A Tale of Three Cities: Labour and Housing Market Development in a Post-Industrial Era

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ABSTRACT:

According to Sassen (1991) some cities are becoming post-industrial production sites because of comparative advantages in terms of efficiency of their infrastructure, the international connectedness of their city economies, the presence of a workforce with expertise in knowledge-intensive activities and an agglomeration of 'new economy' firms. The global city literature postulates that economic restructuring and integration within global cities is accompanied by increasing polarisation. This paper examines and compares economic restructuring trends in three Australian cities – Sydney, Melbourne and Adelaide – and asks whether the global city concept is useful in helping us understand the impact of economic restructuring on local housing and labour markets.

We find that both Sydney and Melbourne display characteristics associated with global cities, but that these characteristics are more muted in Adelaide. We also find evidence of increasing income segregation in Sydney and Melbourne. This effect is not as apparent in Adelaide. Indeed average taxable income in Adelaide's poorer communities is improving relative to poorer communities in Sydney and Melbourne. We explore residential sorting and wage inequality explanations of these different geographical patters in income inequality.

INTRODUCTION

According to Sassen (1991) some cities are becoming global cities. These are post-industrial production sites where comparative advantages are obtained by the ability of firms to economise on time; where the efficiency of infrastructure is becoming increasingly important to maintain a competitive edge; and where the ability of employees to utilise knowledge increasingly characterises the post-industrial employee. Time and trust (transaction costs) become crucial competitive factors. Global cities increasingly concentrate within them business services and financial functions ('new economy' firms); are more strongly integrated into the global economy than other cities; and there is a higher return on 'new economy' firm's business capital in global cities than other cities (Sassen, 1991, 1998). The emergence and concentration of specialised finance and business services alongside continued deindustrialisation and growth in in-person services ensures employment growth in high income and low income employment, but also the exclusion of "redundant" skills from the labour market all together. Global cities are therefore experiencing a higher degree of social polarisation and income inequality than non-global cities – the so called 'polarisation thesis' (Friedman 1986; Sassen 1990; Hamnett 1994, 1996; Burgers 1996; Baum 1997, 1999).

While much of the global city literature has focused on the 'polarisation thesis' it often fails to engage in any depth with the economic rationale for polarising trends and the analysis is frequently aspatial and tends to focus on a single city with few points of comparison. The interconnectivity between global processes, economic restructuring and social and city wide impacts are often taken for granted. In this paper we focus on the economic rationale behind why and how economic restructuring and global integration *may* result in inequitable local developments. We examine three Australian cities in order to introduce a degree of comparative analysis. Specifically we address three main questions:

1. Taking the global city characteristics proposed by Sassen and others, are there measurable differences between an aspiring global city (Sydney), a second tier city (Melbourne) and a city that does not feature strongly in the literature as a growth city (Adelaide)?;
2. What are the spatial impacts within these cities of their respective economic trajectories? Our hypothesis is that new forms of agglomeration economies encourage the spatial concentration of new economy activities, and cause structural change in land, property, and labour markets in ways that widen the divide between high income and low income communities; and
3. Do different economic trajectories have different manifestations in local housing and labour markets? We hypothesise that economic restructuring induces a skills premium. This skills premium is sustained by positive externalities in some cities and acts through the housing market to generate spatial polarisation and exacerbates income inequality.

We explore whether the 'global city' concept is useful in helping us understand the economic profile of Australian cities, and the impact of that development on local housing and labour markets. The paper is divided into four main sections (2-4). We begin with a brief review of the 'global city' literature and critique. The literature identifies a number of economic characteristics that distinguish global cities. In section three we measure these characteristics and examine whether they differ between Sydney, Melbourne and Adelaide. Section four relates differences in economic trajectories to polarisation and measures of spatial income inequality and offers two possible explanations for interconnectivity between economic restructuring/globalisation and differences in observed trends between the three cities. A final section summarises and concludes.

WHAT CHARACTERISES GLOBAL CITIES? – THEORY AND BACKGROUND

Over the past two decades scholars and academics have extensively debated the notion that global economic integration has direct consequences for the development and evolution of cities. Specifically, it has been argued that a new type of city has emerged that perform key roles in the coordination of global financial flows and the coordination of global production processes (Friedman, 1986; Sassen, 1991, 1998, 2000). Global cities are, according to Sassen (1990), (1) command points in the organization of the world economy; (2) key locations and marketplaces for the leading industries of the current period – finance and specialized services for firms; (3) major sites of production for these industries, including the production of innovations in these industries.

Sassen (1991, 1998) views urban form (high density) and concentration of finance and business services in metropolitan areas as the spatial expressions of the post-industrial production cite and a process of renewed importance of inner cities as places of business, residence and leisure. Global cities are, further, characterised by increased labour market polarisation and income inequality. A particular emphasis in the American literature (Friedman 1986; Sassen 1994) is placed on immigration (legal and illegal) from low-income countries to global cities – generating downward wage pressure in un- and low-skilled jobs and accentuating income differentials (Friedman 1986, Goldberg & Fullerton, 1994, Sassen 1994).

The need for 'command points' in the global economy is related to global and regional disintegration of production processes, induced by technological and governance change, and increased service intensity of economic activity which has generated a demand for control and organisation functions in global cities

(Sassen, 1991). The notion of regional and national interconnectedness has latterly shifted the focus increasingly to global-city regions (Scott *et al*, 2001) and an emphasis on the analysis of city networks as opposed to city hierarchies (Taylor, 2004). Technological innovations, particularly in information technologies and telecommunications, disintegration of production processes, induced by technological and governance change, and increased service intensity of economic activity have facilitated the decentralisation as well as concentration of different types of economic activities *and* the growth in specialised services. The post-industrial production site is thus a strategic place where firms and organisations can access specialised services to sustain their local and/or global activities. Global cities are such strategic places.

