT products and services, it is still a net importer of new technologies with a mixed though rapidly improving performance in R&D as well as in the take-up and diffusion of ICT across the economy as a whole.

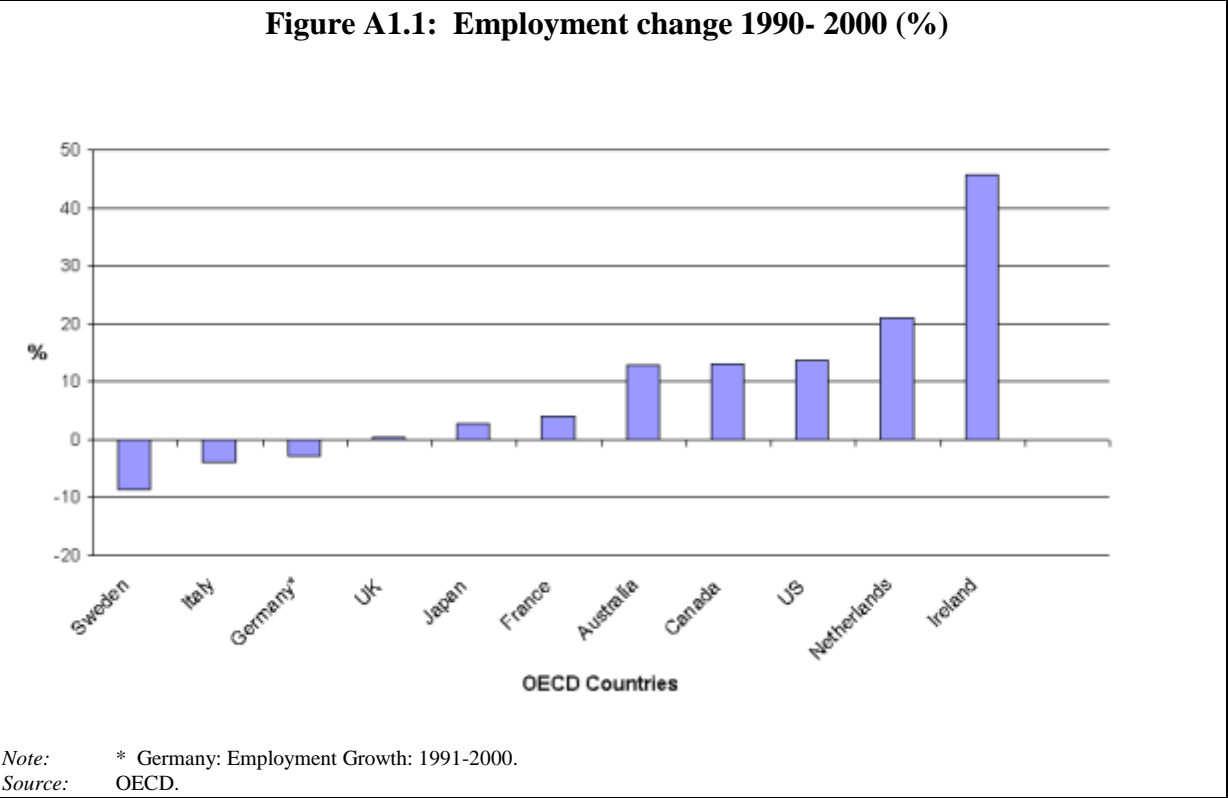
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<sup>45</sup> This paper is based on research currently being undertaken for the OECD National Innovation Systems programme. The author appreciates the assistance of James Cunningham, Imelda Duggan, Majella Giblin, Mike Moroney and Leo Smyth.

## Economic context and performance

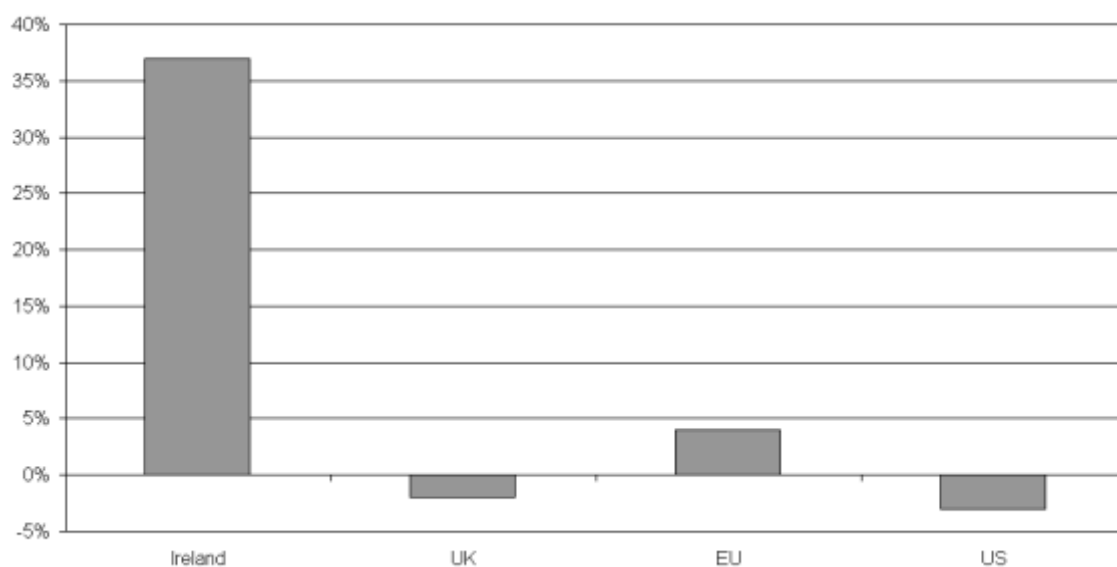
Over the past decade, Europe’s smaller member states have experienced the fastest growth rates in the OECD, outpacing even the US which is said to benefit from a more flexible and dynamic labour market (Green 2000). Ireland has had the best performance of all, with annual average growth rates of 8 per cent and the number of jobs across the economy increasing by nearly 50 per cent between 1990-2000 (see Figure A1.1). While the services sector was the main source of this increase, manufacturing employment also grew rapidly, for the most part in high value adding, knowledge-based activities (see Figure A1.2). There is a recognition in Irish policy circles that growth in the ‘new economy’ does not signify the end of manufacturing – still less a ‘post-industrial society’ – but simply a further change in the form of industrial production and accompanying work organisation (Grimes 1999b). It is the sheer scale and composition of this growth which has given rise to the term ‘Celtic Tiger’, paralleling the East Asian rapid development phase of the 1970s and 80s, and initial doubts about its sustainability have been met with evidence of far-reaching cumulative structural change and adaptation.<sup>46</sup>

**Figure A1.1: Employment change 1990- 2000 (%)**



<sup>46</sup> This evidence is not yet conclusive. Ireland is now ranked fifth by the World Economic Forum, after the US, Singapore, Luxemburg and the Netherlands, in terms of ‘growth competitiveness’ which measures factors contributing to growth. However, Ireland remains 22<sup>nd</sup> in the world for ‘current competitiveness’, encompassing factors in the continuation of growth, mainly due to an infrastructure deficits in a number of areas: *Irish Times*, September 7 2000.

**Figure A1.2: Manufacturing employment change 1990-97 (%)**



Source: OECD and Eurostat.

Irish growth is essentially export led, with over 90 per cent of GDP sold abroad and an average increase in export volumes of more than 12 per cent a year during the 1990s. Indeed, export growth shows signs of accelerating even further this year. Ireland has consistently recorded a trade surplus over this period in excess of 10 per cent of national production, primarily due to the impetus provided by a world scale, export-oriented and increasingly sophisticated ICT sector. This surplus has been a key ingredient in Ireland's improved capacity to overcome the balance of payments problems that characterised its disappointing performance in the 1980s. For the purposes of this analysis, the ICT sector may broadly be disaggregated into (1) a large electronics hardware industry, which produces a standardised output of PCs and office machinery, and (2) a smaller but more rapidly growing computer software industry, which combines elements of standardisation and differentiation in a constantly evolving product mix.

Ireland is now the *fifth largest exporter of computers* in the world, despite its small size (OECD 2000). These account for more than a third of Irish exports, with a third of the PCs sold in Europe manufactured in Ireland. Recent data also indicates that Ireland has the highest proportion of high technology industries represented in its manufacturing exports of all OECD countries (OECD 1999). In addition, with 34 per cent of the global market, Ireland is the *biggest exporter of software products* in the world, having overtaken the US in 1998. Over 40 per cent of packaged software and 60 per cent of business application software sold in Europe are produced in Ireland. International demand is the main factor in continuing export growth not only for multinational companies in Ireland but also for the indigenous software industry which exports almost 60 per cent of its output (Travers 1999).

However, the key drivers of Ireland's trade performance have been the immense scale, high quality and local 'embeddedness' of inward investment, with FDI accounting for two thirds of manufacturing output and over 80 per cent of manufacturing exports. This has been a deliberate strategy of the Industrial Development Agency (IDA), at least since the influential Tesis report of 1982, supplemented by the role of Enterprise Ireland in the promotion of indigenous supply chains (see Forfas 1996). In 1998, Ireland attracted FDI inflows of \$6.8 billion, which makes it one of only four countries in the OECD – along with Finland, Sweden and the Netherlands – where FDI amounts to more than 8 per cent of GDP. Moreover, with only 1 per cent of the EU population, Ireland gained *23 per cent of all FDI projects in Europe* in 1997, covering manufacturing, software, teleservices and shared services projects. This is a remarkable achievement, but one which, as we shall see below, is not wholly positive.

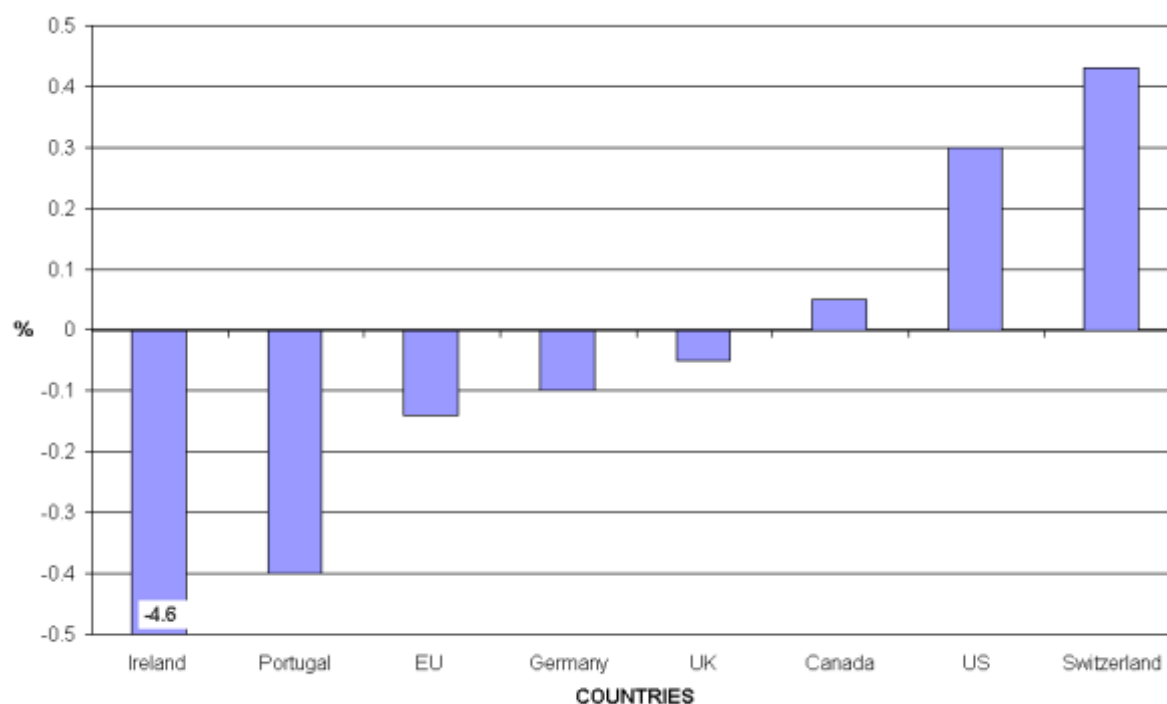
In computer software, Ireland has the largest market share of FDI in Europe with 55 per cent of the total, more than twice the market share of the next most successful country (France at 21 per cent). Similarly, Ireland's market share of FDI in teleservices (over 28 per cent in 1994-97) and in shared services such as back office activities (37 per cent over 1996-97) is also the highest in Europe. In electronics, Ireland's market share is second only to the UK at around 22 per cent, and the gap is closing. In the manufacturing sector too, Ireland's market share of FDI increased to 13 per cent of the total by 1997, behind the UK and France. Finally, it is noteworthy that 19 of the top 25 computer firms in the world have manufacturing operations in Ireland, with Microsoft recently committing itself to major European 'hub' facilities in Dublin.

While the tax regime, telco facilities and EU membership have all played their part in attracting high levels of FDI (Gunnigle and McGuire 2000), Ireland's human resource base has also been an important factor, particularly for the ICT sector. This goes beyond use of the English language. It is recognised that 'the ability of a country to attract, successfully absorb and benefit from foreign direct investment, and the transfer of technology which it may bring, depends to a large extent on its own technological capabilities, of which the skills and technical knowledge of its workforce are critical components' (ILO 1999). With its cuts to public expenditure on education and research, the Australian Federal Government seems to have lost sight of this obvious and well established fact. Again, by contrast, in the 1998 IMD *World Competitiveness Report*, Ireland was ranked first in the world for the 'fit' between its educational system – with its high output of third level graduates in computer science and engineering – and the needs of a competitive economy. According to recent analysis by the OECD,

*[P]ast national strategies for investing in education and training have paid off in terms of faster productivity growth and higher levels of productivity at the aggregate level, and higher earnings and employability at the individual level (OECD 1998b).*

Yet the economy's dependence on FDI has also encouraged the use of *imported* rather than locally generated technologies. This is reflected in the very large deficit in Ireland's 'technology balance of payments', which measures flows in knowledge and 'disembodied' technologies between countries (see Figure A1.3) and which in turn is due to Ireland's traditionally low R&D intensity, as indicated by low levels of business expenditure on R&D as a proportion of GDP (at 1.5 per cent) and a low government share of R&D spending of 5.5 per cent compared with an OECD average of 8 per cent. It is only in the most recent phase of ICT expansion that this problem is being addressed, with significant support from EU 'cohesion' programmes targeted at Research, Technology, Development and Innovation (RTDI) (Grimes 1999a). R&D business spending as a proportion of GDP has more than doubled over the 1990s, with ICT industries now contributing a third of the total (OECD 2000). The major part of this contribution is in electronics, but software companies, especially in the indigenous sector, are making up ground, with companies undertaking R&D allocating 20 per cent of the value of sales to this function (National Software Directorate 1996). Some recent developments suggest that a 'critical mass' has been reached in indigenous private sector R&D, though the latest economy-wide data has yet to be released. The public sector is also increasing its investment in research, as we shall see below, through the *National Development Plan 2000-2006*.

