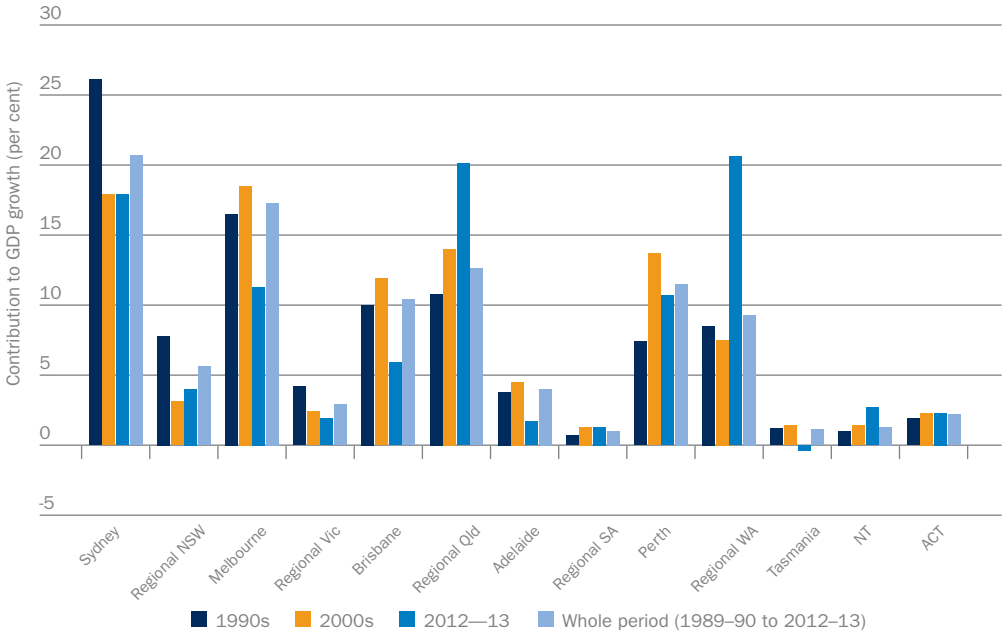
Chapter 4
Economy

Cities are critically important parts of the national economy and gateways for much of Australia's interaction with the global economy. While globally competitive export-orientated industries across the country are a significant component of national prosperity, Australia's major cities are where the majority of the country's Gross Domestic Product (GDP) is generated. They house much of the nation's key economic infrastructure such as container ports and airports, which are critical to the prosperity of industries and sectors located across Australia.

Figure 4.1 Contribution to Gross Domestic Product growth (volume measure) by cities and regions, 1990's, 2000's and 2012–13



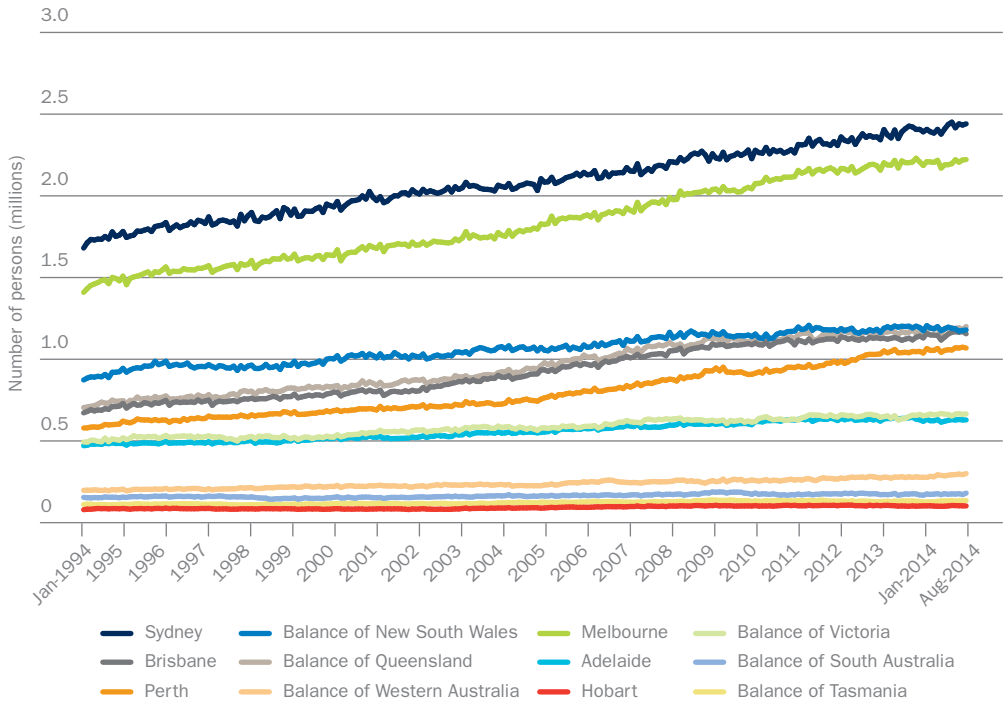
Source: SGS Economics & Planning 2014.

Infrastructure plays a key role in improving the productivity of Australia's cities. It has a direct impact on the volume of capital stock in the economy and an indirect effect on productivity (Productivity Commission 2009). Urban infrastructure assets – road networks, public transport, ports, airports and utility networks – all have the ability to catalyse and direct urban growth that supports more economically productive and socially inclusive cities.

The long-term health of the national economy depends on the enhancement, renewal and maintenance of productivity given the expected decline in Australia's terms of trade after an extended 'boom' and, as discussed in the **Population** chapter, the effect of an ageing population. Cities are home to fast-growing, high-productivity sectors that rely on the efficient functioning of the city to thrive. The economic infrastructure found in cities is therefore increasingly central to Australia's productivity.

Not only is a majority of GDP generated in Australia's major cities but a majority of Australian jobs are also located in urban environments, particularly in capital cities as shown in Figure 4.2. In 2014, more than 7.6 million people were employed in Australia's state capital cities, with slightly more than 4 million employed in regional or remote areas (ABS 2014). Changes in economic structures and international trade as well as an increased drive to enhance productivity benefits will have an impact on the Australian workforce, the effect of which will be felt most strongly in the major cities.

Figure 4.2 Jobs distribution by capital city and balance of state, 1994–2014



Source: ABS 2013a.

The international context – cities and global competiveness

In a recent OECD study taken across 5 countries and 140 cities (Ahrend et al. 2014), the relationship between city size and productivity was established. This empirical analysis showed that a doubling in city size was associated with an increase in productivity of between 2 per cent and 5 per cent over and above those productivity gains from broader economic processes.

Figure 4.3 presents the level of city productivity premiums indexed against city populations. The study further found that city productivity is positively associated with the population of nearby cities (within 300 kilometres) (Ahrend et al. 2014).

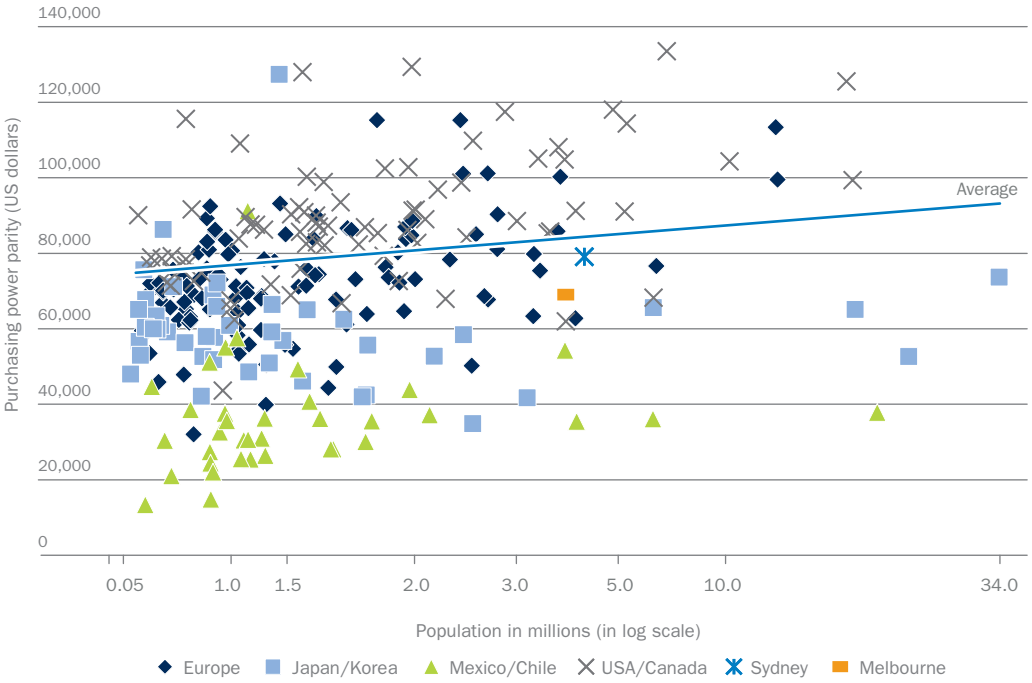
The 5 lines in the chart represent cities productivity premium trends, by city sizes, for each country. The natural algorithm of population is on the horizontal axis, the vertical axis plots city productivity, estimated by applying individual wage regressions to national micro-data in order to control for workforce composition of cities.

Figure 4.3 Population size and productivity premium by cities in North America, Mexico, Germany, Great Britain and Spain

Source: Ahrend et al. 2014.

The study also found that the presence of a port increases city productivity by 3 per cent. However, it did not examine the importance of metropolitan airports.

Figure 4.4 International metropolitan area labor productivity, 2010



Source: Ahrend et al. 2014.

Asian cities tend to cluster in the lower mid-range of labour productivity in cities of between 500,000 to 1.5 million persons. Metropolitan Sydney and Melbourne (shown in Figure 4.4) are below international average levels of labour productivity by constant US dollars purchasing power parity (or PPP) for similar sized cities in the scope of the study (Ahrend et al. 2014).

Research by Loughborough University World Cities Group and the Chinese Academy of Social Sciences, which rated Asian-Pacific cities in 2010 in terms of their international linkages and relative importance, has shown that Sydney is the only Australian city that is close to the leaders of the overall group of 500 cities in terms of its Global Urban Competitiveness (Table 4.1). Except for Melbourne and Sydney, all of Australia's cities ranked outside the top 100 Asian-Pacific cities for Global Urban Competitiveness. Enright and Petty (2013 p.42), commenting on Australia's ranking observed that:

> Only Sydney and Melbourne are in the upper tier on some measures. Cities tend to manage flows of goods and service, finance and people on a local, national and regional and global basis. If global cities are not just a result of dynamic national economies, but a major contributor, then Australia would appear to be disadvantaged compared with many other countries.

Table 4.1 Selected Australian capital cities competiveness rankings within the Asia–Pacific, 2009-2010

		Global urban competitive-ness		GDP		GDP per capita		GDP per square kilometre		GDP growth		Patent application	
Cities	Economics	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank
Tokyo	Japan	0.92	3	1.00	1	0.64	69	0.37	19	0.09	472	0.27	41
Singapore	Singapore	0.76	8	0.25	14	0.44	157	0.28	31	0.36	172	0.05	183
Seoul	Korea	0.74	9	0.40	6	0.31	193	0.53	8	0.16	363	0.07	150
Hong Kong	China	0.74	10	0.33	7	0.39	181	0.24	47	0.28	239	0.05	177
Yokohama	Japan	0.68	21	0.20	17	0.44	160	0.36	22	0.15	387	0.41	16
Osaka	Japan	0.68	24	0.32	8	0.50	126	0.14	117	0.07	499	0.31	34
Shanghai	China	0.64	37	0.26	11	0.14	251	0.04	258	0.57	70	0.09	122
Taipei	China	0.63	38	0.11	42	0.33	190	0.21	60	0.11	443	0.18	75
Sydney	Australia	0.62	46	0.30	10	0.56	97	0.15	108	0.13	414	0.01	281
Nagoya	Japan	0.61	49	0.19	19	0.69	45	0.47	10	0.08	490	0.17	79
Beijing	China	0.59	59	0.20	16	0.10	287	0.01	375	0.56	71	0.08	130
Kawasaki	Japan	0.59	61	0.07	67	0.43	163	0.40	15	0.09	473	0.41	15
Sagamihara	Japan	0.58	70	0.04	149	0.45	148	0.35	23	0.16	364	0.32	31
Shenzhen	China	0.58	71	0.15	25	0.14	252	0.06	223	0.74	21	0.15	85
Chiba	Japan	0.56	82	0.05	100	0.47	134	0.16	95	0.09	476	0.37	23
Saitama	Japan	0.56	84	0.06	84	0.42	166	0.23	53	0.11	440	0.39	20
Kyoto	Japan	0.56	86	0.09	49	0.53	113	0.09	171	0.10	450	0.29	40
Melbourne	Australia	0.55	91	0.25	13	0.54	110	0.03	307	0.23	283	0.02	237
Macau	China	0.55	93	0.02	236	0.36	187	0.54	7	0.56	72	0.00	343
Brisbane	Australia	0.51	136	0.12	35	0.51	121	0.07	199	0.17	352	0.01	260
Canberra	Australia	0.44	229	0.03	205	0.67	53	0.03	295	0.18	338	0.01	292
Hobart	Australia	0.43	238	0.02	293	0.67	52	0.03	305	0.23	281	0.01	244
Adelaide	Australia	0.43	243	0.06	80	0.44	162	0.03	297	0.12	430	0.01	257