According to Sassen (1998) '[t]he ascendance of finance and specialized services, particularly concentrated in large cities, creates a critical mass of firms with extremely high profit-making capabilities (p. 139)'. To the extent that these industries cluster in different parts of the city this also implies differences in intra city profit making capabilities. New economy type industries concentrate in cities due to agglomeration economies and the presence of highly innovative environments, where the 'growing complexity, diversity, and specialization of services required makes it more efficient to buy them from specialised firms rather than hiring in-house professionals' (Sassen, 2000:71). The agglomeration of new economy type businesses in certain cities offer comparative advantages in the form of economising on time and transaction costs through networked forms of production that also allow greater flexibility and adaptability in a rapidly changing environment (Powell, 1990; Scott *et al*, 2001). It is the proximity to other key input services and advantage of face-to-face interaction in the *production* of services, in particular, but also sale of services, that offers economies of scale in global cities. Greater service intensity and complexity through skill biased technical change has generated a skills premium, which induces wage and earning inequality. Sassen offers little evidence for what she calls 'extreme profit-making capabilities', but several studies have emphasised positive externalities (increased productivity) from co-location/ agglomeration of high skilled workers with respect to the transfer of intangible assets, eg knowledge (Powell, 1990; Scott *et al*, 2001; Yorukoglu, 2002).

Compared to the 'industrial era', 'new economy' activity is characterised by a more frequent re-constitution of the production process; a higher turnover of supplier-customer relationships; more idiosyncratic production processes and outputs (often custom made for each client); and more rapid technological advances and demand change that induces a higher degree of risk and greater amortisation costs. Co-location of 'new economy' reduces transactions cost firms by facilitating the existence and maintenance of more personalised trust relationships; and reduces risk through networked production processes (Powell, 1990). Though not widely tested, the combined transaction costs and externalities factors offer a plausible explanation for why 'new economy' firms in global cities should be able to generate extreme profits. Agglomeration economies offer a plausible explanation for why rates of return will not necessarily equalise over time.

The growth in finance and producer service firms is again linked to greater global economic integration. Thus, global cities contain a 'multiplicity of international markets, major concentrations of foreign firms and producer services selling to the world market' (Sassen 1991: p.169). Higher 'profit making capability' in global cities is a function of the ability to operate internationally by generating economies of scale in the production of customised or idiosyncratic outputs (Sassen 1991). Greater global economic integration has created a market for producer and specialised services as intermediate outputs (*ibid*, p. 124). The agglomeration of such services in global cities therefore reflects agglomeration economies in the production of producer service outputs *and* the global city as a global market for such outputs. The degree of international connectedness is likely to vary within global cities, creating a new geography of centrality and marginality within global cities (Sassen 1998).

Economic restructuring in global cities is seen as a driver of social polarisation and income inequality as new jobs growth has taken place in high and low income employment with a decline in "middle" income

employment. In terms of occupational change Sassen finds that the contemporary growth categories are professionals and clerical types of jobs (1991). The growth in finance and business services and increasing female workforce participation along with a decline of traditionally male dominated employment and de-unionisation have generated a more dichotomising labour demand (Friedman, 1986; Reich, 1991; Sassen, 1991, 1994). Whereas the industrial era generated greater (male) income equality, 'new economy' activity generates both highly skilled, knowledge intensive employment and routine, low skilled employment. Less standardised working conditions, decline of the nuclear family and increased levels of wealth in some section of the population have also created demand for low skilled in-person services (Reich, 1991). Finally, immigration (legal and illegal) from low-income countries to global cities generates down ward wage pressure and serves to accentuate income differentials and to further downgrading of the manufacturing sector (Friedman, 1986; Goldberg & Fullerton, 1994; Sassen, 1994).

This aspect of the Global city literature has been extensively tested, debated and criticised (Baum, 1997, 1999; Burgers, 1996; Chui & Lui, 2004; Hamnett 1994, 1996). In a study of Sydney, Baum (1997) finds that there is a dual trend in the occupational structure: firstly, a trend towards growing professionalisation; secondly, at complementary level, also evidence of polarisation. Baum concludes that polarisation may be between three groups: high income, high status individuals strongly attached to the global economy; a growing group of low-paid service workers – only weakly attached to the global economy; and a group who are outside the employed labour force – dependent on welfare and benefit little from global processes.

A TALE OF THREE CITIES

Population growth in Sydney and Melbourne has been substantially higher than in Adelaide over the period 1991-2001 (Table1). While inner city revival has occurred in all three cities (Badcock, 2001; Raskall, 2002; Reynolds & Porter, 1998) renewed centrality of inner cities is particularly evident in Sydney and Melbourne. Both cities have had extensive high rise, commercial and residential, development in the inner parts of the city over the past two decades and the number of people now living in the inner parts of these two cities has increased substantially above the average city wide growth level - Table 1. While starting from a very low base the population enumerated in the Sydney local government area (LGA) grew more than threefold in the relative short time period of 10 years. Though not much smaller than Sydney's absolute growth, Melbourne's relative growth was substantially less. In both these

Table 1 General population, education and labour market statistics, three cities

	Sydney SD			Melbourne SD			Adelaide SD		
	1991	2001	% point chng.	1991	2001	% point chng.	1991	2001	% point chng.
SD Population ('000)	3,538	3,997	13.0	3,022	3,367	11.4	1,023	1,073	4.9
Population LGA containing CBD	13,501	47,204	249.6	40,164	67,784	68.8	14,843	17,861	20.3
Bachelor degree or higher % (SD)	9.5	16.5	7.0	9.5	16.1	6.6	7.2	12.2	5.0
Bachelor dg. CBD %	13.2	24.1	10.9	19.3	28.5	9.2	17.9	26.4	8.5
Employment 15-64 %	89.6	93.8	4.2	88.0	93.4	5.4	88.3	92.0	3.7
Male %	89.0	93.3	4.4	87.2	93.0	5.8	87.0	91.1	4.1
Female %	90.5	94.4	4.0	88.9	93.8	4.8	90.0	93.2	3.2
Work force participation 15-64 %	72.0	70.9	-1.1	72.1	71.5	-0.6	72.2	70.5	-1.8
Male %	81.7	77.9	-3.8	81.8	78.7	-3.1	82.2	77.5	-4.8
Female %	62.3	63.9	1.7	62.4	64.4	2.0	62.4	63.7	1.3
Average House Price* ('000) $=1995	**201.2**	**372.7**	**85.2**	**145.6**	**285.4**	**96.0**	**112.3**	**164.6**	**46.6**

Note: population based on total population enumerated in private or non-private dwelling and including overseas visitors. '*' final row is based on moving annual median house price in each of the three cities for Q3 1995 and Q2 2003.
Source: ABS Census (Time series profile); Australian Taxation Office (various years); and Real Estate Institute of Australia (various years).

cases the inner city population grew relatively and absolutely, substantially faster than the equivalent increases in Adelaide. Education levels grew in all three cities, but by 2001 the number of people with a bachelor degree or higher had increased faster in Sydney and Melbourne than in Adelaide. The Australian average in 2001 was 12.9 per cent.

