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Abstract

Recent policy discourse on the dynamics of regional development has centred on growing levels of uneven development – the patchwork economy – and the importance of local competitiveness as a driver of growth. In this paper, we examine both of these issues in the context of the state's regional capital cities. Drawing on recent work in endogenous growth theory, we explore the extent to which differential employment growth across regional Western Australia can be accounted for by changes in the prevailing economic structures of localities, as opposed to local competitive effects. To test the relative significance of economic structure and local competitiveness we utilise conventional shift-share decompositions of employment growth. We then consider the implications of the results for regional policy, arguing that a focus on local competitiveness is important, though needs to be understood in the context of both macro-economic processes and the wider structure of the settlement system.

Keywords

Endogenous Growth, Competitiveness, Regional Cities, Western Australia

Introduction

One of the ongoing concerns of regional policy-makers and planners in Australia is the persistence of spatial economic inequality (Beer et al., 2003; Stimson et al., 2009; Beer, 2012). Indeed, there is considerable evidence to suggest that the nation's recent resources boom has contributed to growing levels of uneven development as some cities and regions forge ahead in economic and social terms relative to others (Plummer and Tonts, 2013). In attempting to address the problem of uneven development, there has been an increasing interest in the way in which endogenous growth theory might be able to influence regional policy and practice.

Endogenous or 'new' growth theory emerged in the 1980s largely as a response to dissatisfaction with neoclassical models of economic growth, and in particular their inability to adequately account for technological change and innovation as drivers of growth (Boltho and Holtham, 1992). While neoclassical growth models treat technological change as exogenous, within new growth theory these are treated as endogenous; the result of innovation and the accumulation of knowledge, which are central to explaining economic performance and competitiveness. This drew more explicit attention to attributes such as levels of education, investment in research and development, institutional support and entrepreneurship in determining growth rates at the national level (see Lucas, 1988; Romer, 1990). Yet geographers, economists and other social scientists soon began to apply endogenous growth theory to understanding development at sub-national scales, and in particular cities and regions (see Cheshire and Magrini, 2000; MacKinnon et al., 2002; Acs and Armington, 2004; Harrison 2006; 2007; Button, 2011; Stimson et al., 2011). A core part of this intellectual project has been to account for the regional drivers of economic growth and, by extension, to understand the geography of uneven development, with reference to an increasingly complex and nuanced suite of attributes and processes encompassing technological change and innovation, human capital, agglomeration and knowledge clusters, infrastructure investment, local environmental amenity, knowledge spillovers, and economic and social diversification (see Martin and Sunley, 1998; MacKinnon et al., 2002; Taylor, 2010; Tonts et al., 2012).

Much of the emphasis within the endogenous growth model is on the ways in which these processes and attributes affect the competitiveness of cities and regions. It is here that endogenous growth theory has had its most direct impact on policy and practice, with considerable attention given to strategies that might enhance local and regional competitiveness (see Johansson et al., 2001; Asheim et al., 2011; Barca et al., 2012). Indeed, as Lovering (1999, p. 392) has pointed out,

cities and regions are now the “imagined unit of competition”. As a consequence, considerable attention is often directed at place-based measures that aim to improve innovation, human capital, environmental amenity, infrastructure and a range of other ‘endogenous’ economic, social and institutional attributes and conditions that are deemed to be significant to local and regional competitiveness (Taylor and Plummer, 2011).

One of the outcomes of this has been an increasing focus on ‘supply side’ policy and planning approaches to economic development (Fothergill, 2005). Indeed, this strong focus on ‘supply side’ policies implicitly assumes the operation of a regional version of Say’s law, suggesting that if all the local ‘drivers’ are in place, then demand for a region’s products and services will automatically follow (Kitson et al., 2004). As a policy approach this is deeply problematic, since it overlooks the crucial role that demand plays in stimulating economic growth (see Armstrong and Taylor, 1985). This is particularly evident in Australia, where regional and local economic growth is typically driven by international demand for agricultural, mineral and energy commodities. This is not to say that supply side interventions are not important, but that local policy and planning measures are more likely to be successful when implemented in the context of existing, proven or potential demand (Beer et al., 2003; Tonts et al., 2013).

All of this raises questions about the nature of competitiveness itself. As Kitson et al. (2004) point out, defining and measuring competitiveness is not straightforward. Despite this, measuring and monitoring regional and local competitiveness has become something of an industry in itself, with various indices claiming to offer robust insights into the performance of places. For example, the European Union has a competitiveness index for its designated regions (Annoni and Dijkstra, 2013), the Centre for International Competitiveness has compiled an index of competitiveness for cities and localities in the United Kingdom (Huggins and Thompson, 2013), and in 2013 the Regional Australia Institute (2013) released [In]sight: Australia’s Regional Competitive Index.

One of the implicit (and sometimes explicit) messages that these indices promote is that localities and regions should use these measures of competitiveness to adjust local and regional policy settings in order to enhance competitiveness. For Kitson et al. (2004), the concern is that these ‘universal’ indicators are constructed in the absence of a robust theoretical understanding of competitiveness or endogenous growth, fail to adequately account for local context, downplay the role of demand, and have the potential to result in over-prescribed policies. Indeed, recent evidence from regional Australia suggests that competitiveness and local growth is contingent upon both the ways in which broader economic

processes play out through the impact of economic structure, and through a range of economic, social and institutional factors operating at the regional and local scales (see Plummer and Taylor, 2001a; 2001b; 2011; Stimson et al., 2009; Tonts et al., 2012).

Building on this body of work, this paper considers the role of broader structural processes and place-based competitiveness in accounting for local growth differentials in Western Australia's regional cities over the period 2001-2011. The selection of these centres reflects a growing recognition that they act as critical 'interchange points' in the Australian space economy, linking regional industries with both the world economy and the nation's capital cities (Ekelund, 2012). Moreover, recent evidence suggests that regional cities are experiencing growth dynamics that are quite distinct from both the major metropolitan centres and smaller rural localities, with significant implications for policy and planning (Plummer et al., 2013a,b). In examining the dynamics of change in these centres, we follow Stimson et al. (2009; 2011), employing a conventional shift-share decomposition in which broader structural processes are assumed to play out through their impact on local industry mix (economic structure) and endogenous growth processes are assumed to capture local competitiveness. The paper is organised in four sections. The first section offers a brief overview of the economic and policy context of each of the regional capitals. The second section outlines the methodological approach, while the third section reviews the findings, focusing on economic growth and local competitiveness. The final part of the paper reflects on the implications of the research findings for regional policy.

