Corporate clustering in Australian cities: An analysis of the geographic distribution of ASX-listed headquarters

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Abstract: The geographic distribution of company headquarters has been studied in a variety of contexts as a means by which to understand the hierarchies and vectors of corporate power. Much of this is framed in the context of 'agglomeration economies'—the concept that spatial clustering creates synergistic relationships – both tangible and intangible – between firms, their employees, and related institutions. This paper provides a comprehensive cross-sectional analysis of the geographic dimensions of corporate headquartering both within and between Australia's major city-regions. Drawing on a list of 1,913 endogenous corporate headquarters, the country's agglomerations are detailed and interrogated so as to provide an understanding of how their locational structure crystallized over time and the implications thereof. This research supports the notion that Sydney and Melbourne are Australia's most prominent nodes of economic power, but also recognises a significant cluster of relatively small mining-related companies in Perth, as well as an orientation toward larger median firm size in Brisbane. Specific metropolitan-scale industrial clusters are also considered, and defined pathways for further research in this vein are suggested vis-à-vis a range of contemporary network analysis methods.

Abbreviated Title: "Corporate Clustering in Australian Cities"

Keywords: Australian Cities; Urban Networks; Agglomeration Economies; Economic Geography

Introduction

The distribution of corporate headquarters has been a longstanding subject of study within the social sciences. This scholarly focus on corporate headquarters has sharpened since the 1980s, as globalised productions networks (Henderson et al., 2002) and divisions of labour (Fröbel et al., 1978) have increasingly de-coupled managerial from productive functions within corporations (Ghoshal and Bartlett, 1990). Corporate headquarters are viewed as expressions of economic power, and it could be argued that corporations wield more power than ever before, as the regulatory role of the state has been categorically marginalised (cf. Brenner, 1999). Headquarters house the operational bases of firms' top levels of command, and the attraction and retention of headquarter offices and the related high-skill workforce has thus been a key focus of regional development policy, as evidenced by the intense inter-local competition of the past few decades (Peck, 2005).

Within Australia, corporate power has traditionally been seated in Melbourne and Sydney, with a gradual transition from the former to the latter over the second half of the 20th century (Tonts and Taylor, 2013; Taylor and Thrift, 1981), while Brisbane, Perth, and other cities are understood to occupy complementary roles in the national urban hierarchy. Although this hierarchy is relatively well understood, to date no comprehensive cross-sectional study of corporate headquarters has supported this understanding. This paper provides a comprehensive analysis of the spatial dimensions of corporate headquartering within Australia using data from all Australian Securities Exchange (ASX) listed firms with the objective of identifying metropolitan-scale and industry-specific clusters as the basis for better understanding the national urban system.

Corporate Headquarters: At What Scale?

The study of corporate headquartering is framed by literatures on two alternative scales (Tonts and Taylor, 2013). On one hand, the tendency for firms within particular industries to agglomerate within metropolitan regions has drawn myriad scholars from Planning (Drennan and Kelly, 2011; Saxenian, 1996), Geography (Scott, 2000), Business (Porter, 2000), and other social sciences (Torre, 2008) to interrogate the merits of so-called clusters. Economic agglomerations at the regional scale have been perceived as particularly competitive for a variety of reasons that includes the synergies between firms, a strong local labour market, and the economies of scale derived from the use of common infrastructure such as airports, convention centres, and fibre-optic networks. Furthermore, cities with large numbers of corporate headquarters often house related industries, particularly advanced producer services (APS) such as law, accounting, insurance, and financial firms (Sassen, 2001) as well as proportionally large numbers of well-paid managerial and professional staff, who in turn contribute to a regional economic base by spending on high-value amenities. This leads to a 'virtuous circle' through which a strong labour market and quality-of-life factors (e.g. social amenities) lead to the creation of new firms, further reinforcing the primacy of particular metropolitan regions (Coe and Townsend, 1998). Over the past decade, much of this literature has centred on learning and innovation as key outcomes of clustering (Iammarino and McCann, 2006) and as mechanisms for fostering regional development.

On the other hand, the distribution of firms on a larger scale has been used to articulate the meta-geography of urban power and influence in a national or global context (Beaverstock et al., 1999; Taylor and Csomos, 2012). In such analyses, corporate headquartering is often used as a proxy measure of the strength of a city's relative economic prowess. Most significantly, the Global/World Cities literatures[1] (henceforth Global Cities) have applied corporate headquarters as an operational variable in the myriad league tables that quantify urban hierarchies throughout the world. Globally, New York and London are generally atop such tables due to their strong positions within corporate command networks (Taylor et al., 2011; Wójcik, 2011). This is supported by hundreds of scholarly papers by the Globalization and World Cities research network (GaWC), as well as by numerous widely circulated rankings by corporate and non-profit actors such as The Economist; Foreign Policy; MasterCard; and CitiGroup.

