

CHAPTER 2

BOOMTOWN GLOBALISING: PERTH AS AN INTERNATIONALLY CONNECTED RESOURCE HUB

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INTRODUCTION

Perth's economic role as a resources hub has historically been a source of both prosperity and volatility. From the outset, the fortunes of the Swan River colony, and later Perth and Western Australia, were largely determined by commodity-based exports. Likewise, economic busts can be tied to commodity downturns as demonstrated by the depressions of the early 1900s, the inter-war years and, more recently, in 2014–15 (Scott & Purvis, 2015). In this chapter we show that the global footprint of Perth's economic network is vast, creating both new vulnerabilities as well as novel opportunities for its expansion. If one assumes that global trade patterns and relations exhibit path dependency where past political, cultural and industry relations influence contemporary and future connections (cf. Martin & Sunley, 2006), then a snapshot of existing trade linkages can provide insight into historic global connectivities as well as visions of future ones. In Perth, the internationalisation of key export sectors is focussed on a range of mining-based services, such as engineering and prospecting firms and companies providing related expertise (CMEWA & KPMG, 2013), which have a globally extensive footprint.

This chapter overviews the intra-firm connections that produce these lines of trade and communication, connecting contemporary Perth – and the Western Australian resource economy

– to the world at large. It does so by extracting corporate strategic locational data during a relative economic boom to understand Perth’s influence and connectivity with other cities around the world. In what follows, we firstly review Perth’s economic development before introducing the corporate data set and social network analysis methodology employed to unpack Perth’s key industry and regional connections. The chapter concludes with observations of Perth’s connectivity and what this might mean looking forward.

PERTH AS A RESOURCES HUB

A scholarly search on ‘boomtowns’ quickly reveals the precarious economic nature of such places, with related concepts of population growth and socioeconomic well-being largely shaped by the boom-bust economic cycles of global resource or financial commodity markets (Harrison, 2010; Lawrie, Tonts & Plummer, 2011; Shandro, Veiga, Shoveller, Scoble & Koehoorn, 2011). Perth’s socioeconomic history largely conforms to the typical boom-bust cycles of resource towns, albeit somewhat saved from the severe lows of single resource towns elsewhere in Australia (Lawrie et al., 2011; Storey, 2001). Nonetheless, Perth’s economic booms of the 1890s, 1960s, 1980s and 2000s were catalysed by waves of resource-related development tied initially to mineral commodities from other regions of Western Australia (Ghosh, 1981; Ye, 2008; see chapter 1). The increasing globalisation of commodity markets inevitably linked these waves to the prices of key resources, with successive booms fuelled by international demand for gold, nickel, iron ore and other commodities. Large waves of migration and investment have accompanied successive booms, with outmigration and (relatively) high unemployment only present during countercyclical periods. Perth’s exponential population and economic growth compared to other regional centres has led to its disproportionate accumulation of key WA educational,

economic, political and social infrastructure and, in turn, its overwhelming primacy within the WA urban system.

Given the diversity of WA's vast resource deposits, its historical development is heavily linked to its land and natural resources (Snooks, 1981). Indeed, while Western Australia's colonial development began modestly with links to the timber and wool trades, its upward economic momentum occurred with the 1890s discovery of gold in the Kalgoorlie-Coolgardie Goldfields. With a suitable deep-water harbour in Fremantle, Perth was well-placed to benefit from the state's mineral resources, acting as WA's global trading post (Martinus, 2016; Tonts, Martinus & Plummer, 2013). The city's population has grown accordingly from 107,000 during the 1911 census to more than 1.8 million a century later (ABS, 2015).

The evolution of Perth's trade networks affords insight into the geopolitical and economic relations defining its contemporary global connectivity. Shifting geo-economic realities and globalisation-induced free trade saw commercial connections gradually shunted from British colonial and European industrialised-core economies in the early 1900s to regional (Asia), industry (oil producers) and emerging economic core (the USA and Russia) partners. The easing of export restrictions on iron ore in 1960 and large-scale state investments in offshore oil and gas were critical in the diversification of resource exports and by the early 2000s, trade from Perth exhibited further deepening of network relations with ever more internationalised connections (Martinus & Tonts, 2013).