**Figure A1.3: Technology balance of payments**



Source: OECD.

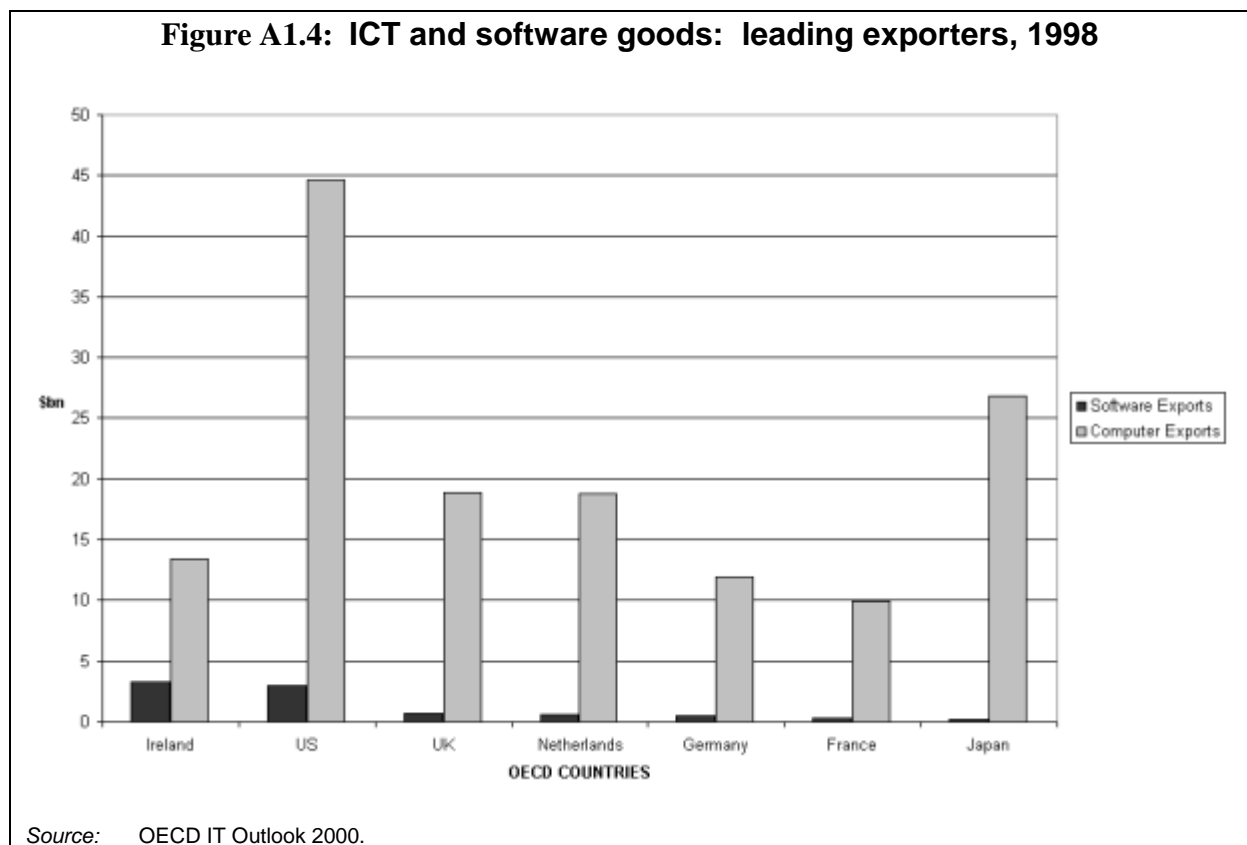
## ICT cluster characteristics

Ireland's participation in global ICT activity was characterised at the initial stages of development by relatively low value adding manufacture and assembly of electronics hardware, but this has been overtaken by more complex integrated manufacturing and software operations, including those of a 'boundaryless' indigenous software industry cluster as assembly operations relocate to lower cost countries. During the 1990s, indigenous firms achieved growth rates of 11 per cent a year for employment, 25 per cent a year for the value of sales and almost 40 per cent a year for the value of exports. While the electronics sector continues to be dominated by large multinational companies – with significant technology and skills transfer – employment in software products and services is more evenly divided between overseas and Irish companies, which consist mainly of small to medium enterprises (SMEs).

Ireland's ICT cluster is primarily a self-contained group of *producers* rather than consumers of ICT. The Irish ICT market is very small at 0.18 per cent of the OECD, and ICT intensity – measured by ICT expenditure as a proportion of GDP – is low at 6 per cent, compared with an OECD average of 7 per cent. At the opposite end of the spectrum, Australia's ICT intensity is 10 per cent, but it ranks poorly as a producer with ICT accounting for only 1 per cent of GDP, which severely restricts its global options (Green and Genoff 1998). The recent claim by the Federal Industry Minister that Australia can be counted as a 'knowledge-based economy' due its relatively high internet take-up – that is, as a *consumer* of ICT – reflects a complacency born of self-delusion. On the other hand, Ireland is ranked 16 out of 19 OECD countries for diffusion of ICT equipment, such as number of phone lines per 100 inhabitants and use of PCs. It is only recently that the problem areas of telecommunications, including fibre optics and bandwidth, have begun to be addressed. Previously,

the take-up of ICT in the ‘old economy’ was seen as a spill-over effect of globally targeted production rather than as a strategic objective in its own right.

It is as a producer, however, that Ireland has constructed the foundations for long-term growth, both domestically and in international markets. In the period 1991-97, turnover in electronics hardware increased by 25 per cent a year and numbers employed in the sector by 14 per cent a year to more than 35,000, taking it beyond chemicals and pharmaceuticals to become Ireland’s largest manufacturing employer. Although there are still three times as many people working for the Irish subsidiaries of multinationals as for indigenous companies, the latter are expanding considerably faster at over 17 per cent a year. The electronics sector is almost entirely geared to exports, with three quarters of all firms exporting and more than 80 per cent of turnover accounted for by exports. These comprise mainly PCs, computer components and office equipment, and their value more than doubled in the period 1990-98 to £13.4 billion – just lagging the UK and Netherlands but ahead of Germany and France (see Figure A1.4).



While the low level of business expenditure on R&D generally in Ireland has been a matter for concern, at least until more recent favourable data began to emerge, the electronics sector is increasing its own contribution, already the largest of any industry, by almost 30 per cent a year. This reflects the trend for MNCs to devolve the R&D function to ‘nodes’ of creativity and expertise in established clusters encompassing their subsidiaries, their suppliers and even in some cases their competitors as shorter product life cycles, ‘virtual’ proximity to markets and the seemingly insatiable demand for high level skills redefine first mover advantage in the industry. Clearly the larger organisations will maintain central research and incubator facilities, but there is an awareness that size may not be everything and that investment in such facilities will eventually run into diminishing returns, often simply because technicians and research staff leave to form their own companies.



A similar trend is discernible in the Irish software sector, which is experiencing even more spectacular growth with exports of £3.3 billion in 1998. In the period 1993-97, the number of firms in the sector increased by over 60 per cent, employment doubled to 18,000 and revenue more than doubled to £4.5 billion. In software, by contrast with electronics hardware manufacturing, indigenous firms not only account for 83 per cent of all firms in the industry but also *more than half of total employment*. However, the firms are generally small, with just 27 in 1997 employing more than 50 people, and they generate only 12 per cent of total revenue. The MNC subsidiaries are again much larger, and, given the limited size of the domestic market, it is not unexpected that they would export their output. On the other hand, an 80 per cent of indigenous firms are also exporters, creating new benchmarks of global penetration and competitiveness.

Most of the software multinationals in Ireland are packaged software or product companies selling to mass markets, though the growing emphasis on localisation and product development, especially in the financial sector, requires a higher level of software engineering skills and is more reliant on outsourcing and indigenous supply chains, including translation, fulfilment, packaging, manual printing, transport and technical support. Irish public policy has recognised that 'the full benefit of the presence of foreign production firms depends on the extent to which they can be integrated into their environment. Such relationships are not only beneficial for local suppliers that benefit from technology transfer... Foreign firms will be anchored to the regional economy, merging local and global interests, and making sudden divestiture less likely than before' (OECD 1998a).<sup>47</sup>

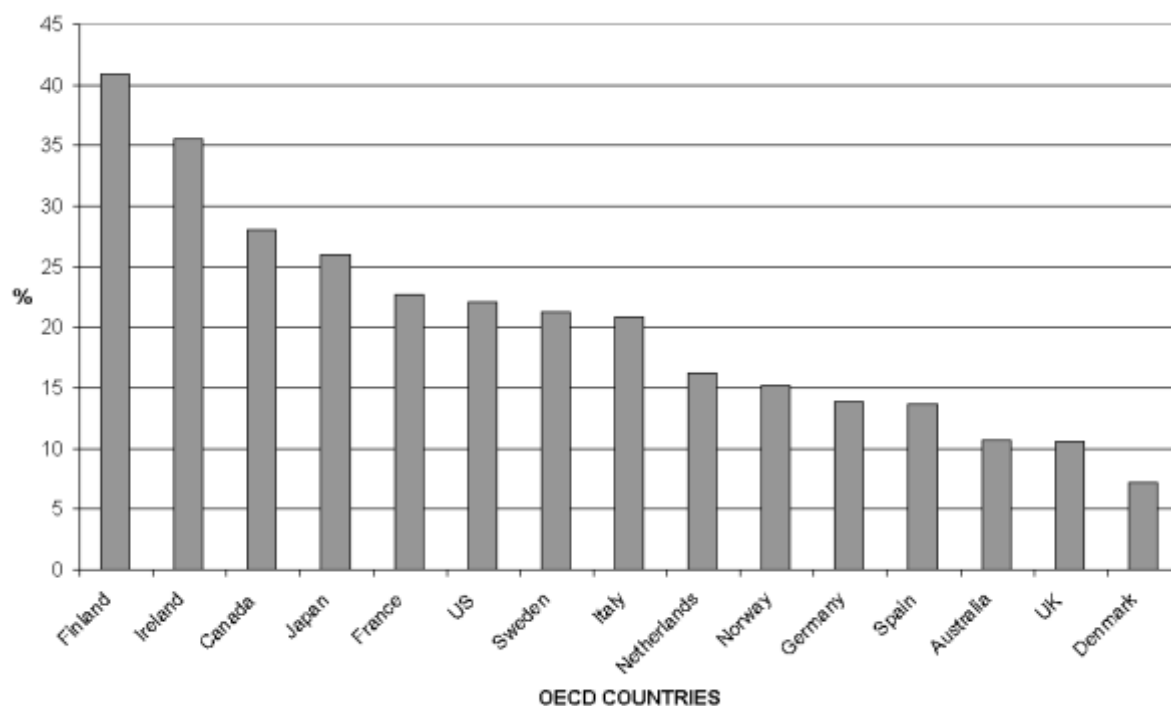
As a result, indigenous software producers tend to be more specialised in terms of both types of products and types of customers. According to a recent survey, half or more of the sales of about a third of these firms go to the Irish subsidiaries of multinationals (O'Gorman et al 1997). However, a further third have little or no linkage with the MNC sector and have targeted niche markets both locally and globally. Indigenous firms also provide software services such as programme development, consultancy and technical training, which tend in many cases to lead to the development of new software products. Irish software start-ups, particularly Iona, SmartForce, Baltimore Technologies, Trintech, Parthus and Riverdeep, have contributed to the 'critical mass' achieved by the industry, but they have now been joined by an array of dynamic new operators such as Datalex, Flexicom, Macalla, Piercom, Managed Solutions Corporation, Peregrine Systems and Build-online.com.

A major source of competitive advantage for a growing number of these firms is ingenuity and speed of adaptation. They have demonstrated a capacity to meet these requirements, and in most cases to sustain their momentum, not only by benefiting from technology transfer but also by originating software applications, including for e-business. This capacity is based on the remarkable growth of R&D expenditure in the software sector during the 1990s of more than 40 per cent a year, with over three quarters of this growth accounted for by indigenous firms. The ICT share in total business expenditure on R&D is at 35 per cent much higher than any other country apart from Finland (see Figure A1.5). However, this may also reflect to some degree the lower levels of R&D in other sectors. Nor is very much known other than on an anecdotal basis about the nature, quality and direct and indirect outcomes of R&D in the ICT sector and the social organisation needed to foster 'collective and cumulative learning' in this context (O'Sullivan 2000).

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<sup>47</sup> This cluster dynamic may be further reinforced by leading edge research, such as that envisaged for the MIT's MediaLab Europe facility to be sited in Dublin. By contrast, the lack of 'embeddedness' in local supply chains was a factor in disinvestment by MNCs such as Siemens, Fujitsu and Panasonic in Wales and the North East of England over the last two years, and as we shall see below, by Digital in Galway in the early 1990s.

**Figure A1.5: Share of ICT in total business expenditure on R&D, 1997**



Source: OECD IT Outlook 2000.

## Galway regional cluster

While manufacturing employment tends to be widely dispersed in Ireland, the software industry is concentrated largely in the Dublin area, with smaller regional clusters in Cork, Limerick/Shannon and Galway itself. There is now a policy commitment to 'foster the development of clusters of new knowledge-intensive enterprise in regional centres' (Enterprise Ireland, 2000, p.2) in recognition of the increasingly accepted finding that 'clusters of industries... are the driving force behind economic development... Their mutually reinforcing character energises innovation, fosters upgrading, spawns new companies and new industries, and stimulates demand for local industries' (Porter 1991). This finding has been incorporated into both EU funding guidelines and the operational methodology of Enterprise Ireland. Indeed, over the 1990s they first became interdependent and then mutually reinforcing. The cluster dynamic is supplied in the case of Irish regions by a unique mix of inter-firm collaboration, interaction and rivalry, by the development and constant replenishment of common pools of skilled labour, by the localised support of research and educational institutions, by the commitment of local business organisations and unions and by the strategies of national and regional development agencies.

This dynamic also broadly follows the pattern identified by previous OECD research which found that 'industrial clusters with links to local and regional innovation networks have been associated with accelerated diffusion of technology and know-how. The pace at which technologies are diffused within national innovation systems depends on the country's industrial structure and technological specialisation, institutional set-up, corporate governance regimes, degree of economic openness and the flexibility of firms' organisational and managerial structures' (OECD 1997). This 'holistic' interpretation of regional growth may be illustrated by the development over the past decade of the Galway software cluster, which had its origins not so much in conscious policy-making, though

ultimately policy and planning played a role, but in the closure of a large computer manufacturing facility owned and operated by the Digital Electronics Corporation.