Regional Cities in Western Australia

The past decade has seen extraordinary economic growth in Western Australia, largely as a result of expansion in the minerals and petroleum industries. Between 2002 and 2012, the economy grew at an average of 4.6 percent per annum, while export earnings increased from \$27b to \$113b over the same period (Department of State Development, 2013). In terms of the resource sector, major contributors to exports in 2012 included iron ore (\$53.5b), gold (\$15.2b), liquefied natural gas (\$10.7b) and crude oil (\$10.3b) (Department of State Development 2013). While the growth rate at the state level is impressive, the geography of economic activity within the state is complex and highly uneven. Indeed, analysis undertaken at the local scale indicates that the state is very much characteristic of a multi-speed, or patchwork, economy (Plummer and Tonts, 2014), with those regional and local economies dominated by mining forging relative to other places.

In response to this rising level of spatial inequality, the state government has developed a number of policy initiatives aimed at enhancing social and economic opportunities across regional Western Australia. This includes not only dealing with lagging localities, but also those experiencing growing pains as a result rapid resource led development. Arguably, the most widely known of these schemes is the 'Royalties for Regions' scheme. This was established in 2008 with the objective of distributing 25 percent of the income raised through mining and onshore petroleum royalties to non-metropolitan areas. Funds from the scheme have been used on a range of projects covering social and community development, infrastructure provision, service delivery and incentives for resource exploration. Funds are delivered through the state's regional development commissions, local governments and a range of initiatives by central government agencies (see Tonts et al., 2013).

Within the Royalties for Regions program there are a number of initiatives that deal with specific components of the state's settlement system. One of the most significant of these is the SuperTowns initiative, which has targeted nine towns with populations ranging from a few hundred (Boddington and Morawa) to around 10,000 (Collie and Esperance) in southern Western Australia. In a similar vein to the key settlements policy in the United Kingdom in the 1960s and 1970s (Clope, 1979), and the Whitlam government's growth centres strategy in the early 1970s (Lloyd and Anderton, 1990), the SuperTowns initiative aims to concentrate development in selected centres through improvements in infrastructure and services, the development of human capital, and enhancement of the built environment. In the north of the state, an even more substantial settlement strategy has been implemented in the resource-rich Pilbara region. The Pilbara Cities project aims to increase the population of the towns of Karratha and Port Hedland to around 50,000 each by the year 2035. This involves substantial investments in the built environment (i.e. housing, urban design), services, infrastructure and land development.

While this latter scheme involves two of Western Australia's more substantial regional cities, at present there is no strategy to deal with the state's larger regional hubs in any coherent fashion. Notwithstanding this, there is considerable evidence to suggest that these centres occupy a quite distinctive economic and social role within the state's settlement system (Plummer et al., 2013a,b). This is reflected in the goals of the recently-formed Western Australian Regional Capitals Alliance (WARCA), which comprises the local governments of the seven of the state's largest centres outside of the Perth metropolitan area. WARCA was established in part out of recognition that these settlements shared a number of common concerns related to economic growth, infrastructure and service

provision, regional trade, and exports. Moreover, these cities form important hubs in the state's space economy. Five of the cities (Albany, Bunbury, Geraldton-Greenough, Karratha-Dampier [Roebourne] and Port Hedland) have major ports through which the bulk of the state's agricultural, mineral and petroleum exports are handled. The other two centres play a significant economic role, with Kalgoorlie-Boulder the major economic service and distribution hub for the Goldfields-Esperance region and Broome playing a similar role in the southern part of the Kimberley region.

One of the characteristics of the Western Australian settlement system is the high level of metropolitan primacy. The Perth metropolitan area accounts for some 1.74 million people, or 76 percent of the state's total population. The next largest settlements (excluding Mandurah which might now be regarded as part of the greater Perth area) are the state's regional cities (Table 1). The data in Table 1 show that between 2001 and 2006, all of the regional cities grew, with the most significant expansion evident in Roebourne, Broome and Geraldton-Greenough. More rapid growth is evident in the period 2006-2011, largely as a result of the expansion of the resources sector. Not surprisingly, therefore, the strongest growth was recorded in Roebourne (dominated by iron ore and petroleum industries) and Port Hedland (iron ore). We would also note that one of the most contentious aspects of measuring regional population change in Western Australia is the impact of fly-in/fly-out (FIFO) workforce practices. Most local governments where FIFO is present argue that census data typically under-record the number of people actually present within a locality (House of Representatives Standing Committee on Regional Australia, 2013).

Table 1: Population of Western Australia's Regional Cities, 2001-2011

Local Government Area	2001	2006	2011	% Change, 2001-2006	% Change, 2006-2011
Albany	29,571	30,593	32,906	3.5	7.6
Broome	18,507	19,782	22,350	6.9	13.0
Bunbury	28,682	29,434	31,277	2.6	6.3
Geraldton-Greenough	31,229	32,702	36,486	4.7	11.6
Kalgoorlie-Boulder	28,818	29,223	31,963	1.4	9.4
Port Hedland	13,309	13,346	18,552	0.3	39.0
Roebourne*	15,974	19,352	29,968	21.1	54.9

(Source: Australian Bureau of Statistics, 2012)

* Note for this analysis the local government area of Roebourne includes the settlements of Dampier, Karratha, Roebourne, Wickham and Port Samson.

One of the patterns evident in Table 1 is the large differential in rates of population change between the state's regional cities. While all of the state's regional capitals recorded growth across the two time periods, it is clear that a number of settlements are doing so at a much faster rate than others. This would accord with recent discussion about a multi-speed economy within Australia, with those places dominated by mining outperforming those that are based around other sectors. While it would be tempting to simply point to the role of global demand and macro-economic processes as the main drivers of growth, the recent work on endogenous growth suggests that a suite of more local processes and characteristics may be critical. Accordingly, the next section of the paper turns to a discussion of how we measure uneven development and assess the role of broader scale processes and local contingencies in contributing to the performance of Western Australia's regional cities.

Accounting for Local Growth Differentials

Accounting for Convergence/Divergence: Growth Regression Analysis

In contrast to the neoclassical presumption that the forces of competition will eventually produce convergence across the capitalist space economy, endogenous growth theories are consistent with the hypothesis that there is persistence in the geography of uneven development, with spatial inequalities the result of variable local attributes; including knowledge, innovation, infrastructure and services (MacKinnon et al., 2002). One of the potential outcomes here is rising levels of uneven development, as more successful localities forge ahead of lagging competitors. To empirically evaluate the extent to which there is either a process of catching up or forging ahead, there exists a literature that employs growth regressions in testing for convergence across a set of localities or regions (e.g. Jeffrey and Webb, 1972; Baddeley et al., 1998; Trendle, 2001). Essentially, whether the growth rates of a set of localities are converging depends on the nature of the relationship between local growth rates over a period in time and levels of economic activity in the initial period; if there is a positive (negative) relationship between growth rate and initial levels then localities are diverging (converging).