All three cities witnessed increasing levels of employment for both men and women over the period 1991 to 2001. While the latter part of the 1990s was an era of strong economic growth, it is notable that the work force participation rate fell in all three cities over the same period. This decline has been due to falling labour force participation rates for men. In all three cities the labour force participation rate for women increased, though not enough to offset the overall decline. Baum (1997) finds that labour force participation rates for men in NSW also declined over the period 1985-1995. Over the period 1995-2003 house prices increased faster in Sydney and Melbourne than in Adelaide; while average income gap (compared to the Australian average) over the period 1976-2001 increased faster in Sydney than in the other cities – the income gap remained largely constant in Melbourne, but decreased in Adelaide.[1]Overall, aggregate economic indicators show that Sydney and Melbourne have had stronger economic growth than Adelaide over the recent past.

Concentration of New Economy Type Employment

Following Friedman (1986), Sassen (1998) and O'Connor (2002, 2004) we have defined 'new economy' type jobs as jobs in the 'communication services', 'finance and insurance' and 'property and business services'. The combined employment in these three sectors grew in all three cities (1996-2001). Only Sydney and Melbourne, 23 and 20 per cent respectively, had combined employment levels in these industries above the national average – 16.6 per cent (see Table 2). Property and business services had the largest absolute growth in Sydney and Melbourne followed by retail trade. While manufacturing as a share declined in all three cities, the absolute number of residents employed in this sector increased in all three cases.

There are, however, some important differences between Sydney and the two other cities with the finance and insurance industry being particularly prominent in Sydney. Some 77 per cent of bank head offices are located in Sydney – reflective of Sydney's strength as Australia's leading financial city (Daly and Pritchard, 2000). Data for 2003/04 indicate that Sydney's position in this respect has strengthened even further (NSW Competitiveness Report 2003/04).

With respect to occupational growth Table 3 shows that the professionals and the intermediate and elementary clerical categories grew in all three cities, but growth in the former category along with the management and administration category grew at a substantially higher rate in Sydney and Melbourne than in Adelaide.

An important element of the global city restructuring argument is that new economy type industries are disproportionately concentrated in the down town areas of these cities. Table 4 shows location quotients of employment in new economy industries for Sydney, Melbourne and Adelaide at two spatial levels of aggregation – the LGA that contains the CBD of each city and the metropolitan area as approximated by the census defined statistical divisions of each city. The location quotient is defined in the present context as;

[1] Taking average income per person as a proxy for economic growth Sydney's income increased from 8.6 per cent above the Australian average in 1976 to 14.8 per cent in 2001. The equivalent figure for Melbourne were 5.9 per cent above and 5.1 per cent above; and for Adelaide, 2.7 per cent above and 6.9 per cent *below* (Business Council of Australia, 2004).

City Economy 10

$$LQ = \frac{\frac{NE_i}{NE_{aus}}}{\frac{E_i}{E_{aus}}} \quad (1)$$

Table 2 Industry of employment 1996-2001

	Sydney SD				Melbourne SD				Adelaide SD			
	Persons 2001	% Empl'd	Change % '96-'01	%point change '96-'01	Persons 2001	% Empl'd	Change % '96-'01	%point change '96-'01	Persons 2001	% Empl'd	Change % '96-'01	%point change '96-'01
Agriculture, Forestry, Fishing and Mining	13,307	0.7	-9.6	-0.1	14,707	1.0	-1.2	-0.1	7,104	1.5	20.7	0.2
Manufacturing	220,923	12.2	2.9	-0.7	246,350	16.0	2.5	-1.3	71,532	15.3	5.3	-0.2
Construction, Utilities, Transport & Storage	226,674	12.5	10.8	0.3	167,506	10.8	15.6	0.4	47,749	10.2	17.8	0.9
Retail and wholesale	352,880	19.4	6.4	-0.4	317,574	20.6	12.6	0.3	93,215	20.0	8.6	0.3
New Economy	417,034	23.0	18.4	1.9	308,076	19.9	19.1	1.4	75,887	16.3	12.6	0.8
Gov. Admin. and Defence	61,772	3.4	-6.3	-0.5	44,301	2.9	-13.3	-0.8	20,909	4.5	4.7	-0.1
Education and Health	277,724	15.3	7.2	-0.2	250,962	16.3	14.0	0.4	91,539	19.6	6.2	-0.1
Acc, cafes, restaurants, culture and personal services	202,059	11.1	12.3	0.4	157,951	10.2	17.2	0.5	50,373	10.8	6.9	0.0
Total	**1,816,225**	**100.0**	**8.4**	**0.0**	**1,544,301**	**100.0**	**11.0**	**0.0**	**466,829**	**100.0**	**6.9**	**0.0**

Source: ABS Census (Time series profile). *Note*: 'Non-classifiable economic units' and 'Not stated' categories are omitted from table, but included in 'totals'.
Note: 'New economy' defined as employment in communication services', 'finance and insurance' and 'property and business services'.