Digital established its manufacturing operation in 1971 and by 1977 employed 1000 people in the production of the PDP 8E computer, mainly for the European market. The numbers employed rose to 1800 in the 1980s with further expansion of the operation, the development of Digital's first European Software Distribution Centre (ESDC) and the establishment of European Systems and Support Engineering. The role of the ESDC was to redistribute and 'localise' software products sourced in the US to Europe, including both software programmes and technical documentation. At this point, Digital had become not simply the major employer in the local economy, with an estimated 'net worth' to local business and the community of £100 million a year, but also a provider of advanced training and development for its workforce, a large employer of third level graduates and a source of broader research linkages and collaboration. For example, Digital contributed in the early stages to a high profile research project on Computer Integrated Manufacturing with Renault, Compaq, Politecnico di Torino and NUI Galway.<sup>48</sup>

During the 1980s and early 90s, Digital was the focus, perhaps an overly dominant one, of a shallow but functional regional innovation network in Galway. Its closure in 1993 decimated this network, including at least 40 direct suppliers to the company such as Pulse Engineering (Tuam) and Cable Products (Castlebar), but it may be seen in retrospect that it also facilitated the development of a new, more open and diversified set of linkages (WESTBIC 1999). The closure resulted in 760 redundancies in the Digital operation itself, after a period of already severe downsizing, whose scale and impact became a focus of national as well as local concern. The reasons for closure were complex, but included (1) the world-wide economic downturn, (2) intense competition in computer manufacturing, with Nixdorf, Wang and IBM building their manufacturing presence in Europe, (3) failure to manage the shift in technology and consumer preferences from large mainframes to personal desktop computers, (4) a preference, in contrast with Microsoft, for 'closed' rather than 'open' operating systems, and (5) lack of support within the company for local R&D initiatives, such as a powerful new microprocessor chip which was ultimately sold to a competitor, Intel (Needham 1999, ch 4).

However, the response of Digital, the local business chamber and national and regional development agencies to the closure of the manufacturing operation set the pace for European regional policy. In particular, it created new opportunities in the Galway region for the pool of skills and professionalism within Digital's workforce. In addition to provision of generous redundancy packages, Digital itself established in-house programmes for job search, career change, new business start-ups and relocation. This approach was supplemented by an Inter-Agency Task Force established by Minister for Enterprise and Employment Mr Ruairi Quinn TD, comprising the IDA, FAS and Enterprise Ireland as well as local government, business, trade unions, Udaras na Gaeltachta and WESTBIC with the support of NUI Galway and the institutes of technology. The most significant outcome of these discussions was the establishment of Galway Technology Centre, the provision of additional training support and advisory services and funding for business start-ups, including via the conversion of tax on redundancy pay into a seed capital grant (Keating 1994).

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<sup>48</sup> Building on this experience, Compaq's super computing engineering team subsequently designed the Alphaserver SC in Galway, which integrates Alpha processors in a 'massively parallel system' to deliver super computing power (used, for example, to sequence the Human Genome).

No single measure could be identified as responsible for the subsequent growth of Galway's software cluster, but business support, training and 'incubator' facilities together with informal networks among key ex-Digital staff all played their part, and continue to do so, in an ongoing transformation of the local economy.<sup>49</sup> Nor did all ex-Digital staff enter the software sector. It required some high profile successes, however, exemplified by Toucan Technology, to create the momentum necessary to encourage other start-ups and to attract major new investors such as Siebel Systems while at the same time persuading existing ones such as Nortel and Compaq (which took over what was left of Digital) to expand their operations. These investors have in turn generated local supply chains, and have had to cooperate as well as compete for skills, infrastructure and market opportunities, both with each other and with the simultaneous emergence in Galway of Europe's leading medical instruments cluster, which is anchored by the presence of Medtronic AVE and Boston Scientific.

On the other hand, there are also impediments to the future growth and sustainability of the Galway cluster, some of which relate to the ICT sector as such and others to its regional status. While in principle distance from markets should not be an obstacle to ICT companies, especially in the software sector, the reality remains that scale and proximity are factors in competitive advantage. These problems can be addressed to some degree by the cluster approach which combines the positive attributes of scale with small firm flexibility and which creates 'virtual' proximity through 'international recognition associated with establishing a world leading position in the market' (Enterprise Ireland 2000, p 5). However, in the short term, the problems are compounded by poor access to venture capital, and the propensity of 'dotcom' firms to position for a buy-out of intellectual property rather than expansion through an Initial Public Offering (IPO).

Other impediments, common to ICT world-wide, include shortages of high-level skills. Employment in the Irish software sector, for example, is expected to double by 2003. Recent estimates indicate a supply of 6,100 employees a year but an average demand of 8,300, leaving a shortfall of 2,200 (Expert Group on Future Skill Needs 1999). Even if the demand for core technological capabilities can be met, the ICT cluster generally has a narrow skill set and is weak in functional areas of sales and marketing, management of human resources, corporate finance and strategy. This is an area where business and engineering schools, including those at NUI Galway, will be required to play a more active role as part of regional innovation systems. Finally, there are still severe infrastructure deficits in the BMW region, mainly affecting transport and communications, though high bandwidth is in the process of being rolled out and connected with the new Global Crossing transatlantic cable.

## **Innovation processes and policies**

The Galway ICT cluster comprises elements that are unique to the regional innovation system and those with a more universal application. The unique elements include the withdrawal of Digital from the region, with the loss of many previously secure jobs, and the precise configuration of the response of policy-makers, development agencies and the local community. While these elements are instructive, there are also broader processes of regional business growth and innovation at work, which have major implications for national policy frameworks across the OECD. Following its National Innovation Summit in February this year, Australia should have been well placed to consider such implications and act upon them (Green 1999), but little seems to have eventuated since then. Indeed, as R&D spending in Australia, once again by contrast with Ireland, goes into reverse, this crucial area of public policy seems to be gripped by paralysis. Whether this is due to historical

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<sup>49</sup> A survey conducted in 1999 found that 90 per cent of the redundant staff had returned to full-time employment, with 10 per cent starting their own businesses in Galway and 70 per cent of these earning the same or better pay than prior to redundancy (Needham 1999, ch 7). There are parallels here with the closure of steel-making at BHP's Newcastle operation in Australia in 1999, but also substantive differences (O'Neill and Green 2000). In retrospect, it may be seen that the prospects of the Galway workforce would prove more favourable due to the nature of their skills, the emerging opportunities in the ICT sector and the coherence of national and regional intervention, which matched available skills to the opportunities.

dominance of policy-making by resources and finance interests or simply political short-sightedness is a matter for speculation beyond the scope of this paper.

From the vantage point of recent experience in Ireland and Europe, the first point to make about the processes of growth and innovation evidenced in the Galway example is that the Porter 'diamond' model of competitive advantage may not be applicable to ICT cluster formation in a small regional economy (O'Donnell 1998, O'Gorman and Kautonen 2000). The globalised nature of Irish ICT, the influence of the multinational sector and the niche operations of indigenous firms suggest the need for a new theoretical approach to the advent of the 'boundaryless' cluster. This approach would recognise the significance of the shift in thinking from traditional forms of industry and regional development policy to one which promotes new technologies, skills and work organisation within a cluster framework – a shift most recently endorsed in the UK's White Paper on competitiveness – but it would also acknowledge the operation of a new cluster dynamic which is specific to small economies with a limited domestic market, a large number of internationally oriented firms and few if any direct local competitors.

Second, the presence of at least one large ICT operation provides an indispensable focus for cluster development, even when, as in the case of Galway, the operation withdraws from the region at a later stage. This presence affords the opportunity to build local capacity in new technologies and skills both within the operation itself and more widely in the emerging cluster through outsourcing, vertical supply chains and, ultimately, horizontal inter-firm linkages. However, the extent to which the potential benefits are realised in practice will depend not just on company strategy but also on the policy environment created by the national and regional innovation system. The greatest benefits flow from global, high value adding, research-intensive investments that are nevertheless embedded in the location; while the least are associated with low value adding operations, such as assembly manufacture and call centres, which also tend to be more 'footloose'.

Third, the development of the regional skills base is cumulative and parallels the scale and sophistication of the industry cluster, whose growth patterns are themselves path dependent. The large ICT operation may act as a catalyst, establishing a demand for skills that are met through graduate employment, attraction of skilled personnel and through the creation of complex networks which supply training, consultancy and proprietary products and services. As well as employing skills, however, the operation may also play a role in the diffusion of research and technological competencies, which in turn become a springboard for entrepreneurship and participation in global niche markets. This was the experience of the Galway software cluster, which, after the closure of Digital, was required very rapidly to demonstrate an independent capacity to participate in these markets. The regional skills base was a necessary but not sufficient condition for doing so.<sup>50</sup>

Fourth, appropriate regional business support structures are the final major local ingredient in successful cluster development. Without such structures, skilled personnel would be unemployed or under-employed, or alternatively would emigrate. As previously indicated, the traditional concept of 'regional aid' has been superseded by more cost effective approaches to the promotion of long-term growth and jobs, including business start-up assistance, industry network broking and incubator facilities and collaborative approaches to new technology, R&D, training and project management. In Galway, a key role was played by Enterprise Ireland, in association with WESTBIC and the Technology Centre, in developing new enterprises with ideas, products and technologies that contribute to critical mass in the ICT cluster. Indeed, the demand for its sliding scale, fee for service facilities is such that the Technology Centre can impose a rigorous system of entry and review, ensuring high quality outcomes that feed into future demand for the facilities and generate the resources to improve them.

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<sup>50</sup> In this sense, Robert Reich's thesis in the *Work of Nations* (1991) is incomplete and even misleading. The futility of a world class skills base without relevant and expanding local employment opportunities has been demonstrated in many places, including Ireland itself in the 1980s, prior to the economic take-off, as well as in many of Australia's industrial and rural regions (Green 1998, ESC 1999).

Fifth, the policy framework (and to some extent the funding) for regional business support and innovation are settled at national and increasingly EU level (Grimes 1999a). There is wide recognition in Ireland of the need for inward investment, but, given the success of the IDA in attracting MNCs in recent years, especially in global growth sectors, the emphasis is now shifting to the quality and location of investment. This approach has been complemented over the last decade by Enterprise Ireland in ‘developing an indigenous, entrepreneur-driven technology sector’, with a newly announced commitment to ‘clusters of new knowledge-intensive enterprises in regional centres’ (Enterprise Ireland, 2000, pp 2, 13). The most recently developed instrument of intervention will be a series of technology hubs known as ‘Webworks’, whose task will be to ‘generate a critical mass of high potential start-ups in the regions – companies that are high R&D and export performers’ (p 17). The first Webworks facility is to be established in Galway.

Sixth, the sustainability of the ICT cluster will derive from constant innovation, which in turn is based on leading edge research. This has been a weakness in the past, but it is now being addressed not only by firms themselves but by government through increased support for third level education and expansion of research funding as part of the *National Development Plan 2000-2006*. In particular, the RTDI strategy is based on the recognition that ‘there is a strong link between investment in the research and innovation base of the economy and sustained economic growth... [T]he accumulation of “knowledge capital”... will facilitate the evolution of the “knowledge-based” economy’ (Government of Ireland 1999, para 6.35)<sup>51</sup>. Substantial resources have been earmarked for internationally peer-reviewed research on ICT and biotechnology to be administered by a new body, Science Foundation Ireland, and further rounds of third level research funding are also in preparation as part of a total allocation of €1.9 billion.

## Conclusion

The evolution of Ireland’s ICT sector has been driven not only by market forces but by the conscious design and implementation of interventionist public policy in the context of EU ‘cohesion’ programmes and, over the last decade, social partnership (see O’Donnell 2000). This has comprised measures to attract knowledge-intensive inward investment through IDA Ireland, support for indigenous companies and networks through Enterprise Ireland, promotion of education and training at all levels, especially universities and technical colleges, development of a world class telecommunications infrastructure, increased funding support for research in third level institutions and strengthened linkages between companies and the education sector. A major feature has been the emergence of internationally competitive clusters that are positioned to take advantage of local skills and expertise on the one hand and global scale on the other.

However, the experience of the Galway software cluster also demonstrates that the presence of a dynamic skills base is a necessary but not sufficient condition for success in international ICT markets. There is also a role for active industry and regional policies that contribute to business growth, technological innovation and cluster development – with an increasing emphasis on capacity building in research and commercial applications. This is the approach of the ‘flexible developmental state’, which is ‘defined by its ability to nurture Post-Fordist networks of production and innovation, attract international investment and link these local and global technology and business networks together in ways which promote development (O’Riain 1999). It is this strategic approach to the role of government and markets in conjunction with a unique evolution of the boundaryless cluster that lies at the heart of Ireland’s knowledge-based economy and the broader canvas of European regional innovation policy.

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<sup>51</sup> The objectives of the RTDI are to: (1) develop intellectual infrastructure to ‘root’ overseas companies here through more extensive use of research based in Ireland, (2) persuade and encourage companies to develop their own research activities, (3) develop a world class research environment in our higher education institutions and State research institutions, and (4) ensure a vibrant and dynamic pool of high quality, technically literate graduates from the graduate to postdoctoral levels to service the needs of these companies and to start their own companies (Government of Ireland 1999, para 6.35).

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## **Appendix 2**

### **Agricultural and rural innovation**

By

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This appendix examines the support for agricultural innovation in Australia and concludes that the cause of rural development is not well served by current arrangements.

The interchangeable use of the terms rural and agriculture leads to an over-emphasis on agriculture at the expense of developing alternative or complementary economic activities. In any event the agricultural innovation system lacks diversity and is unlikely to produce the range of evolutionary and revolutionary innovation products required for the agricultural sector, let alone for rural Australia more generally.

Irrespective of the nature of the innovation system, the creativity required for regional development will most likely be met only if creative people are intrinsically motivated and if people who judge the novelty and usefulness of products are receptive to the need for and the nature of creativity. There are indications that neither of these conditions is being met.

There is a need to develop institutional arrangements for innovation in rural Australia which are less risk adverse and which are less constrained by traditional paradigms and existing economic activities. In other words there needs to be a fundamental overhaul of innovation systems supporting rural Australia.

We need to design and test a range of innovation systems which are directed at broad goals established by rural communities and supported by a pooling of resources from each of the three tiers of government and from the private and community sectors.

### **Misuse of terminology**

Confusion between what is meant by agricultural systems, farming and rural can lead to a misunderstanding of what needs to be done to promote rural innovation and hence it is important that we use these terms consistently and universally.

Agricultural systems are the economic, social and physical activities involved in the marketing, handling, processing and production of food, fibre and related products such as plant and animal-based pharmaceuticals and floriculture.

Farming is the term we use to describe activities which occur solely or principally on farms, including, for instance, agricultural activities, off-reserve conservation, management of investments which might be on or off-farm, and farm tourism. The term 'farming systems' is the purposeful management of farming including the economic, social and cultural determinants of this behaviour (after McCown, unpublished). The important point here is that these definitions extend the activities encompassed by farming beyond agriculture and enable integrated development of potentially synergistic agricultural and non-agricultural farming pursuits. We should also recognise that future

food and fibre-producing systems increasingly may not involve a land or marine environment as they are conventionally conceived.

Whilst agriculture and farming are forms of activity, 'farm' and 'rural' delineate location with rural being used to describe all things and activities occurring on land outside metropolitan areas. The interchangeable use of 'rural' and 'farm' has led to much confusion the classic being the assumption that agencies termed 'rural' actually deal with all matters rural when in reality their charter is restricted to agriculture, and often that narrowly defined. This agricultural centrality can lead to perspectives that distort our understandings of rural Australia. For instance ABARE began its 1999 report to the Department of Transport and Regional Services with the statement that:

*"Agriculture is the dominant industry in inland and remote Australia"*

However, the same report presents figures indicating that agriculture accounts for only 15 per cent of employment in inland and remote Australia. In fact, in the twenty years to the early 1990s, employment in agriculture in rural Australia halved, while total employment in rural Australia doubled (Synapse 1998).