In the Australian context, such league tables generally indicate that Sydney and Melbourne sit atop urban hierarchies based on corporate headquartering and related attributes (Sigler, 2012). In some cases, such as in 'The World According to GaWC' (GaWC, 2013), Brisbane is also featured among Australian cities, but generally speaking Sydney is the clear leader, on par with Chicago, Dubai, and Shanghai in terms of global status. This methodology, however, has increasingly come

[1] For the purposes of this paper, these two are treated as identical concepts.

under fire, as both academics and policymakers grow wary of rankings based solely on the presence of globalised corporations, with a particular bias toward APS (Toly et al., 2012).

This paper considers both of these theoretical perspectives in an effort to better comprehend the spatial dimensions of headquarters distributions within Australia. Despite the ostensible shortcomings of corporate headquartering as a proxy for measuring urban hierarchies, the identification of industry-specific clusters serves as a useful tool for *understanding* the inner workings of an urban system. In the sections that follow, this paper attempts to make two contributions to the state of existing knowledge on corporate clustering in metropolitan regions. First, instead of a narrow focus on APS or 'knowledge-based' industries (Yigitcanlar, 2010), this analysis takes a comprehensive look at all Australian Securities Exchange-listed (ASX) corporations, disaggregated by industrial designation. As such, inferences can be made about both the absolute clustering tendency of firms and the relative clustering of particular industries. As discussed in greater depth below, the profile of corporations headquartered in Melbourne, for example, differs substantially from those found in Perth, despite both being among the top three (with Sydney) in both the total market capitalization (share value) of local corporations as well as in the total number of headquarters. Second, rather than relying on global datasets containing a pre-selected group of 'global' corporations, this analysis relies upon a set of all publicly traded endogenous firms. In other words, in lieu of considering only the presence or absence of American, Asian, and/or European corporations in Australia, which are strongly clustered in Sydney (O'Neill and McGuirk, 2005; O'Connor and Edgington, 1991), this study considers the distribution of Australian corporations among major domestic metropolitan areas, which reveals quite a divergent pattern.

The Australian Urban System

The Australian urban system serves as a strong basis for such research for a variety of reasons. First, the number of cities is relatively small, and state capitals exhibit a high degree of primacy within their respective states, the implication of which is that the location of firms is neatly bound within a handful of cities. Even within large metropolitan areas, Australia has relatively few 'edge cities' that decentralise business activities from urban CBDs (Freestone, 1997). Second, data are relatively abundant and robust. As Grant and Nijman contend, corporate address data is often limited to lists of transnational corporations and/or incomplete local datasets (2002: 324), particularly in the less-developed world. In Australia, not only are data readily available, but the country's geospatial data infrastructure supports this type of research activity. Third, Australia has many endogenous firms and therefore reliance on multinational corporation (MNC) data is unnecessary. This facilitates the analysis of local companies, which indeed produces different results than an assessment of MNC activity in Australia. A corollary to this is that Australia features a large number of firms engaged in the primary sector, resulting in a wider range of economic activities than is generally captured by analyses of MNCs alone. Furthermore, in contrast to other securities exchanges, more than 98% of ASX-listed corporations are headquartered within Australia, meaning that the distribution of firm headquarters serves to mirror domestic business activities.

The distribution of corporate headquarters in Australia has been the subject of a limited number of studies. Johnston (1966) found that Sydney and Melbourne dominated the majority of industries, and that only "Adelaide in the vehicle and transport industries and Perth and Brisbane in mineral exploitation seriously challenge this leadership" (1966, p.52). In 1981, Taylor and Thrift confirmed essentially the same finding, adding that the contrasts between Sydney and Melbourne tended to intensify in times of economic expansion, which is best explained by "the resilience of Melbourne's larger organisations and the susceptibility of Sydney's relatively smaller organisations to the exigencies of recession" (1981, p.144). A major finding, however, later corroborated by Searle (1996), is that Sydney's influence expanded over the second half of the 20th century as it became Australia's main Global City, a role that was further cemented by the Sydney's hosting of the 2000 Olympic Games. Tonts and Taylor (2013 and 2010) confirm the primacy of Sydney and Melbourne in a contemporary context, adding that although Perth's relative influence has increased due to its strong concentration of mining enterprises, the Western Australian capital, along with Brisbane and Adelaide plays a "highly peripheralised" role in the national urban system (2010, p.2651). They note that the distribution of corporate headquarters is to some degree explained by traditional geographic advantages (Testa, 2006), though many 'legacy' companies are bound to their original location by path-dependent trajectories.

The primacy exhibited by Melbourne and Sydney stems from Australia's colonial history, in which Victoria and New South Wales emerged as centres of economic activity early on. Prior to the First World War, Australian cities functioned largely as entrepôts mediating transactions in wool and

precious metals (Meredith and Dyster, 1999). Even well after federation, trade patterns largely conformed to state boundaries into the 1960s, as a lack of railway gauge standardisation prevented widespread integration. The contemporary Australian urban system has therefore effectively taken shape since the 1970s, as Australia simultaneously deregulated and integrated its national systems while liberalising international trade. Building on earlier developments, this period of restructuring favoured Australia's largest cities, and Melbourne and Sydney emerged as globally oriented centres of corporate command. The legacy of the past thus had a strong influence of the corporate landscape of today, particularly as Australia's seven largest firms are located in one of the two cities.