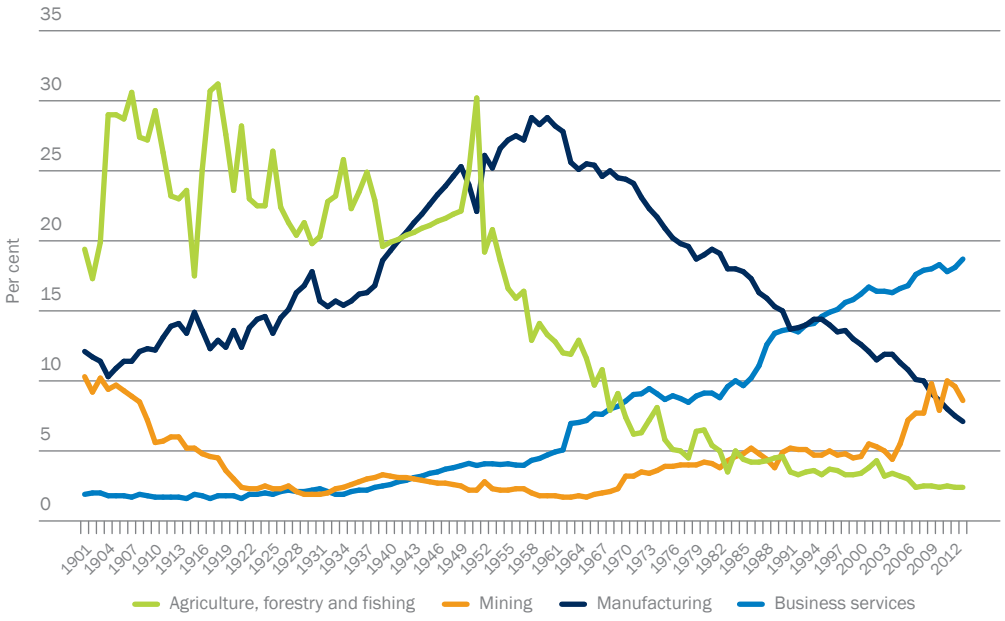
Source: Enright and Petty 2013.

Australia's changing economic structure

The Australian economy has undergone several stages of transition in its modern history. Each stage has had distinct implications for its cities, their economic makeup and the urban structure and form built to serve that stage. A high-level historical overview of these periods of economic transition provides valuable context to understanding the current state of the economy and its possible future direction. It is important to acknowledge that our cities still maintain layers of urban structures from economic periods now past.

Figure 4.5 illustrates the historical transition of the Australian economy by depicting the relative shares of GDP produced by 4 selected export-oriented industries over the 20th and early 21st century.

Figure 4.5 Industry share of total Australian Gross Domestic Product, selected industry sectors, 1901–2013



Source: ABS 2013c, Butlin 1985.
Note: Interpolation between 1939 and 1949 due to break in series.

The Australian economy before World War II was heavily reliant on agriculture, forestry and fishing industries. This sector accounted for between 20 and 30 per cent of national income, with fluctuations based on global agriculture markets and domestic climatic conditions. The sector saw a large spike in 1951 (due to a wool boom brought about by the Korean War), but since then the sector's share of national income has been dwarfed by growth in other sectors, and the role of cities in Australia's economy has expanded.

Figure 4.5 also illustrates the pronounced rise, then fall, of manufacturing over the last 100 years.

The rapid industrialisation that commenced around the time of Australian federation, continued in the inter-war years and accelerated during World War II, saw a substantial increase in the importance of manufacturing to national GDP before it peaked in the initial phases of the long post-World War II boom. At its peak, manufacturing accounted for almost 30 per cent of Australia's GDP. In cities, this economic growth saw the suburbanisation of jobs, with large-scale automobile, textile and other manufacturing industries set up under protectionist policies. As these policies were gradually wound back and the process of globalisation took hold, the share of GDP generated in the manufacturing industry sector has steady declined since the 1960s.

Alongside a sustained period of growth in business services, the impact of the resources boom, especially in the last decade, is also evident (Figure 4.5).

Through the period of the 1980s to early 2000s, the mining sector consistently represented around 5 per cent of Australia's GDP. In the decade that followed, mining's share of GDP jumped considerably, with the sector growing to around 10 per cent of GDP at the peak of the resources boom in 2010. In this period, over half of Australia's per capita income growth came from improvements in the terms of trade, driven by the resources boom and, in particular, China's commensurate economic rise (Department of Industry 2013).The impact of the mining boom has been felt in cities as much as in rural and regional Australia, with output increasing in city economies and many employees of mining companies living in capital cities.

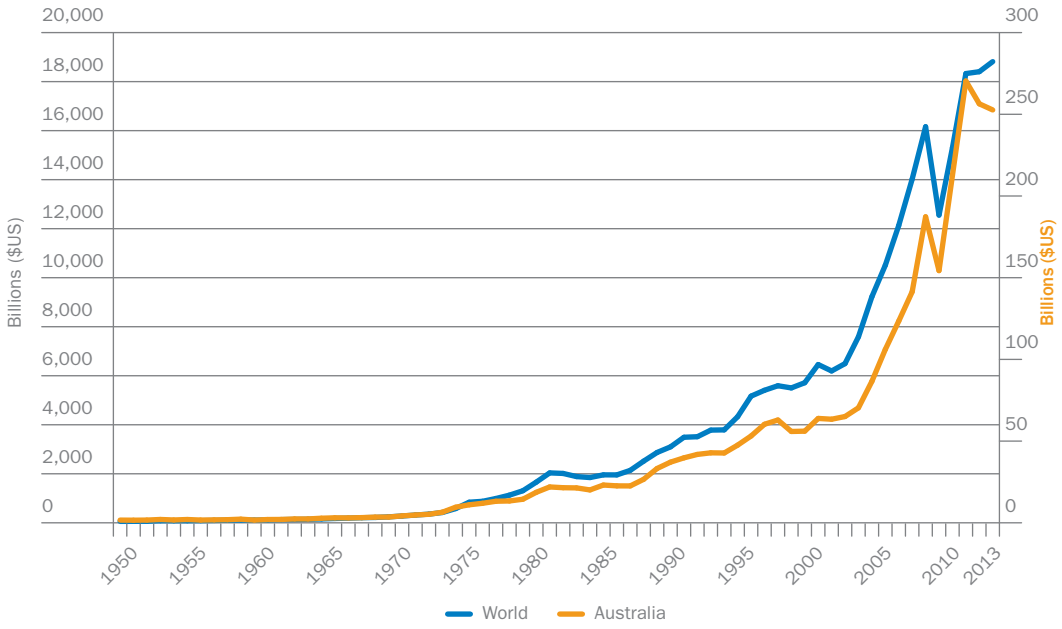
The resources boom, economic growth in the Asia–Pacific region, the increase in Australia's terms of trade, the ratio of export prices to import prices and the fluctuations of the Australian dollar have all had implications for the composition of the Australian export and import markets. The competitiveness of certain industries and sectors has altered significantly over time, resulting in fresh waves of structural economic change.

The growth of global trade

Trade exists because people, regions, and nations have a competitive advantage in supplying a tradable commodity, be it a natural resource such as iron ore, or a service such as expertise in financial mergers and acquisitions. Trade allows for specialisation, and as such individuals, cities, and nations profit from playing to their strengths. Trade is crucial because openness to trade is correlated with economic growth (OECD 2012).

World trade has increased dramatically in recent decades, with global merchandise trade increasing from around US$4 trillion in the early 1990s to over US$18 trillion in 2013 (Schwab (ed.) 2013), as shown in Figure 4.6.

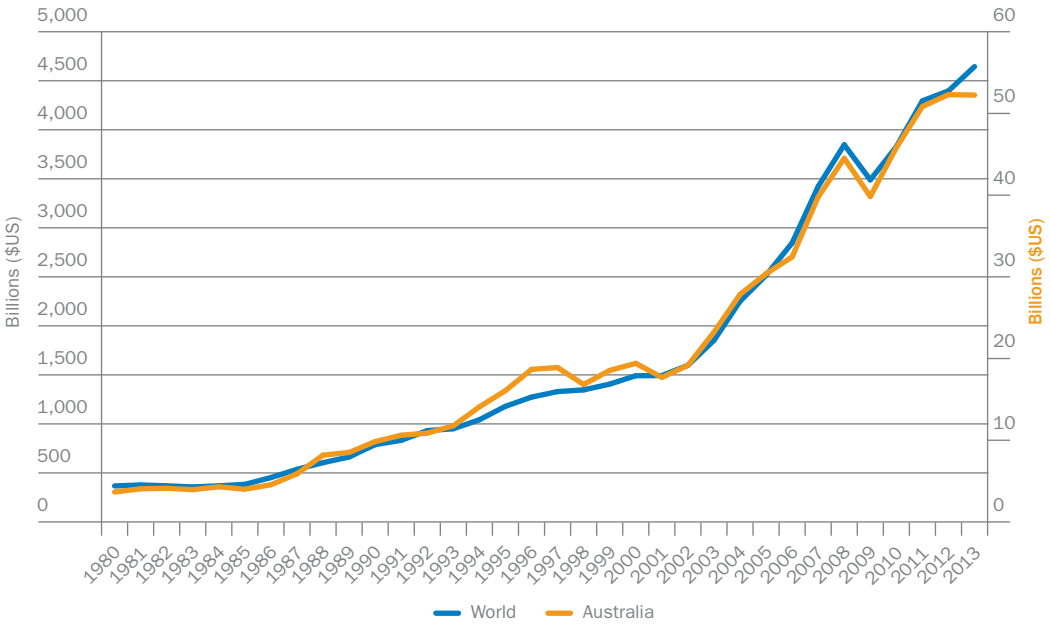
Figure 4.6 World and Australia total merchandise trade, 1948–2013



Source: World Trade Organization Statistical Database 2014.
Note: Derived from World Trade Organization Statistical Database for imports and exports using WTO valuations.
Note: Some of the increase in Australia's trade results from the appreciation of the Australian dollar.

Figure 4.7 shows how global trade in commercial services has also increased dramatically since the early 2000s now amounting to over US$4 trillion (Schwab (ed.) 2013).

Figure 4.7 World and Australia total commercial services trade, 1980–2013



Source: World Trade Organization Statistical Database 2014. Note: Excludes government services.
Note: Derived from World Trade Organization Statistical Database for imports and exports using WTO valuations.
Note: Some of the increase in Australia's trade results from the appreciation of the Australian dollar.

This growth in the value of global trade has, on average, increased at nearly twice the pace of world production, reflecting the increasing prominence of international supply chains and the trade in components of final products (Schwab (ed.) 2013). This is not unique to Australia; trade in components of manufactured goods and intermediate goods are over 3 times greater than flows of final goods, and are growing at a faster rate (McKinsey 2014).

This increase in trade has important implications for city infrastructure, especially ports and airports and the land transport links that serve them.

The Progress in Australian Regions – Yearbook 2014 shows that the value of international freight through Australian ports and airports increased by more than $140 billion between 2006–07 and 2012–13. The largest increase of approximately $66 billion occurred in major cities – up from $287 billion to $353 billion – while remote areas have experienced the next largest increase of almost $31 billion, related mainly to bulk commodities like iron ore (DIRD 2014, C 2.2.2).

What Australia is trading

Australia exports high-value services such as education, business services and tourism, as well as mining and agricultural products, in which the nation has a clear competitive advantage. Australia's resources and energy sectors also continue to drive our economic growth (see Table 4.2).