In this paper we are considering local competitiveness of Western Australia's regional cities over the census periods 2001-2006 and 2006-2012 drawing on employment data. While this is an imperfect measure of economic performance and growth, it is nevertheless highly relevant for at least two key reasons. First, it offers a comparable measure of economic structure and performance over the time periods and spatial units in question. Second, employment growth remains a

significant area of public policy concern in Australia, and is often used as a measure of the success or otherwise of regional policy (Tonts, 1999). Accordingly, let g_r define the rate of employment growth between two time periods and E_{r-1} be the employment level in locality r in the initial time period. Incorporating the possibility that the speed of convergence/divergence may vary over the course of the decade, we allow the slope and intercept of the growth regression to vary by including a time dummy (2001), which takes on a value of zero in 2001 and unity in 2006, and an interaction term between the initial employment level and the time dummy (Chatterjee and Hadi, 2012). This model specification can be fitted using ordinary least squares (OLS) estimation:

$$g_r = \beta_0 + \beta_1 \ln E_{r-1} + \beta_2(2001) + \beta_3(\ln E_{r-1})*(2001) + \varepsilon_r \quad \varepsilon_r \sim N(0, \sigma^2) \quad (1)$$

Where β_0 is the baseline comparison for the census period 2001-2006, β_1 is the baseline contrast between growth rates in 2001-2006 and 2006-2011, β_2 captures the speed of convergence/divergence between localities, and β_3 captures the contrast in speed of adjustment between 2001-2006 and 2006-2011. Finally, it is assumed that the error term ε_r is normally distributed, with constant variance across localities and time, with no serial correlation.

Accounting for Economic Structure and Local Competitiveness: Shift-Share Analysis

Shift-share is a widely used simple decomposition technique designed to account for differential growth (Dunn, 1960; Esteban-Marquillas, 1972; Stimson et al., 2006). In the context of endogenous growth theory, shift-share is particularly useful in that it allows us to identify the impact of local competitiveness on growth differentials. However, an additional advantage is that it also offers a measure of how broader structural processes are playing out through an economy by identifying the impact of local economic structure, or industry mix, on growth differentials. Collectively then, this offers insights into how both local competitiveness and broader structural processes are driving growth differentials. Typically, growth is measured in terms of employment by industrial sector but the technique has been extended to occupational categories, multi-factor productivity, and interregional and international trade flows (Haynes and Dinc, 1997; Dinc and Haynes, 2005; Rigby and Anderson, 1993; Markusen et al., 1991; Smith, 1991; Brox et al., 2010).

Although the technique has been criticised for delivering ambiguous and ill-defined empirical results, it nonetheless remains a widely used policy tool with which to explore the impact of the changing structure of the space economy on local economic performance (Fothergill and Gudgin, 1979; Shaffer et al., 2004; Jones 2012). Significantly, the technique has been criticised for its lack of theoretical foundations, methodological problems associated with defining a local competitive effect that is independent of economic structure, and the sensitivity of results to the scale of aggregation, both sectorally and geographically (Stimson et al., 2006). Set against these limitations, shift-share analysis is a simple technique to employ that has relatively modest data requirements; typically, a significant issue in regional or locality-based empirical research.

In this paper we address the lack of theoretical foundations head-on by situating our empirical analysis within the context of recent developments in endogenous growth theory, accepting the problems of interpreting the ‘residual’ component of a shift-share decomposition as a local competitive effect (Plummer and Taylor, 2001b; Stimson et al., 2009). Specifically, we interpret the industry mix component derived from a shift-share decomposition as a measure of the way in which broader processes play out differently in places because of the composition of their industrial structure. That is, if a place is specialised in industries that are growing relatively rapidly/slowly in the reference economy (Western Australia), then that locality will have a positive/negative industry mix component. Similarly, we interpret the “residual” local component of a shift-share decomposition as a local competitiveness effect insofar as it measures the overall impact of the growth of an industry in a place relative to the growth rate of the same industry in the reference economy. As a corollary, by comparing the relative size of the industry mix and local competitiveness components we can use a shift-share decomposition to empirically evaluate the importance of broader scale processes relative to the types of local, endogenously-generated processes identified by endogenous growth theory.

Lovering and Selting (1998) establish that there are many equivalent ways to formulate a shift-share decomposition. However, to fix ideas, consider the following shift-share decomposition. For each census period, t , let the regional economy be subdivided into r localities ($r = 1, \dots, R$) defined in terms of local government areas (LGAs) across Western Australia. The economic activity in each locality is measured in terms of the number of persons employed (E) disaggregated by industrial sector i , where the locality has $i=1, \dots, N$ industrial sectors. Accordingly, the number of persons employed in industrial sector i in locality r at time t is E_{ir}^t . Hence, the growth rate in employment between period t and period $t-1$ in region r , industrial sector i is defined as:

$$g_{ir} = \frac{E_{ir}^t}{E_{ir}^{t-1}} - 1$$

(1)

And, repeating the definition of the local growth rate in locality r :

$$g_r^t = \frac{\sum_i^N E_{ir}^t}{\sum_i^N E_{ir}^{t-1}} - 1 = \sum_{i=1}^N \theta_{ir}^{t-1} g_{ir}^t$$

(2)

Where $\theta_{ir}^{t-1} = \frac{E_{ir}^{t-1}}{\sum_{i=1}^N E_{ir}^{t-1}}$ is the regional share of employment in industry i , region r .

Similarly, the growth rate in industry i across the reference economy is:

$$g_i = \frac{\sum_r^R E_{ir}^t}{\sum_r^R E_{ir}^{t-1}} - 1$$

(3)

And, the growth rate in a reference economy is:

$$g_N^t = \sum_i^N \lambda_i^{t-1} g_i^t$$

(4)

Where $\lambda_i^{t-1} = \frac{E_i^{t-1}}{\sum_{i=1}^N E_i^{t-1}}$ is the share of employment in industry i in the reference

economy, in this instance Western Australia.

The aim of shift-share decomposition is to account for differential growth rates between local and reference economies (A_r), which can be expressed as follows:

$$A_r^t = g_r^t - g_n^t = \sum_{i=1}^N \theta_{ir}^{t-1} g_{ir}^t - \sum_{i=1}^N \lambda_i^{t-1} g_i^t$$

(5)

Accordingly, employment differentials depend on the local (θ_{ir}^t) and reference economy (λ_i^t), sectoral weightings (shares) and the industry growth rates in the local and reference economy respectively. Conventionally, the industry mix effect (IM_r) is defined as the growth rate that would have occurred locally if each industry had grown at the corresponding rate in the reference economy (Armstrong and Taylor, 1985). Here we define industry mix, equivalently weighting the industry growth rate in the reference economy by the difference between the share of employment in that industry in the local economy compared to the share of employment in the same industry in the reference economy:

$$IM_r^t = \frac{\sum_{i=1}^N E_{ir}^{t-1} g_i^t}{\sum_{i=1}^N E_{ir}^{t-1}} - \sum_{i=1}^N \lambda_i^{t-1} g_i^t = \sum_{i=1}^N (\theta_{ir}^{t-1} - \lambda_i^{t-1}) g_i^t$$

(6)

A local economy will have a favourable industry mix if it is relatively specialised in industries that are growing rapidly in the reference economy. To maintain the balance of the accounting identity in equation (5), the local competitiveness effect (LC_r) is defined as the difference between the local and reference economy growth rate in industry i weighted by the local share of employment in that industry:

$$LC_r^t = \sum_{i=1}^N \theta_{ir}^{t-1} (g_{ir}^{t-1} - g_i^{t-1})$$

(7)

Combining equations (5), (6) and (7) gives the familiar shift-share decomposition:

$$g_r^t - g_n^t = \sum_{i=1}^N (\theta_{ir}^{t-1} - \lambda_{ir}^{t-1}) g_i^t + \sum_{i=1}^N \theta_{ir}^{t-1} (g_{ir}^{t-1} - g_i^{t-1})$$

(8)

Equation (8) can be employed to decompose employment growth differentials into an industry mix component and a local competitiveness component.