Table 3 Selected occupation shares 1996-2001

	Sydney		Melbourne		Adelaide	
	% Empl'd 2001	% Change empl'd '96-'01	% Empl'd 2001	% Change empl'd '96-'01	% Empl'd 2001	% Change empl'd '96-'01
Managers and Administrators	9	16.3	8.3	17.9	7.1	3.2
Professionals	21.2	16.8	20.6	20.2	18.8	9.7
Advanced Clerical and Service Workers	4.5	-9	3.9	-7.6	3.5	-7.5
Interme. Clerical, Sales and Service Workers	17.2	8.9	16.9	15.4	17.9	7.9
Elemen. Clerical, Sales and Service Workers	9.1	12.4	9.7	18.7	9.8	16.1
Total	100.0	8.4	100	10.1	100	6.9

Source: ABS Census (Time series profile)

where NE is new economy employment, E is total employment and the subscript '*i*' denotes the LGA or SD spatial level of disaggregation and '*aus*' denotes Australia wide values. These measures are workplace based, that is employment is classified by the industry grouping of people working in area '*i*', and therefore reflects the geographical distribution of jobs. Location quotients exceeding 1 indicate that area '*i*' has a disproportionately high level of employment in new economy industries. The values for central city LGAs in Sydney (3.3) and Melbourne (2.7) are relatively high by comparison with the comparable location quotient in Adelaide (1.9). Though location quotients are higher for the Sydney statistical division (SD) (1.4) and Melbourne SD (1.2) than Adelaide (1.0), the agglomeration of new economy activities is not so evident at the metropolitan wide level. Table 4 does then document the central city agglomeration of new economy activities in Sydney and, to a somewhat lesser degree, Melbourne.

Table 4 Concentration of New Economy type jobs – location quotients

	Total employment 2001	New Economy employment 2001	% of all Australian employment	% of all Australian new economy employment.	LQ 2001
Sydney LGA (CBD)	252586	137948	3.0	10.0	3.3
Sydney SD	1673591	398273	20.2	28.8	1.4
Melbourne LGA (CBD)	277208	124221	3.3	9.0	2.7
Melbourne SD	1437855	297900	17.3	21.6	1.2
Adelaide LGA (CBD)	92557	30020	1.1	2.2	1.9
Adelaide SD	**439306**	**73257**	**5.3**	**5.3**	**1.0**

Source: ABS census. Author's calculation.

The agglomeration of new economy activity in specific areas of Sydney and Melbourne might reflect the pull of externalities that motivate co-location by new economy firms. If these externalities are significant that will be reflected in higher profit rates for new economy businesses in those cities where agglomeration of new economy activity is most evident.

Profitability

This analysis is based on the ABS' 'Experimental Estimates, Regional Small Business Statistics, Australia' (Cat. No 5675.0). Small businesses (SB) are, in this dataset, defined as businesses with a total income or expense between $10,000 and $5million in a financial year (see also notes to Table 5). The data is sourced from business income tax files supplied by the Australian Tax Office (ATO). To enable regional estimates to be produced for a subset of the economy, the ABS created a small business definition designed to capture businesses which operate from only one location. A key feature is that these small businesses are single location, or all locations are within the one region and so any differences in profitability can be attributed to business operations at that location. The data covers 76 per cent of all businesses, but only 24 per cent of business income.

Table 5 Comparison of small business indicators, capital cities

	Sydney	Melbourne	Adelaide	Brisbane	Perth	Greater Hobart	Canberra
NESB as a share of all SB 2000/01	35.6	32.6	30.5	30.4	32.3	22.0	33.6
NESB profit as a share of all SB profit 2000/2001	70.8	65.4	46.8	46.6	43.1	32.9	38.4
NESB profit as a share of all SB profit % point change since 1995/96	7.6	4.5	-2.1	3.8	-2.0	0.8	-7.9
NESB per 1000 residents	29.7	26.1	20.4	21.8	28.4	13.4	20.7
NESB growth per 1000 residents 1995/96-2000/01	5.6	4.9	3.1	4.5	3.8	1.2	4.3

Note: New Economy Small Business (NESB); small business (SB). The data covers individuals declaring business income and three types of organisations - companies, partnerships and trusts. A company is a business or organisation incorporated under the Corporations Act 2001. By incorporating (becoming a corporation), a legal entity is created which is a separate body from the owners. New economy businesses are defined as in Table 2.
Source: ABS 'Experimental Estimates, Regional Small Business Statistics, Australia', Cat. no. 5675.0. Author's calculation.

City Economy 10

Table 5 gives an overview of SB activity in each of capital cities. Sydney has the largest share of New Economy Small Businesses (NESB) – somewhat higher than Melbourne, which again is higher than Adelaide. Sydney and Melbourne have a higher NESB per capita (29.7 and 26.1, respectively) than Adelaide (20.4), and both cities also have a higher NESB per capita growth (5.6 and 4.9, respectively) than Adelaide (3.1). The share of SB profit accounted for by NESB is substantially higher in Sydney and Melbourne, at around two-thirds of SB profits. In the remaining capital cities NESB profits is less than half of a SB profit. There is also a noticeable difference in trends between 1995 and 2000. The NESB profit share declined in Adelaide (and Canberra and Perth), but showed an increase in Sydney and Melbourne.