The Bureau of Resources and Energy Economics (BREE 2014) forecasts Australia's resources and energy export earnings to reach $251 billion (in 2014-15 dollars) in 2018–19. BREE predicts that over the next five years iron ore exports will grow at an average annual rate of six per cent, totaling 889 million tonnes in 2019. Despite an increase in 2013-14 of 31 per cent in Iron ore export values to $74.8 billion, they are expected to decrease 4.2 per cent in 2014-15. Australia is expected to become the world's largest exporter of Liquefied Natural Gas (LNG) by 2019, with total exports predicted to reach 78.4 million tonnes, worth around $52.2 billion in 2014-15 dollar terms. Metallurgical coal exports are predicted to increase by 1.2 per cent annually to 198 million tonnes in 2019, worth around $28.2 billion in 2014-15 dollar terms, and thermal coal by an annual average of 4 per cent to 239 million tonnes in 2019, worth $20.2 billion in 2014-15 dollar terms.

Table 4.2 Australia's top 25 exports, 2011–2013

					% growth	
Rank	**Commodity**	**2011**	**2012**	**2013**	**2012–13**	**5-year trend**
1	Iron ores & concentrates	64,097	54,447	69,492	27.6	19.4
2	Coal	46,691	41,273	39,805	-3.6	-1.6
3	Education-related travel services	15,144	14,467	15,020	3.8	0.1
4	Natural gas	11,084	13,416	14,602	8.8	12.6
5	Gold	15,077	15,526	13,898	-10.5	0
6	Personal travel (excl education) services	11,661	12,148	13,115	8	1.6
7	Crude petroleum	11,451	10,988	9,016	-17.9	2
8	Wheat	6,076	6,531	6,085	-6.8	11.1
9	Aluminium ores & concentrates (incl. alumina)	5,443	5,273	5,904	12	-0.4
10	Beef	4,684	4,754	5,695	19.8	3
11	Copper ores & concentrates	5,437	5,255	5,192	-1.2	6.9
12	Professional services	3,259	3,836	4,562	18.9	4.6
13	Other ores & concentrates	4,544	4,217	4,486	6.4	4.2
14	Business travel services	3,573	4,031	3,954	-1.9	9.6
15	Technical & other business services	3,452	3,555	3,877	9.1	1.2
16	Aluminium	4,657	3,774	3,675	-2.6	-6.7
17	Copper	3,861	3,349	3,373	0.7	3
18	Medicaments (incl. veterinary)	3,278	3,849	3,085	-19.8	-1.9
19	Meat (excl. beef)	2,375	2,370	2,884	21.7	5
20	Refined petroleum	2,938	3,271	2,743	-16.1	-0.1
21	Wool & other animal hair (incl. tops)	2,837	2,524	2,608	3.3	5.4
22	Cotton	2,537	2,626	2,604	-0.8	51
23	Oil-seeds & oleaginous fruits, soft	1,287	1,780	2,516	41.3	44.6
24	Financial services	1,289	1,627	2,468	51.7	9.1
25	Other transport services	2,233	2,268	2,367	4.4	1.1
Total		**313,078**	**300,436**	**318,539**	**6.1**	**4.1**

Source: DFAT 2013.

Australia's major imports include high-value services such as personal travel (tourism), and commodities such as crude oil and petroleum products, passenger motor vehicles, machinery and transport equipment, computers and telecom equipment and parts, as shown in Table 4.3.

Table 4.3 Australia's top 25 imports, 2011–2013

					% growth	
Rank	**Commodity**	**2011**	**2012**	**2013**	**2012–13**	**5-year trend**
1	Personal travel (excl. education) services	22,550	22,437	24,725	10.2	5.6
2	Crude petroleum	20,827	21,567	20,227	-6.2	7.6
3	Passenger motor vehicles	14,159	16,919	18,290	8.1	6.1
4	Refined petroleum	14,306	15,871	18,229	14.9	7.8
5	Freight transport services	8,363	9,228	9,348	1.3	0.3
6	Telecom equipment & parts	8,323	8,746	9,068	3.7	6
7	Medicaments (incl. veterinary)	8,530	8,201	7,831	-4.5	2.9
8	Computers	6,634	6,777	6,943	2.4	4.3
9	Passenger transport services	6,389	6,901	6,839	-0.9	3
10	Goods vehicles	6,153	8,562	6,436	-24.8	5.7
11	Technical & other business services	4,733	5,107	6,182	21	4.9
12	Professional services	2,678	3,631	5,050	39.1	10.3
13	Gold	6,396	5,841	4,796	-17.9	-13.3
14	Charges for intellectual property	3,982	4,044	3,992	-1.3	3.1
15	Business travel services	2,992	3,493	3,574	2.3	0.9
16	Civil engineering equipment & parts	4,264	6,822	3,464	-49.2	6.9
17	Heating & cooling equipment & parts	2,173	2,265	3,212	41.8	6.5
18	Furniture, mattresses & cushions	2,780	2,905	3,176	9.3	2.8
19	Pumps (excl. liquid pumps) & parts	1,726	2,418	3,172	31.2	2.2
20	Vehicle parts & accessories	2,648	2,932	2,797	-4.6	2.9
21	Measuring & analysing instruments	2,635	2,950	2,774	-6	0.3
22	Rubber tyres, treads & tubes	2,672	3,053	2,748	-10	10.4
23	Electrical machinery & parts, nes	2,509	2,608	2,725	4.5	2.7
24	Iron, steel, aluminium structures	1,550	1,889	2,647	40.1	33
25	Mechanical handling equip. & parts	1,987	2,541	2,579	1.5	6.8
Total		**301,423**	**324,026**	**328,806**	**1.5**	**4.0**

Source: DFAT 2013.

The OECD characterises Australia's linkages to global value chains as weak because its exports are largely unprocessed raw materials and do not integrate with most typical high value-added global supply chains (Department of Industry 2013). Nevertheless, Australia exports high value-add services such as financial services and technical and other business services. Table 4.3 shows that Australia also imports some of these services, as well as manufactured goods.

This lack of integration is true also for Australian manufacturing, with most specialised manufacturing occurring in low- and medium-technology intensity sectors that are either upstream in the supply chain (for example, primary aluminium and steel) or at the final stages of processing, such as processed food (Department of Industry 2013).

Trade in services within Australia has grown significantly in the last decade. Melbourne Institute's Asia Link Index shows services trade between both Australia and Asia and Australia and the rest of the world grew by 80 per cent and 43 per cent respectively in the period 2000–2011, and 60 per cent within cities. Education constitutes the largest service export, amounting to $9.8 billion or 48.2 per cent of Australian services exports to Asia in 2011 (Department of Industry 2013).

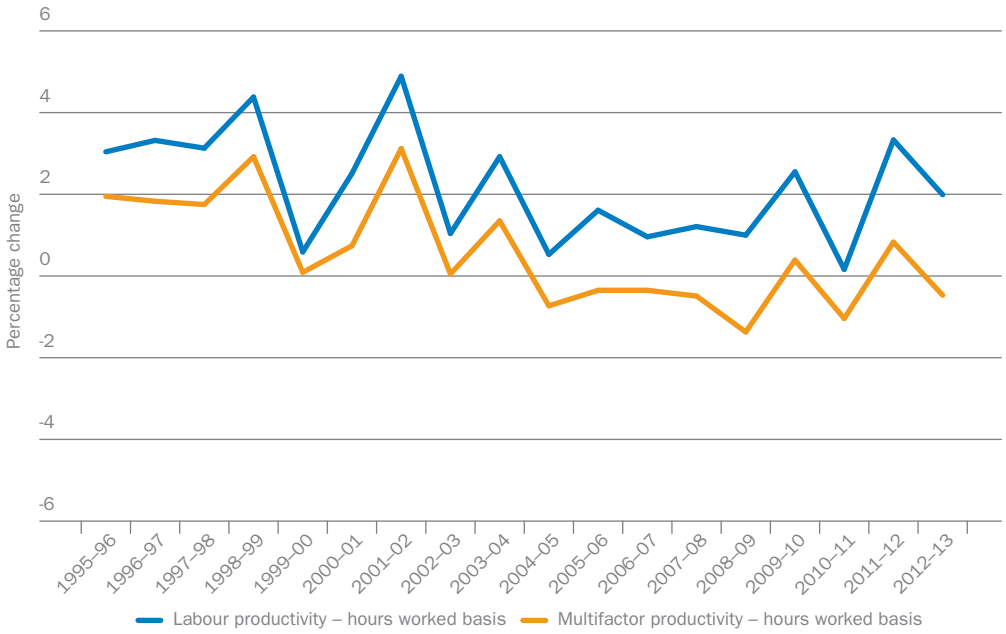
Productivity of Australia's cities

Cities contain economic infrastructure critical to national productivity, including hosting many of Australia's important international gateways. Cities as a whole are highly productive; however, this productivity is not spread evenly across cities and there are strikingly large differences in levels of productivity between

cities (Abel, Dey and Gabe 2011). A lift in the functioning capacity of Australia's major cities will provide a considerable stimulus for reversing the current decline in national productivity and global competitiveness (IPA 2012).

Productivity can grow through technological advances, new products, capital intensity and the flexibility and efficiency of the allocation of labour and capital (Australian Government 2010). As shown in Figure 4.8 related to Australia's labour productivity and multifactor productivity, the measure of a combination of production inputs, including labor, materials and capital, has risen and fallen irregularly and has been in overall decline since the high of 2001–02.

Figure 4.8 Labour productivity and multifactor productivity measures (market sector industries aggregate), 1995–96 to 2012–13



Source: ABS 2013e.

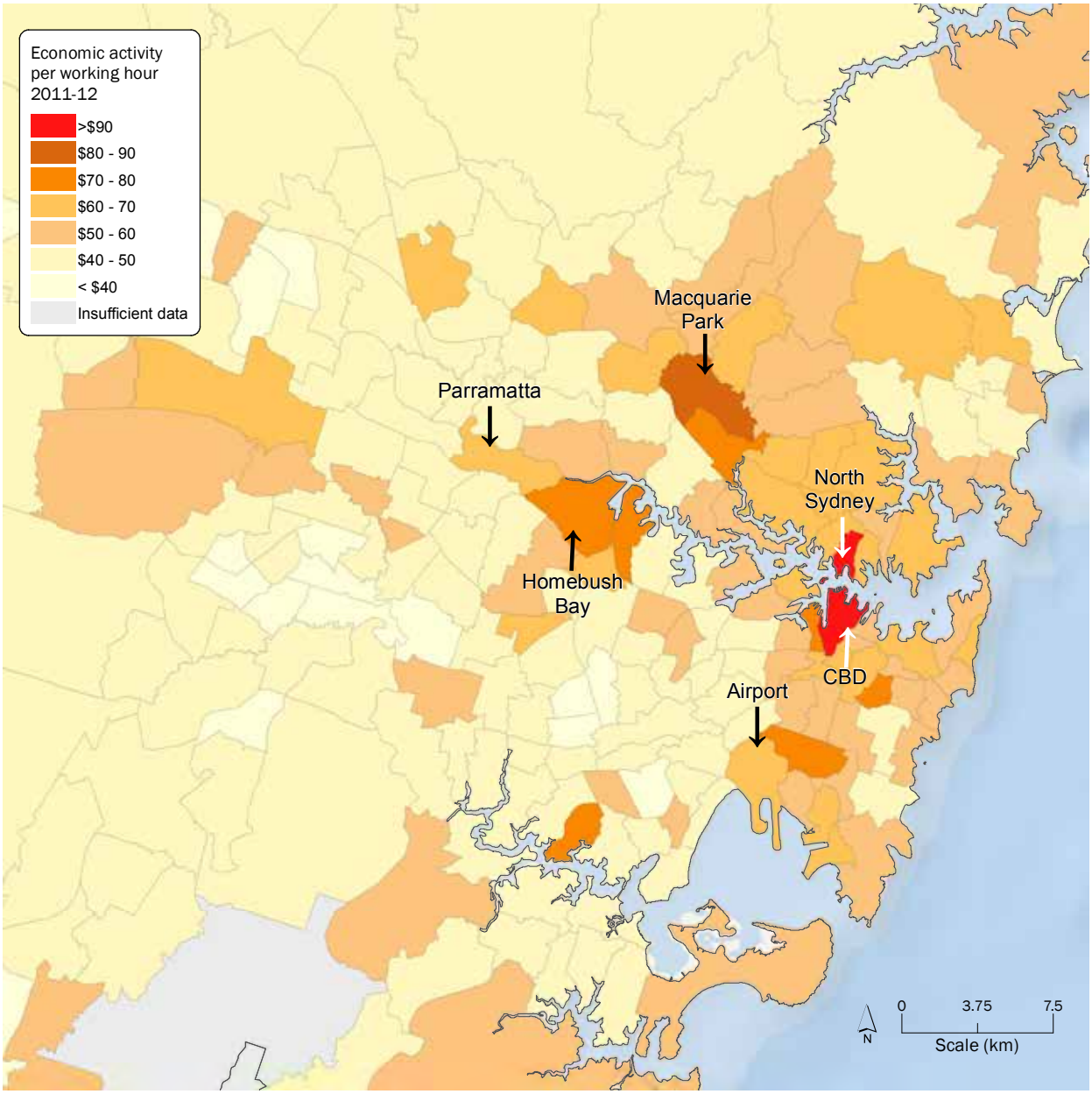
Productivity is measured as the quantity of output that can be produced with a given amount of input. Productivity growth requires producing more outputs with the same or fewer inputs (workers and capital).