Endogenous Growth and Local Competitiveness: Western Australia and the Regional Cities

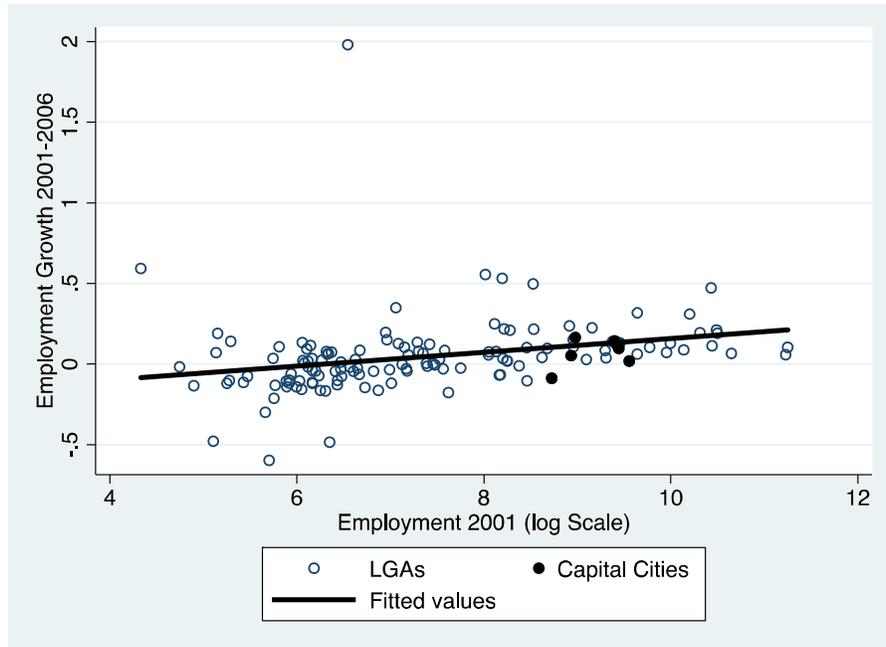
The number of persons employed in Western Australia increased from 827,802 in 2001 to 935,837 in 2006, and 1,101,990 in 2011. This represents an overall increase in employment between the 2001 and 2006 census periods of 13.1 percent. In the following intercensal period, 2006 to 2011, employment increased by 17.8 percent. Over the same periods, the number of people employed in Perth grew by 14.8 percent (2001-2006) and 17.4 percent (2006-2011). Table 2 shows that collectively, employment in the state's regional cities grew at a slower rate (7.9 percent) than both Perth and Western Australia between 2001 and 2006, while in the period between 2006 and 2011 the rate of job creation was much higher in these centres (22.3 percent). While this points to the growing importance of the regional cities in the state's economy, Table 2 also shows considerable differences in performance across these settlements. In the period 2001-2006, only Albany and Roebourne created jobs at a faster rate than for Western Australia as a whole. By 2006-2011, substantial growth was recorded in the resource hubs of Port Hedland and Roebourne, both of which increased the number of jobs by nearly 70 percent. Employment growth was also higher than the state average in Geraldton-Greenough, with Broome slightly below the state total: both communities expanding on the back of the resource industry, lifestyle migration and tourism. In the state's other regional centres, growth was more constrained and typically well below the state average. The data presented here suggest that, rather than competitive forces driving the settlement system towards equilibrium as we might expect under neoclassical growth theory (see Armstrong and Taylor, 1985), the system is characterised by persistent spatially uneven development.

Table 2: Employment in Western Australia’s Regional Cities, 2001-2011

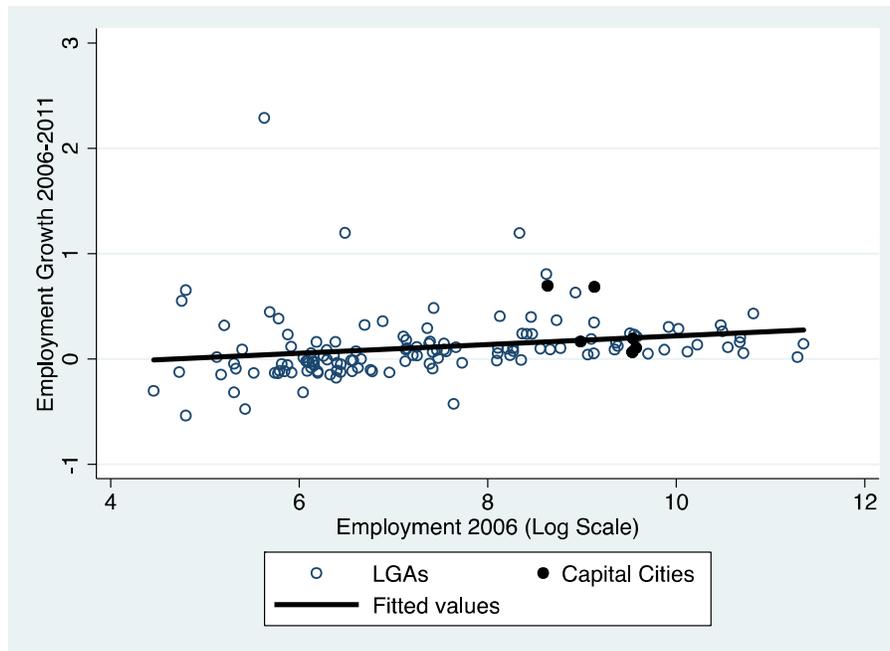
Local Government Area	2001	2006	2011	% Change, 2001-2006	% Change, 2006-2011
Albany	12,064	13,789	14,711	14.3	6.7
Broome	7586	7985	9303	5.3	16.5
Bunbury	12,619	13,841	14,711	9.7	6.3
Geraldton-Greenough	12,470	13,902	16,601	11.5	19.4
Kalgoorlie-Boulder	14,124	14,377	15,902	1.8	10.6
Port Hedland	6164	5619	9526	-8.8	69.5
Roebourne	7929	9234	15,554	16.5	68.4

(Source: Australian Bureau of Statistics, 2012)

To better understand this geography of uneven development, Figure 1 shows the relationship for initial employment levels and growth rates for all of Western Australia’s 138 local government areas (including a disaggregation of the Perth metropolitan area) over the census periods 2001-2006 and 2006-2011 respectively. The state’s regional cities are represented by the black dots. If the WA regional economy had experienced convergence over the resource boom we would expect to see a negative relationship between employment growth rates and initial employment levels. However Figure 1 indicates that, in fact, there has been divergence in employment growth across the resource boom. In overall terms, the position of Western Australia’s regional cities is largely as expected, with stronger growth typically evident compared to the state’s smaller settlements.