This study is framed by past research on the corporate landscape of Australia and by economic conditions that break from the legacy of the past. The dismantling of Australia's protective tariff barriers in the 1980s has greatly diminished the role of manufacturing since peaking in the mid-20th century in favour of a services-oriented economy (Henry, 2011). Furthermore, although the Australian economy has always been buoyed by the primary sector, the recent resources boom (mark two) has re-emphasised the country's role in mining and related industries. This role goes far beyond the exportation of raw materials, as there are 768 (mostly small) corporations listed on the ASX under the category of 'materials', which in fact includes a wide range of activities related to the mining-resources complex.

Data and Methodology

The study of spatial distribution toward clustering or dispersion is one of the primary foci within the field of Geography. Nearly all phenomena, but particularly those that can be identified at discrete points (e.g. the locations of oil wells, Chinese restaurants, or koala sightings) can be analysed for clustering tendencies as well as the relationships between types of points. In many cases, clusters are analysed quantitatively for patterns, particularly where the distribution is unknown or difficult to determine. However, corporate clustering is clearly an urban phenomenon, with less than 4% of ASX corporations located outside of Australia's major capital city-regions, and 74% within statistical region sectors (SRS) containing CBDs. Thus, in this analysis, descriptive statistics have been deployed so as to highlight both the clustering tendencies within individual metropolitan areas as well as the qualitative differences between respective clusters.

The research methodology applied in this study derives from the work of those that have studied the distribution of corporate headquarters in both national and global contexts. Corporate headquarters are a commonly used variable in the elaboration of quantitative Global Cities research (Beaverstock et al., 2000). Firm-by-city matrices are the most common way to tabulate data (Liu and Derudder, 2013) in such research, and various network analysis techniques have been employed to analyse the resulting geometries of urban power (Neal, 2013). Consequently, the basis of this project is a firm-by-city matrix, detailing on one axis a list of publicly traded Australian firms (discussed below) and on the other axis attribute data including both absolute (e.g. address) and relative (e.g. metropolitan area) location, industrial designation, and market capitalisation. This methodology follows the precedent of Taylor and Thrift (1981), and Tonts and Taylor (2010), but draws upon a wider set of firm data. Furthermore, Tonts and Taylor (2013) apply a similar methodology, but utilise a longitudinal, rather than cross-sectional analysis. Consequently, this paper seeks to fill this gap by analysing the spatial distribution of *all* publicly listed corporate headquarter offices by industry[2] and metropolitan region within the Australian urban system.

Corporate data were taken from the full set[3] of companies listed on the Australian Securities Exchange (ASX) as of 5 February 2013. Located in Sydney's central business district (CBD), the ASX serves as Australia's largest securities exchange and among the world's largest in terms of market capitalisation. The ASX serves as a platform for trading shares; futures and options; trusts; funds; warrants; and a variety of other financial products (Australian Securities Exchange, 2013). A total of 1,913 records for individual ASX-listed corporations were obtained from the ASX website, which lists a registered office address for each company. Headquarter office locations were geocoded as Lat/Long coordinates and subsequently inputted into ESRI ArcGIS 10.1 for analysis. Offices were classified according to the Global Industry Classification Standard (GICS) code, and

[2] The term 'industry' is preferred to 'sector', as firms are likely to include functions within multiple sectors (e.g. the finance department of a large agricultural conglomerate).

[3] Approximately 200 companies were excluded from this analysis due to data consistency issues.

further classified within ArcGIS by metropolitan area, which corresponds to capital city[4] statistical divisions (SD)[5] as enumerated by the Australian Bureau of Statistics (ABS).

Once corporate headquarter data were disaggregated by industry and metropolitan area, two metrics were considered. First, metropolitan areas were classified by the number and market capitalisation of locally registered companies. Market capitalisation is an indicator of the relative size and importance of an industry, and refers to the total value of all shares held for a particular company. These metrics were chosen in order to identify the significance of each Australian capital city-region in both absolute and relative terms. Second, industries were analysed for resulting spatial patterns. 24 industry types were identified, ranging in presence from three firms (semiconductors and household & personal products) to 768 (materials), and in aggregate market capitalisation from $444 million (automobiles and components)[6] to $336 billion (banks). Table 1 details the complete set of industries by market capitalisation.

Table 1. ASX-Listed Industries by Firm Presence and Aggregate Market Capitalisation

GICS Code	Number of Firms	Total Cap Value	Mean Cap Value
Banks	13	335,679	25,821
Materials	768	301,476	393
Energy	253	107,642	425
Real Estate	83	103,651	1,249
Food & Staples Retailing	4	81,304	20,326
Telecommunication Services	23	67,564	2,938
Insurance	9	56,971	6,330
Diversified Financials	131	55,077	420
Transportation	26	47,556	1,829
Media	27	34,339	1,272
Consumer Services	37	32,797	886
Pharmaceuticals	66	32,764	496
Commercial & Professional Services	63	32,114	510
Capital Goods	104	31,780	306
Health Care Equipment & Services	55	30,336	552
Utilities	32	26,875	840
Food Beverage & Tobacco	36	20,732	576
Retailing	39	20,104	515
Software & Services	66	13,837	210
Consumer Durables & Apparel	25	2,584	103
Technology Hardware & Equipment	30	885	29
Semiconductors	3	634	211
Household & Personal Products	3	591	197
Automobile & Components	11	444	40
GICS Sector Code Not Applicable	6	71	12
Total	**1,913**	**1,437,807**	**752**

Market capitalisation values in millions of AUD. Source: Sydney Morning Herald (2013).