## **Agricultural myths**

Given the focus on agriculture one could be forgiven for thinking that at least the basic agricultural parameters would be well understood. But this is not the case and the myths so created distort how we view and respond to rural Australia.

Let's consider a few examples: economic growth, export-import performance, employment, assistance and multi-functionality.

We are encouraged to believe that Australian farmers do a pretty fair job in increasing the value of agricultural production. Take for instance another quote from recent advice from ABARE to the Department of Transport and Regional Services:

*"Between 1955-56 and 1998-99, the volume of farm production rose by 187 percent. Despite falling real prices for farm product, the real gross value of farm production rose by over 25 percent. However, with rising costs of production, the net value of farm production fell by around 54 percent in real terms".*

(ABARE 1999)

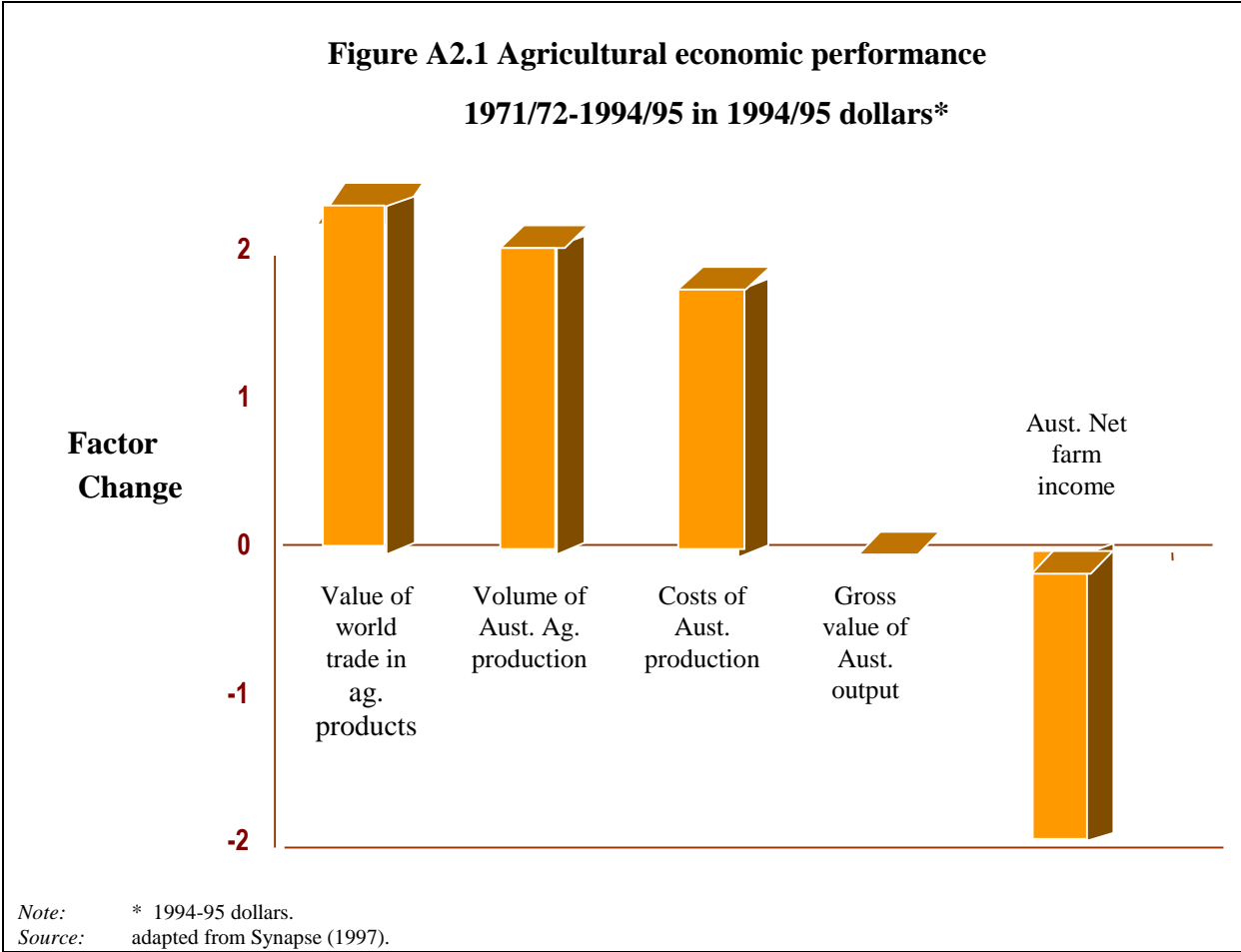
But it all depends on what slant one wants to put on it, what phrases one uses, what institutional baggage one carries. Certainly some individuals in some industries do well but in an aggregate sense we really have not been doing too well economically. It is time to stop and reflect.

Since the early 1970s, there has virtually been no change in the real gross value of Australian agricultural output, notwithstanding a two-fold increase in the real value of world trade in agricultural products. Agriculture is an increasingly unattractive national investment, with aggregate real net farm income falling two-fold over the twenty years to 1994-1995.

As for agricultural economic growth, we are encouraged to take a "pollyanna" view of the export-import performance of the food and fibre sectors.

It is generally understood that approximately 75 per cent by value of Australian agricultural products are exported and that those exports represent about 20 per cent of all Australian exports (*see* ABS 1996; DPIE 1997). However, comparable production, export and import statistics across industry sectors are not readily available and the proportion by value of agricultural products exported is

inflated by comparing the value of production at the farm gate with the value of processed exports. Some analyses estimate the proportion of agricultural products exported as low as 33 per cent (*see* DITAC 1993).



A clearer picture emerges when one examines the export-import statistics for the food and fibre industries. These industries combined account for approximately 30 per cent of Australian merchandise exports. Over the ten years to 1996-97, the ratio of imports to exports of non-manufactured food and fibre products<sup>52</sup> was about 1:4.5, that is imports equated to about 23 per cent of exports. For manufactured food and fibre products<sup>53</sup>, the ratio was approximately reversed with exports equating to about 18 per cent of imports (ABS 1998c). The overall outcome for the food and fibre based industries is that, in general terms, Australia imported by value about half as much as it exported, with net exports in 1996-97 being valued at about \$12 billion.

<sup>52</sup> Standard International Trade Classifications 0,1,2 except 27 and 28.

<sup>53</sup> Standard International Trade Classifications 61, 62, 63, 64, 65, 84 and 85.

Another widely held belief is that Australians, and particularly the urban café society services sector, rely heavily on exports from primary industries. Maybe, but again it depends on what slant one wishes to take. The reality is that when both direct and indirect inputs from the service sector are taken into account, the service sector contributes about 40 per cent of the value of Australian exports as compared to about 14 per cent from the agricultural sector. This simply reflects the fact that sectoral inter-dependencies are a feature of maturing economies (*see* Deeley, 1991).

How often have you heard that subsidising Australian agriculture is not a realistic option because of our small population and our high ratio of exports to domestic consumption? Yet reflect on the fact that assistance to Australian agriculture is now higher or as high as assistance to any other sector. Throughout the 1980s and the 1990s, assistance to agriculture equated to between 100 and 50 per cent of net farm income, and was in addition to very significant environmental expenditures.

This leads us into the phenomenon of multi-functionality which, simply put, recognises the many purposes of farms. Australian governments seem to have a great deal of trouble with the concept. Strange really for Australian farmers have fully embraced the idea that farms are not just for the growing of agricultural products. This is dramatically illustrated by the fact that about 45 per cent of broadacre farmers earn two thirds of their net income off-farm. This form of adjustment by farm households has enormous implications for farm policy and for the future of rural Australia. In comparison the rate of diversification of agricultural production, at least to the mid -1990s, has been quite slow.

**Table A2.1 Farm and off-farm income: Australian farmers 1996-97 (based on ABARE 1998)**

Industry	Farm cash income* (\$'000)	Off-farm income \$'000 (as % of total cash income)	Share of industry population (%)	Share of gross value of production
Wheat and other crops (Farm receipts \$<200K)	34	13 (28)	30	9
Mixed livestock – crops (Farm receipts \$<100K)	12	20 (62)	33	11
Sheep (Farm receipts \$<100K)	6	22 (78)	49	19
Beef (Farm receipts \$<100K)	2	25 (92)	67	27
Sheep-beef (Farm receipts \$<100K)	7	28 (80)	70	32
Dairy (Farm receipts \$<100K)	17	6 (26)	24	8

*Note:* \* The difference between the total cash receipts of the business and the total cash costs incurred by the business. It does not account for changes in trading stocks, depreciation or the imputed value of labour provided by owner managers and their families.

*Source:* Synapse 1999.

Thirty years ago the Council for Aboriginal Affairs recognised that, for economic, cultural and political purposes, Aborigines' leasehold should be multi-purpose. Furthermore the Council believed that social should be included in the definition of multi- purpose. In fact the needs of the Gurindji people in relation to the Wave Hill land claim had been expressed as being the protection of sacred and ceremonial places, the provision of a residential area and the provision of an area for a viable pastoral enterprise (see Rowse 2000).

The aspirations of neither rural nor urban Australians are likely to be well served by land use policies that are based on the premise that the prime, universal use of natural resources should be expansion of agricultural activity.

## **Characteristics of the existing agricultural innovation system**

Clearly the agricultural sector as a whole has not adjusted well to changing commercial and environmental circumstances and the first point of call to understand why this is so is to look at the innovation system.

Structured agricultural innovation in Australia is dominated by the formal public agricultural R&D and Extension (RD&E) effort. This agricultural RD&E effort, including that managed by the Rural Research and Development Corporations (RDCs), is substantial with expenditure in the order of \$1 billion per year. Australian agricultural R&D represent about 10 percent of all Australian R&D and 3 per cent of the international agricultural R&D market

Public funding provides about 85 per cent of formal agricultural RD&E expenditure and this form of assistance equates to about half of the assistance provided to the agricultural sector.

The execution of agricultural R&D is principally confined to the public sector with the private sector largely excluded from competing for agricultural R&D funding.

Rural Research and Development Corporations, most of which are commodity based partnerships between the federal government and individual or groups of agricultural industries, account for about two thirds of the influence on the direction and hence on the expenditure of agricultural R&D.

Support for rural innovation continues to be dominated by support for agricultural technological innovation within the farm based component of agricultural systems.

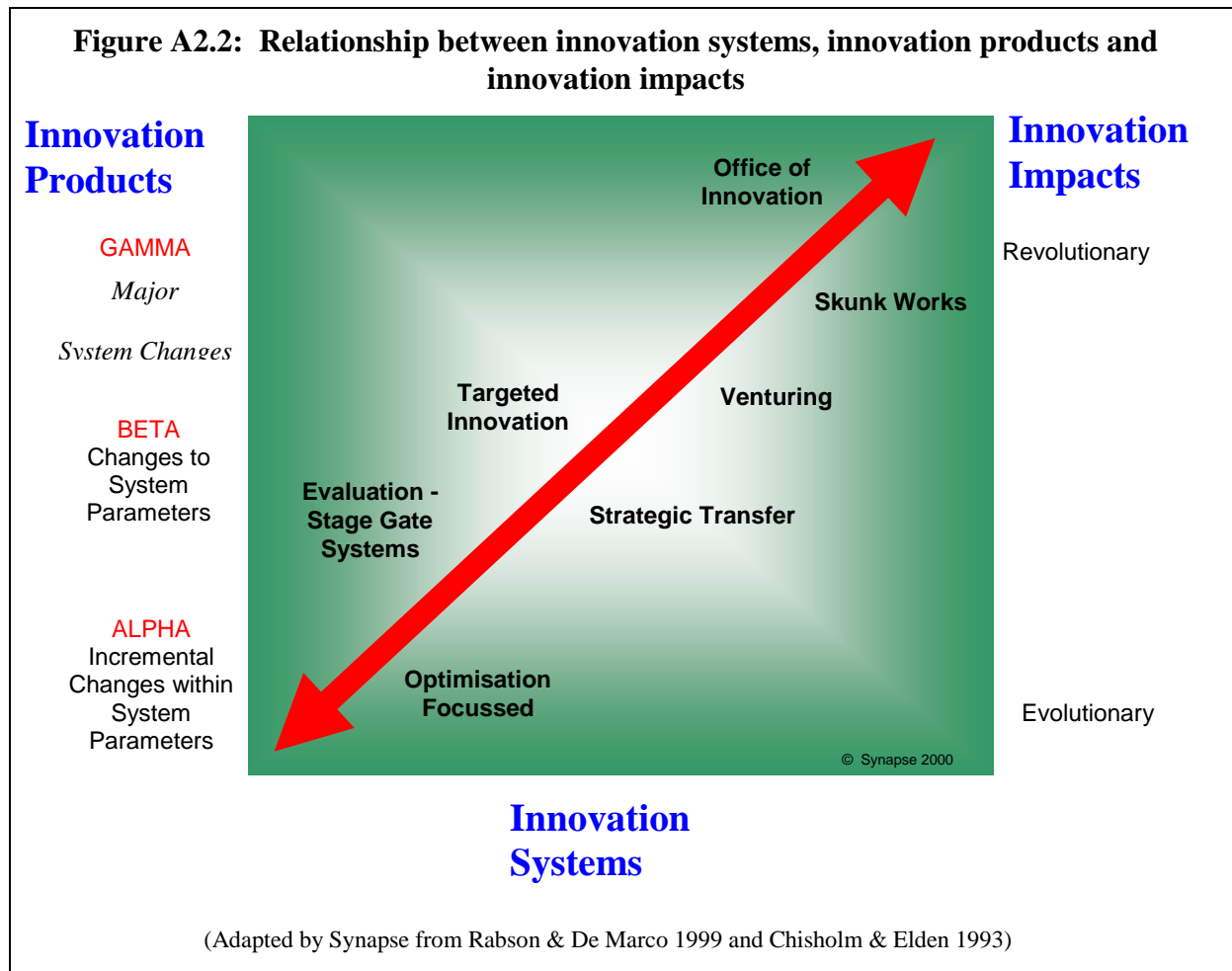
In Queensland, for instance, agricultural RD&E accounts for approximately 70 per cent of State government support for all R,D&E. Virtually all of these agricultural RD&E funds are allocated to and used by the Department of Primary Industries with the majority of the influence over expenditure coming from the commodity based RDCs.

Until recently support for agricultural innovation was almost solely of a technological nature with little attention given to organisational and managerial innovation. In fact notwithstanding the increased emphasis on, for instance, supply chain management and education and training, the technological orientation remains very strong. This pattern began in the mid-1850s with the establishment of experimental farms and the employment almost exclusively of agricultural and veterinary trained scientists. It has persisted notwithstanding nearly continuous review and restructuring of State Departments of Agriculture.