(a) 2001-2006



(b) 2006-2011

Figure 1: Testing for Convergence in Employment Growth, Comparing 2001-2006 to 2006-2011

The evidence of divergent employment growth over the course of the resource boom is supported by fitting the simple OLS regression to equation (1):

$$g_{rt} = -0.27 + 0.04*\ln E_{rt-1} + 0.08*(2001) - 0.00*(\ln E_{rt-1})*(2001)$$

(0.11) (0.01) (0.01) (0.02)

$$adj R^2 = 0.06 \quad F(3, 272) = 7.03^{**}$$

(.) = Standard Error ** 1% Significance level

Although the parameter estimates for the intercept terms in the model are difficult to interpret because they lie outside of the plausible range of the data, there is a statistically significant time dummy (2001) at the 5 percent significance level, indicating that there is evidence of a shift in the relationship between initial employment and growth rates between census periods. Similarly the estimate for the slope parameter, which measures the speed of convergence/divergence, is statistically significant and positive, confirming that employment rates are diverging over the course of the resource boom. Put another way, there is evidence of a widening gap in the economic performance of localities across Western Australia. However the interaction term, intended to capture the contrast between the speed of convergence/divergence between 2001-2006 and 2006-2011 is not statistically significant at the 5% level, indicating that there is no evidence to support the hypotheses that the rate of divergence has increased or decreased over the course of the resource boom. In other words, there is no evidence that the process of uneven development is either gathering pace or slowing down. Indeed, the rate of divergence appears to be stable over the 2001-2006 and 2006-2011 census periods. Furthermore, it is clear that there are significant differentials in the performance of localities in Western Australia, including the regional cities. These findings are consistent with endogenous growth theory's predictions of persistence differentials between places; a process of forging ahead rather than catching up. The extent to which this is the result of broader socio-economic processes or local competitiveness can be explored through shift-share analysis, to which we now turn.

Table 3 shows the shift-share decomposition for employment growth in each regional city for the period 2001-2011. For the 2001-2006 period, as outlined above, the regional cities typically lagged behind the state average in terms of job creation. During this period, apart from Albany, Broome and Geraldton-Greenough, all of the cities had a positive industry mix, which is indicative of relative specialisation in high growth industries in the Western Australian context.

However, more problematic for all of the cities except Albany was the impact of an unfavourable local competitive environment on employment growth. Furthermore, for all of the localities apart from Roebourne the negative impact of the local competitive environment was greater in absolute value than the impact of economic structure (industry mix). In the case of Albany, the positive local competitive environment helped it to overcome a negative economic structure. From these findings, we would draw the conclusion that the relatively poor performance of the regional capitals during this period was the result of environments that were less-than-optimal in terms of competitiveness.

By the 2006-2011 period, circumstances had begun to change quite dramatically. The industry structure of the resource-based mining communities of Roebourne, Port Hedland and Kalgoorlie Boulder still retained their relative specialisation in the high growth mining sectors, which made a substantive contribution to their economic success during this period. For Port Hedland and Roebourne the presence of a positive economic structure was reinforced by the local competitiveness of these places. In contrast, the dynamism created by its specialisation in mining was offset by a poor degree of local competitiveness, at least relative to the mining industry across Western Australia. By contrast, Albany, Broome, Bunbury and Geraldton-Greenough all had economic structures that tended to work against them. Put differently, these economies tended to specialise in industrial sectors that on average grew slowly in the Western Australian context. However, for some of these places these disadvantages were overcome through increased local competitiveness, with Broome and Geraldton-Greenough both demonstrating strong growth as a result. Local competitiveness was also important in driving growth in Bunbury and Albany; indeed, more so than their industrial structure. For these localities, slow growth resulting from specialisation in low growth industries was reinforced by relatively poor local competitive environments.

Table 3: Shift-Share Decomposition by Regional City, 2001-2011

Local Government Area	Employment Growth Rate (g_r)	Difference (A_r)	Industry Mix (IM_r)	Local Competitiveness (LC_r)
<i>2001-2006</i>				
Albany	0.1430	0.0113	-0.0156	0.0270
Broome	0.0526	-0.0790	-0.0035	-0.0756
Bunbury	0.0968	-0.0348	0.0091	-0.0439
Geraldton-Greenough	0.1148	-0.0168	-0.0051	-0.0118
Kalgoorlie-Boulder	0.0179	-0.113	0.0542	-0.1680

Port Hedland	-0.0884	-0.2201	0.0603	-0.2803
Roebourne	0.1646	0.0329	0.0582	-0.0252
<i>2006-2011</i>				
Albany	0.0669	-0.1104	-0.0333	-0.0771
Broome	0.1651	-0.0122	-0.0148	0.0026
Bunbury	0.0629	-0.1144	-0.0049	-0.1096
Geraldton-Greenough	0.1941	0.0169	-0.0031	0.0200
Kalgoorlie-Boulder	0.1061	-0.0712	0.1011	-0.1723
Port Hedland	0.6953	0.5180	0.0939	0.4242
Roebourne	0.6844	0.5071	0.1177	0.3894

Shift-share decomposition by regional cities provides an aggregated and summative picture of the impact of economic structure and local competitiveness on economic performance. However, it is possible using the technique to explore the sources of regional differentiation by examining the relative importance of each industrial sector in accounting for employment growth. Figures 2 and 3 show these patterns and enable the identification of sectors that contribute most to both the industry mix and local competitive components of change (see Appendix A for the industrial classification mnemonic employed in this paper).