Connectivity can be a key determinant of a firm's productivity. Firms can achieve benefits by locating themselves in a city that has high levels of connectivity (by mass transit or car or via airports or seaports). For example, producing for a larger customer base will tend to reduce unit costs. With increased numbers of clients, firms may be able to specialise in a particular field and gain efficiencies through more focused skill development and innovation in that field. Furthermore, a large and diverse marketplace also presents a firm with many potential clients, freeing it from reliance on a single customer and reducing risk.

As a result of the increased connectivity of industries within Australian cities, highly globally connected firms, particularly those in the advanced business services sector, tend to be attracted to well-connected central city locations. These highly accessible locations give them access to all the inputs that make their businesses so profitable – a large (global) market of potential clients and a diverse and deep pool of labour. Nevertheless, as the Grattan Institute has argued, residential patterns and transport systems mean that central business district (CBD) employers have access to only a limited proportion of workers in metropolitan areas, particularly in the case of Sydney (Kelly 2013).

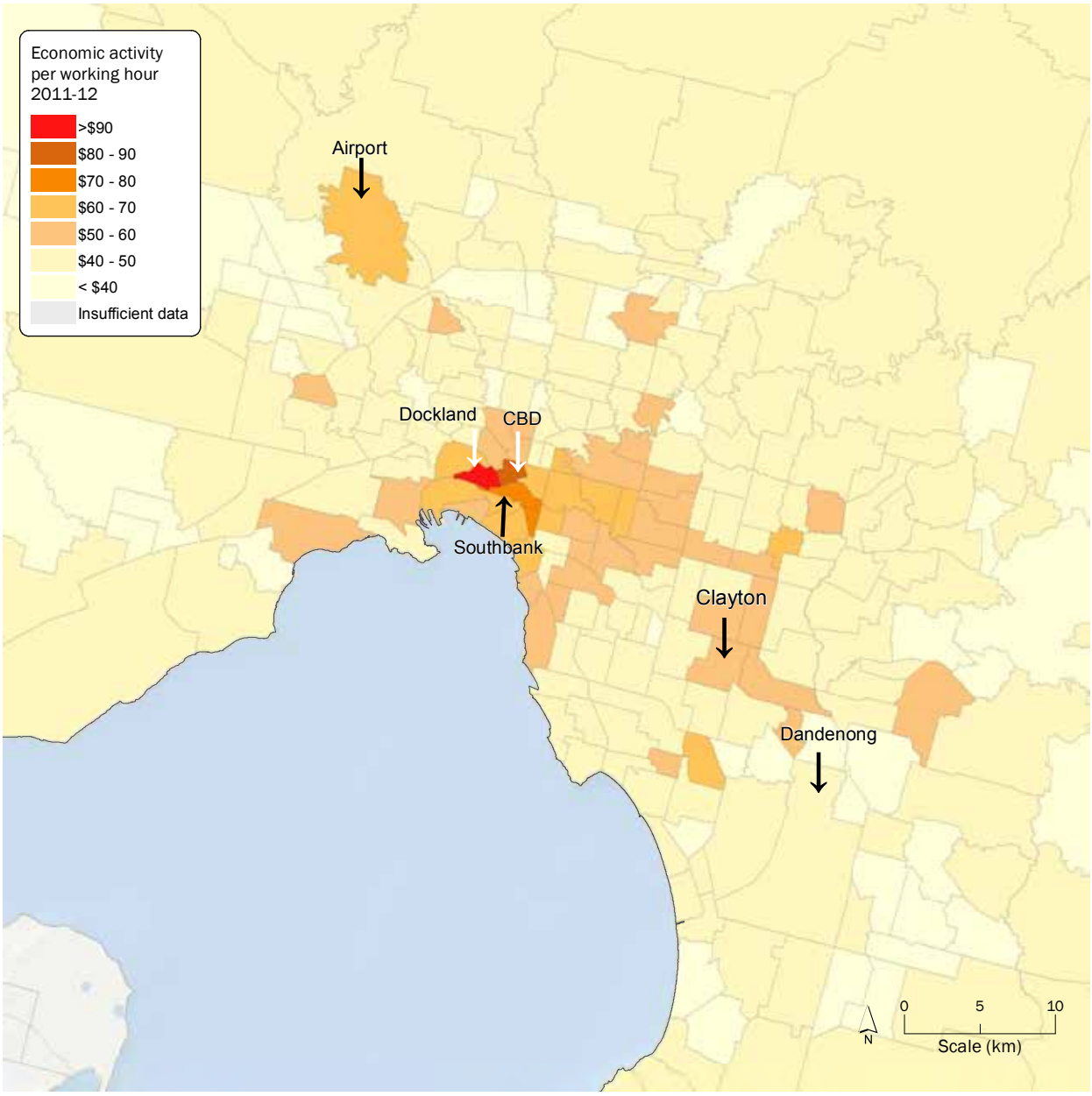
Thus the intensity of economic activity is much higher in dense urban locations (often, but not always, in CBDs), both in quantum and in terms of the productivity of individual workers, which in turn is reflected in higher wages. The varying productivity (calculated as dollars per person per hour) of Australia's major cities is illustrated spatially in the maps below, as discussed by Kelly and Donegan (2014).

Map 4.1 Sydney's productivity, 2011–12



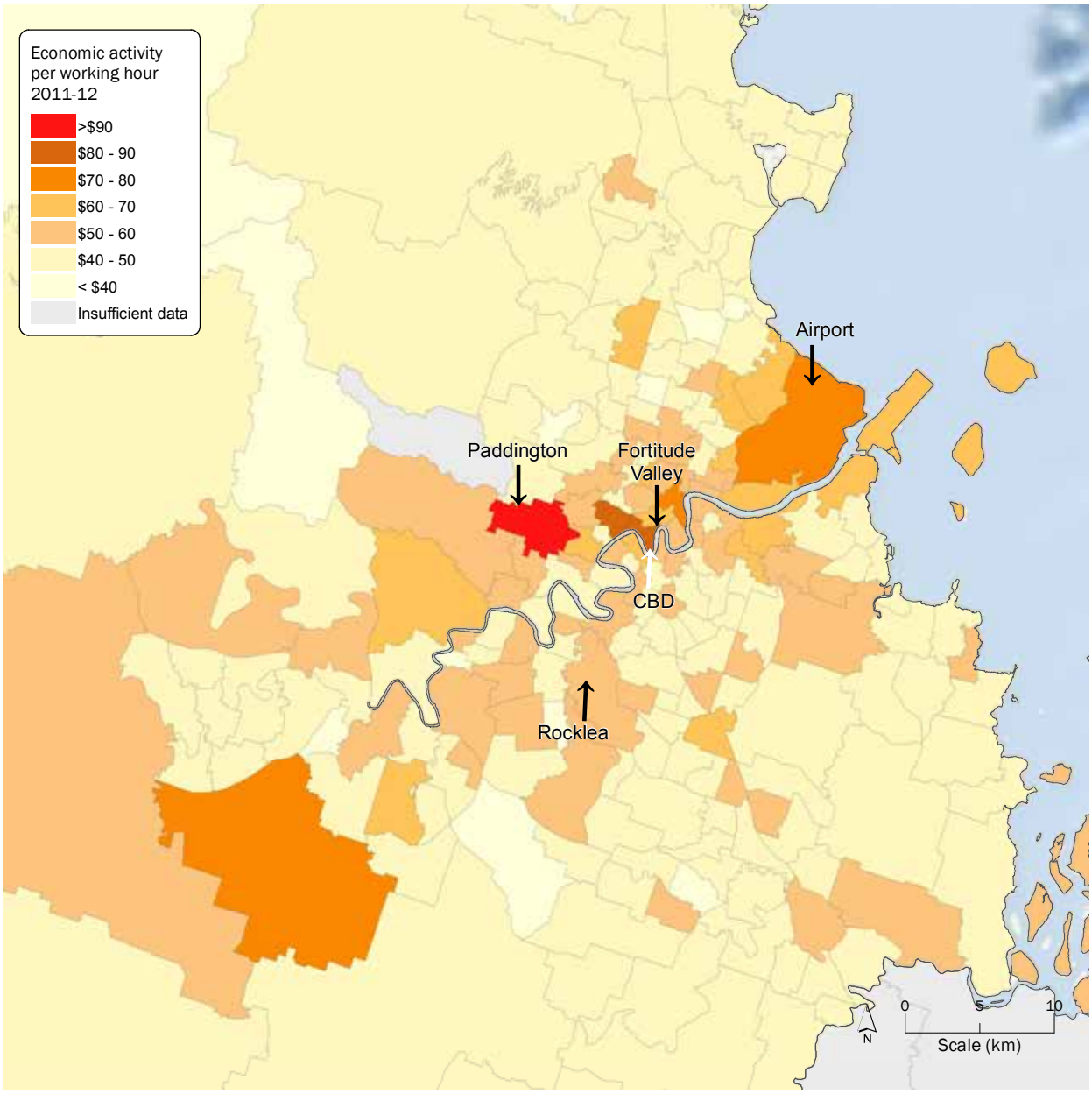
Source: Kelly and Donegan 2014.

Map 4.2 Melbourne's productivity, 2011–12



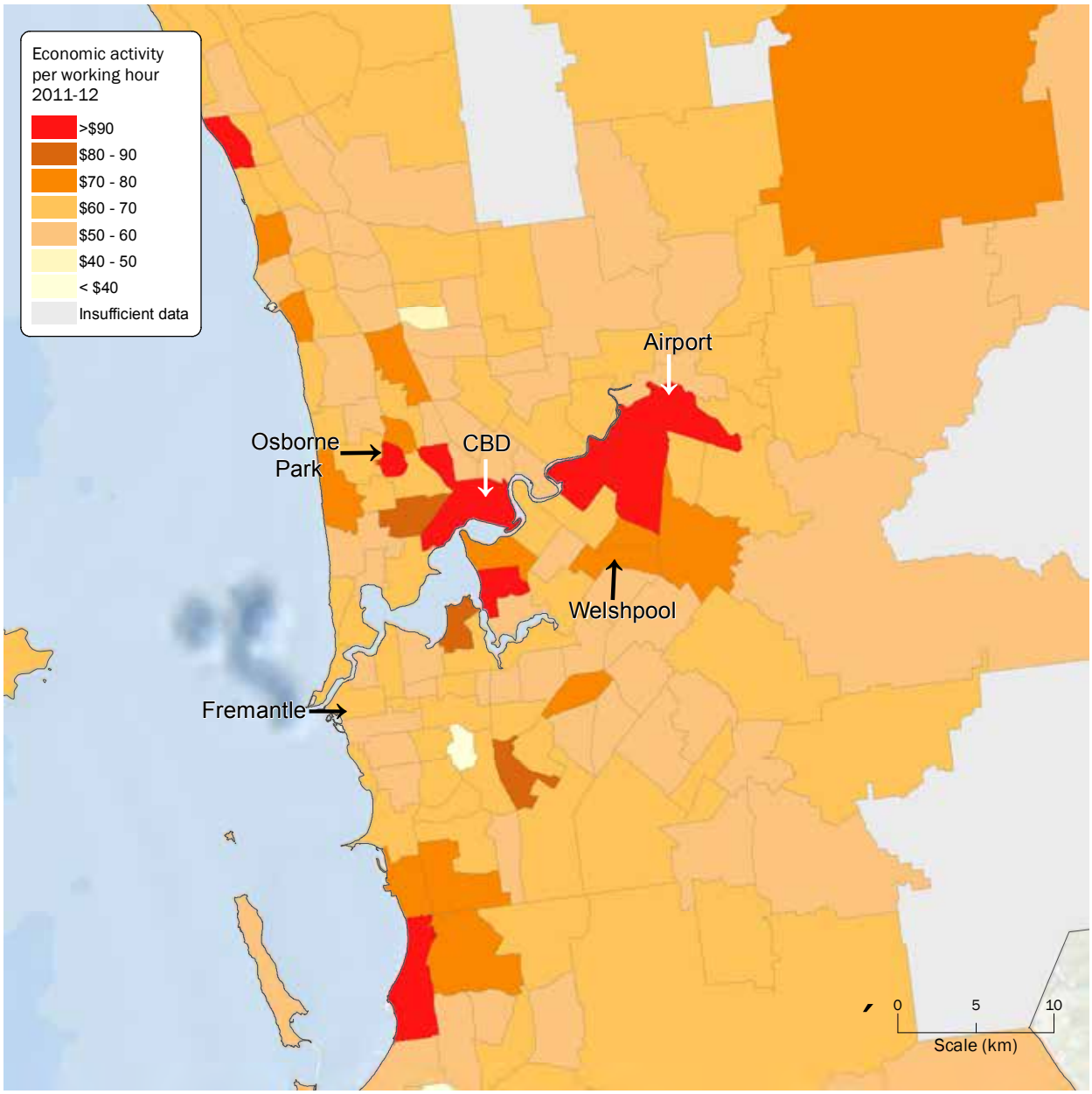
Source: Kelly and Donegan 2014.