In 2014, Western Australia's minerals and petroleum industry was valued at \$114 billion per annum (65 per cent of the national total), with iron ore accounting for more than \$65 billion and gold for \$9 billion (DMP, 2015). The petroleum sector attracted nearly \$28 billion and the state is projected to be one of the largest liquefied natural gas (LNG) exporters by 2020 (HSBC, 2012). WA is also a major producer of mineral sands and a global leader in ilmenite, rutile and zircon production, in addition to

diamonds (industrial grade), alumina and nickel. This wealth has been a great boon to state and federal coffers, creating a distinctive reliance on resources by Perth and making diversification out of resource production difficult (Martinus, 2016; Tonts et al., 2013).

MAPPING PERTH'S CONNECTIVITY

Global connectivity has historically been a key factor in the economic development process, driving the interdependent processes of urbanisation, industrialisation, trade and economic growth. Indeed, it has allowed cities to take advantage of economies of scale, agglomeration and scope, moving beyond their own spatial boundaries to include the resource, labour, product, knowledge and investment markets of distant economies (Lorenzen & Mudambi, 2012; McCann & Acs, 2011). It is this intersection of trade, globalisation and strategic corporate location where an understanding of international connectivity is derived through the location of cities within a global network of production (Martinus, Sigler, Searle & Tonts, 2015; Sassens, 2002; Taylor, Derudder, Faulconbridge, Hoyler & Ni, 2014).

An overview of the office locations of multinationals listed on the Australian Securities Exchange (ASX) contextualises Perth within a broader economic system of capital market flows and access to Australian finance and resources. Within Australia, the strongest agglomeration of commercial activity is found in Sydney and Melbourne with ASX-listed corporate headquarters accumulating respectively 43 per cent and 37 per cent of total national market capitalisation in January 2013 (Figure 1). Perth and Brisbane, at respectively 11 per cent and 4 per cent, appear to be significantly less able to attract the headquarters of ASX-listed corporations.

Nonetheless, as noted by Sigler (2013), the primacy of Sydney and Melbourne as Australia's centres for global trade and business is somewhat less significant when other measures of business attraction are considered, such as the absolute number of

headquarters. As is apparent in Figure 1, the small proportion of market capitalisation housed in Perth is hardly an adequate means of measuring Perth's global connectivity given that 39 per cent of ASX firms are headquartered there. Sydney is a far second with 27 per cent of headquarters, Melbourne 16 per cent and Brisbane 8 per cent. The vast majority of Perth-based firms are in the energy (118) and materials (453) Global Industrial Classification Standard (GICS) sectors, while Sydney and Melbourne have a broader range of industries and strong agglomerations within several. Perth's industrial base is more focussed on 'small-cap' and 'mid-cap' resource firms (Sigler, 2013).

The importance of materials and energy to the city's economy is evident when a cross-section of Perth-headquartered firms is examined. Of the top thirty firms (see Table 1), nineteen are directly involved in the resources sector and several others indirectly implicated. Many focus on gold production and exploration (Regis, Sandfire, Silver Lake, Resolute) or a range of minerals (Perseus, Western Areas, Independence) such as nickel, copper, zinc and mineral sands (Iluka). A significant few conduct iron ore exploration and production (Sundance, Mount Gibson, Aquila) or are in resource-support industries of construction, building and engineering expertise (Clough, Mermaid Marine, Mineral Resources, Monadelphous). The state's largest resource company, Woodside, has large-scale energy production interests in WA's North West Shelf along with international firms such as BP, Chevron and Royal Dutch Shell. Other firms are involved in uranium (Paladin) and oil- and gas-related ventures (Aurora, taken over by Baytex). Many are Western Australian ventures extracting mineral deposits in the Kimberley, Pilbara and Coolgardie-Kalgoorlie regions. Others have domestic corporate networks and far-reaching international footprints tied to global consumer markets and resource deposits.