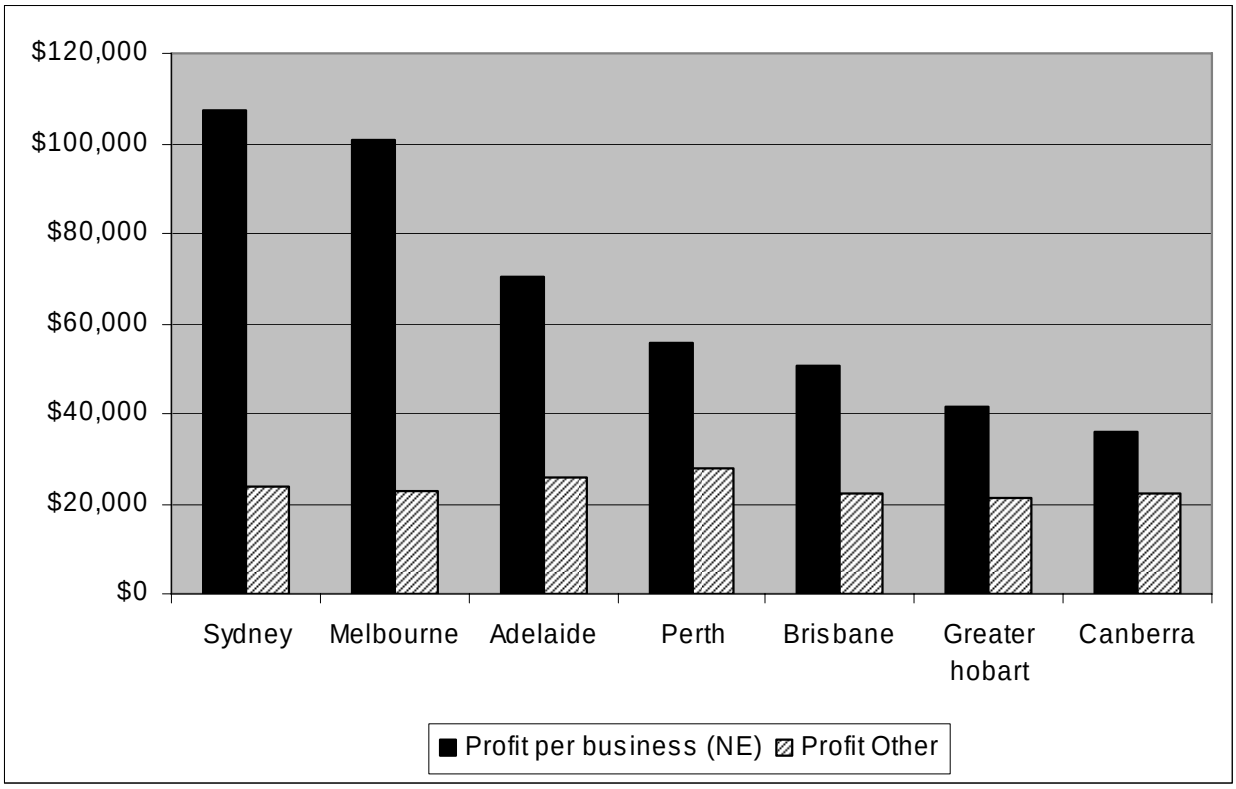

Figure 1 Average profit per business 1995/96-2000/01
Note: As Table 11.
Source: ABS 'Experimental Estimates, Regional Small Business Statistics, Australia', Cat. no. 5675.0. Author's calculation.

Figure 1 compares profit per small business in new economy industries and profit per small business in all other industries. NESB in Sydney and Melbourne typically yield much higher profits than NESB in other capital cities. However, while there are significant differences in profit levels for new economy type businesses that appear to be related to their degree of urban agglomeration, there is no equivalent pattern for profit levels for other businesses. Despite the much larger number of NESB in Sydney and Melbourne and the greater entry of NESB in these cities (see Table 5), rates of return appear not to have been equalised as would be predicted by the perfectly competitive model of neoclassical economics. Agglomeration economies appear a likely explanation.

Information Intensity

In Table 6 we examine internet activity and internet infrastructure. 'New economy' type activity is typically more knowledge intensive than manufacturing activity and therefore requires more ready access to electronic forms of communication. We would then expect new economy businesses to gravitate toward those cities where telecommunication infrastructure is superior (Chinitz 1999). Table 6 confirms this expectation.

Table 6 Information intensity and internet infrastructure (Q3 2002)

	Sydney	Melbourne	Adelaide
Average data download per subscriber	657	527	389
Access lines per '000 usual residents	49.8	43.4	29.1
Average number of subscribers per access line	6.1	7.0	9.3

Source: ABS 'Internet Activity' Cat. no. 8153.0

Average data download per subscriber, is higher in Sydney, and to a lesser extent Melbourne, than in Adelaide. Moreover, the internet infrastructure measured as access line per 1000 residents is substantially higher in both Sydney and Melbourne than in Adelaide. Congestion is also more likely to be problematic in Adelaide with subscribers per access line more than 50 per cent higher than in Sydney. While by no means exhaustive, the evidence presented in this section may indicate that there may be sizeable positive externalities associated with agglomeration of new economy activity.

Global Integration

In Table 7 we estimate a city specific indicator of international connectedness based on the international connectedness of industries and the relative weight of these industries in each city. In this case trade is the proxy for connectedness. A common measure of the international character or connectedness of a particular industry is the Grubel-Lloyd Index (IIT) of intra industry trade.[2] The IIT ranges from zero to 100 and is a measure designed to capture the degree of international trade flows – defined as a two-way exchange of goods and services within industrial classifications. Industries that are part of a vertical value chain spanning several countries will have higher IIT indexes.

The IIT statistics calculated in Table 7 are based on 106 four digit ANZIC classifications from the ABS' Input-Output tables (Cat. No. 5209.0). A weighted average for 17 main industrial classifications (2 digit ANZIC) was calculated on the basis of each 4 digit groups' share of the gross domestic product (GDP) within the 2 digit classification. A city specific weighted average (*w*IIT) was then calculated on the basis of the employment structure (share of employment in each of the 17 main 2 digit industrial classifications from the work place profile 2001 census) in the statistical division of Sydney, Melbourne and Adelaide and the local government area containing each city's central business district (CBD).[3]

Table 7 International connectedness Grubel-Lloyd Index (IIT)

	Sydney SD	Sydney LGA	Melbourne SD	Melbourne LGA	Adelaide SD	Adelaide LGA
Weighted IIT	51.8	58.1	52.1	56.1	49.9	50.7
% difference LGA v SD		12.1		7.6		1.7

Note: A Grubel-Lloyd Index of intra-industry trade was calculated for 4 digit ANZIC codes in the ABS's National Input-Output publications. A weighted average (by GDP) for 17 major ANZIC groups was calculated and multiplied by a city specific weight (employment in each of the 17 major ANZIC groups). Values of the IIT range between 0 and 100. A higher value indicates a greater degree of international connectedness.
Source: ABS 5209.0 (National Input-Output Tables), ABS Census, author's calculation.

[2] IIT = $\left[\frac{(X_i + M_i) - |X_i - M_i|}{(X_i + M_i)}\right] * 100$ where 'X' is exports; 'M' is imports; and the sub fix 'i' is industry category.