In summary support for innovation in rural Australia is dominated by public sector investment in and execution of agricultural R&D. The main influence over the direction of this investment arises from the RDCs. The RDCs are focused on optimising the profitability and environmental sustainability of existing farm based agricultural enterprises. Together these factors lead to a lack of diversity and a risk adverse environment. But our real difficulties come from our failure to account for the importance of the characteristics of the innovation systems and the processes of creativity.

## The nature of innovation systems and creativity

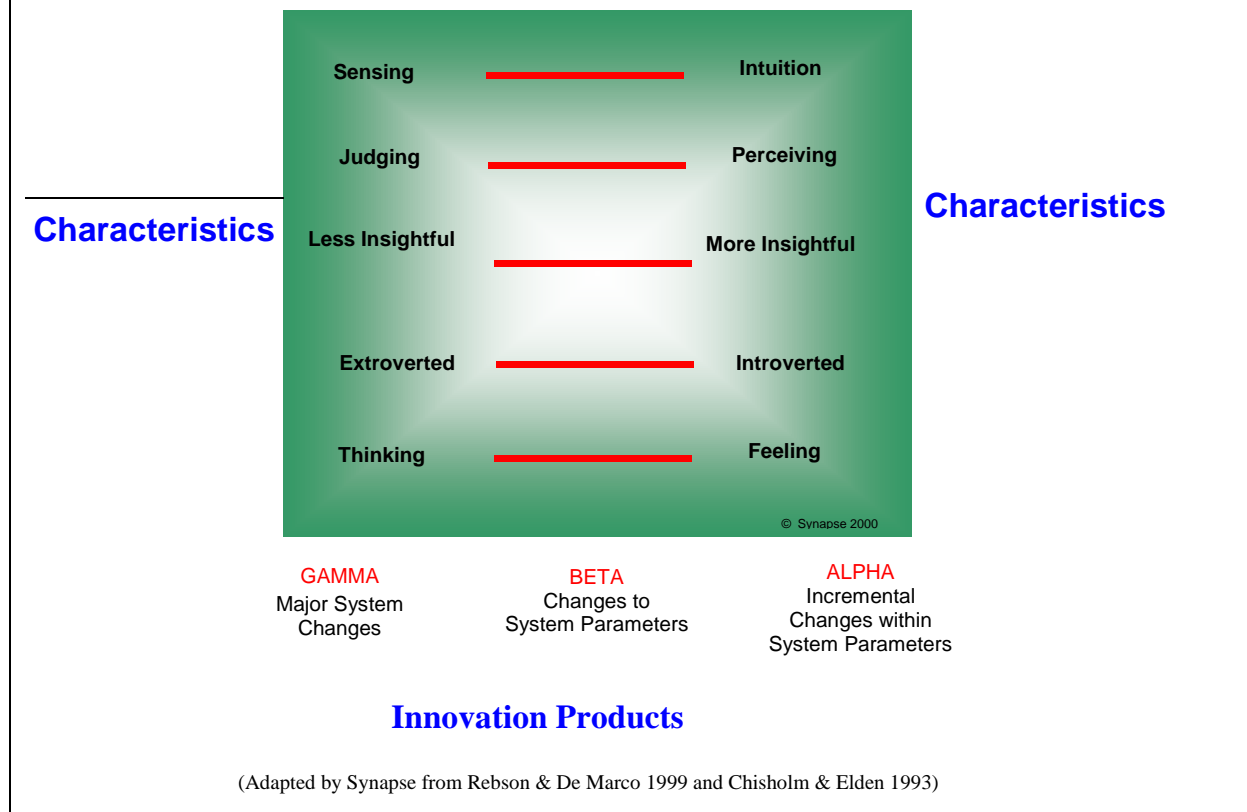
The types of innovation products we produce are predetermined by the nature of the innovation systems we create. If the innovation system is highly planned and controlled then we probably will produce innovation products that make incremental changes to existing systems. Such changes are necessary but alone they are unlikely to represent the range of innovation products needed to meet changing requirements in rural Australia.



Innovation systems can also be described by the attributes of the innovation processes as illustrated in Figure A2.3.

And this brings us to the critical question of how we can foster creativity in rural Australia irrespective of what type of innovation system we are using.

**Figure A2.3: Relationship between innovation products and characteristics of innovation systems**



Creativity is the capacity to produce new or original ideas, insights, restructurings, inventions or artistic objects that are accepted by appropriate people as being of scientific, aesthetic, social or technological value (Vernon 1989). Inherent in this definition of creativity is the proposition that creativity is not determined entirely by the person with the creative idea. Rather creativity is the outcome of a whole system of influences arising from the creative person, the domain or discipline within which the creative person is operating and importantly from the gatekeepers of ideas and practice. In agriculture these gatekeepers include the members of the Boards and Advisory Committees of the RDCs and influential farm leaders.

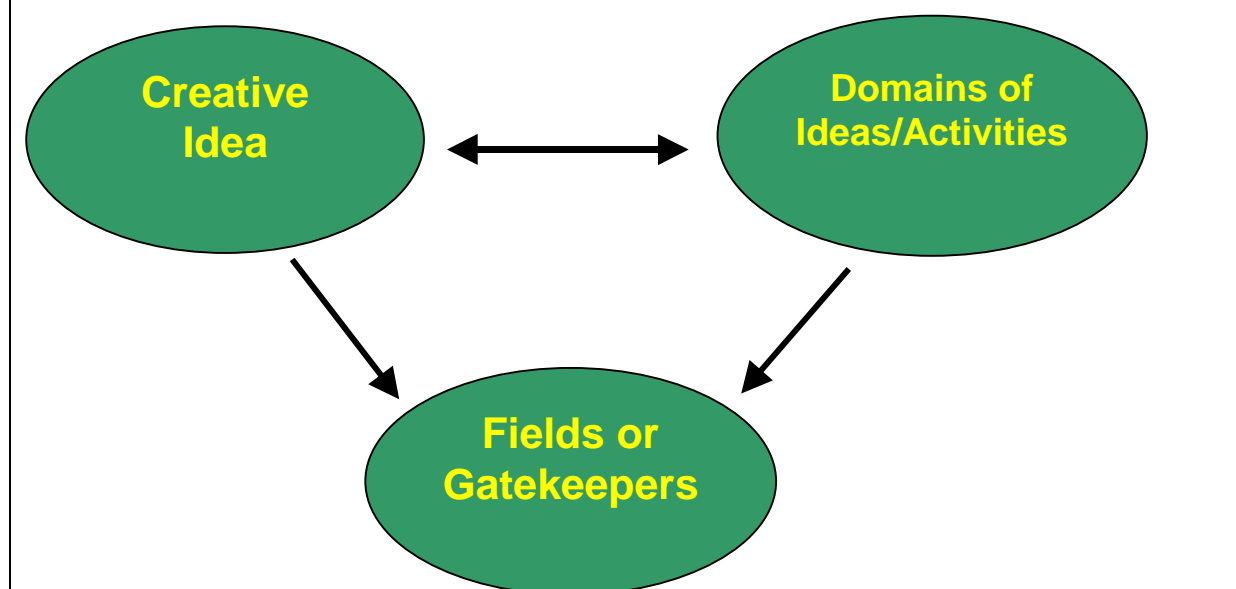
*“Creativity lies not in the head or hand of the artist or in the domain of practices or in the set of judges: rather the phenomenon of creativity can only - or at any rate, more fully - be understood as a function of interactions among these nodes”.*

(Gardner 1993)

We must then consider the factors affecting not only the capacity of people to be creative but also the willingness and capacity of communities to recognise creativity and to use creative products.

There is no better place to start than with the well established principle of intrinsic motivation that states that people will be most creative when they feel motivated primarily by the interest, enjoyment, satisfaction and challenge of the work itself-not by external pressures. This principle has significant implications for the design of innovation systems and processes and for institutional reform in rural Australia more generally. For instance, we need communities determining their own directions for innovation rather than being constrained by externally directed and monitored programs.

**Figure A2.4: A systems approach**



We also need to avoid a fixation on a particular way of thinking. If for instance we visualise a landscape as being dominated by introduced pasture species, fences and watering points, then it is virtually impossible to conceive of it not being occupied by domestic livestock. Having so envisioned the landscape, we then look to define the problem and the solution in relation to the economic and ecological implications of livestock production. Furthermore, given the dominance of the scientific and economic disciplines, more often than not we will seek an explanation based on analysis of the facts. The critical potential contributions from imagination and intuition are lost.

*“...Insight and a consequent drive for achievement...fuel a thought process which is basically creative and intuitive rather than rational. Strategists do not reject analysis...but they use it only to stimulate the creative process...to test new ideas.”*

(Ohmae 1982)

## **Conclusion**

This is just the beginning of a discussion we need to have on rural innovation. My intent has been to question some of the assumptions underpinning agricultural and rural policies and to suggest that we need more flexible and integrated institutional arrangements.

There is a need to unshackle us from the chains of past analyses. There is a need for the birth of new institutions to re-represent rural Australia.

Tinkering at the edges of a failed system is more likely to prolong the suffering than meet the realistic aspirations that Australians generally have for rural Australia.

*“It is not enough to teach people how to swim better in a tide, a time comes when people have to do more than swim more effectively. They have to get together and say, This river seems to be going in the wrong direction and somehow it has to be stopped--and it has to be redirected”.*

(Wiseman, 1998)



We need to design new innovation systems for rural Australia to produce a diversity of evolutionary and revolutionary innovations. We need to scope our possibilities as broadly as possible and we need to remove the constraints on creativity throughout rural communities.

We need to design and test a range of innovation systems which are directed at broad goals established by rural communities and supported by a pooling of resources from each of the three tiers of government and from the private and community sectors.

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### Appendix 3: Regional maps



**Brisbane Core Region**



**Sydney Core Region**



**Melbourne Core**



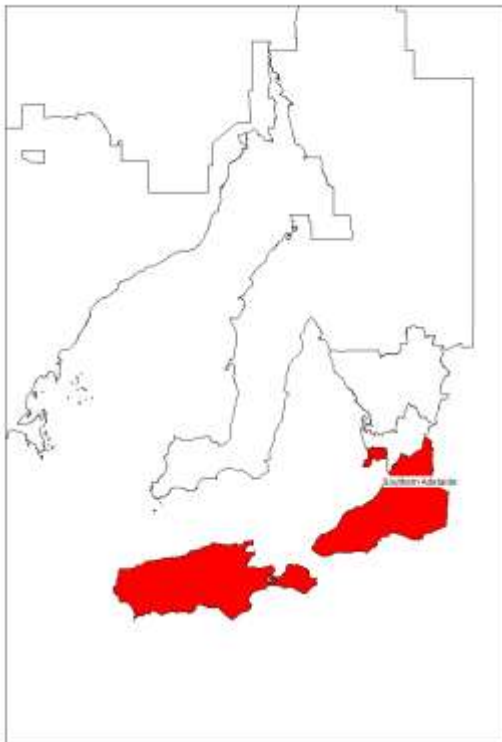
**Adelaide Core**



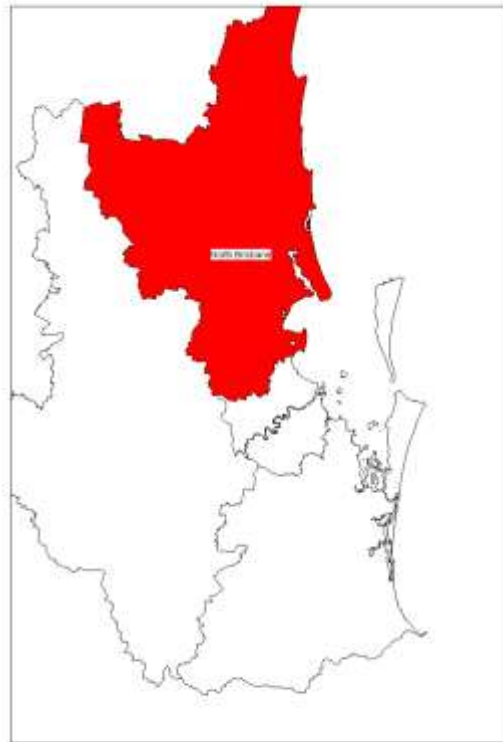
**Perth Core**



**Tasmania Core**



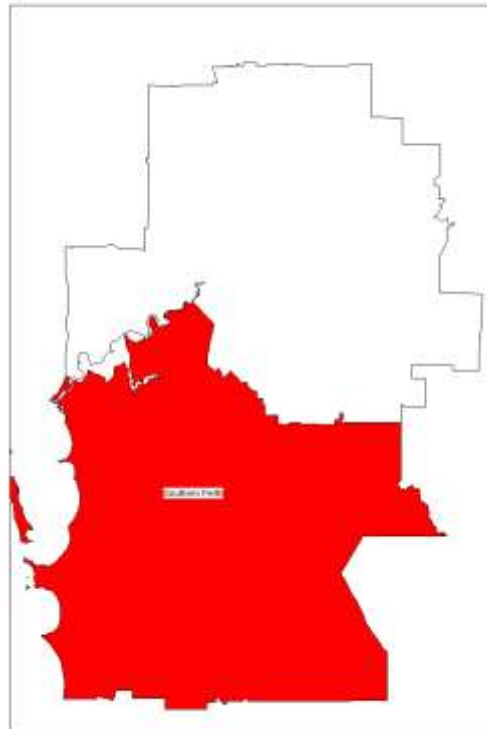
**Adelaide Dispersed**



**Brisbane Dispersed**



**Melbourne Dispersed**



**Perth Dispersed**



**Sydney Dispersed**

## Appendix 4.1 Index of localities

Local Government Area	Region	Local Government Area	Region
Adelaide (C)	Central Adelaide		QLD
Adelaide Hills (DC)	Central Adelaide	Berri and Barmera (DC)	Murraylands SA
Albany (C)	Southern WA	Berrigan (A)	Murray - Murrumbidgee NSW
Albury (C)	Murray - Murrumbidgee NSW	Beverley (S)	Midlands and Central WA
Alexandrina (DC)	Southern Adelaide	Biggenden (S)	Wide-Bay Burnett QLD
Alice Springs (T)	Southern NT	Bingara (A)	Northern NSW
Alpine (S)	Ovens - Hume VIC	Blackall (S)	Central QLD
Aramac (S)	Central QLD	Blacktown (C)	Sydney Production Region
Ararat (RC)	Golden Region VIC	Bland (A)	Central Western NSW
Armada (C)	Southern Perth	Blayney (A)	Central Western NSW
Armidale (C)	Northern NSW	Blue Mountains (C)	Outer West Sydney
Ashburton (S)	Pilbara - Kimberley WA	Boddington (S)	Southern WA
Ashfield (A)	Inner West Sydney	Bogan (A)	Far and North Western NSW
Atherton (S)	Far North QLD	Bombala (A)	South East NSW
Auburn (A)	Sydney Production Region	Boonah (S)	Ipswich QLD
Augusta-Margaret River (S)	Southern WA	Booringa (S)	Darling Downs and South West QLD
Aurukun (S)	Far North QLD	Boorowa (A)	South East NSW
Ballarat (C)	Golden Region VIC	Boroondara (C)	East Melbourne
Ballina (A)	North Coastal NSW	Botany (A)	Global Sydney
Balonne (S)	Darling Downs and South West QLD	Boulia (S)	Central QLD
Balranald (A)	Murray - Murrumbidgee NSW	Bourke (A)	Far and North Western NSW
Banana (S)	Central QLD	Bowen (S)	Nth QLD
Bankstown (C)	Sydney Production Region	Boyup Brook (S)	Southern WA
Banyule (C)	North Melbourne	Break O'Day (M)	Northern Tasmania
Barcaldine (S)	Central QLD	Brewarrina (A)	Far and North Western NSW
Barcoo (S)	Central QLD	Bridgetown-Greenbushes (S)	Southern WA
Barossa (DC)	Northern Adelaide	Brighton (M)	Hobart and Southern Tasmania
Barraba (A)	Northern NSW	Brimbank (C)	West Melbourne
Bass Coast (S)	Gippsland VIC	Brisbane (C)	Brisbane City
Bassendean (T)	Northern and Central Perth	Broadsound (S)	Mackay QLD
Bathurst (C)	Central Western NSW	Broken Hill (C)	Far and North Western NSW
Bauhinia (S)	Central QLD	Brookton (S)	Southern WA
Baulkham Hills (A)	N.N. West Sydney	Broome (S)	Pilbara - Kimberley WA
Baw Baw (S)	Gippsland VIC	Broomehill (S)	Southern WA
Bayside (C)	Southern Melbourne	Bruce Rock (S)	Midlands and Central WA
Bayswater (C)	Northern and Central Perth	Bulloo (S)	Darling Downs and South West QLD
Beaulesert (S)	Gold Coast and Hinterlands	Buloke (S)	Mallee - Wimmera VIC
Bega Valley (A)	South East NSW	Bunbury (C)	Southern WA
Bellingen (A)	North Coastal NSW	Bundaberg (C)	Wide-Bay Burnett QLD
Belmont (C)	Southern Perth	Bungil (S)	Darling Downs and South West QLD
Belyando (S)	Mackay QLD		
Bendemere (S)	Darling Downs and South West		