Taking Figures 2 and 3 together, it is evident that there is a complex and differentiated pattern of industry mix and local competitiveness components of growth across the regional cities. Put differently, inspection of the components of change across the localities indicates that the sources of employment growth are significantly different between places, both in terms of industry mix and local competitiveness. Nevertheless, it is possible to distinguish between the resource-based mining and petroleum communities (Kalgoorlie-Boulder, Port Hedland and Roebourne) and the remainder of the cities, all of which have more diversified economies. As might be expected, in the case of the resource-based economies, the mining (MIN) component of industry mix was critical in both 2001-2006 and 2006-2011, providing an overall positive effect on job creation. In Roebourne this was reinforced by the competitiveness of the local economic environment, whereas in the 2001-06 period, both Port Hedland and Kalgoorlie-Boulder were constrained by local competitive issues in the mining sector. We would speculate that this likely reflects the former's engagement in the petroleum industry, while the latter are both linked to mineral commodities. By 2006-2011, the situation appears to have changed dramatically: Port Hedland improved its local competitiveness, Roebourne's advantage had been largely lost, while Kalgoorlie-Boulder continued to lag behind its competitors in Western Australia. In Port Hedland and Roebourne, the other sector performing extremely well on local

competitiveness for 2006-2011 was construction (CON), perhaps reflecting the numerous new resource projects in the pipeline at that time (Lawrie et al., 2011). This raises issues about the knock-on effect of inter-industry linkages on the overall rate of employment growth; an issue that is difficult to handle within the context of a shift-share framework and requires more comprehensive modeling methodologies.

The non-mining localities present a far more complex and diverse picture, with a broader set of industrial sectors contributing to the impact of both industry mix and local competitiveness on local economic performance. Indeed, there appears to be little in common regarding the overall pattern across the non-mining regional capitals. In Albany, the overall industry mix component was dominated by the negative impact of mining (MIN) and agriculture, forestry, and fishing (AGR) in both periods, and construction (CON) in 2006-2011. Outside of these, industry mix had minimal impact on growth. More significant was the impact of local competitive effects. For the 2001-2006 period, local competitiveness contributed to growth in agriculture, forestry and fishing, and this more than offset the negative impact of economic structure in this sector. Other sectors to perform well as a result of competitive effects included the local manufacturing (MAN) and retail (RET) sectors. By the 2006-2011 period, what is particularly problematic for Albany is that almost across-the-board its sectors performed relatively poorly in terms of competitiveness. That is, whatever positive local competitiveness existed appears to have diminished or disappeared, to be replaced by a negative local economic environment. Furthermore, industry mix is now working against this locality through its impact on accommodation and food services (AAF) and construction (CONS), with very few positive impacts elsewhere in the local economy.

Although the impact of each industrial sector appears to be different between Albany and the port city of Bunbury, the data tell us a similar story of relative decline in local competitiveness. In the period 2001-2006, only a small number of sectors grew as a result of local competitiveness, including construction (CONS) and retailing (RET). By the 2006-2011 period, all sectors with the exception of manufacturing (MAN) recorded a negative effect for local competitiveness. In addition, between 2001 and 2006, industry mix had relatively little impact in most sectors, although by the 2006 to 2011 period a small advantage was evident for construction (CONS) and a negative effect for mining (MIN).

In the case of Geraldton-Greenough, the city recorded positive effects for competitiveness in education and training (EAT), mining (MIN), transport and wholesaling (TWH) for the 2001-2006 period. During the same period, the city's

industry mix had a more limited effect, recording small positive effects for construction (CONS), education and training (EAT), and retailing (RET). By 2006-2011, industry mix recorded negatives for professional, scientific and technical services (PST), with relatively little effect for any other sector. In terms of competitiveness, construction (CONS), public administration and safety (PAS), and transport and wholesaling (TWH) were positive, while mining (MIN) was clearly a lagging sector.

The remote Kimberly town of Broome had an industry mix in which no sector stood out as being a major contributor to growth or decline for the period 2001-2006. In terms of competitiveness for this period, only health care and social assistance (HAS) had a significant positive effect, while public administration was negative. By 2006-2011, industry mix was important for accommodation and food services (AFS), but negative for mining. For competitive effects, accommodation and food services (AFS) performed poorly, while a number of the services sectors recorded higher levels of competitiveness.

Despite their difference, taken together Broome and Geraldton paint a similar and brighter picture than either Albany or Bunbury. Over the 2001-2006 period, both local economies demonstrated a strong pattern of overall negative local competitiveness which has been largely reversed in the 2006-2011 period. In the case of Geraldton, the dynamism and diversity of the local economic environment was sufficient to dominate the impact of its industry mix.