[3] $wIIT_c = \sum w_{e2}^c * IIT_{i2}$ where *c* denotes city, $w_{e2}^c = \frac{E_{e2}}{E_c}$ denotes employment share of two digit ANZIC code of city employment, IIT*i2* denotes Grubel-Lloyd Index for ANZIC code 2. The latter is given by

$IIT_{i2} = \sum \left(\frac{GPD_{i4}}{GDP_{i2}}\right)\left(\left[\frac{(X_{i4} + M_{i4}) - |X_{i4} - M_{i4}|}{(X_{i4} + M_{i4}}\right] * 100\right)$, where *i4* denotes four digit ANZIC code.

The international connectedness measure reflects each city's employment structure and the IIT of different industries. As such the measure assumes that international connectedness of an industry is spatially uniform across Australia. Cities differ in the degree of international connectedness because they have different urban industry structures. In reality this assumption is not necessarily met. It is likely that our IIT measure understates differences in the degree of international connectedness.

There is a difference across cities in the IIT measure, with Sydney and Melbourne marginally more internationally connected than Adelaide. The more significant difference emerges between the core city areas – a finding that is to be expected in view of the inner city new economy agglomeration patters that are revealed in Table 4. The IIT measure for the LGAs that contain each city's CBD are more than 10 per cent higher in Sydney and Melbourne, but only marginally higher for Adelaide.

POLARISATION AND SPATIAL INCOME INEQUALITY

Our global city measures indicate that Sydney, and to a lesser extent Melbourne, are making the transition to post industrial sites of production. Both cities have growing concentrations of knowledge intensive new economy industries that tend to co-locate in core city regions. The profitability of these industries is high relative to those same industries elsewhere, and they are also high in comparison to other industries located in Sydney and Melbourne. Finally, these cities have a relatively high international connectedness, particularly in their core city regions. In this section we look at accompanying trends in the geography of income inequality and spatial polarisation. Do global cites become more polarised and spatially unequal, as global theorists contend? Do they in this respect differ from non-global cities?

Spatial income inequality

Earlier Australian research shows that income polarisation increased in Sydney, Melbourne and Adelaide in the period 1976-1993 (for an overview see Badcock, 1997). In Table 8 we revisit this issue by calculating the Gini-coefficient based on Australian Taxation Office statistics at the post code level. The calculations are based on the Milanovic-Gini (MG) coefficient for grouped data (Milanovic, 1994; Abounoori & McCloughan, 2003).[4] The MG is sensitive to changes in group size and group specific mean income and population specific mean income. Table 8 shows the MG coefficient based on total income for post codes in each city over the period spanning the occupation and industry data examined

Table 8 Income Inequality Total Income, Gini coefficient 1995/96-2002/03

Total income	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	% Change 95/96-02/03 (97/98-02/03)
Sydney	0.104	0.113	0.118	0.124	0.140	0.153	0.141	0.145	39.4
Melbourne	0.086	0.089	0.096	0.098	0.110	0.121	0.112	0.115	33.7
Adelaide	0.077	0.076	0.079	0.080	0.085	0.094	0.089	0.090	16.9

Source: ATO. Author's calculation.

above. Over this period the MG coefficient for total income increased by almost 40 per cent in Sydney, 34 per cent in Melbourne, but only 17 per cent in Adelaide.[5] The income data thus seems to confirm that

[4] $G = C\sum_{k=1}^{K} W_k \left(1 - \frac{\bar{Y}_k}{\bar{Y}}\right)$ where $C = 2/n(n+1)$ and is an inverse population weight, W_k is a group weight, $\bar{Y}$ is mean population income or group income if denoted by *k* and *n* is number of individuals. For the last group of individuals n_k the weight will be given by $W_k = \frac{n_k(n_k+1)}{2}$, for *k*-1 by $W_{k-1} = \left(\frac{(n_{k-1}+n_k)(n_{k-1}+n_k+1)}{2}\right) - W_k$, etc.

[5] The trends and patterns are similar when examining wage and salary income only. We have used total income data in order to maintain timeframe consistency – wage and salary information from the ATO is not available for the entire period. Over the

inequality increased more sharply in Sydney and Melbourne – cities that have travelled further along the global city indicator trajectory. Though economic indicators (see Table 1) indicate that Sydney and Melbourne have had higher levels of growth than Adelaide, average real taxable income in the 10 poorest postcodes in Adelaide has grown faster and are 'catching-up' with equivalent postcodes in Sydney and Melbourne (see Table 9). Moreover, the ratio of average annual taxable income in the 10 richest postcodes than that of the 10 poorest postcodes remained largely unchanged in Adelaide, while it increased in Sydney and Melbourne (see final row).

Table 9 Average income by postcodes ($=1995/96)

	Sydney		Melbourne		Adelaide	
Financial Year	**10 poorest PC**	**Ratio top 10/ bottom 10**	**10 poorest PC**	**Ratio top 10/ bottom 10**	**10 poorest PC**	**Ratio top 10/ bottom 10**
1995/96	25,826	2.28	24,038	2.14	22,590	1.78
1996/97	26,008	2.35	24,451	2.14	23,166	1.73
1997/98	27,300	2.42	25,191	2.36	24,206	1.75
1998/99	28,429	2.52	26,883	2.25	25,279	1.76
1999/00	29,074	2.78	27,324	2.39	25,871	1.76
2000/01	27,742	3.06	26,895	2.60	25,214	1.91
2001/02	27,155	2.82	25,838	2.60	25,513	1.81
2002/03	27,429	2.89	26,205	2.70	25,626	1.83
Change	1,603		2,167		3,036	
% change	6.2	26.8	9.0	26.2	13.4	2.8

Source: ATO. Author's calculation.

In the following sections we examine two potential explanations for these spatial income inequality trends. The first explanation emphasises labour market developments. Given existing income segregation across metropolitan suburbs, spatial income inequality will increase if the gap between pay in low wage jobs and high wage jobs is widening. This explanation is in line with Sassen's emphasis on individual earnings capacity. Such an outcome might be expected in the Sydney and Melbourne labour markets if unskilled migrants typically locate in these two cities, placing downward pressure on unskilled wages, and if skills premiums are boosted by a relatively high demand for skilled labour in these cities. A second explanation places emphasis on developments in housing markets. The housing market sorts low income households into communities where housing is affordable. If house price and rent differentials are wider in Sydney and Melbourne this sorting mechanism will be more powerful in these cities.