Local Government Area	Region
Buranga West (DC)	Eyre and Yorke SA
Burdekin (S)	Nth QLD
Burke (S)	North West QLD
Burnett (S)	Wide-Bay Burnett QLD
Burnie (C)	Mercy-Lyell TAS
Burnside (C)	Central Adelaide
Burwood (A)	Inner West Sydney
Busselton (S)	Southern WA
Byron (A)	North Coastal NSW
Cabonne (A)	Central Western NSW
Caboolture (S)	North Brisbane
Cairns (C)	Far North QLD
Calliope (S)	Central QLD
Caloundra (C)	North Brisbane
Cambooya (S)	Darling Downs and South West QLD
Cambridge (T)	Northern and Central Perth
Camden (A)	Outer South West Sydney
Campaspe (S)	Goulburn VIC
Campbelltown (C) (NSW)	Outer South West Sydney
Campbelltown (C) (SA)	Central Adelaide
Canning (C)	Southern Perth
Canterbury (C)	Sydney Production Region
Capel (S)	Southern WA
Cardinia (S)	Westernport VIC
Cardwell (S)	Far North QLD
Carnamah (S)	Midlands and Central WA
Carnarvon (S)	Midlands and Central WA
Carpentaria (S)	North West QLD
Carrathool (A)	Murray - Murrumbidgee NSW
Casey (C)	Westernport VIC
Casino (A)	North Coastal NSW
Ceduna (DC)	Eyre and Yorke SA
Central Coast (M)	Mercy-Lyell TAS
Central Darling (A)	Far and North Western NSW
Central Goldfields (S)	Loddon VIC
Central Highlands (M)	Hobart and Southern Tasmania
Cessnock (C)	Hunter NSW
Chapman Valley (S)	Midlands and Central WA
Charles Sturt (C)	Central Adelaide
Charters Towers (C)	Nth QLD
Chinchilla (S)	Darling Downs and South West QLD
Chittering (S)	Midlands and Central WA
Circular Head (M)	Mercy-Lyell TAS
Clare and Gilbert Valleys (DC)	Eyre and Yorke SA

Local Government Area	Region
Claremont (T)	Northern and Central Perth
Clarence (C)	Hobart and Southern Tasmania
Cleve (DC)	Eyre and Yorke SA
Clifton (S)	Darling Downs and South West QLD
Cloncurry (S)	North West QLD
Cobar (A)	Far and North Western NSW
Cockburn (C)	Southern Perth
Coffs Harbour (C)	North Coastal NSW
Colac-Otway (S)	Golden Region VIC
Collie (S)	Southern WA
Conargo (A)	Murray - Murrumbidgee NSW
Concord (A)	Inner West Sydney
Cooper Pedy (DC)	Eyre and Yorke SA
Cook (S)	Far North QLD
Coolah (A)	Far and North Western NSW
Coolamon (A)	Murray - Murrumbidgee NSW
Coolgardie (S)	South Eastern WA
Cooloolah (S)	Wide-Bay Burnett QLD
Coomalie (CGC)	Southern NT
Cooma-Monaro (A)	South East NSW
Coonabarabran (A)	Far and North Western NSW
Coonamble (A)	Far and North Western NSW
Coorow (S)	Midlands and Central WA
Cootamundra (A)	Murray - Murrumbidgee NSW
Copmanhurst (A)	North Coastal NSW
Copper Coast (DC)	Eyre and Yorke SA
Corangamite (S)	Western Victoria
Corowa (A)	Murray - Murrumbidgee NSW
Corrigin (S)	Southern WA
Cottesloe (T)	Northern and Central Perth
Cowra (A)	Central Western NSW
Cranbrook (S)	Southern WA
Crookwell (A)	South East NSW
Crow's Nest (S)	Darling Downs and South West QLD
Croydon (S)	Far North QLD
Cuballing (S)	Southern WA
Cue (S)	Midlands and Central WA
Culcairn (A)	Murray - Murrumbidgee NSW
Cunderdin (S)	Midlands and Central WA
Dalby (T)	Darling Downs and South West QLD
Dalrymple (S)	Nth QLD
Dalwallinu (S)	Midlands and Central WA
Dandaragan (S)	Midlands and Central WA
Dardanup (S)	Southern WA
Darebin (C)	North Melbourne

Local Government Area	Region
Darwin (C)	Darwin Top End
Delatite (S)	Goulburn VIC
Deniliquin (A)	Murray - Murrumbidgee NSW
Denmark (S)	Southern WA
Derby-West Kimberley (S)	Pilbara - Kimberley WA
Derwent Valley (M)	Hobart and Southern Tasmania
Devonport (C)	Mercy-Lyell TAS
Diamantina (S)	Central QLD
Donnybrook-Balingup (S)	Southern WA
Dorset (M)	Northern Tasmania
Douglas (S)	Far North QLD
Dowerin (S)	Midlands and Central WA
Drummoyne (A)	Inner West Sydney
Duaringa (S)	Central QLD
Dubbo (C)	Far and North Western NSW
Dumaresq (A)	Northern NSW
Dumbleyung (S)	Southern WA
Dundas (S)	South Eastern WA
Dungog (A)	Hunter NSW
Eacham (S)	Far North QLD
East Fremantle (T)	Southern Perth
East Gippsland (S)	Gippsland VIC
East Pilbara (S)	Pilbara - Kimberley WA
Eidsvold (S)	Wide-Bay Burnett QLD
Elliston (DC)	Eyre and Yorke SA
Emerald (S)	Central QLD
Esk (S)	Ipswich QLD
Esperance (S)	South Eastern WA
Etheridge (S)	Far North QLD
Eurobodalla (A)	South East NSW
Evans (A)	Central Western NSW
Exmouth (S)	Midlands and Central WA
Fairfield (C)	Sydney Production Region
Fitzroy (S)	Central QLD
Flinders (M)	Northern Tasmania
Flinders (S)	North West QLD
Flinders Ranges (DC)	Eyre and Yorke SA
Forbes (A)	Central Western NSW
Franklin Harbor (DC)	Eyre and Yorke SA
Frankston (C)	Westernport VIC
Fremantle (C)	Southern Perth
Gannawarra (S)	Mallee - Wimmera VIC
Gatton (S)	Ipswich QLD
Gawler (M)	Northern Adelaide
Gayndah (S)	Wide-Bay Burnett QLD

Local Government Area	Region
George Town (M)	Northern Tasmania
Geraldton (C)	Midlands and Central WA
Gilgandra (A)	Far and North Western NSW
Gingin (S)	Midlands and Central WA
Gladstone (C)	Central QLD
Glamorgan/Spring Bay (M)	Hobart and Southern Tasmania
Glen Eira (C)	Southern Melbourne
Glen Innes (A)	Northern NSW
Glenelg (S)	Western Victoria
Glenorchy (C)	Hobart and Southern Tasmania
Gloucester (A)	Hunter NSW
Gnowangerup (S)	Southern WA
Gold Coast (C)	Gold Coast and Hinterlands
Golden Plains (S)	Golden Region VIC
Goomalling (S)	Midlands and Central WA
Goondiwindi (T)	Darling Downs and South West QLD
Gosford (C)	Central Coast NSW
Gosnells (C)	Southern Perth
Goulburn (C)	South East NSW
Goyder (DC)	Eyre and Yorke SA
Grafton (C)	North Coastal NSW
Grant (DC)	South East SA
Great Lakes (A)	Hunter NSW
Greater Bendigo (C)	Loddon VIC
Greater Dandenong (C)	Westernport VIC
Greater Geelong (C)	Golden Region VIC
Greater Lithgow (C)	Central Western NSW
Greater Shepparton (C)	Goulburn VIC
Greater Taree (C)	North Coastal NSW
Greenough (S)	Midlands and Central WA
Griffith (C)	Murray - Murrumbidgee NSW
Gundagai (A)	Murray - Murrumbidgee NSW
Gunnedah (A)	Northern NSW
Gunning (A)	South East NSW
Guyra (A)	Northern NSW
Halls Creek (S)	Pilbara - Kimberley WA
Harden (A)	South East NSW
Harvey (S)	Southern WA
Hastings (A)	North Coastal NSW
Hawkesbury (C)	Outer West Sydney
Hay (A)	Murray - Murrumbidgee NSW
Hepburn (S)	Golden Region VIC
Herberton (S)	Far North QLD
Hervey Bay (C)	Wide-Bay Burnett QLD
Hinchinbrook (S)	Nth QLD

Local Government Area	Region	Local Government Area	Region
Hindmarsh (S)	Mallee - Wimmera	Kingborough (M)	Hobart and Southern Tasmania
Hobart (C)	Hobart and Southern Tasmania	Kingston (C)	Southern Melbourne
Hobsons Bay (C)	West Melbourne	Knox (C)	East Melbourne
Holbrook (A)	Murray - Murrumbidgee NSW	Kogarah (A)	Southern Sydney
Holdfast Bay (C)	Southern Adelaide	Kojonup (S)	Southern WA
Holroyd (C)	Sydney Production Region	Kolan (S)	Wide-Bay Burnett QLD
Hornsby (A)	N.N. West Sydney	Kondinin (S)	Southern WA
Horsham (RC)	Mallee - Wimmera VIC	Koorda (S)	Midlands and Central WA
Hume (A)	Murray - Murrumbidgee NSW	Kulin (S)	Southern WA
Hume (C)	North Melbourne	Ku-ring-gai (A)	N.N. West Sydney
Hunter's Hill (A)	Global Sydney	Kwinana (T)	Southern Perth
Huon Valley (M)	Hobart and Southern Tasmania	Kyogle (A)	North Coastal NSW
Hurstville (C)	Southern Sydney	La Trobe (S)	Gippsland VIC
Ilfracombe (S)	Central QLD	Lacepede (DC)	South East SA
Indigo (S)	Ovens - Hume VIC	Lachlan (A)	Central Western NSW
Inglewood (S)	Darling Downs and South West QLD	Laidley (S)	Ipswich QLD
Inverell (A)	Northern NSW	Lake Grace (S)	Southern WA
Ipswich (C)	Ipswich QLD	Lake Macquarie (C)	Hunter NSW
Irwin (S)	Midlands and Central WA	Lane Cove (A)	Global Sydney
Isis (S)	Wide-Bay Burnett QLD	Latrobe (M)	Mercy-Lyell TAS
Isisford (S)	Central QLD	Launceston (C)	Northern Tasmania
Jabiru (T)	Darwin Top End	Laverton (S)	South Eastern WA
Jericho (S)	Central QLD	Le Hunte (DC)	Eyre and Yorke SA
Jerilderie (A)	Murray - Murrumbidgee NSW	Leeton (A)	Murray - Murrumbidgee NSW
Jerramungup (S)	Southern WA	Leichhardt (A)	Inner West Sydney
Johnstone (S)	Far North QLD	Leonora (S)	South Eastern WA
Jondaryan (S)	Darling Downs and South West QLD	Light (DC)	Northern Adelaide
Jundalup (C)	Northern and Central Perth	Lismore (C)	North Coastal NSW
Junea (A)	Murray - Murrumbidgee NSW	Litchfield (S)	Darwin Top End
Kalamunda (S)	Northern and Central Perth	Liverpool (C)	Sydney Production Region
Kalgoorlie/Boulder (C)	South Eastern WA	Livingstone (S)	Central QLD
Kangaroo Island (DC)	Southern Adelaide	Lockhart (A)	Murray - Murrumbidgee NSW
Karoonda East Murray (DC)	Murraylands SA	Loddon (S)	Loddon VIC
Katanning (S)	Southern WA	Logan (C)	Gold Coast and Hinterlands
Katherine (T)	Darwin Top End	Longreach (S)	Central QLD
Kellerberrin (S)	Midlands and Central WA	Lower Eyre Peninsula (DC)	Eyre and Yorke SA
Kempsey (A)	North Coastal NSW	Loxton Waikerie (DC)	Murraylands SA
Kent (S)	Southern WA	Macedon Ranges (S)	Loddon VIC
Kentish (M)	Mercy-Lyell TAS	Mackay (C)	Mackay QLD
Kiama (A)	Illawarra NSW	Maclean (A)	North Coastal NSW
Kilcoy (S)	North Brisbane	Maitland (C)	Hunter NSW
Kilkivan (S)	Wide-Bay Burnett QLD	Mallala (DC)	Northern Adelaide
Kimba (DC)	Eyre and Yorke SA	Mandurah (C)	Southern WA
King Island (M)	Mercy-Lyell TAS	Manilla (A)	Northern NSW
Kingaroy (S)	Wide-Bay Burnett QLD	Manjimup (S)	Southern WA
		Manly (A)	N.N. West Sydney
		Manningham (C)	East Melbourne