Metropolitan-scale data and industry-specific data were then cross tabulated in order to identify significant clusters in each capital city-region of Australia. The resulting output indicates both the

[4] The city-regions of all state capitals and Canberra were included in this analysis. There are two corporate headquarters located in Darwin, as well as small clusters (<10) in regional cities such as Newcastle, Launceston, Ballarat, Cairns, Townsville, and Kalgoorlie. Queensland's Gold Coast is the only non-capital city-region with more than 10 corporate headquarters within Australia, and Auckland, New Zealand features by far the most significant cluster of ASX-listed firms outside of the country.

[5] The term metropolitan area has been retained for this analysis, as SD is specific to the Australian system.

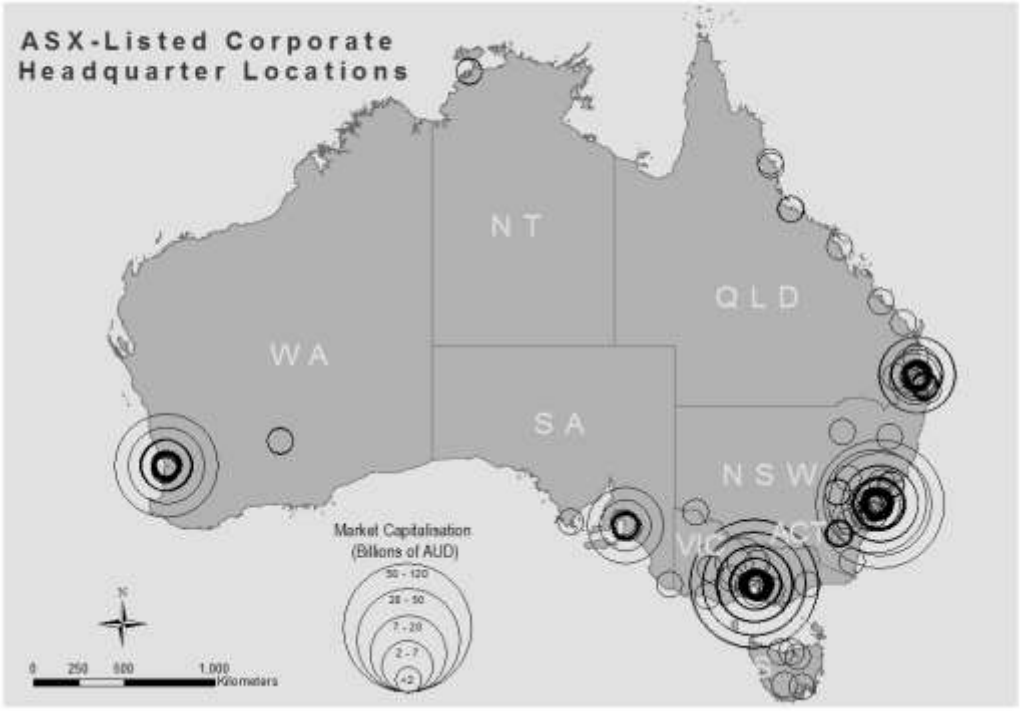
[6] It is worth noting that Australia's largest automobile producers – Holden, Ford, and Toyota – are held by foreign MNCs and therefore listed on other securities exchanges.

relative strength of metropolitan-scale clusters as measured by the overall presence of firms, as well as the type of industry present in each capital city-region of Australia.

Analysis and Discussion

The fundamental concern of this research project is to understand the spatial distribution of corporate power within the Australian urban system. The underlying presumption is that corporations are distributed among Australia's cities in a hierarchical manner, with Sydney and Melbourne housing the largest agglomerations of company headquarters and with ever-fewer headquarters as one moves down the order. Upon cursory analysis this proves to be true. Figure 1 shows the spatial distribution of corporate headquarters, with graduated circles representing the market capitalisation values of firms at their registered headquarter locations, geocoded to discrete points.