Skills Premium and Earnings Differentials

Table 10 examines wage differentials across occupational categories in Sydney, Melbourne and Adelaide. In each city median weekly earrings are highest amongst managers and administrators, and lowest among elementary clerical, sales and service workers. Greater wage inequality in Sydney is evidenced by median earnings of managers and administrators that are a 4.6 multiple of median earnings in the elementary clerical, sales and service workers occupational category. The equivalent ratios in Melbourne and Adelaide are 3.4 and 3.3. As expected median earnings in the higher wage occupational categories (Manager and administrators; Professionals; and Associate professionals) are greater in Sydney. In the two lowest wage occupations (Elementary clerical, sales and service workers; Labourers and related workers) median earnings are lower in Sydney than in Adelaide. Differences in the lower income categories are not statistically significant, but are so for managers and administrators and associate professionals ($p. < 0.05$).[6] As shown in Table 3, employment growth in the lower income categories were

period 1997/98-2002/03 the Gini coefficient for wage and salary increased by 23 per cent in Sydney, 20 per cent in Melbourne and 14 per cent in Adelaide..

[6] Test of significance based on un-weighted SIHC (sample) data.

relatively similar between the three cities, but employment in the management and professional categories increased substantially faster in Sydney and Melbourne than in Adelaide.[7]

Table 10 Weekly individual earning differentials (earnings from main employment) 1999/2000

	Australia	Sydney	Melbourne	Adelaide
	Median	Median	Median	Median
Managers and administrators (1)	960	1,123	1,000	899
Professionals	820	882	802	850
Associate professionals	675	800	640	608
Tradespersons and related workers	590	630	600	570
Adv. clerical and service workers	590	600	600	550
Inter. clerical, sales & serv. wrk's	485	558	486	460
Inter. prod. and transport workers	558	585	550	500
El'm.cler, sales and serv wrk's (8)	260	245	294	270
Labourers and related workers	400	448	427	460
Ratio 1/8	3.7	4.6	3.4	3.3

Note: Estimates have been weighted using ABS person weights.
Source: Survey of Income and Housing: confidentialised unit record file, ABS.

Table 11 presents census based summary statistics on the size of the overseas born population and recent arrivals from overseas and interstate locations. In 2001 Sydney and Melbourne had an overseas born population larger than Adelaide. Furthermore, over the past 5 years in-migration from overseas has favoured Sydney and Melbourne *vis-à-vis* Adelaide. The pattern of recent overseas migrant destination is then as expected. The pattern of recent inter-state migrant destination is reverse. Though several studies find an adverse impact on wage from un- or low-skilled migration or global exposure (Sassen, 1994; Feenstra, 1998; Karunaratne, 1999) the data presented here does not evidence such an effect on an inter-city basis.

Table 11 Population residing overseas or born overseas

	Sydney	Melbourne	Adelaide
Usual resident population born overseas %	31.2	28.5	23.7
Usual resident overseas 5 years ago %	6.4	4.5	2.5
Usual resident population enumerated interstate 5 years ago %	2.1	2.8	3.4

Source: ABS.

Residential Sorting

The agglomeration of 'new economy' service industries in and around the Sydney and Melbourne CBDs is contributing to rent and house price pressures in commercial land and property markets. Accessibility to jobs in 'new economy' service industries has boosted demand for residential propertied in the inner and middle ring suburbs. The residential sorting hypothesis claims that increasing competition for housing in and near to the core of these cities is steepening the rent (price) – distance from the CBD gradient in these cities. Lower income households are being displaced as a consequence, and this process is contributing to growing spatial income inequality. By contrast Adelaide is not witnessing a re-centralisation of economic activity, or a steepening rent (price) – distance gradient. Residential sorting pressure in Adelaide is then weaker; lower income households are more likely to reside in the vicinity of higher income households in this city. Spatial income inequality is not then expected to be as apparent in Adelaide as it is in Sydney and Melbourne.

Figures 3, 4 and 5 compare rent-distance gradients in the private rental housing markets of Melbourne, Sydney and Adelaide. In Sydney and Adelaide we are able to profile the gradients over the period

[7] These conclusions must be qualified as the median earnings figures in Table 10 will reflect any differences in age distribution, levels of human capital and hours or work.