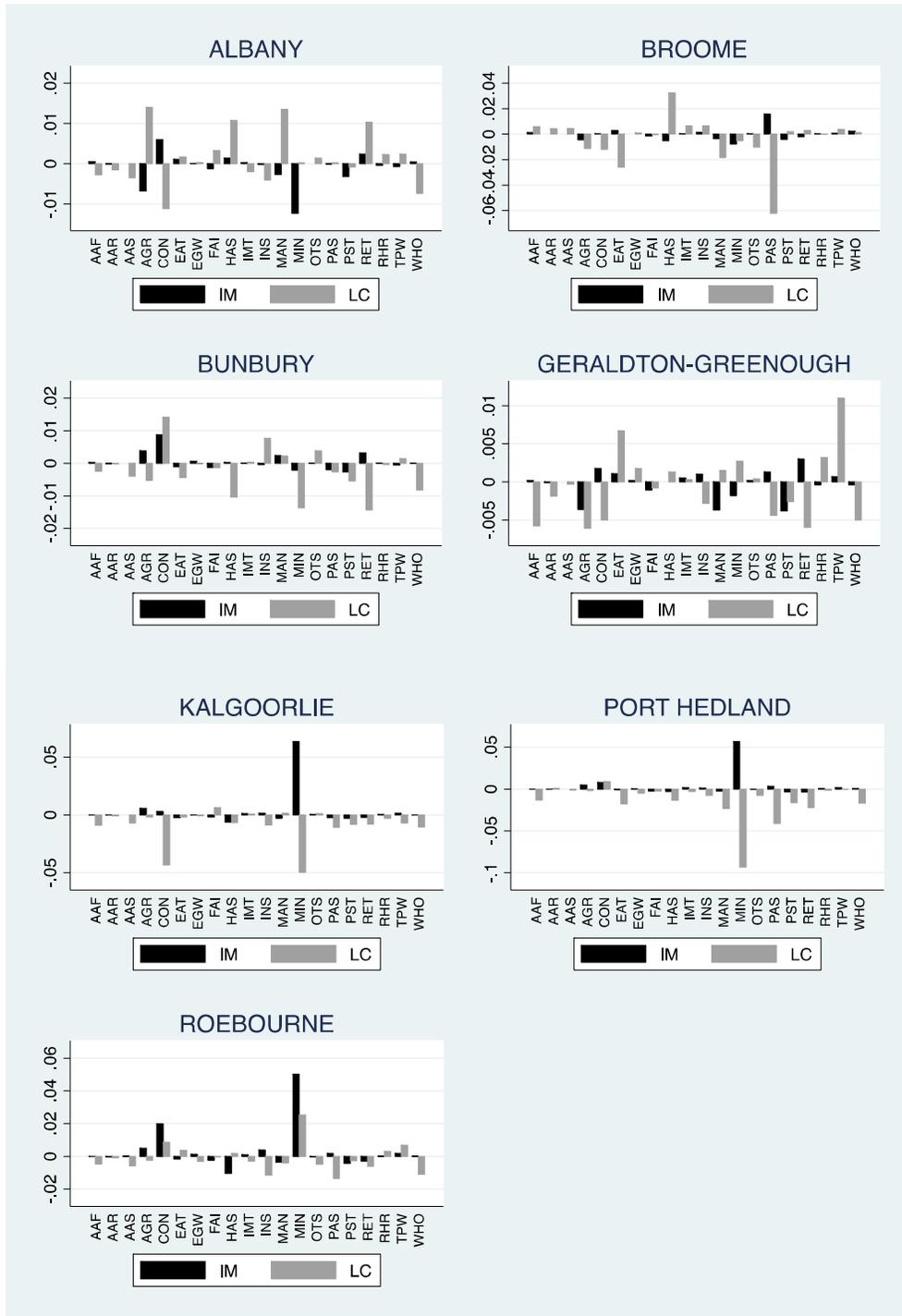


Figure 2: Industry Sector Shift-Share Patterns, 2001-2006. IM-Industry mix. LC-Local competitiveness

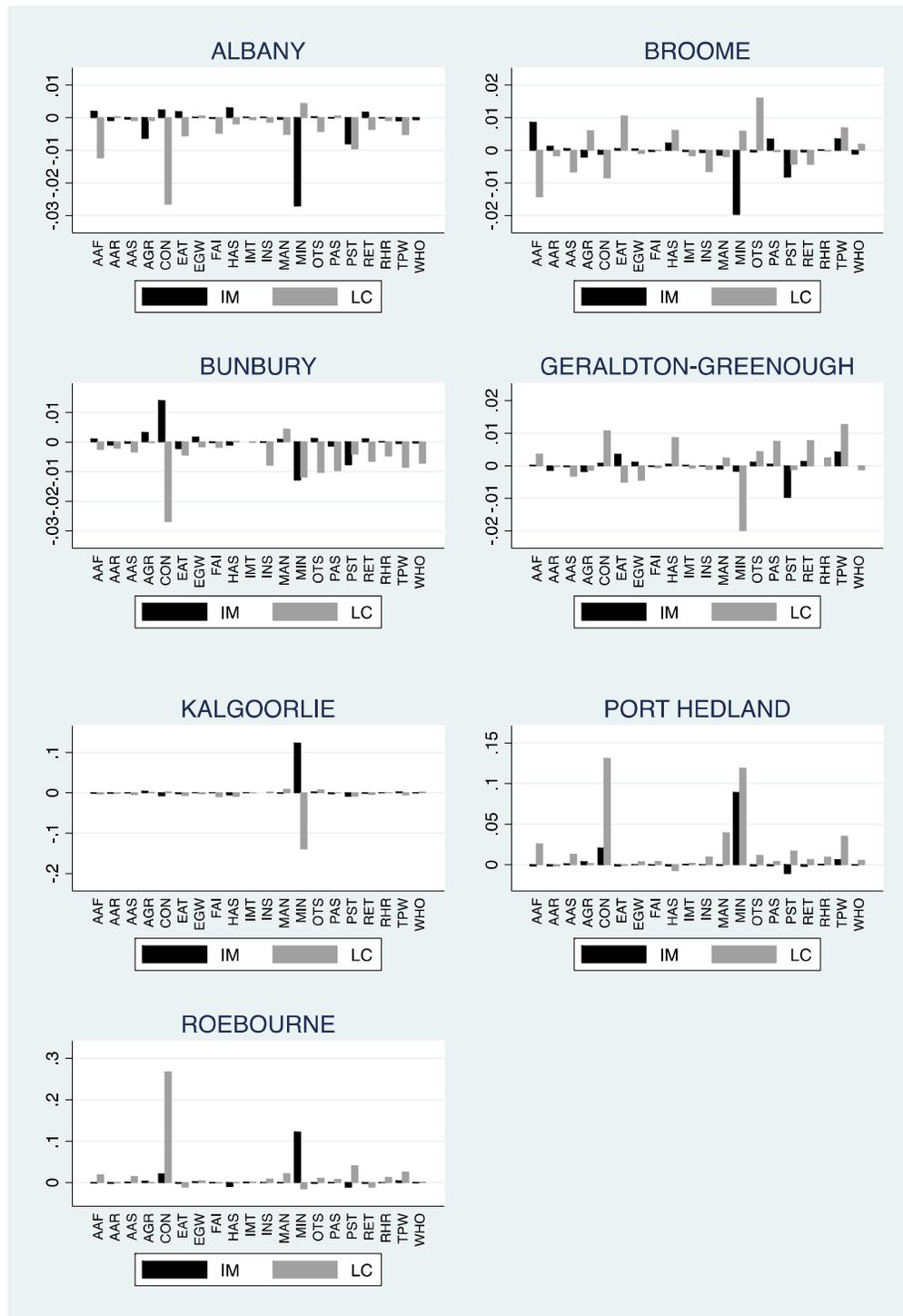


Figure 3: Industry Sector Shift-Share Patterns, 2006-2011. IM-Industry mix. LC-Local competitiveness

Understanding Local Competitiveness

As outlined earlier, one of the challenges with shift-share analysis is how to interpret the results. Indeed, one of its criticisms has been that while the technique is able to decompose economic structure and performance, and account for structural and local competitive effects, it is unable to offer insights into what drives economic change. For this paper, our interpretation rests in large part on the perspectives offered by endogenous growth theory. As such, we interpret the local competitiveness of the cities as an indicator of the degree to which endogenous factors drive growth. The industry mix component reflects the overall structure of the economy, and how each sector performs relative to the wider Western Australian reference economy. In essence, it measures the extent to which the local economic structure is positioned to deliver growth by engaging in those sectors that are expanding in the wider economy.

In terms of designing and implementing effective regional policies, the different insights that these indicators provide are important. In many respects, the industry mix component is difficult to influence since it is the outcome of wider economic processes and at the local level, is largely a reflection of long-run, path-dependent development. From the perspective of regional policy, and particularly from the perspective of endogenous growth theory, more direct influence can be asserted over local competitiveness. This is complementary to the prevailing view that regional economic performance can be facilitated through improvements in local economic conditions, including the quality of infrastructure, technological innovation, improving social capital, enhancing local environmental or urban amenity, reducing regulatory imposts and creating conducive planning regimes. So, while the shift-share analysis does not provide an explanation as to which local factors are important for any given city, it does help to provide a barometer of both overall competitiveness and the performance of individual sectors. A more careful and nuanced local assessment can then begin to shed light on the particular attributes shaping growth.