PERTH'S NETWORKS: CITY CONNECTIVITY AND REGIONAL GEOMETRIES

Beyond a merely descriptive overview of Perth's top firm headquarters, the connectivities of intra-firm relations reveal how these corporations extend their reach overseas. We discern this using social network analysis (SNA) applied to the 1839 ASX-listed corporate stocks in January 2014. SNA has become a popular means to unpack the spatial patterns associated with city connections and regional clusters (see Alderson & Beckfield, 2004; Henneman & Derudder, 2014; Krätke, 2014; Martinus et al., 2015; Martinus & Tonts, 2015). Data were analysed by compiling three city-by-firm matrices of corporate headquarters and branch office locations, one for the complete ASX-derived data set and the others for the sub-networks of Perth's two most significant GICS industries of energy and materials.

City-by-city matrices (585x585) were constructed by assuming that cities housing corporate offices in the first column reported to cities with higher level offices along the top row. It employed a 0 to 5 service value system based on the position of a corporate office position in the firm hierarchy. Direction was assigned to the matrix as offices with lower service values reported higher value offices, such that a local or national office in Perth reporting to a regional office in Hong Kong was assigned values of 3 and 4 respectively. This draws on the notion that a multinational's operational success is based on knowledge of local conditions (see Hennemann & Derudder, 2014; Martinus et al., 2015; Martinus & Tonts, 2015). Larger firms were implicitly given more weighting as they tended to have more branch offices and therefore were more strongly represented in the overall matrices.

A SNA of the three matrices computed the strength of city connections in the overall industry network and the materials and energy sub-networks. These connections were organised according to network mutually shared attributes to detect sub-network communities or city clusters (Hansen, 2011)¹. This method of cluster analysis allows the exploration of historical geographic, socially

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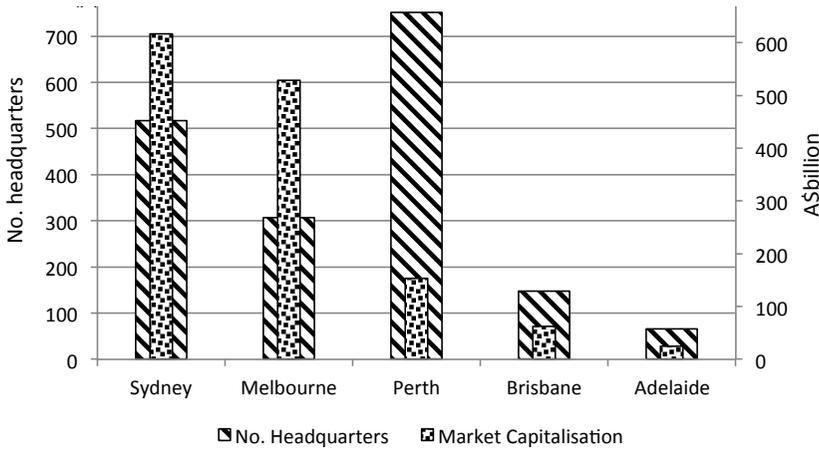


Figure 1: ASX-listed corporate headquarters and market capitalisation, 2013 (ASX, Sydney Morning Herald/Morningstar, (2013)).

and culturally shaped ties and the uneven core-periphery relationship (cf. State, Park, Weber, Mejova & Macy, 2013). This means that the spatial patterns of firm locational strategies defining city clusters can be contextualised within a geopolitical framework (cf. Mans, 2014; Martinus et al., 2015; Martinus & Tonts, 2015).