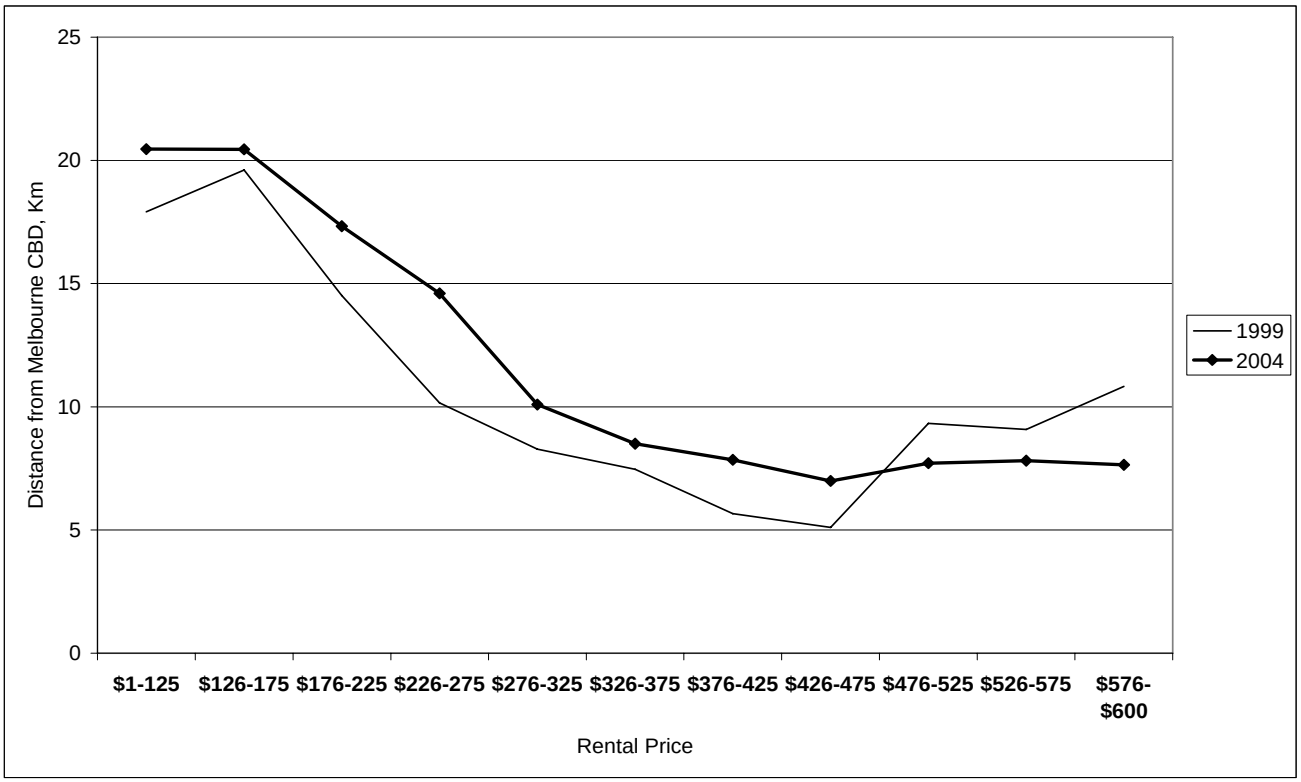

Figure 3 Price-distance gradient; rental properties – Melbourne
Source: Rental Bond Data (Wood *et al*., 2005).

Figure 4 Price-distance gradients; rental property – Sydney
Source: New South Wales Rental Bond Board database (Wood *et al*., 2004)

Figure 5 Price-distance gradients; rental property – Adelaide
Source: South Australian Rental Tenancy Tribunal Database (Wood *et al*, 2004).

1991-2001; in Melbourne data limitations restrict our examination to a 1999-2004 timeframe.[8] There are considerable differences in the shape of these gradients. Sydney and Melbourne have steeply negative gradients, while the geography of Adelaide's private rental market generates concave rent-distance relationships with rents peaking in the middle ring of suburbs. In both Sydney and Melbourne the rent distance gradients are shifting outwards over time as a result relatively low rent housing is to be found at increasing distances to the CBD.

These patterns are consistent with residential sorting hypothesis. Lower income households seeking affordable housing in Sydney and Melbourne must seek it in locations increasingly distant from the CBD. Meanwhile residential locations offering accessibility to the CBD are becoming relatively more expensive and unaffordable for lower income households. Growing income segregation and widening spatial income inequality can be anticipated.

The links between residential housing markets and structural change in labour markets are explored in Table 11. The composition of SLA adult populations by educational attainment and occupational status is analysed using the Duncan and Duncan dissimilarity index (DDI).

Table 11 Spatial polarisation of individuals by occupational status and education levels, inter cencal change in DDI

DDI	Sydney	Melbourne	Adelaide
	96-01 (%)	96-01 (%)	96-01 (%)
Occupation Cat. 1-3	11.1	5.9	1.0
Education (Bachelor degree or higher)	1.0	-0.6	-3.2
Education (Pg, & Grad Dipl., Cert.)	2.3	3.3	-2.5

Note: Occupation Categories were altered before the 1996 census.
Source: ABS Census (Time series profile)

[8] The gradients are constructed from rental bond data as described in Yates and Wood (2005). Rental bond records are available over a shorter time period in Melbourne.

Table 11 shows the DDI for occupational status and educational attainment levels at the SLA level. The DDI increased faster in the two former cities, whereas it, with respect to educational attainment, declined in Adelaide. In other words, whereas SLAs in Sydney and Melbourne are increasingly becoming more dissimilar – with respect to the educational and occupational status of residents – Adelaide is becoming more similar with respect to education levels.

SUMMARY & CONCLUDING COMMENTS

The global city literature argues that some cities are becoming post-industrial production sites. These cities are increasingly integrated into the global economy, their 'new economy' business sectors generate relatively high profits and their geography features the return to a more centralised pattern of economic activity around the city core. Global cities are also characterised by increasing social polarisation.

A key aim of this paper has been to compare measures of global city characteristics for three Australian cities – Sydney, Melbourne and Adelaide. Sydney and Melbourne both have relatively important 'new economy' business sectors, whose small businesses achieve high profits. Their urban economies are more internationally integrated, more knowledge intensive and the geographical pattern of their 'new economy' employment reveals a greater concentration in the city core. By comparison, Adelaide has none of these characteristics.

In terms of conventional measures of economic success, Sydney and Melbourne have stronger urban economies. Yet the geography of income inequality in Sydney and Melbourne is more unequal and has in recent years worsened relative to Adelaide. More unexpected is a finding that per capita income growth in Sydney and Melbourne's poorer communities has fallen behind that of their counterparts in Adelaide. We find some evidence to suggest that growing urban wage inequality and residential sorting are causes, though firm conclusions await the findings of further research.

Our findings have important implications for national economic governance and for local (city) planning and land utilisation. Firstly, the expression of economic growth and restructuring varies between the cities. Our analysis suggests that the degree of economic restructuring and global economic integration *does* contribute to differences between the cities. For planners in Sydney and Melbourne this then raises the question whether growing spatial polarisation and income inequality is a price that has to be paid for higher economic growth? And whether planners can ameliorate inequitable outcomes without forgoing economic growth or impeding regional and local competitiveness? The evidence presented here indicate that agglomeration economies in new economy activity and a skills premium may cause further labour market imbalances that, *ceteris paribus*, may impede long-term growth and competitiveness. Planners in Adelaide will to some extent approach these questions from the opposite side. How can planners and local governments facilitate the kind of economic growth that the other two cities have been experiencing without generating similar social and economic outcomes?

The different economic trajectories analysed in this paper implies that in a time of growing global economic integration federal policies will continue to play a significant role in shaping local outcomes. It is therefore imperative that federal policies do not have an eastern-seaboard bias if accelerated growth and prosperity is desired in cities such as Adelaide.

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