In the case of Western Australia's regional cities, the shift-share analysis presented in this paper suggests that industry mix has been important in driving economic growth. This is particularly evident in the resource-dependent communities of Roebourne, Port Hedland and Kalgoorlie-Boulder where being specialised in mining has clearly made a major contribution to growth. However, the analysis also suggests that local competitiveness is critical in enabling these cities to capitalise on their industry structure. For example, in Roebourne local competitiveness was a major driver of growth, particularly in the mining sector during the period 2001-2006. While it is not possible without further investigation

to make definitive statements regarding exactly what attributes underpinned this, it is apparent that competitiveness waned in the period 2006-2011. Based on local knowledge, we would conjecture that the rapid rise in local wages, increasing cost of living, low levels of available housing, and an infrastructure struggling to keep pace with development might be part of the explanation (see Department of Planning, 2012). Competitiveness was an issue in Kalgoorlie-Boulder across the decade 2001-2011, so while its industry mix contributed to growth, the city appears to have been unable to capitalise on its potential. Again, drawing on local insights it seems likely that factors such as the inability of mining companies in this region to compete with the salaries on offer in the north west of the state, quality and availability of housing, perceptions regarding quality of services, and levels of human capital were important (see Tonts, 2010).

However, local competitiveness is not only important in enabling cities to capitalise on a favourable industry mix. It can also provide a basis for local economies to grow despite having an unfavourable industry mix. For example, in both Broome and Geraldton-Greenough the industry mix performance was negative, while local competitiveness was positive. We would suggest that a combination of local environmental amenity, improvements in services and infrastructure and, at least in the case of Geraldton-Greenough, affordable housing were important local attributes.

There is, of course, a need for some caution in focusing excessively on local competitiveness as a means of developing the economies of regional capitals. While it is true that local attributes are important in contributing to growth, it is important not to underestimate the importance of external demand in driving development. In all of the regional cities examined here, macro-economic processes, such as commodity prices, exchange rates, trade policy and interest rates all affect the performance of the local economy. Thus, any policy focus on the drivers of endogenous growth cannot be in isolation of the wider economic realities within which these cities are situated. In this sense, the industry mix is a good indicator of how local economies are plugged into the wider economy. The evidence presented here suggests that the economic performance of local economies is a complex outcome of both global and local processes that we are able to identify, if not explain, in any given context.

Conclusion and Implications for Regional Policy

From a regional development policy perspective, two key themes emerge from the analysis presented in this paper. The first is that there is evidence of growing divergence or uneven development across Western Australia. Not only is this

evident across the entire settlement system, but also amongst the state's regional cities with some performing far better than others. The second theme to emerge is the ongoing importance of local competitiveness, and that this has the potential to have a significant impact on the growth dynamics of settlements. Moreover, the findings demonstrate that competitiveness plays out differently by sector and locality, suggesting the need for not just broad, place-based policy interventions but also strategies that are specific to individual sectors and places.

Taken together, these two themes suggest that the state government's interest and pro-active engagement in regional development policy is well-founded. On the one hand, it is responding to the failure of competitive market-based forces to drive the space economy towards equilibrium and is attempting to reign in a worsening level of spatial inequality. This is being implemented through a broad program of support for community development, infrastructure, and the service and other activities of local government. On the other hand, it is aiming to improve the competitiveness and resilience of both places and industries, in some cases through settlement specific strategies (e.g. Pilbara Cities and SuperTowns), and in others through more targeted, place-based industry initiatives (e.g. port enhancements, industrial land development).

Yet, it is apparent that despite these interventions uneven development is deepening in Western Australia, with some places forging ahead while others are being left behind. Of course, it is not possible to test the counterfactual here, that spatial inequality might have been worse had there been no intervention at all. Nonetheless, we would suggest that the findings point to some of the challenges facing regional policymakers and practitioners. The first is that broader economic structures, as reflected in the 'industry mix' component of the preceding analysis, are difficult to influence at the regional scale, since they are a product of longstanding, path-dependent processes and often influenced by macro-economic conditions. This is not to say that structure and structural adjustment should be ignored but that it presents a limitation for regional policy and points to the need for local/regional engagement with wider policy processes. The second is that local competitiveness is complex and difficult to define. Competitiveness needs to be understood *in locational context*. In other words, it is critical to understand the local economic landscape, institutional structures and social characteristics, and how these in turn shape competitiveness. Moreover, this needs to be understood for each major or emerging industry sector. In the case of Western Australian initiatives such as a requirement for each regional to prepare an investment 'blueprint', the expansion of the state's strategic planning spatial processes beyond the Perth metropolitan region, and the identification of development needs through the 'hotspot' reports are valuable. In addition, there is a need for detailed

assessments of local and regional productivity, incorporating assessments of gross value added, regional exports/imports, and local regional product. We would also argue that there is a need for a more cohesive regional development strategy that focuses on the peculiarities of the settlement hierarchy. The analysis here has shown that in the case of the state's regional cities, these occupy a particular economic niche both in terms of size and function. How these centres interact with other places (both within their immediate regions, with other centres in Australia, and even internationally) is an important part of understanding and enhancing their local competitiveness.

There is, however, a dilemma in developing regional policy built around notions of local competitiveness and endogenous growth. Endogenous growth policies that are targeted towards specific projects run the risk of attempting to 'pick winners', which of course has a long history of policy failure. Moreover, when undertaken in the absence of a recognition of the broader dynamics and interactions occurring within settlement systems, these initiatives have the potential to further entrench or even deepen spatially-uneven development. Indeed, such strategies might reinforce a pattern of 'winners and losers'. Accordingly, a rapprochement is needed between broad spatial policies and more targeted programs. In essence, this is a balancing act that Western Australia's regional policymakers are grappling with through the current suite of quite progressive regional programs. We would suggest that the next evolution in policy framework is to incorporate an explicit focus on two dimensions: i) settlement hierarchy; ii) settlement geography. The first of these recognises that the state is characterised by a distinctive hierarchy of settlements in non-metropolitan areas, each with an identifiable set of economic functions (Charnock and Jones, 1980; Plummer et al., 2013a,b). The second reflects the spatial interactions between centres within the hierarchy and the ways in which interventions or initiatives in one or more localities play out through the rest of the system. An integrated approach incorporating these elements has the potential to ensure that a focus on local competitiveness does not drive spatial divergence.

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Appendix

Anzac Industrial Classification and Mnemonic Employed in this Paper

ANZAC Classification	Mnemonic
Agriculture, forestry & fishing	AGR
Mining	MIN
Manufacturing	MAN
Electricity, gas, water & waste services	EGW
Construction	CON
Wholesale trade	WHO
Retail trade	RET
Accommodation & food services	AAF
Transport, postal & warehousing	TPW
Information media & telecommunications	IMT
Financial & insurance services	FAI
Rental, hiring & real estate services	RHR
Professional, scientific & technical services	PST
Administrative & support services	AAS
Public administration & safety	PAS
Education & training	EAT
Health care & social assistance	HAS
Arts & recreation services	AAR
Other services	OTS
Inadequately described/Not stated	INS