Map 4.3 Brisbane's productivity, 2011–12



Source: Kelly and Donegan 2014.

Map 4.4 Perth productivity, 2011–12



Source: Kelly and Donegan 2014.

The above maps clearly illustrate the spatial dimension of productivity, with central city areas and the land surrounding airports producing substantially more economic activity per working hour than other areas.

Ensuring that Australia's most productive regions – the inner areas of its cities – remain unconstrained, efficient and productive is critical. With such dense economic activity occurring within these relatively small areas, even minor inefficiencies can have a major impact on Australia's national economy and remedying those inefficiencies can reap large economic benefits (PWC 2014).

The changing economy and employment structure

The infrastructure needs of Australian cities are evolving. The World Economic Forum considers labour market rigidity and transport infrastructure constraints as key contributors to Australia's relative decline from the 10th most competitive economy in 2003 to the 21st most competitive economy in 2013–14 (Schwab 2014). Furthermore, Infrastructure Australia estimates that infrastructure bottlenecks cost approximately 0.5 per cent of annual GDP and the value-add (economy-wide spending) attributable to infrastructure services was 13.3 per cent of GDP in 2011, over 70 per cent of which is transport–related (Infrastructure Australia 2008 and 2015).

Changes in economic geography have been paralleled by a settlement pattern that has often seen high population growth on the urban fringes. The result is a widening spatial divide between jobs and residents across many of Australia's cities, with significant implications for productivity growth.

The distinction between types of employment within Australia is important in understanding the cities' economies, as different jobs have varying spatial characteristics and demands. Broadly speaking, within cities (WAPC 2003, BITRE 2013):

- services such as finance and insurance, as well as professional services favour central locations;
- population-serving jobs, such as retail, education and personal services are more dispersed and tend to follow the distribution of population; and
- some industries, such as manufacturing, freight and logistics and wholesale locate in places that meet their specific infrastructure and land use needs.

These locational preferences are reflected in the growth of different industries across different parts of Australia's cities between 2001 and 2011 (BITRE 2013), as shown in Table 4.4.

Table 4.4 Main industry contributor to job growth

Sector of city	Main industry contributor to job growth
Inner	Property and business services in Melbourne, Brisbane and Perth. Finance and insurance in Sydney.
Middle	Health and community services in Sydney, Melbourne and Brisbane. Construction in Perth.
Outer	Health and community services in Sydney, Melbourne and Brisbane. Retail trade in Perth.

Source: BITRE 2013.

Urban economists theorise that the firms that choose to locate in the city centre do so because they draw benefit from being in proximity to suppliers, clients, staff and even competitors. This concept is called agglomeration and it has become a powerful theory in explaining the competition for scarce CBD real estate.

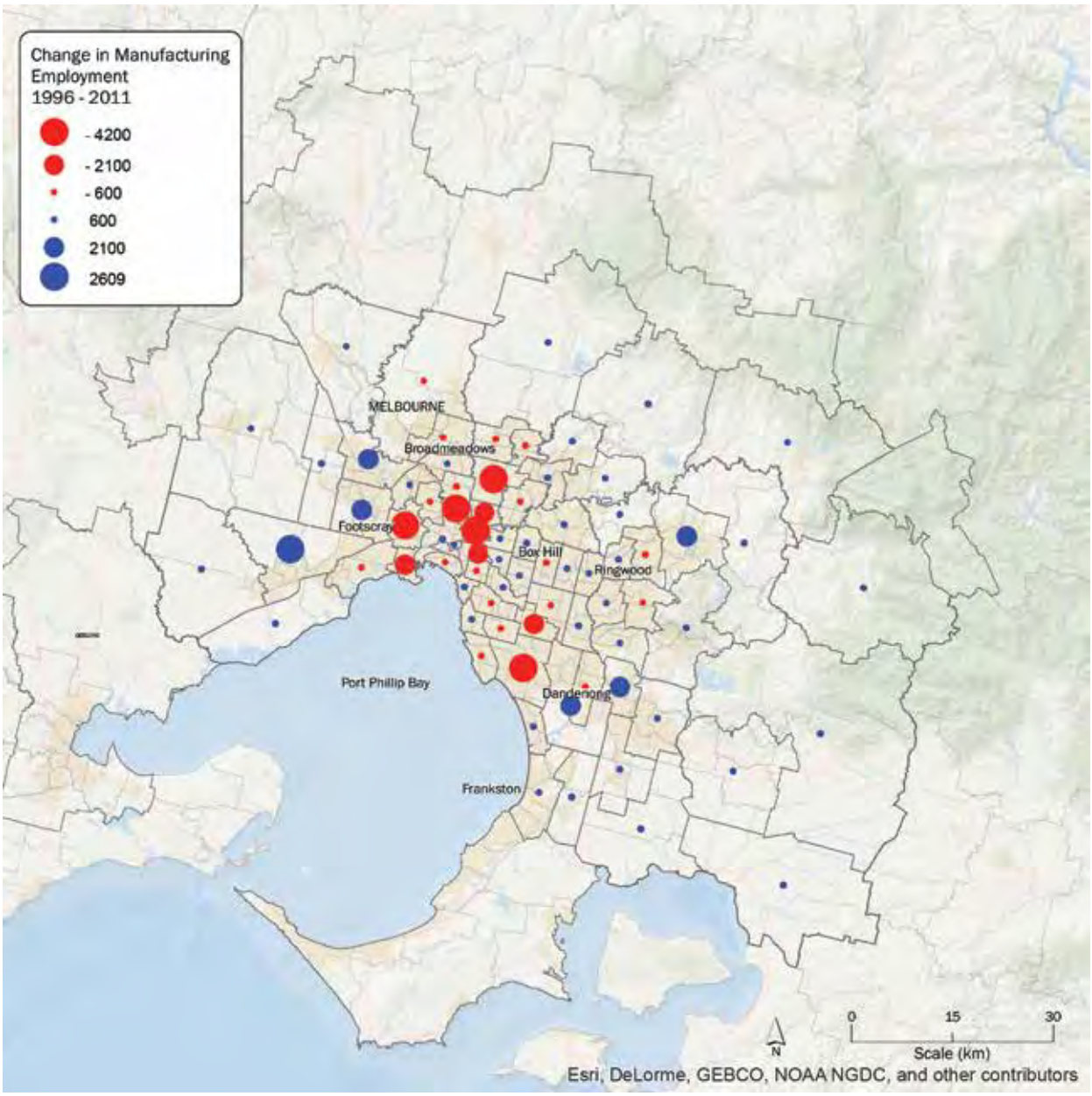
With different job types having differing spatial distributions across each of Australia's major cities, there is a heavy concentration of economic activity in the centre of cities, while the bulk of the city – the parts where most people live – have relatively low levels of economic activity (Kelly and Donegan 2014). Map 4.5 illustrates that professional services jobs have grown across Melbourne, but especially in its centre.

Map 4.5 Professional services jobs concentration in Melbourne's suburbs, 1996–2011

Source: SGS Economics & Planning 2014.

Paralleling the concentration of certain types of employment in the inner city since 1996, the middle suburbs have lost much of the traditional jobs base provided by manufacturing industries. This change in economic structure and its impact on the spatial distribution of jobs is illustrated in Maps 4.5 and 4.6, with Melbourne an example of a nationwide trend. The central city has seen significant growth in professional services employment (Map 4.5), while in Melbourne's middle suburbs, there has been a steady loss of a considerable number of manufacturing jobs since 1996 (Map 4.6). This change in economic geography reflects productivity differences across cities for different industries, as outlined in previous State of Australian Cities reports.

Map 4.6 Manufacturing jobs concentration in Melbourne's suburbs, 1996–2011



Source: SGS Economics & Planning 2014.

Employment change

With trends like that shown for Melbourne, city centres have increasingly become the single largest location of employment. Cities are home to fast-growing, high-productivity sectors that rely on the efficient functioning of cities to thrive. The social and economic geography of Australia's major cities has been changing significantly over the past few decades. Rapid technological advancements, market liberalisation and lower costs of transport, communications and computation have driven unprecedented global marketplace integration and are also changing cities. As shown in Table 4.5, the inner cities of Sydney, Melbourne, Brisbane and Perth are by far the most important single centres of employment.

Table 4.5 Employment clusters in the centres of cities and in selected suburban centres, 2011

Rank	Greater Sydney	Jobs	Greater Melbourne	Jobs	Greater Brisbane	Jobs	Greater Perth	Jobs
1	Sydney–Haymarket–The Rocks	251,452	Melbourne	186,129	Brisbane City	116,133	Perth City	134,275
2	North Sydney – Lavender Bay	43,021	Dandenong	54,232	Rocklea – Acacia Ridge	24,004	Subiaco – Shenton Park	22,062
3	Parramatta–Rosehill	42,625	Southbank	33,992	South Brisbane	22,759	Osborne Park Industrial	20,977
4	Macquarie Park – Marsfield	38,627	Docklands	32,037	Fortitude Valley	20,109	Welshpool	17,946
5	Pyrmont–Ultimo	29,691	Richmond	29,975	Paddington–Milton	16,759	Nedlands–Dalkeith–Crawley	17,713

Source: BITRE analysis of ABS Census of Population and Housing place of work data for 2011, extracted from Tablebuilder. BITRE 2013.
Notes: Based on 2011 SA2 boundaries. Excludes undefined place of work in capital city.

Between 2001 and 2011, Australia's CBD's and inner suburbs saw significant jobs growth. Of the employment centres located in the middle and outer suburbs of Australia's cities, jobs growth has been high in Sydney's Ryde (which houses Macquarie Park commercial centre).This area is ranked 4th in Table 4.5 above.

Additionally, strong jobs growth has occurred near the airports of Australia's major cities, with jobs growth in Belmont, Hume–Craigieburn and Pinkenba – Eagle Farm areas attributed to the activities of the respective airports (BITRE 2013).

The Progress in Australian Regions – Yearbook 2014 shows that in the decade to 2011 Sydney City and the Inner South employed residents grew by over 1 quarter – an increase of 38,000 persons – by comparison, in Sydney's Inner West and South West, a much lower 14 per cent and 11 per cent more residents were in employment compared with 2001. The Gold Coast experienced the second highest increase of employed persons with an increase of 73,800 persons and Newcastle-Maitland recorded the largest increase in the employment rate of all the major cities, 4.6 percentage points (DIRD 2014).