Figure 1. Locations of ASX-Listed Corporate Headquarters by Market Capitalisation



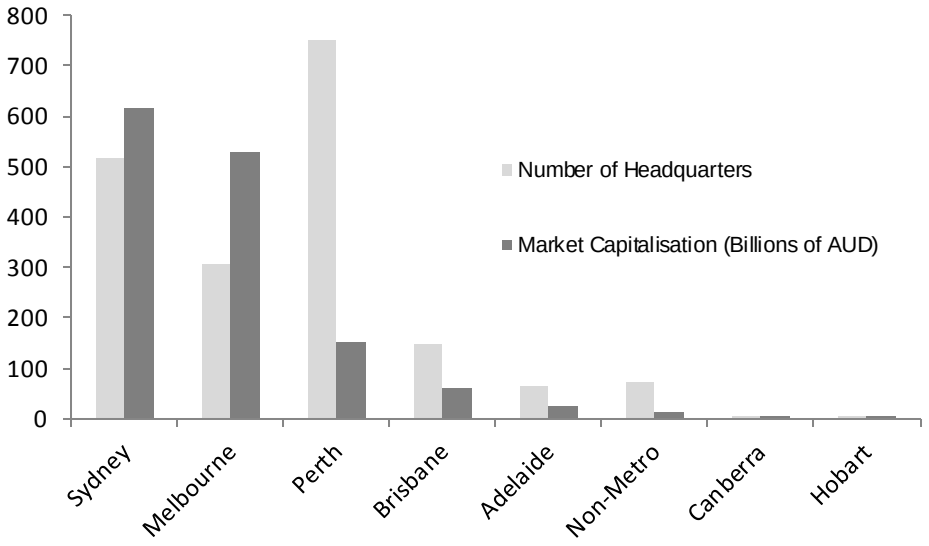
As Figure 1 reveals, the distribution of firms largely conforms to the Australian urban hierarchy, with Sydney, Melbourne, Perth, and Brisbane hosting the largest clusters. Firms headquartered in the Sydney metropolitan area have the highest aggregate market capitalisation ($617 billion), followed closely by Melbourne ($529 billion). Firms located within the two metropolitan areas comprise 79.7% of total market capitalisation of ASX-listed companies.

However, upon closer examination, there are numerous data points that question the sustained primacy of Sydney and Melbourne as Australia's unequivocal business hubs. For example, when average firm size is considered – operationalised as median market capitalisation – corporations headquartered in Brisbane tend to be the largest in Australia at over $43 million, with Sydney's firms averaging $29 million, Melbourne's averaging $24, and $21 million for all ASX-listed corporations. Thus, although Sydney's and Melbourne's major banks and other industrial conglomerates dominate the upper echelons of the corporate hierarchy (discussed below), the vast majority of the firms fall into the 'small-cap' and 'mid-cap' category (<$300 million), and many are located in Australia's second-tier cities. Furthermore, while Tonts and Taylor (2010, p. 2654) found that in 2005 Brisbane and Perth were home to only 3.1% and 6.1% of ASX300 corporations[7], respectively, the two currently comprise 7.7% and 39.2% of all ASX corporations.

[7] ASX300 refers to the 300 largest firms listed on the ASX by market capitalization.

In terms of sheer number of firms, Perth emerges as the clear leader with 752 firms— nearly as many as Sydney and Melbourne combined (824). Thus, Sydney and Melbourne together house less than half of all ASX-listed firms, with Brisbane (147) and Adelaide (66) also home to significant numbers. Figure 2 details the aggregate market capitalisation and number of firms by metropolitan area.

Figure 2. ASX-listed corporations per Metropolitan Area by Value and Number



Metropolitan Scale Clusters

When disaggregated by metropolitan area *and* industry, the trends detailed above become even clearer, as several patterns emerge that define the Australian corporate landscape at a metropolitan scale. While the emergence of many smaller firms can be explained by locational advantages such as proximity to resources or labour, many of Australia's largest corporations were initially founded as state-owned enterprises (i.e. 'natural monopolies') that were at some point privatised or demutualised (Tonts and Taylor, 2013), including Commonwealth Bank (Sydney) and Telstra (Melbourne).

In Sydney, the corporate landscape is characterised by a strong presence of 'industry giants' within a variety of sectors. This includes Australia's largest bank (Commonwealth), retailer (Harvey Norman), media conglomerate (News Corp), insurance company (AMP Limited), energy provider (Origin), and real estate group (Westfield), among many others. The fourteen largest real estate corporations are all located in Sydney, as are five of the seven largest diversified financials companies. Metropolitan Sydney is home to 12 of the top 25 corporations, and 29 of the top 50.

In Melbourne, the composition is slightly different, as the city's history—first as the commercial epicentre of the 19th century gold rush, and then as the first national capital city—still have great influence. Melbourne is home to Australia's largest company—BHP Billiton (which is also the world's largest resources conglomerate) as well as the Australian headquarters of Rio Tinto. Melbourne is also home to Australia's three largest software & services corporations and four of the five largest pharmaceuticals firms, attributable to the development of Commonwealth Serum Laboratories, or CSL (Tonts and Taylor, 2013), which has traditionally been the country's leading medical research laboratory. While further research is needed to uncover more detail on the nature of these clusters, possible explanations may be the innovation and knowledge spillover from local research laboratories, or linkages to Melbourne's commercial-industrial complex (Rich, 1987; Logan, 1966).