The overall industry network highlights the key roles of Perth, Sydney, Melbourne and Brisbane alongside London, Houston and Dubai, with the sub-networks of these cities demonstrating the geographic dimension of particular industry sectors (Figure 2a). Australian industry is broad-reaching and connectivity is organised around particular flows of information, goods and services, many of which are predicated upon path-dependent commercial ties linked to both colonial-era regimes and, more recently, to Asia. These key geopolitical linkages influence corporate relations, emerging as sub-network communities within the overall network.

Perth sits at the centre of the most dominant sub-network defined by similarities in industry specialisation in minerals and energy. This includes WA resource regions as well as the resource-rich economies of South America (Peru, Brazil), Southern Africa (Angola, Botswana, Namibia) and West Africa (Cameroon, Liberia, Ghana). Perth shows strong bi-lateral

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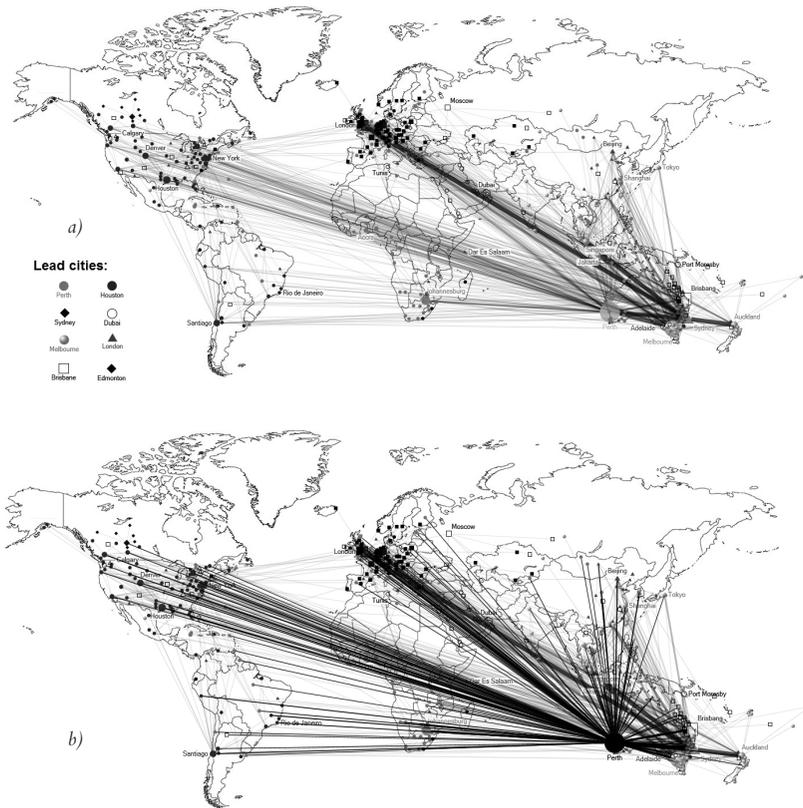


Figure 2: a) Sub-networks of all Australian cities using total ASX derived network, b) direct connections to Perth (size of circles indicates relative importance of that city to the network, thickness and darkness of lines indicates strength of connection between two cities).

relations (city-pairs) with Jakarta, Singapore, Beijing, Houston and Accra. Figure 2b shows the Perth-based network as it extends globally. In contrast, Melbourne's alliances with Australia's key trading bloc of Asia-Pacific nations (including New Zealand) reflects a historic financial focus and strong relationships with key commonwealth cities (Hong Kong, Auckland). Sydney's strong connections with Australian cities and regions appear to reflect its pivotal role in managing Australian capital and resources across a range of industries.