Table 4.6 Fastest-growing areas (centres of cities), 2001–2011

Rank	Inner sector SLAs	City	Job growth	Middle and Outer sector SLAs	City	Job growth
1	Southbank–Docklands	Melbourne	38,500	Ryde	Sydney	16,800
2	Sydney Inner	Sydney	30,300	Swan	Perth	15,600
3	Perth Inner	Perth	27,100	Hume–Craigieburn	Melbourne	11,300
4	Melbourne Inner	Melbourne	26,800	Belmont	Perth	10,900
5	Melbourne Remainder	Melbourne	14,700	Wyndham North	Melbourne	10,500
6	Sydney West	Sydney	12,300	Cockburn	Perth	10,200
7	City Inner	Brisbane	11,000	Pinkenba – Eagle Farm	Brisbane	10,100
8	South Brisbane	Brisbane	10,500	Rockingham	Perth	9,700

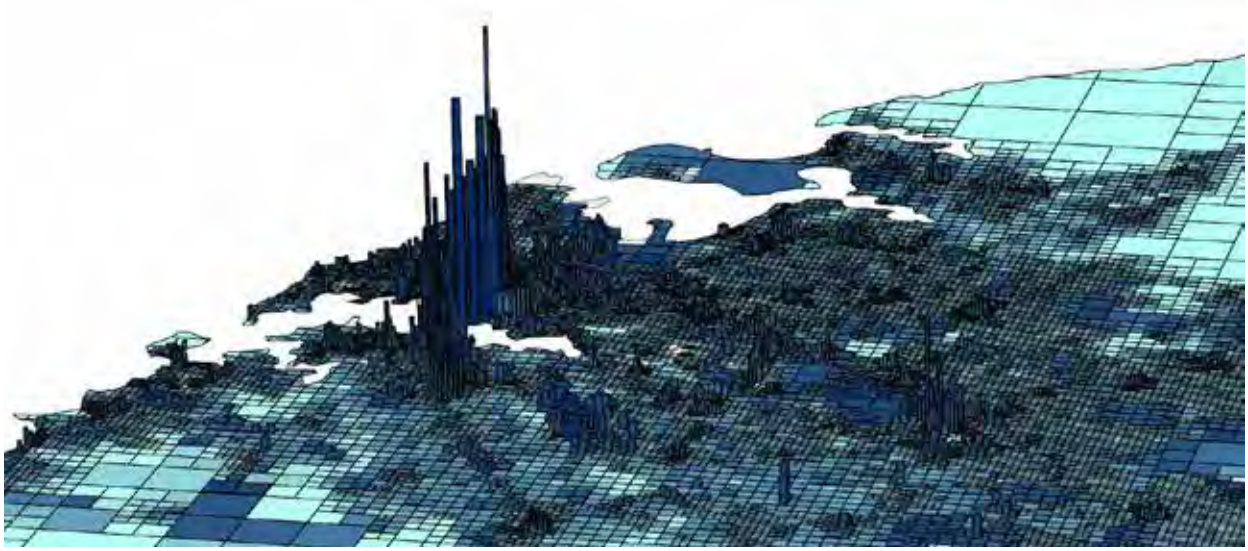
Source: BITRE analysis of ABS Census of Population and Housing place of work data for 2001 and 2011, and BTS online journey to work tabulations for 2001 (table 19), BITRE 2013. Note: Covers SLAs in Sydney, Melbourne, Brisbane and Perth Statistical Districts only. 2001 and 2011 data converted to 2006 ASGC boundaries.

Major cities within Australia have experienced a large increase in the number of jobs in knowledge-intensive industries – industries where innovation and creativity are central to competitive advantage. The growth of these industries has a distinct spatial element, as they tend to concentrate in central areas of cities. The manufacturing and retail jobs that had previously provided the backbone of overall jobs growth were generally located in the suburbs (Department of Sustainability and Environment 2007).

The concentration of jobs in the city centre and specialist business parks, including those in close proximity to airports, reflects an increasing need of businesses to locate in dense urban environments, despite the high price premiums attached to these locations. As O'Connor and Rapson (2003) note, 'the central region has maintained its dominance of new economy employment but has relinquished some of the retail, medical and other services it once provided to suburbanites'.

Maps 4.7 and 4.8 show the largest economic outputs of our 2 largest cities spatially.

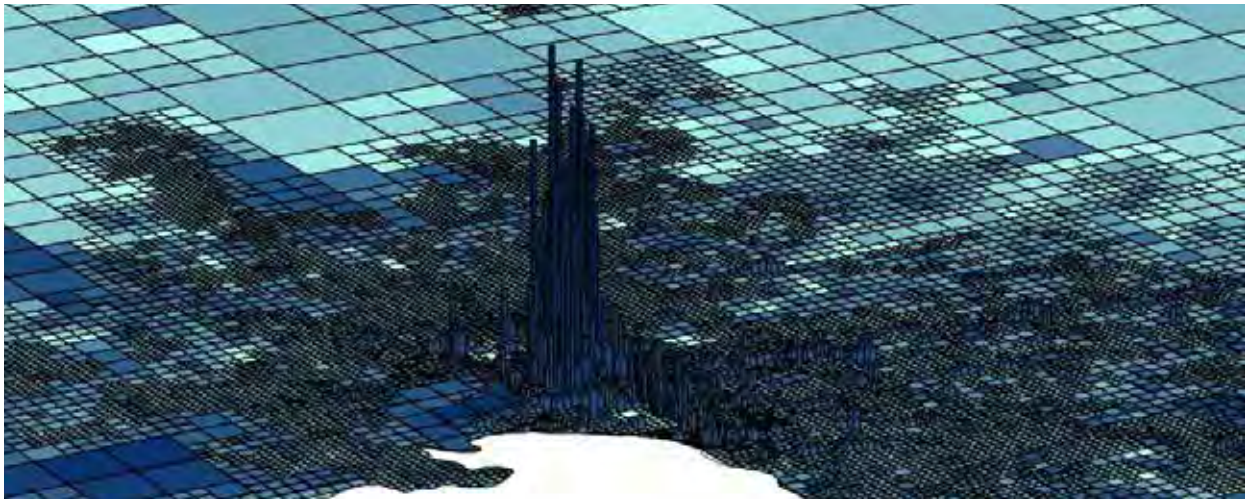
Map 4.7 Economic output density, Sydney



Source: Map supplied by PwC, developed using PwC's Geospatial Economic Model v. 1.0, April 2014.

The Progress in Australian Regions – Yearbook 2014 shows that Sydney City and Inner South and the Eastern Suburbs have a high density of knowledge-intensive industry workers (as high as 44 per cent of workers), while in North Sydney and Hornsby almost half of workers (49.3 per cent) are classified as employed in knowledge-intensive industries. Melbourne has a similar percentage of people employed in knowledge-intensive industries (36.1 per cent), while the other capital cities have a lower concentration of these workers (DIRD 2014, Table C 3.3.1).

Map 4.8 Economic output density, Melbourne



Source: Map supplied by PwC, developed using PwC's Geospatial Economic Model v. 1.0, April 2014.

The business services sector, which includes financial and insurance services, professional, scientific and technical services and real estate services, has grown as a share of the Australia's national economy (GDP) from 5 per cent in 1961 to almost 20 per cent in 2011. The economic reforms of the 1980s facilitated a rapid reconfiguration of the economy towards knowledge-intensive services. This sector contains many of the knowledge-intensive jobs that tend to cluster in cities. The growth of this sector has centred on Australia's major cities, with approximately four-fifths of these types of jobs located in Sydney, Melbourne, Brisbane, Adelaide and Perth (ABS 2014). This trend was also apparent in non-capital major cities, for example employment in knowledge-intensive industries in Cairns and Gold Coast-Tweed Heads increased by over 3 percentage points from 2006 to 2011 (DIRD 2014).

Ports

One of the most striking aspects of the economic restructuring, not only within Australia but also more broadly across the global economy, is the dramatic increase in trade. Ports and the transport networks that support them are enablers of the economic growth facilitated through increased trade and their performance greatly impacts on many sectors of the economy across a broad geographical region. The worldwide separation of place of production from place of consumption, coupled with the rapid development of many countries, has resulted in massive and sustained increases in both bulk and containerised cargo shipping.

Resource exports are Australia's highest-value export. Ports that export bulk mining resources and agriculture products play an important role in the national economy that occurs largely outside cities (the exceptions being Townsville, Newcastle and Wollongong). Trade in bulk goods often involves a supply chain stretching back into regional hinterlands. While there is a sustained increase in traffic in urban ports, as demonstrated in Figures 4.9 and 4.10, the importance of regional ports cannot be overstated. Ports like Port Hedland and Dampier have a significant impact on Australia's economy and productivity. The volume of freight through Newcastle port increased by 53.1 million tonnes from 95.6 million tonnes in 2008-09 to 148.7 million tonnes in 2012-13, the highest increase in volume of freight through an Australian port in a major urban area.

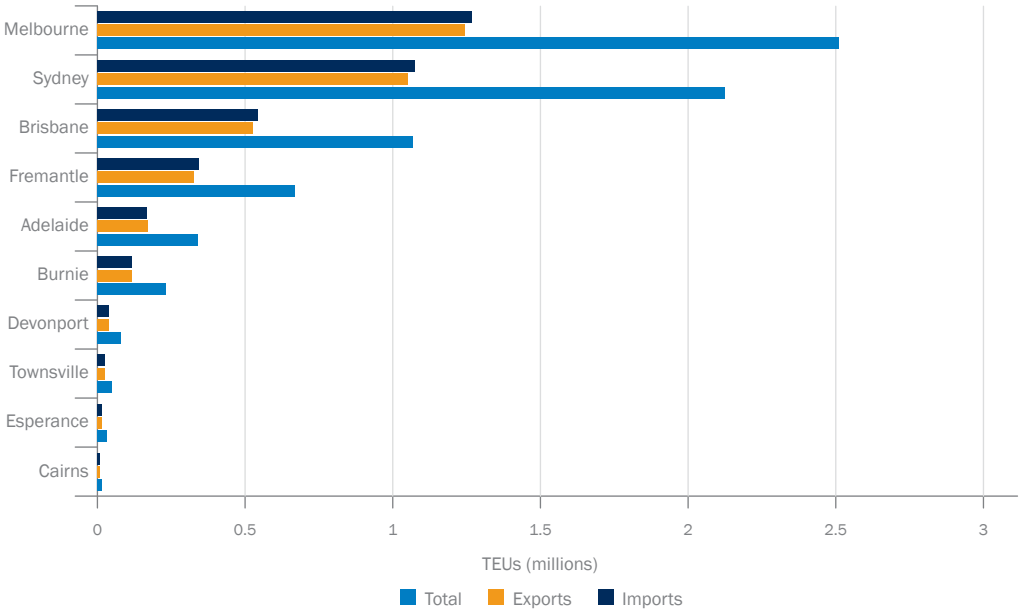
However, in the urban context, trade competitiveness is heavily dependent on effective access to international shipping services and port networks (UNCTAD 2013). According to the 2011 world port rankings, Melbourne is the 47th biggest port for container traffic globally, Sydney is 62nd and Brisbane is 99th.

The role of urban ports

The volume of Australia's total containerised trade is forecast to increase by almost 5 per cent a year over the next 2 decades, to reach 18.7 million TEUs[1] in 2031–32 (BITRE forthcoming).

In further considering the role of ports in major cities, it is evident that the biggest container ports in Australia have grown even bigger in recent times, with the Port of Melbourne projected to be handling 5.5 million containers per year by 2025, causing significant implications for landside freight routes. In addition, Port Botany (Sydney) forecasts it will handle 7 million containers per year by 2030. Figure 4.9 shows the total number of shipping containers, both full and empty passing through the top 10 Australian ports.

Figure 4.9 Top 10 Australian ports by highest number of shipping containers (full and empty), 2012–13

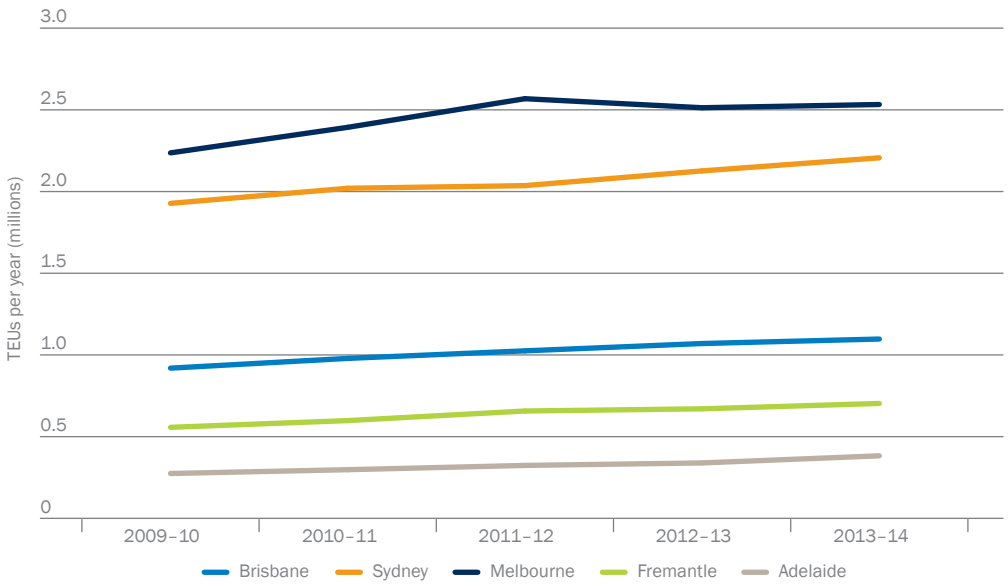


Source: Ports Australia 2013.