Local Government Area	Region
Mareeba (S)	Far North QLD
Maribyrnong (C)	West Melbourne
Marion (C)	Southern Adelaide
Maroochy (S)	North Brisbane
Maroondah (C)	East Melbourne
Marrickville (A)	Sydney Production Region
Maryborough (C)	Wide-Bay Burnett QLD
McKinlay (S)	North West QLD
Meander Valley (M)	Northern Tasmania
Meekatharra (S)	Midlands and Central WA
Melbourne (C)	Inner Melbourne VIC
Melton (S)	West Melbourne
Melville (C)	Southern Perth
Menzies (S)	South Eastern WA
Merredin (S)	Midlands and Central WA
Merriwa (A)	Hunter NSW
Mid Murray (DC)	Murraylands SA
Mildura (RC)	Mallee - Wimmera VIC
Millmerran (S)	Darling Downs and South West QLD
Mingenew (S)	Midlands and Central WA
Mirani (S)	Mackay QLD
Miriam Vale (S)	Wide-Bay Burnett QLD
Mitcham (C)	Southern Adelaide
Mitchell (S)	Goulburn VIC
Moira (S)	Goulburn VIC
Monash (C)	East Melbourne
Monto (S)	Wide-Bay Burnett QLD
Moonee Valley (C)	West Melbourne
Moora (S)	Midlands and Central WA
Moorabool (S)	Golden Region VIC
Morawa (S)	Midlands and Central WA
Moree Plains (A)	Northern NSW
Moreland (C)	North Melbourne
Mornington (S)	North West QLD
Mornington Peninsula (S)	Westernport VIC
Mosman (A)	Global Sydney
Mosman Park (T)	Northern and Central Perth
Mount Alexander (S)	Loddon VIC
Mount Barker (DC)	Southern Adelaide
Mount Gambier (C)	South East SA
Mount Isa (C)	North West QLD
Mount Magnet (S)	Midlands and Central WA
Mount Marshall (S)	Midlands and Central WA
Mount Morgan (S)	Central QLD
Mount Remarkable (DC)	Eyre and Yorke SA

Local Government Area	Region
Moyne (S)	Western Victoria
Mudgee (A)	Far and North Western NSW
Mukinbudin (S)	Midlands and Central WA
Mullewa (S)	Midlands and Central WA
Mulwaree (A)	South East NSW
Mundaring (S)	Northern and Central Perth
Mundubbera (S)	Wide-Bay Burnett QLD
Murchison (S)	Midlands and Central WA
Murgon (S)	Wide-Bay Burnett QLD
Murilla (S)	Darling Downs and South West QLD
Murray (A)	Murray - Murrumbidgee NSW
Murray (S)	Southern WA
Murray Bridge (RC)	Murraylands SA
Murrindindi (S)	Goulburn VIC
Murrumbidgee (A)	Murray - Murrumbidgee NSW
Murrurundi (A)	Hunter NSW
Murweh (S)	Darling Downs and South West QLD
Muswellbrook (A)	Hunter NSW
Nambucca (A)	North Coastal NSW
Nanango (S)	Wide-Bay Burnett QLD
Nannup (S)	Southern WA
Naracoorte and Lucindale (DC)	South East SA
Narembeen (S)	Midlands and Central WA
Narrabri (A)	Northern NSW
Narrandera (A)	Murray - Murrumbidgee NSW
Narrogin (S)	Southern WA
Narrogin (T)	Southern WA
Narromine (A)	Far and North Western NSW
Nebo (S)	Mackay QLD
Nedlands (C)	Northern and Central Perth
Newcastle (C)	Hunter NSW
Ngaanyatjarraku (S)	South Eastern WA
Nillumbik (S)	North Melbourne
Noosa (S)	North Brisbane
North Midlands (M)	Northern Tasmania
North Sydney (A)	Global Sydney
Northam (S)	Midlands and Central WA
Northam (T)	Midlands and Central WA
Northampton (S)	Midlands and Central WA
Northern Areas (DC)	Eyre and Yorke SA
Northern Grampians (S)	Mallee - Wimmera VIC
Norwood Payneham St Peters (C)	Central Adelaide
Nundle (A)	Northern NSW
Nungarin (S)	Midlands and Central WA

Local Government Area	Region	Local Government Area	Region
Nymboida (A)	North Coastal NSW	Richmond River (A)	North Coastal NSW
Oberon (A)	Central Western NSW	Robe (DC)	South East SA
Onkaparinga (C)	Southern Adelaide	Rockdale (C)	Southern Sydney
Orange (C)	Central Western NSW	Rockhampton (C)	Central QLD
Orroroo/Carrieton (DC)	Eyre and Yorke SA	Rockingham (C)	Southern Perth
Palmerston (T)	Darwin Top End	Roebourne (S)	Pilbara - Kimberley WA
Paringa Renmark (DC)	Murraylands SA	Roma (T)	Darling Downs and South West QLD
Parkes (A)	Central Western NSW	Rosalie (S)	Darling Downs and South West QLD
Paroo (S)	Darling Downs and South West QLD	Roxby Downs (M)	Eyre and Yorke SA
Parramatta (C)	Sydney Production Region	Ryde (C)	Global Sydney
Parry (A)	Northern NSW	Rylstone (A)	Central Western NSW
Peak Downs (S)	Central QLD	Salisbury (C)	Northern Adelaide
Penrith (C)	Outer West Sydney	Sandstone (S)	Midlands and Central WA
Peppermint Grove (S)	Northern and Central Perth	Sarina (S)	Mackay QLD
Perenjori (S)	Midlands and Central WA	Scone (A)	Hunter NSW
Perry (S)	Wide-Bay Burnett QLD	Serpentine-Jarrahdale (S)	Southern Perth
Perth (C)	Northern and Central Perth	Severn (A)	Northern NSW
Peterborough (DC)	Eyre and Yorke SA	Shark Bay (S)	Midlands and Central WA
Pine Rivers (S)	North Brisbane	Shellharbour (A)	Illawarra NSW
Pingelly (S)	Southern WA	Shoalhaven (C)	Illawarra NSW
Pittsworth (S)	Darling Downs and South West QLD	Singleton (A)	Hunter NSW
Pittwater (A)	N.N. West Sydney	Snowy River (A)	South East NSW
Plantagenet (S)	Southern WA	Sorell (M)	Hobart and Southern Tasmania
Playford (C)	Northern Adelaide	South Gippsland (S)	Gippsland VIC
Port Adelaide Enfield (C)	Northern Adelaide	South Perth (C)	Southern Perth
Port Augusta (C)	Eyre and Yorke SA	South Sydney (C)	Global Sydney
Port Hedland (T)	Pilbara - Kimberley WA	Southern Grampians (S)	Western Victoria
Port Lincoln (C)	Eyre and Yorke SA	Southern Mallee (DC)	Murraylands SA
Port Phillip (C)	Inner Melbourne VIC	Southern Midlands (M)	Hobart and Southern Tasmania
Port Pirie & Dists (M)	Eyre and Yorke SA	Stanthorpe (S)	Darling Downs and South West QLD
Port Stephens (A)	Hunter NSW	Stirling (C)	Northern and Central Perth
Prospect (C)	Central Adelaide	Stonnington (C)	Inner Melbourne VIC
Pyrenees (S)	Golden Region VIC	Strathbogie (S)	Goulburn VIC
Quairading (S)	Midlands and Central WA	Strathfield (A)	Inner West Sydney
Queanbeyan (C)	South East NSW	Streaky Bay (DC)	Eyre and Yorke SA
Queenscliffe (B)	Golden Region VIC	Subiaco (C)	Northern and Central Perth
Quilpie (S)	Darling Downs and South West QLD	Surf Coast (S)	Golden Region VIC
Quirindi (A)	Northern NSW	Sutherland Shire (A)	Southern Sydney
Randwick (C)	Global Sydney	Swan (S)	Northern and Central Perth
Ravensthorpe (S)	South Eastern WA	Swan Hill (RC)	Mallee - Wimmera VIC
Redcliffe (C)	North Brisbane	Sydney (C)	Global Sydney
Redland (S)	Gold Coast and Hinterlands	Tallaganda (A)	South East NSW
Richmond (S)	North West QLD	Tambellup (S)	Southern WA

Local Government Area	Region	Local Government Area	Region
Tambo (S)	Central QLD	Walcha (A)	Northern NSW
Tammin (S)	Midlands and Central WA	Walgett (A)	Far and North Western NSW
Tamworth (C)	Northern NSW	Walkerville (M)	Central Adelaide
Tara (S)	Darling Downs and South West QLD	Wambo (S)	Darling Downs and South West QLD
Taroom (S)	Darling Downs and South West QLD	Wandering (S)	Southern WA
Tasman (M)	Hobart and Southern Tasmania	Wangaratta (RC)	Ovens - Hume VIC
Tatiara (DC)	South East SA	Wanneroo (S)	Northern and Central Perth
Tea Tree Gully (C)	Northern Adelaide	Waratah/Wynyard (M)	Mercy-Lyell TAS
Temora (A)	Murray - Murrumbidgee NSW	Warroona (S)	Southern WA
Tennant Creek (T)	Southern NT	Warren (A)	Far and North Western NSW
Tenterfield (A)	Northern NSW	Warringah (A)	N.N. West Sydney
The Coorong (DC)	Murraylands SA	Warrnambool (C)	Western Victoria
Three Springs (S)	Midlands and Central WA	Warroo (S)	Darling Downs and South West QLD
Thuringowa (C)	Nth QLD	Warwick (S)	Darling Downs and South West QLD
Tiaro (S)	Wide-Bay Burnett QLD	Wattle Range (DC)	South East SA
Toodyay (S)	Midlands and Central WA	Waverley (A)	Global Sydney
Toowoomba (C)	Darling Downs and South West QLD	Weddin (A)	Central Western NSW
Torres (S)	Far North QLD	Wellington (A)	Far and North Western NSW
Townsville (C)	Nth QLD	Wellington (S)	Gippsland VIC
Towong (S)	Ovens - Hume VIC	Wentworth (A)	Murray - Murrumbidgee NSW
Trayning (S)	Midlands and Central WA	West Arthur (S)	Southern WA
Tumbarumba (A)	Murray - Murrumbidgee NSW	West Coast (M)	Mercy-Lyell TAS
Tumby Bay (DC)	Eyre and Yorke SA	West Tamar (M)	Northern Tasmania
Tumut (A)	Murray - Murrumbidgee NSW	West Torrens (C)	Central Adelaide
Tweed (A)	North Coastal NSW	West Wimmera (S)	Mallee - Wimmera VIC
Ulmarra (A)	North Coastal NSW	Westonia (S)	Midlands and Central WA
Unincorporated ACT	ACT	Whitehorse (C)	East Melbourne
Unincorporated ACT	South East NSW	Whitsunday (S)	Mackay QLD
Unincorporated NSW	Unincorporated_NSW	Whittlesea (C)	North Melbourne
Unincorporated NT	Unincorporated_NT	Whyalla (C)	Eyre and Yorke SA
Unincorporated SA	Unincorporated_SA	Wickepin (S)	Southern WA
Unincorporated Vic	Unincorporated_Vic	Williams (S)	Southern WA
Unley (C)	Central Adelaide	Willoughby (C)	Global Sydney
Upper Gascoyne (S)	Midlands and Central WA	Wiluna (S)	Midlands and Central WA
Uralla (A)	Northern NSW	Windouran (A)	Murray - Murrumbidgee NSW
Urana (A)	Murray - Murrumbidgee NSW	Wingecarribee (A)	Outer South West Sydney
Victor Harbor (DC)	Southern Adelaide	Winton (S)	Central QLD
Victoria Park (T)	Southern Perth	Wodonga (RC)	Ovens - Hume VIC
Victoria Plains (S)	Midlands and Central WA	Wollondilly (A)	Outer South West Sydney
Vincent (T)	Northern and Central Perth	Wollongong (C)	Illawarra NSW
Wagga Wagga (C)	Murray - Murrumbidgee NSW	Wondai (S)	Wide-Bay Burnett QLD
Waggamba (S)	Darling Downs and South West QLD	Wongan-Ballidu (S)	Midlands and Central WA
Wagin (S)	Southern WA	Woocoo (S)	Wide-Bay Burnett QLD
Wakefield (DC)	Eyre and Yorke SA	Woodanilling (S)	Southern WA
Wakool (A)	Murray - Murrumbidgee NSW	Woollahra (A)	Global Sydney

<b>Local Government Area</b>	<b>Region</b>
Wyalkatchem (S)	Midlands and Central WA
Wyndham (C)	West Melbourne
Wyndham-East Kimberley (S)	Pilbara - Kimberley WA
Wyong (A)	Central Coast NSW
Yalgoo (S)	Midlands and Central WA
Yallaroi (A)	Northern NSW
Yankalilla (DC)	Southern Adelaide
Yarra (C)	Inner Melbourne VIC
Yarra Ranges (S)	Westernport VIC
Yarriambiack (S)	Mallee - Wimmera VIC
Yarrowlumla (A)	South East NSW
Yass (A)	South East NSW
Yilgarn (S)	Midlands and Central WA
York (S)	Midlands and Central WA
Yorke Peninsula (DC)	Eyre and Yorke SA
Young (A)	South East NSW

## Appendix 4.2

### Index of region membership

Region	Local Government Area	Region	Local Government Area
ACT	Unincorporated ACT		Forbes (A)
Brisbane City	Brisbane (C)		Greater Lithgow (C)
Central Adelaide	Adelaide (C)		Lachlan (A)
	Adelaide Hills (DC)		Oberon (A)
	Burnside (C)		Orange (C)
	Campbelltown (C) (SA)		Parkes (A)
	Charles Sturt (C)		Rylstone (A)
	Norwood Payneham St Peters (C)		Weddin (A)
	Prospect (C)	Darling Downs and South West QLD	Balonne (S)
	Unley (C)		Bendemere (S)
	Walkerville (M)		Booringa (S)
	West Torrens (C)		Bulloo (S)
Central Coast NSW	Gosford (C)		Bungil (S)
	Wyong (A)		Cambooya (S)
Central QLD	Aramac (S)		Chinchilla (S)
	Banana (S)		Clifton (S)
	Barcaldine (S)		Crow's Nest (S)
	Barcoo (S)		Dalby (T)
	Bauhinia (S)	Goondiwindi (T)	
	Blackall (S)	Inglewood (S)	
	Boulia (S)	Jondaryan (S)	
	Calliope (S)	Millmerran (S)	
	Diamantina (S)	Murilla (S)	
	Duaringa (S)	Murweh (S)	
	Emerald (S)	Paroo (S)	
	Fitzroy (S)	Pittsworth (S)	
	Gladstone (C)	Quilpie (S)	
	Ilfracombe (S)	Roma (T)	
	Isisford (S)	Rosalie (S)	
	Jericho (S)	Stanthorpe (S)	
	Livingstone (S)	Tara (S)	
	Longreach (S)	Taroom (S)	
	Mount Morgan (S)	Toowoomba (C)	
	Peak Downs (S)	Waggamba (S)	
Rockhampton (C)	Wambo (S)		
Tambo (S)	Warroo (S)		
Winton (S)	Warwick (S)		
Central Western NSW	Bathurst (C)	Darwin Top End	Darwin (C)
	Bland (A)		Jabiru (T)
	Blayney (A)		Katherine (T)
	Cabonne (A)		Litchfield (S)
	Cowra (A)		Palmerston (T)
	Evans (A)	East Melbourne	Boroondara (C)