With the largest number of ASX-listed headquarters in Australia, Perth has gained a significant presence in the national urban system. Of the city-region's 752 firms, 471 are in the materials sector and a further 129 are in energy, with the remaining firms distributed among a variety of other sectors. Perth's materials and energy sectors are characterised by many relatively small firms linked to Western Australia's resource base. Median firm size is $13.6 million—less than half of Sydney and less than a third of Brisbane. This agglomeration centres on Perth as the only major city in all of Western Australia—a state rich in iron ores and gold, and the site of Australia's major

hydrocarbon deposits (DFAT, 2013). Though no longitudinal research on Perth's agglomeration exists, Tonts and Taylor (2013) suggest that it coalesced in the 1980s, and the relatively small size of its firms indicates a strong presence of newer, less-established firms, many of which are engaged in the exploration of a particular element, often in a specific geographical context (not necessarily in Australia). Many of the smallest firms' securities comprise a cohort of so-called 'penny stocks', often deemed to be risky (but sometimes highly remunerative) investments by experts (Bromby, 2011).

Explanations for the nature of Perth's corporate agglomeration include a culture of state-led entrepreneurship in Western Australia (Tonts and Taylor; 2009), and that Perth's isolation and its regional natural resource endowments account for its growing role in the Australian corporate landscape, as well as the role of the free market in shaping the industrial landscape as trade protections were removed (Tonts and Taylor, 2013, p. 1517; 2010, p. 2657). Kane (2012) suggests that knowledge spillovers were responsible for the emergence of the mining industry in Perth's CBD. Regardless of its provenance (likely a combination of many factors), the emergence of Perth as a significant node of corporate headquarters is significant, particularly as studies focusing on the top 100 or 300 Australian firms have overlooked its importance. The speculative nature of many of these firms, however, suggests an inherent vulnerability to a global (or national) 'cash crunch', and Perth's high number of headquarters is not necessarily an indicator economic strength.

Outside of Sydney, Melbourne, and Perth, Brisbane was the most significant in terms of corporate headquarters, followed by Adelaide at a distant fifth. As suggested by the analysis of average firm size, Brisbane is dominated by medium-sized firms, many in the materials and energy sectors, and the city features only one top-25 company (Suncorp). Many of Brisbane's medium-sized firms are related to the exploration, extraction, processing, and export of Queensland's vast resource base, which today is focused on coal, copper, aluminium, and various ores (DFAT, 2013). However, as Tonts and Taylor suggest (2010), sectoral clustering is not strong enough in Brisbane to warrant the identification of a local agglomeration, and Brisbane's economic significance may relegated to the command functions it assumes largely within the Queensland economy. Table 2 summarises the dominant industries in Australia's five major metropolitan areas based on the total market capitalisation.

Table 2. Main Industries in Major Metropolitan Areas (ranked by aggregate market capitalisation)

Rank	Adelaide	Brisbane	Melbourne	Perth	Sydney
1	Energy	Insurance	Materials	Materials	Banks
2	Diversified Financials	Transportation	Banks	Food & Staples	Real Estate
3	Materials	Consumer Services	Telecom. Services	Energy	Energy

Materials and energy, both of which are fundamentally less urbanised industries, are perhaps the most dispersed, with a strong presence in most Australian cities by at least one of the two sectors. Of all industries, however, these may be the most volatile, as economic gains are tied to both export markets and spot prices, both of which are tenuous in the wake of the recent global financial crisis. When quantified by market capitalisation, they constitute Australia's second and third most significant industries (see Table 1), preceded only by banking and followed by real estate. The implication of this is that smaller capital cities may be more vulnerable to economic cycles. According to the Australian Bureau of Resources and Energy Economics (BREE), there were $268 billion of major resources and energy projects in the 'committed' stage as of April 2013. However, this figure is projected to drop to $70 billion by 2017, as high labour costs, bureaucratic hurdles, and the potential for waning demand all converge to render many projects economically unviable (Barber et al, 2013). This has great potential to destabilise local economies – both rural and urban – tied primarily to the energy and resources industries, and it is likely that its impact would be felt disproportionately in Perth, Brisbane, and Adelaide. Furthermore, given that small firms may be less resilient than larger ones, such a downturn would weigh heavily Perth in particular, as nearly half (245) of the smallest 500 ASX-listed firms are headquartered in the Western Australian capital, of which 186 (76%) are in the materials and energy sectors.

Conclusion

This paper has identified the distribution of corporate headquarters among Australia's capital city-regions, as well as industry-specific specialisations within Australian cities. Supporting that which

has been postulated in the Global Cities literature, Sydney and Melbourne emerge as the articulators of corporate power. As Tonts and Taylor claim, "the dominance of Sydney and Melbourne in the corporate geography of Australia tends to overshadow the role of Australia's second-tier cities" (2013: p. 1518). While the data prove this to be generally true, there are of course caveats to this dominance, as fewer than half of ASX-listed firms are located between the two. The large number of materials/mining corporations in Perth, as well as a strong presence of energy, banking, and finance companies elsewhere indicates that further research is needed to fully understanding corporate clustering in the Australian context, as new questions emerge about how and why groups of firms exhibit a tendency to co-locate in particular spaces, and the resulting economic benefits. Not only have clusters been linked to gains in economic productivity, but agglomerations such as the technology hub in California's 'Silicon Valley' and the financial centre within the City of London have emerged as some of the most globally successful economic engines (Porter, 1996; Martin et al., 2003). Consequently, knowledge about how and why firms form clusters is of critical importance for understanding, and consequently for planning, regional economies. At present, very little research has explored the distribution of corporate headquarters in Australia in great detail, and in particular about the clustering tendencies within and between industries on a metropolitan scale.