[1] Twenty-foot Equivalent Unit (TEU) is the measurement of cargo capacity commonly used to describe the capacity of container ships based on the volume of a 20-foot-long container.

The growth in container trade has mainly been felt at Australia's major urban ports, with the Port of Melbourne, Port Botany (Sydney), Port of Brisbane, and Fremantle Port (Perth) all recording a substantial growth in container movements (see Figure 4.10). Over the last decade, the ports of Melbourne, Adelaide, Fremantle and Sydney recorded an average growth rate of between 4.5 and 5.5 per cent (BITRE 2014b). This continued growth will have impacts on the transport systems within cities as the containers are transported and unpacked; their contents redistributed; containers being returned or filled, chiefly within cities. The additional freight task and the impacts of more freight on the roads and railways are discussed in the **Infrastructure and Transport** chapter.

Figure 4.10 Growth in container trade at Australia's largest ports, 2009–10 to 2013–14



Source: BITRE, Waterline (various years).

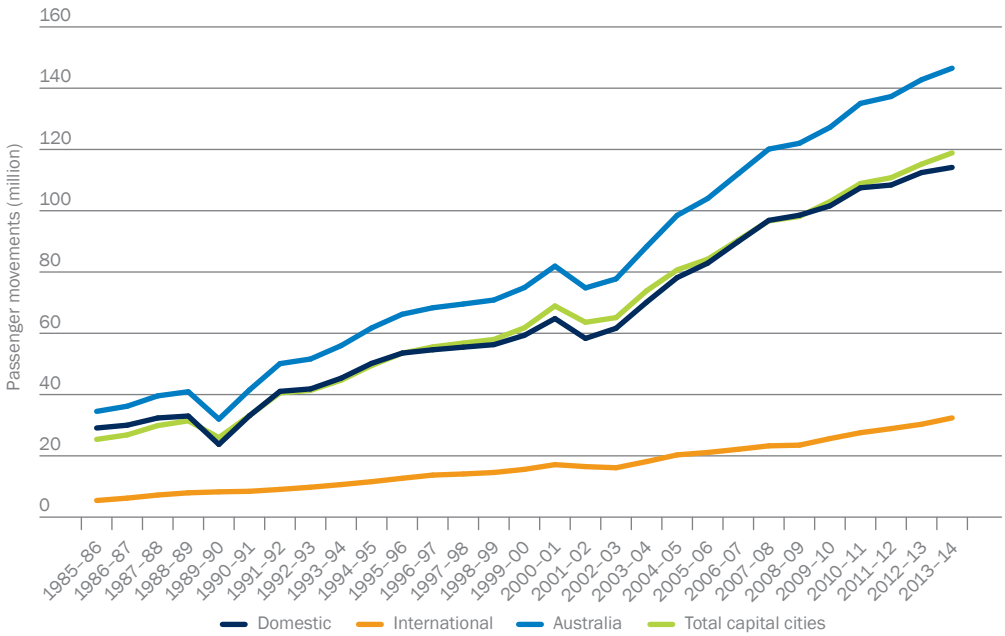
The role of airports

Unlike ports, where commodities move in significant volumes through many non-major cities (such as Dampier and Port Hedland), Australia's international airports are all located in major cities. While the majority of Australian international trade once historically relied on seaborne transport through ports, the movement of people, high-value goods and services through airports has become integral to modern trade.

As Australian cities grow, and firms and the individuals within them increasingly specialise, work-related air travel is becoming increasingly common. This means that easy access to airports is an integral consideration for businesses. The total number of passengers moving through Australia's airports has increased by an average of almost 5 per cent per year in the last 20 years, rising to 146.5 million in 2013–14 (BITRE 2014a). Growth in the number of passenger movements has been particularly strong since the early 2000s.

Growth in the number of domestic passenger movements has made up the majority of this, although the number of international passenger movements has also grown significantly (see Figure 4.11).

Figure 4.11 Air passenger movements through all Australian airports, 1985–2013



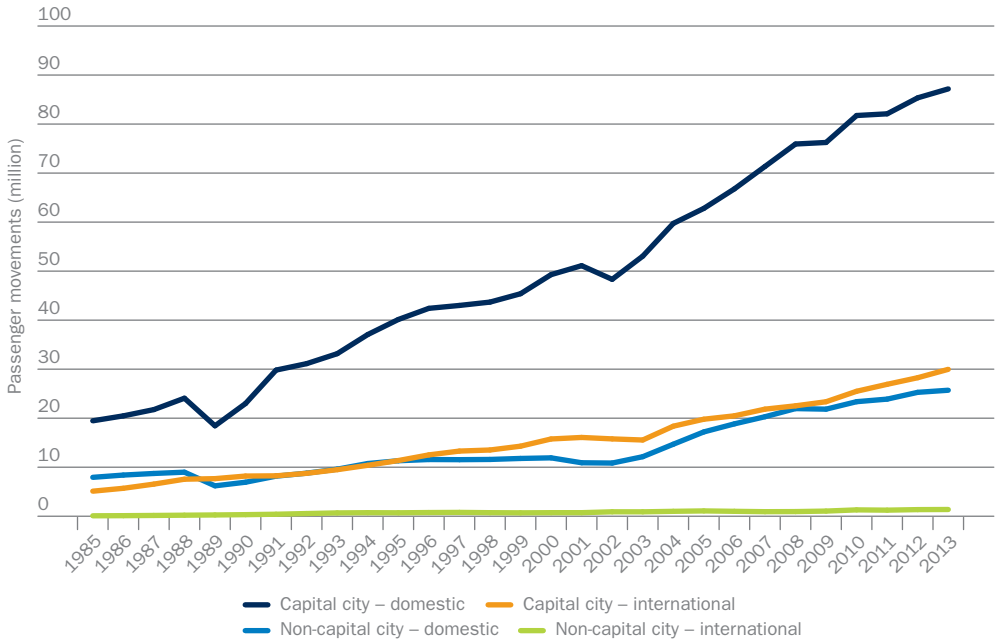
Source: BITRE 2014a.

This strong year-on-year growth in passenger numbers is forecast to continue, with the number of domestic and international passenger movements projected to increase by 3.3 and 4.9 per cent respectively per year to 2031 as shown in table 4.7.

At this rate, the number of passengers passing through Australia's airports is forecast to more than double by 2031 compared with 2010–11 figures. Australia's airports may therefore need to accommodate the movement of 207 million domestic passengers and 72 million international passengers each year (BITRE 2012).

Australia's biggest and busiest airports are in capital cities, with these major airports responsible for the vast majority of passenger movements both internationally and domestically (Figure 4.12).

Figure 4.12 Air passenger movements through capital city airports, 1985–2013



Source: BITRE 2014a.

Sydney Airport is currently, and forecast to remain, Australia's busiest airport. By 2031, Sydney Airport is forecast to have 72 million passenger movements annually, followed by Melbourne, Brisbane, Perth and Adelaide. Growth is anticipated to be fastest in Perth, Brisbane and Darwin (Table 4.7).

Table 4.7 Air passenger movements by airport, actual and projected, 2010–11 to 2030–31

	Number of movements			Annual average growth rate	
Airport	Actual 1991–92 (millions)	Actual 2010–11 (millions)	Forecast 2030–31 (millions)	Actual 1991–92 to 2010–11 (per cent)	Forecast 2010–11 to 2030–31 (per cent)
Capital city airports					
Sydney	15.2	35.8	72.0	4.6	3.6
Melbourne	10.4	28.0	60.4	5.4	3.9
Brisbane	6.7	19.9	45.1	5.9	4.2
Adelaide	3.0	7.3	13.5	4.7	3.1
Perth	3.1	10.9	25.7	6.9	4.4
Hobart	0.7	1.9	3.5	5.6	3.0
Darwin	0.6	1.8	4.2	6.3	4.2
Canberra	1.4	3.2	6.1	4.7	3.3
All capital city airports	41.0	108.9	230.5	5.3	3.8
Non-capital city airports					
Newcastle	0.1	1.2	2.2	17.9	3.1
Cairns	1.8	3.9	8.0	4.1	3.7
Gold Coast	1.5	5.5	13.1	7.1	4.4
Townsville	0.5	1.6	3.4	6.6	3.7
Launceston	0.5	1.2	2.0	5.0	2.7
5 airports total	4.3	13.4	28.7	6.1	3.9
Other airports	5.3	12.8	20.1	4.8	2.3
All non-capital city airports	9.6	26.2	48.8	5.4	3.2
All airports	50.6	135.1	279.2	5.3	3.7

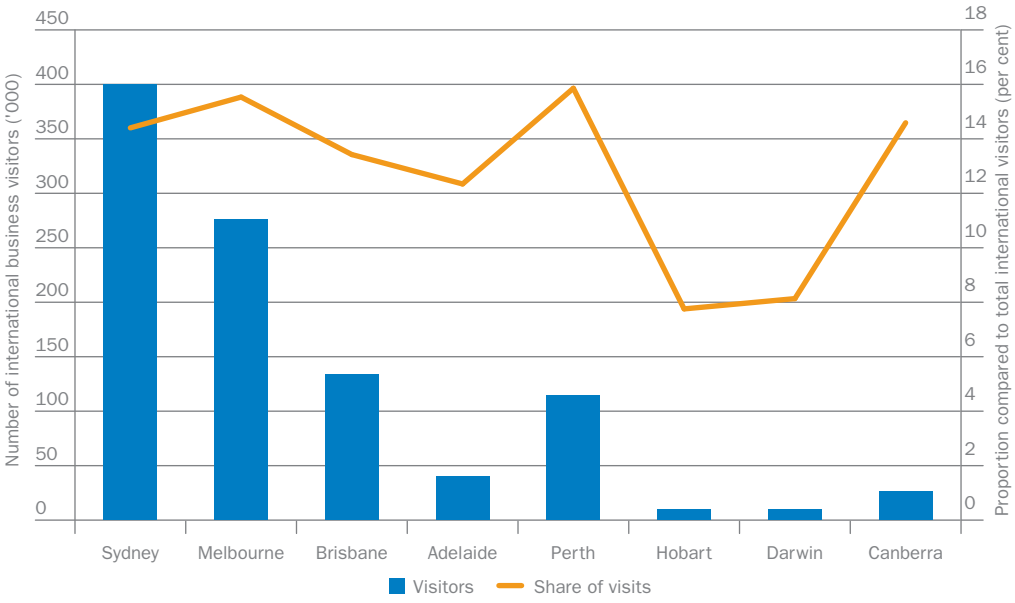
Source: BITRE 2012.

Some cities see a higher proportion of business travelers amongst their international visitors. As shown in Figure 4.13, there were an estimated 400,000 international business travellers to Sydney in 2012–13 compared with other capital cities like Melbourne (276,000) and Brisbane (133,000).

However, as a proportion of the total number of international visitors travelling to Sydney, business travellers represented an estimated 14 per cent of visitors, while the comparable proportion of business travellers to Melbourne and Perth in 2012–13 is higher at an estimated 16 per cent. The estimates for Hobart and Darwin had the lowest proportion of international business travellers to capital cities, with only 8 per cent of visitors travelling for business.

Cairns had over double the rate of international visits per 1,000 residents of any non-capital city in 2012. The largest relative increase in international visitors, of 68 visits per 1,000 residents, was in Bendigo, 2006-2012.

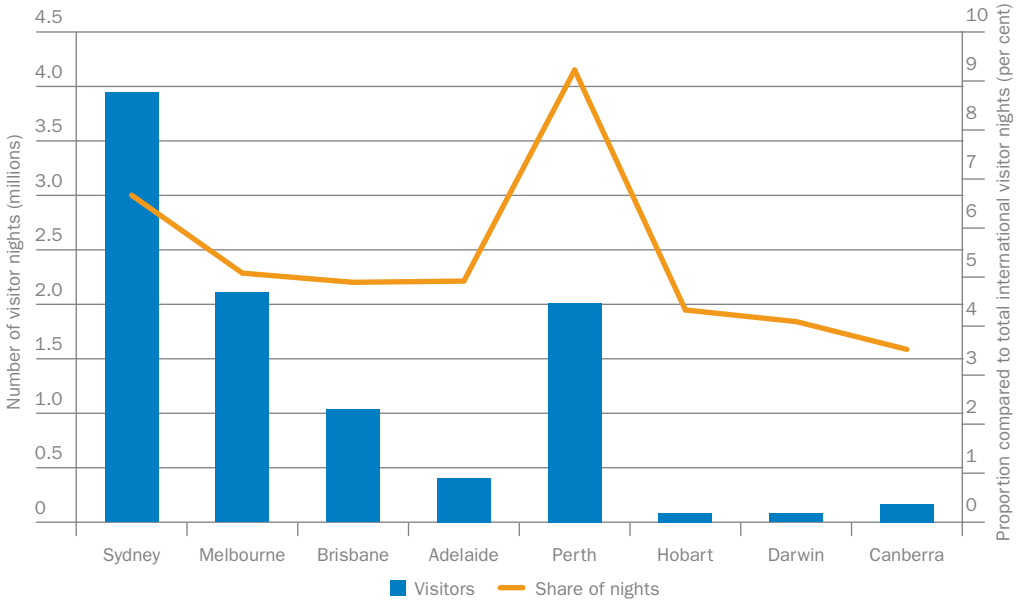
Figure 4.13 Estimated number and proportion of international business visitors by capital city, 2012–13



Source: Tourism Research Australia 2013.