Region	Local Government Area	Region	Local Government Area	
Eyre and Yorke SA	Knox (C)	Gippsland VIC	Aurukun (S)	
	Manningham (C)		Cairns (C)	
	Maroondah (C)		Cardwell (S)	
	Monash (C)		Cook (S)	
	Whitehorse (C)		Croydon (S)	
	Buranga West (DC)		Douglas (S)	
	Ceduna (DC)		Eacham (S)	
	Clare and Gilbert Valleys (DC)		Etheridge (S)	
	Cleve (DC)		Herberton (S)	
	Coober Pedy (DC)		Johnstone (S)	
	Copper Coast (DC)		Mareeba (S)	
	Elliston (DC)		Torres (S)	
	Flinders Ranges (DC)		Bass Coast (S)	
	Franklin Harbor (DC)		Baw Baw (S)	
	Goyder (DC)		East Gippsland (S)	
	Kimba (DC)		La Trobe (S)	
	Le Hunte (DC)		South Gippsland (S)	
	Lower Eyre Peninsula (DC)		Wellington (S)	
	Mount Remarkable (DC)		Global Sydney	
	Northern Areas (DC)		Botany (A)	
	Orroroo/Carrieton (DC)		Hunter's Hill (A)	
	Peterborough (DC)		Lane Cove (A)	
	Port Augusta (C)		Mosman (A)	
	Port Lincoln (C)		North Sydney (A)	
	Port Pirie & Dists (M)		Randwick (C)	
	Roxby Downs (M)		Ryde (C)	
	Streaky Bay (DC)		South Sydney (C)	
	Tumby Bay (DC)		Sydney (C)	
	Wakefield (DC)		Waverley (A)	
	Whyalla (C)		Willoughby (C)	
	Yorke Peninsula (DC)		Woollahra (A)	
	Far and North Western NSW		Bogan (A)	Gold Coast and Hinterlands
Bourke (A)			Gold Coast (C)	
Brewarrina (A)			Logan (C)	
Broken Hill (C)			Redland (S)	
Central Darling (A)		Golden Region VIC	Ararat (RC)	
Cobar (A)			Ballarat (C)	
Coolah (A)			Colac-Otway (S)	
Coonabarabran (A)			Golden Plains (S)	
Coonamble (A)			Greater Geelong (C)	
Dubbo (C)			Hepburn (S)	
Gilgandra (A)			Moorabool (S)	
Mudgee (A)			Pyrenees (S)	
Narromine (A)			Queenscliffe (B)	
Walgett (A)		Goulburn VIC	Surf Coast (S)	
Warren (A)			Campaspe (S)	
Wellington (A)			Delatite (S)	
Far North QLD		Atherton (S)		Greater Shepparton (C)
				Mitchell (S)

Region	Local Government Area	Region	Local Government Area	
Hobart and Southern Tasmania	Moira (S)	Loddon VIC	Central Goldfields (S)	
	Murrindindi (S)		Greater Bendigo (C)	
	Strathbogie (S)		Loddon (S)	
	Brighton (M)		Macedon Ranges (S)	
	Central Highlands (M)		Mount Alexander (S)	
	Clarence (C)	Mackay QLD	Belyando (S)	
	Derwent Valley (M)		Broadsound (S)	
	Glamorgan/Spring Bay (M)		Mackay (C)	
	Glenorchy (C)		Mirani (S)	
	Hobart (C)		Nebo (S)	
	Huon Valley (M)		Sarina (S)	
	Kingborough (M)		Whitsunday (S)	
	Sorell (M)		Mallee - Wimmera VIC	Hindmarsh (S)
	Southern Midlands (M)			Buloke (S)
	Tasman (M)		Mallee - Wimmera VIC	Gannawarra (S)
Cessnock (C)	Horsham (RC)			
Dungog (A)	Mildura (RC)			
Gloucester (A)	Northern Grampians (S)			
Great Lakes (A)	Swan Hill (RC)			
Lake Macquarie (C)	West Wimmera (S)			
Maitland (C)	Yarriambiack (S)			
Merriwa (A)	Mercy-Lyell TAS	Burnie (C)		
Murrurundi (A)		Central Coast (M)		
Muswellbrook (A)		Circular Head (M)		
Newcastle (C)		Devonport (C)		
Port Stephens (A)		Kentish (M)		
Scone (A)		King Island (M)		
Singleton (A)		Latrobe (M)		
Illawarra NSW		Kiama (A)		Waratah/Wynyard (M)
		Shellharbour (A)	West Coast (M)	
		Shoalhaven (C)	Beverley (S)	
		Wollongong (C)	Midlands and Central WA	Bruce Rock (S)
Inner Melbourne VIC		Melbourne (C)		Carnamah (S)
		Port Phillip (C)		Carnarvon (S)
		Stonnington (C)		Chapman Valley (S)
		Yarra (C)		Chittering (S)
Inner West Sydney	Ashfield (A)	Coorow (S)		
	Burwood (A)	Cue (S)		
	Concord (A)	Cunderdin (S)		
	Drummoyne (A)	Dalwallinu (S)		
	Leichhardt (A)	Dandaragan (S)		
	Strathfield (A)	Dowerin (S)		
Ipswich QLD	Boonah (S)	Exmouth (S)		
	Esk (S)	Geraldton (C)		
	Gatton (S)	Gingin (S)		
	Ipswich (C)	Goomalling (S)		
	Laidley (S)	Greenough (S)		

Region	Local Government Area	Region	Local Government Area
Murray - Murrumbidgee NSW	Irwin (S)		Gundagai (A)
	Kellerberrin (S)		Hay (A)
	Koorda (S)		Holbrook (A)
	Meekatharra (S)		Hume (A)
	Merredin (S)		Jerilderie (A)
	Mingenew (S)		Junee (A)
	Moora (S)		Leeton (A)
	Morawa (S)		Lockhart (A)
	Mount Magnet (S)		Murray (A)
	Mount Marshall (S)		Murrumbidgee (A)
	Mukinbudin (S)		Narrandera (A)
	Mullewa (S)		Temora (A)
	Murchison (S)		Tumbarumba (A)
	Narembeen (S)		Tumut (A)
	Northam (S)		Urana (A)
	Northam (T)		Wagga Wagga (C)
	Northampton (S)		Wakool (A)
	Nungarin (S)		Wentworth (A)
	Perenjori (S)		Windouran (A)
	Quairading (S)		Berri and Barmera (DC)
	Sandstone (S)		Karoonda East Murray (DC)
	Shark Bay (S)		Loxton Waikerie (DC)
	Tammin (S)		Mid Murray (DC)
	Three Springs (S)		Murray Bridge (RC)
	Toodyay (S)		Paringa Renmark (DC)
	Trayning (S)		Southern Mallee (DC)
	Upper Gascoyne (S)		The Coorong (DC)
	Victoria Plains (S)		N.N. West Sydney
	Westonia (S)		Baulkham Hills (A)
	Wiluna (S)		Hornsby (A)
	Wongan-Ballidu (S)		Ku-ring-gai (A)
	Wyalkatchem (S)		Manly (A)
	Yalgoo (S)		Pittwater (A)
	Yilgarn (S)		North Brisbane
	York (S)		Warringah (A)
	Albury (C)		Caboolture (S)
	Balranald (A)		Caloundra (C)
	Berrigan (A)		Kilcoy (S)
	Carrathool (A)		Maroochy (S)
	Conargo (A)		Noosa (S)
	Coolamon (A)		Pine Rivers (S)
	Cootamundra (A)		Redcliffe (C)
Corowa (A)	North Coastal NSW		
Culcairn (A)	Ballina (A)		
Deniliquin (A)	Bellingen (A)		
Griffith (C)	Byron (A)		
	Casino (A)		
	Coffs Harbour (C)		
	Copmanhurst (A)		
	Grafton (C)		
	Greater Taree (C)		



Region	Local Government Area	Region	Local Government Area	
North Melbourne	Hastings (A)	Northern Tasmania	Inverell (A)	
	Kempsey (A)		Manilla (A)	
	Kyogle (A)		Moree Plains (A)	
	Lismore (C)		Narrabri (A)	
	Maclean (A)		Nundle (A)	
	Nambucca (A)		Parry (A)	
	Nymboida (A)		Quirindi (A)	
	Richmond River (A)		Severn (A)	
	Tweed (A)		Tamworth (C)	
	Ulmarra (A)		Tenterfield (A)	
	Banyule (C)		Uralla (A)	
	Darebin (C)		Walcha (A)	
	Hume (C)		Yallaro (A)	
	Moreland (C)		Break O'Day (M)	
	Nillumbik (S)		Dorset (M)	
Whittlesea (C)	Flinders (M)			
Northern Adelaide	Barossa (DC)	George Town (M)		
	Gawler (M)	Launceston (C)		
	Light (DC)	Meander Valley (M)		
	Mallala (DC)	North Midlands (M)		
	Playford (C)	West Tamar (M)		
	Port Adelaide Enfield (C)	Nth QLD	Bowen (S)	
	Salisbury (C)		Burdekin (S)	
	Tea Tree Gully (C)		Charters Towers (C)	
	Northern and Central Perth		Bassendean (T)	Dalrymple (S)
			Bayswater (C)	Hinchinbrook (S)
Cambridge (T)			Thuringowa (C)	
Claremont (T)			Townsville (C)	
Cottesloe (T)			North West QLD	Burke (S)
Jundalup (C)				Carpentaria (S)
Kalamunda (S)				Cloncurry (S)
Mosman Park (T)		Flinders (S)		
Mundaring (S)		McKinlay (S)		
Nedlands (C)		Mornington (S)		
Peppermint Grove (S)		Mount Isa (C)		
Perth (C)		Richmond (S)		
Stirling (C)		Outer South West Sydney		Camden (A)
Subiaco (C)				Campbelltown (C) (NSW)
Swan (S)			Wingecarribee (A)	
Vincent (T)	Outer West Sydney	Wollondilly (A)		
Wanneroo (S)		Blue Mountains (C)		
Northern NSW		Armidale (C)	Hawkesbury (C)	
	Barraba (A)	Penrith (C)		
	Bingara (A)	Ovens - Hume VIC	Alpine (S)	
	Dumaresq (A)		Indigo (S)	
	Glen Innes (A)		Towong (S)	
	Gunnedah (A)		Wangaratta (RC)	
	Guyra (A)		Wodonga (RC)	

Region	Local Government Area	Region	Local Government Area			
Pilbara - Kimberley WA	Ashburton (S)	Southern Melbourne	Victor Harbor (DC)			
	Broome (S)		Yankalilla (DC)			
	Derby-West Kimberley (S)		Bayside (C)			
	East Pilbara (S)		Glen Eira (C)			
	Halls Creek (S)		Kingston (C)			
	Port Hedland (T)		Alice Springs (T)			
	Roebourne (S)		Coomalie (CGC)			
	Wyndham-East Kimberley (S)		Tennant Creek (T)			
	South East NSW		Bega Valley (A)	Southern Perth	Armadale (C)	
			Bombala (A)		Belmont (C)	
Boorowa (A)		Canning (C)				
Cooma-Monaro (A)		Cockburn (C)				
Crookwell (A)		East Fremantle (T)				
Eurobodalla (A)		Fremantle (C)				
Goulburn (C)		Gosnells (C)				
Gunning (A)		Kwinana (T)				
Harden (A)		Melville (C)				
Mulwaree (A)		Rockingham (C)				
Queanbeyan (C)		Serpentine-Jarrahdale (S)				
Snowy River (A)		South Perth (C)				
Tallaganda (A)		Victoria Park (T)				
Unincorporated ACT		Southern Sydney	Hurstville (C)			
Yarrowlumla (A)			Kogarah (A)			
Yass (A)			Rockdale (C)			
Young (A)			Sutherland Shire (A)			
South East SA			Grant (DC)		Southern WA	Albany (C)
			Lacepede (DC)			Augusta-Margaret River (S)
	Mount Gambier (C)		Boddington (S)			
	Naracoorte and Lucindale (DC)		Boyup Brook (S)			
	Robe (DC)		Bridgetown-Greenbushes (S)			
	Tatiara (DC)		Brookton (S)			
	Wattle Range (DC)	Broomehill (S)				
	South Eastern WA	Coolgardie (S)	Bunbury (C)			
Dundas (S)		Busselton (S)				
Esperance (S)		Capel (S)				
Kalgoorlie/Boulder (C)		Collie (S)				
Laverton (S)		Corrigin (S)				
Leonora (S)		Cranbrook (S)				
Menzies (S)		Cuballing (S)				
Ngaanyatjarraku (S)		Dardanup (S)				
Ravensthorpe (S)		Denmark (S)				
Southern Adelaide		Alexandrina (DC)	Donnybrook-Balingup (S)			
	Holdfast Bay (C)	Dumbleyung (S)				
	Kangaroo Island (DC)	Gnowangerup (S)				
	Marion (C)	Harvey (S)				
	Mitcham (C)	Jerramungup (S)				
	Mount Barker (DC)	Katanning (S)				
	Onkaparinga (C)	Kent (S)				

Region	Local Government Area	
Sydney Production Region	Kojoonup (S)	
	Kondinin (S)	
	Kulin (S)	
	Lake Grace (S)	
	Mandurah (C)	
	Manjimup (S)	
	Murray (S)	
	Nannup (S)	
	Narrogin (S)	
	Narrogin (T)	
	Pingelly (S)	
	Plantagenet (S)	
	Tambellup (S)	
	Wagin (S)	
	Wandering (S)	
	Waroona (S)	
	West Arthur (S)	
	Wickepin (S)	
	Williams (S)	
	Woodanilling (S)	
	Auburn (A)	
	Bankstown (C)	
	Blacktown (C)	
	Canterbury (C)	
	Fairfield (C)	
	Holroyd (C)	
	Liverpool (C)	
	Marrickville (A)	
	Parramatta (C)	
	Unincorporated NSW	Unincorporated NSW
	Unincorporated NT	Unincorporated NT
	Unincorporated SA	Unincorporated SA
	Unincorporated Vic	Unincorporated Vic
West Melbourne	Brimbank (C)	
	Hobsons Bay (C)	
	Maribyrnong (C)	
	Melton (S)	
	Moonee Valley (C)	
	Wyndham (C)	
Western Victoria	Corangamite (S)	
	Glenelg (S)	
	Moyne (S)	
	Southern Grampians (S)	
	Warrnambool (C)	
Westernport VIC	Cardinia (S)	
	Casey (C)	
	Frankston (C)	

Region	Local Government Area
Wide-Bay Burnett QLD	Greater Dandenong (C)
	Mornington Peninsula (S)
	Yarra Ranges (S)
	Biggenden (S)
	Bundaberg (C)
	Burnett (S)
	Cooloolia (S)
	Eidsvold (S)
	Gayndah (S)
	Hervey Bay (C)
	Isis (S)
	Kilkivan (S)
	Kingaroy (S)
	Kolan (S)
	Maryborough (C)
	Miriam Vale (S)
	Monto (S)
	Mundubbera (S)
	Murgon (S)
	Nanango (S)
Perry (S)	
Tiaro (S)	
Wondai (S)	
Woocoo (S)	