Going forward, empirical data are needed to better articulate the distribution of corporate headquarters and power within Australia. A limitation of this study was a focus on ASX-listed firms, something that could be bolstered by incorporating both private firms as well as foreign MNCs. Such data would further elucidate the specific ways in which power is manifest both within the national system, and between Australia and the global economy, especially as Australian foreign policy is more deeply integrated with Asia in the so-called 'Asian Century'. Furthermore, as Sydney, Melbourne, Perth, and Brisbane strive to be Global Cities (Sigler, 2012), such studies would bolster these aspirations, indicating the specific ways in which each intersects with the global economy. As Liu and Derudder (2013) argue, this can be operationalised with at least three established methods that have been widely applied in the past decade—the ownership linkage model, the interlocking network model, and the two-mode network model.

Australia's cities are positioned for growth in both absolute population and in relative global influence. In the wake of the most recent resources-led boom, Australia exhibits strong economic growth and features the highest gross national income (GNI) per capita of any country over 10 million inhabitants. However, given the country's strong reliance on extractive industries, sensible and strategic policy measures will have to be taken to ensure that Australia's cities remain economically competitive in a global economy. As such, understanding the dynamics of corporate power both within and among Australia's capital city-regions is necessary to achieving aims of competitiveness.

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References

Australian Securities Exchange (2013) ASX website: http://www.asx.com.au (accessed 17 May 2013).

Barber, J., Shael, T., Cowling, S., Bialowas, A., & Hough, O. (2013) *Resources and Energy Major Projects April 2013*. Bureau of Resources and Energy Economics, Canberra. Retrieved 24 October 2013 from http://www.bree.gov.au/documents/publications/remp/REMP-2013-04.pdf.

Beaverstock, J. V., Smith, R. G., & Taylor, P. J. (2000) World-City Network: A New Metageography?, *Annals of the Association of American geographers*, 90(1), pp. 123-134.

Brenner, N. (1999) Beyond state-centrism? Space, territoriality, and geographical scale in globalization studies, *Theory and society*, 28(1), pp. 39-78.

Bromby, R. (2011) Many penny stocks are flops or badly run, but not all are dreadful. *The Australian*. 17 January edition, Retrieved online 24 October 2013 from http://www.theaustralian.com.au/archive/business-old/many-penny-stocks-are-flops-or-badly-run-but-not-all-are-dreadful.

Coe, N. M. & Townsend, A. R. (1998) Debunking the Myth of Localized Agglomerations: The Development of a Regionalized Service Economy in South-East England, *Transactions of the Institute of British Geographers*, 23(3), pp. 385-404.

Department of Foreign Affairs and Trade website (2013) Retrieved 6 June 2013 from www.dfat.gov.au.

Drennan, M. P. & Kelly, H. F. (2011) Measuring urban agglomeration economies with office rents, *Journal of Economic Geography*, 11(3), pp. 481-507.

Freestone, R. (1997) New suburban centers: An Australian perspective, *Landscape and urban planning*, 36(4), pp. 247-257.

Fröbel, F., Heinrichs, J., & Kreye, O. (1978) The new international division of labour, *Social Science Information*, 17(1), pp. 123-142.

Ghoshal, S. & Bartlett, C. A. (1990) The Multinational Corporation as an Interorganizational Network, *Academy of Management Review*, pp. 603-625.

Gillette, C. P. (2005) Conditions of Interlocal Cooperation, *The Journal of Law and Politics* 21, pp. 365.

Globalization and World Cities (GaWC). (2013). *The World According to GaWC 2010*. Retreived 21 October 2013 from http://www.lboro.ac.uk/gawc/world2010t.html.

Grant, R. & Nijman, J. (2002) Globalization and the corporate geography of cities in the less-developed world, *Annals of the Association of American Geographers*, 92(2), pp. 320-340.

Henderson, J., Dicken, P., Hess, M., Coe, N., & Yeung, H. W. C. (2002) Global production networks and the analysis of economic development. *Review of International Political Economy*, 9(3), pp. 436-464.

Henry, K. (2011) *Australia 2011: Opportunities Challenges and Policy Responses*. Giblin Lecture at the University of Tasmania, 4 June: http://www.treasury.gov.au/PublicationsAndMedia/Publications/2011/Economic-Roundup-Issue-2/Report/Australia-2011-opportunities-challenges-and-policy-responses (accessed 5 June 2013).

Iammarino, S. & McCann, P. (2006) The structure and evolution of industrial clusters: Transactions, technology and knowledge spillovers, *Research policy*, 35(7), pp. 1018-1036.