Similar to the estimate for overall number of visitors, in 2012–13 the survey of visitors to Sydney estimated a considerably higher number of international business visitor nights compared with other capital cities (almost 4 million), as shown in Figure 4.14. Melbourne, with just over an estimated 2 million international business visitor nights, and Perth, with an estimated 2 million international business visitor nights, were the second and third highest capital cities respectively.

Figure 4.14 Estimated number and proportion of international business visitor nights by capital city, 2012–13



Source: Tourism Research Australia 2013.

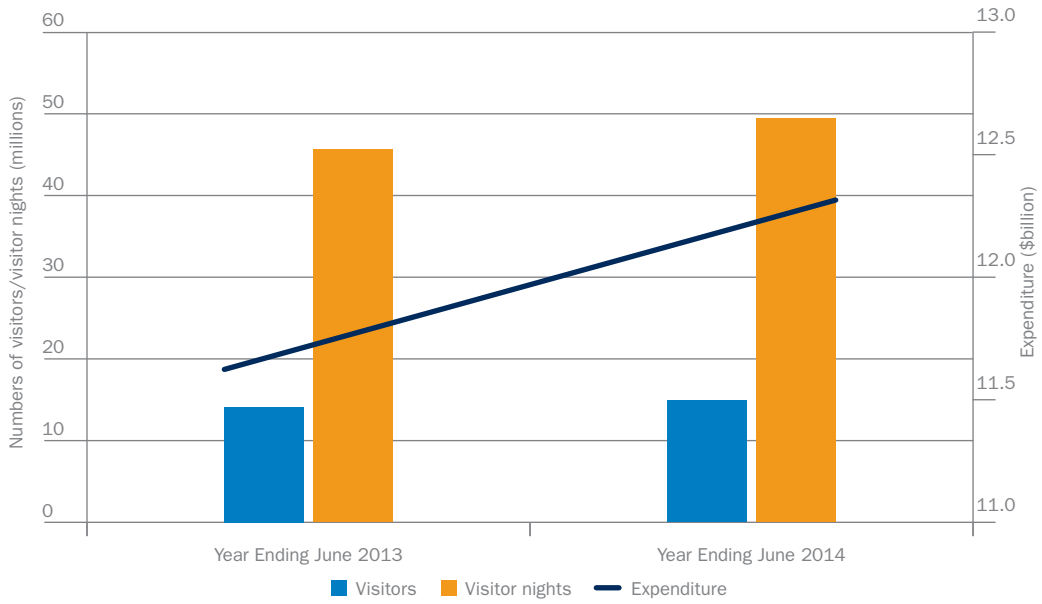
The role of domestic business travellers

To the year ending June 2014, based on surveys where passengers indicated their main reason for travel was business, it was estimated that there were approximately 14.9 million domestic trips undertaken for business purposes. This represents an increase on the figure for the year ending June 2013 (up from approximately 14.1 million).

In terms of number of visitor nights, for the year ending June 2014, as shown in Figure 4.15, there were an estimated 49.4 million business visitor nights for Australian residents travelling for business. The total expenditure of these individuals whilst travelling for business was an estimated $12.3 billion, an increase compared with the year ending June 2013 (45.6 million business visitor nights and $11.6 billion in expenditure respectively).

This would indicate that, in a similar way to international business travellers, domestic business travellers create substantial economic activity during their trips, be they intrastate or interstate.

Figure 4.15 Estimated number of domestic business travellers, (overnight visitors, visitor nights and expenditure), 2013-2014



Source: Tourism Research Australia 2014.

There are quite apparent differences between the states and territories in terms of the composition of their domestic business travellers. For example, in New South Wales and Victoria, business visitors are estimated to account for approximately 17 per cent of the total number of domestic visitors overall. In comparison, within the Northern Territory and the Australian Capital Territory, over 30 per cent of domestic visitors indicated in the survey that they are travelling for business.

The estimate of the highest number of business-related trips in the year ending June 2014 occurred in New South Wales (4.5 million visitors). Around 57 per cent of this figure is intrastate travel. This is similar to the estimate for Victoria, where the comparable intrastate travel figure is 55 per cent.

In Queensland business travel accounted for 69 percent and for Western Australia it was 67 per cent. This may reflect the differing levels of activity in each state's economy, and business travel associated with the resources industry.

Conclusion

While it can be argued that globally competitive export-orientated industries are a significant component of national prosperity, the bulk of the economic activity and productivity drivers of the economy occur within the cities that are the gateways to the global market. This gateway function is facilitated through the application of knowledge-intensive processes benefiting from agglomeration economies and the capacity, strength and efficiency of city airports and seaports.

Increasing the productivity of cities helps to improve the productivity of the whole country. Transport infrastructure can play a critical role in productivity increases for urban economies through improving accessibility to global and national markets. Seaports and airports have a crucial role to play as the gateways to Australian cities and the Australian economy for trade and travellers.

It is clear that business and knowledge sector employers favour central city locations due to strong global linkages facilitated through access to these international gateways; the airports and ports. In addition, the freight task is forecast to grow significantly in the coming decades with commensurate pressure on the landside transport infrastructure in cities where many freight movements originate and terminate.

It is also clear that the distribution of jobs across a city is not even, both in terms of the number of jobs and the type of employment. There is a marked spatial distribution in industry employment structures in cities with population-serving jobs being more dispersed and tending to follow where population is growing. Changes in the economic structures in the city and the clustering of higher-paying and more productive knowledge sector jobs in the city centre are in stark contrast to the relatively low levels of economic activity further from the CBD, in the places where many people live. The **Human Capital and Labour** chapter explores these issues in more detail.

Chapter 4 references

Abel J, Dey I and Gabe T 2011, Productivity and the density of human capital, Federal Reserve Bank of New York Staff Reports, No. 440, March 2010, revised September 2011.

Ahrend, R 2013, 'What makes cities (more) productive?', presentation to the AHURI National Urban Policy Conference 2013, http://www.nupc.com.au

Ahrend, R et al. 2014, What Makes Cities More Productive? Evidence on the Role of Urban Governance from 5 OECD Countries, OECD Regional Development Working Papers, No. 2014/05, OECD Publishing http://dx.org./10.1787/5jz432cf2d8p-en, accessed 30 September 2014.

Australian Bureau of Statistics (ABS) 2013a, Australian System of National Accounts, 2012–13, cat. no. 5204.0, Canberra.

ABS 2013b, *Australian National Accounts: State Accounts, 2012–13*, cat. no. 5220.0, Canberra.

ABS 2013c, *Estimates of Industry Multifactor Productivity*, cat. no. 5260.0.55.002, Canberra.

ABS 2014, *Labour force, Australia, Detailed Quarterly 2014*, cat. no. 6291.0.55.003, Canberra.

Australian Government 2010, *Australia to 2050: Future challenges – intergenerational report 2010*, Commonwealth of Australia, Canberra.

Bureau of Infrastructure Transport and Regional Economics (BITRE) 2012, *Air passenger movements through capital and non-capital city airports to 2030–31*, Report 133, Commonwealth of Australia, Canberra.

BITRE 2013, *Population growth, jobs growth and commuting flows – a comparison of Australia's 4 largest cities*, Department of Infrastructure and Regional Development Research Report 142, Commonwealth of Australia, Canberra.

BITRE 2014a, Airport Traffic Data, https://www.bitre.gov.au/publications/ongoing/airport_traffic_data.aspx (accessed 19 December 2014).

BITRE 2014b, *Ports: Job generation in the context of Regional Development*, Department of Infrastructure and Regional Development Information Sheet 56, Commonwealth of Australia, Canberra.

BITRE [various dates], *Waterline*, Statistical Reports 50 – 55, 2012 -2014, Commonwealth of Australia, Canberra.

Bureau of Resources and Energy Economics (BREE) 2014, *Resources and energy quarterly* September Quarter 2014, Commonwealth of Australia, Canberra.

Butlin, N 1985, *Australian National Accounts 1788–1983*, Source papers in Economic History, No. 6, Department of Economic History, Australian National University, Canberra.

Department of Foreign Affairs and Trade 2013, *Australia's trade in goods and services 2013*, http://dfat.gov.au/publications/tgs/index.html (accessed 13 July 2014).

Department of Industry 2013, *Australian Innovation System Report 2013*, Commonwealth of Australia, Canberra.

Department of Infrastructure and Regional Development (DIRD) 2014, *Yearbook 2014 – Progress in Australian Regions*, Commonwealth of Australia, Canberra.

Department of Sustainability and Environment (VIC) 2007, Melbourne Atlas, Commonwealth of Australia, Melbourne.

DIT 2013, *State of Australian Cities 2013*, Commonwealth of Australia, Canberra.

Enright, M and Petty, R 2013, *Australia's Competitiveness: From Lucky Country to Competitive Country*, Wiley & Sons, Singapore.

Infrastructure Australia 2008, *A Report to the Council of Australian Governments*, Commonwealth of Australia, Sydney.

Infrastructure Australia 2015, *Australian Infrastructure Audit Report Vol 1*, Commonwealth of Australia, Canberra, http://www.infrastructureaustralia.gov.au/policy-publications/publications/files/Australian-Infrastructure-Audit-Volume-1.pdf [accessed 9 July 2015].

Infrastructure Partnerships Australia 2012, *Rethinking cities: a strategy for integrated infrastructure*, IPA and ARUP, Sydney.

Kelly, JF 2013, *Productive cities: opportunity in a changing economy*, Grattan Institute, Carlton, Vic.

Kelly, JF and Donegan, P 2014, *Mapping Australia's economy: Cities as engines of prosperity*, Grattan Institute, Carlton, Vic.

McKinsey 2014, *Compete to prosper: Improving Australia's global competitiveness*, McKinsey Australia.

O'Connor, K and Rapson, V 2003, 'Employment in city and suburban Melbourne: the changing relationship', *People and Place* 11, pp. 41–52.

Organisation for Economic Co-operation and Development (OECD) 2012, *Towards a more open trading system and jobs rich growth*, http://www.oecd.org/trade/50452757.pdf (accessed 13 July 2014).

OECD 2014, OECD.StatExtracts database (accessed 1 July 2014).

Ports Australia 2013, Containerised Trade in TEU for 2012/13, http://www.portsaustralia.com.au/aus-ports-industry/trade-statistics/ (accessed 30 May 2014).

Productivity Commission 2009, *Australia's Productivity Performance,* submission to the House of Representatives Standing Committee on Economics, Commonwealth of Australia, Canberra.

PricewaterhouseCoopers (PWC) 2014, *Australia uncovered – a new lens for understanding our evolving economy*, PwC Australia.

Schwab, K (ed.) 2014, *The Global Competitiveness Report 2013–14*, World Economic Forum, Geneva.

SGS Economics & Planning 2014, *Australian Cities Accounts, 2012–13*, SGS Economics and Planning Pty Ltd Australia.

Tourism Research Australia 2013, *Regional tourism profiles 2012–2013*, http://www.tra.gov.au/ (accessed 15 September 2014)

Tourism Research Australia 2014, *Travel by Australians*, National Visitor Survey, September, Austrade, Commonwealth of Australia, Canberra.

Western Australian Planning Commission (WAPC) 2003, *Greater Perth economy and employment*, Discussion Paper No. 3, WAPC, Perth.

World Trade Organization (WTO) 2013, World Trade Report 2013: factors shaping the future of world trade, WTO Publications, Geneva.

WTO Statistical Database 2014. http://www.wto.org/english/res_e/statis_e/data_pub_e.htm (accessed 21 August 2014).

United Nations Conference on Trade and Development (UNCTAD) 2013, *World Investment Report 2013*.