Johnston, R. J. (1966) Commercial leadership in Australia, *The Australian Geographer*, 10(1), pp. 49-52.

Kane, M. The knowledge economy in a car dependent Perth, Western Australia: The story of knowledge intensification and urban sprawl. Paper for the special session- Cities, regions and the new digital economy: new challenges and opportunities. RSA Delft 2012: http://www.regionalstudies.org/uploads/conferences/presentations/european-conference-2012/presentations/kane.pdf (accessed 6 June 2013).

Liu, X., & Derudder, B. (2013) Analyzing urban networks through the lens of corporate networks: A critical review. *Cities* 31, pp. 430-437.

Logan, M. I. (1966) The Australian Pharmaceutical Industry, *Australian Geographical Studies*, 4(1), pp. 35-47.

Martin, R. & Sunley, P. (2003) Deconstructing clusters: chaotic concept or policy panacea?, *Journal of Economic Geography*, 3(1), pp. 5-35.

Meredith, D. & Dyster, B. (1999) *Australia in the global economy: continuity and change*. (Cambridge, Cambridge University Press).

Neal, Z. P. (2013) *The connected city: How networks are shaping the modern metropolis*. (New York, Routledge).

O'Connor, K. & Edgington, D. (1991) Producer services and metropolitan development in Australia, in P.W. Daniels (Ed.) *Services and Metropolitan Development: International Perspectives.* (London, Routledge).

O'Neill, P. & McGuirk, P. (2005) Reterritorialisation of economies and institutions: the rise of the Sydney Basin economy, *Space and Polity*, 9(3), 283-305.

Peck, J. (2005) Struggling with the creative class, *International Journal of Urban and Regional Research*, 29(4), 740-770.

Porter, M. E. (2000) Location, competition, and economic development: Local clusters in a global economy, *Economic Development Quarterly*, 14(1), pp. 15-34.

Porter, M. E. (1996) Competitive advantage, agglomeration economies, and regional policy, *International Regional Science Review*, 19(1-2), pp. 85-90.

Rich, D. C. (1987) *The Industrial Geography of Australia* (London, Croon Helm).

Rimmer, P. J. (1967) The search for spatial regularities in the development of Australian seaports 1861-1961/2. *Geografiska Annaler. Series B, Human Geography*, 49(1), pp. 42-54.

Sassen, S. (2001[1991]) *The Global City: New York, London, Tokyo*. (Princeton, Princeton University Press).

Saxenian, A. (1994) *Regional advantage: Culture and competition in Silicon Valley and Route 128* (Cambridge, MA: Harvard University Press).

Scott, A. J. (2000) *The cultural economy of cities: essays on the geography of image-producing industries* (London, Thousand Oaks, and New Delhi, Sage).

Searle, G. (1996) *Sydney as a Global City: a discussion paper* (Sydney, Department of Urban Affairs and Planning)

Sigler, T. (2012) Globalising Australian cities: an Overview. In P. Dalziel (Ed.) *36th Annual Conference of the Australian and New Zealand Regional Science Association International* (Canterbury NZ, AERU).

Sydney Morning Herald (2013) *Trading Room*: markets.smh.com.au (accessed 5 February 2013).

Taylor, M. & Thrift, N. (1981) The changing spatial concentration of large company ownership and control in Australia 1953–1978, *The Australian Geographer*, 15(2), pp. 98-105.

Taylor, P. J. (2011) Advanced producer service centres in the world economy. In Taylor, P.J.; Ni, P.; Derudder, B.; Hoyler, M., Huang, J., & Witlox, F. (Eds.) *Global Urban Analysis: A Survey of Cities in Globalization* (London, Earthscan).

Testa, W. A. (2006) Headquarters research and implications for local development, *Economic Development Quarterly*, 20(2), pp. 111-116.

Toly, N., Bouteligier, S., Smith, G., & Gibson, B. (2012) New maps, new questions: Global cities beyond the advanced producer and financial services sector, *Globalizations*, 9(2), pp. 289-306.

Tonts, M. & Taylor, M. (2013) The shifting geography of corporate headquarters in Australia: a longitudinal analysis, *Regional Studies*, 47(9), pp. 1507-1522.

Tonts, M. & Taylor, M. (2010) Corporate location, concentration and performance: large company headquarters in the Australian urban system, *Urban studies*, 47(12), pp. 2641-2664.

Tonts, M. & Taylor, M. (2009), Westward Bound? Perth's Emerging Corporate Power. *FACTBase Bulletin No.1*, (Perth, The University of Western Australia and Committee for Perth).

Torre, A. (2008) On the role played by temporary geographical proximity in knowledge transmission, *Regional Studies*, 42(6), pp. 869-889.

Wójcik, D. (2011). The dark side of NY-LON: financial centres and the global financial crisis. *University of Oxford Employment, Work and Finance Working Paper, No. 11-12.*

Yigitcanlar, T. (2010) Making space and place for the knowledge economy: knowledge-based development of Australian cities, *European Planning Studies*, 18(11), pp. 1769-1786.