Within the energy network, Perth again heads up the strongest subnetwork (as defined by the SNA clusters; Figure 3a), bringing

together a number of producer cities in Western Australia (Karratha, Broome, Bunbury), Africa (Windhoek, Abidjan, Ouagadougou) and global energy hubs (Budapest, Busan/Ulsan). Figure 3b highlights Perth's individual city connectivities – primarily with cities in North America, Western Europe and Asia-Pacific. Its leading position in the key energy cluster implies a strong relationship with other clusters, including the cities clustered with Houston as the global energy operations hub (Martinus & Tonts, 2015; Martinus et al., 2015). This is strongly supported by Sydney's Asia-Pacific network with international links to finance cities (New York) and African resource interests (Dar es Salaam). Other key cities assume more regional roles, with Perth linked to South East Asia via Singapore, Jakarta, Manila and Kuala Lumpur. Weaker links with regional energy centres, such as Tunis, Tulsa, Calgary and Ulaanbaatar, reflect a small but significant tie to international energy circuits-ties that might strengthen as Western Australia's productive capacity in gas is enhanced. Sydney is of lesser importance in the Australian energy industry, with its main linkages to the global cities of London and Beijing, as well as regional energy centres such as Houston and Kuala Lumpur. Brisbane plays a secondary role, linking primarily to other coal-based economies such as North Queensland and Mongolia.

Whilst the energy industry can be broadly reduced to connectivity with energy consumers for coal and gas and energy producers and intermediaries for oil, the materials sector is better established and much more diverse (Figure 4a). The materials sector features far more companies, dealing in a wider range of products, with production circuits that are regionally, if not globally, integrated. It has distinctly different geographies with more Australian centres than international ones and Australia's major cities assuming prominent roles in different sub-groups. Strongest connections are manifest to the capital markets of the eastern states as well as to Johannesburg – one of Africa's most prominent business hubs.

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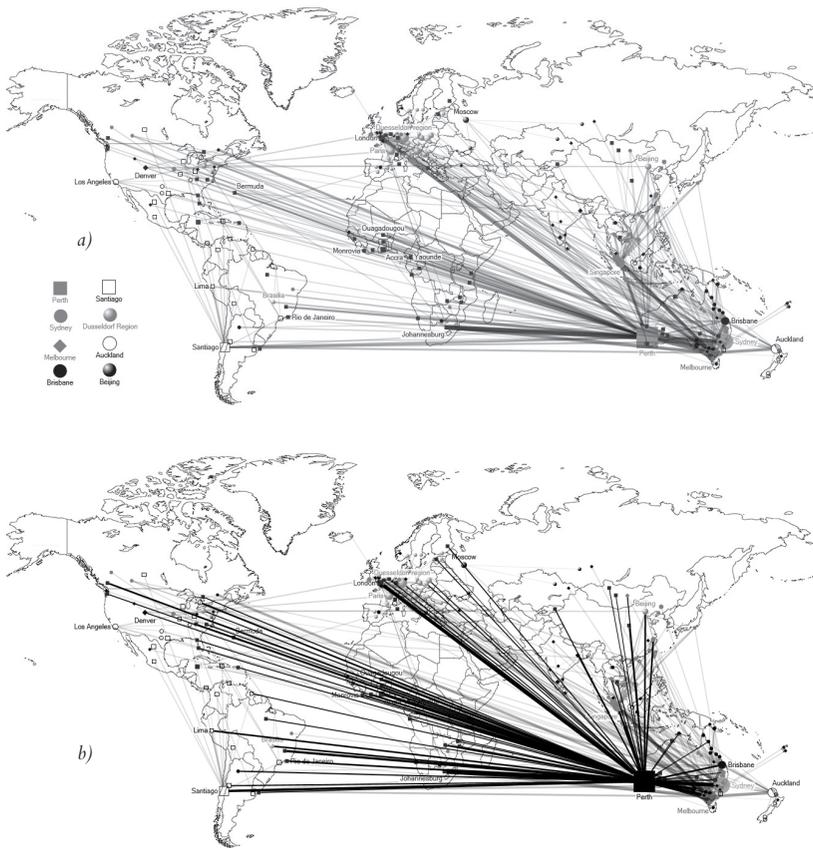


Figure 3: a) Sub-networks of all Australian cities using network of ASX-listed energy firms, b) direct connections to Perth (size of circles indicates relative importance of that city to the network, thickness and darkness of lines indicates strength of connection between two cities).

Emulating the overall industry network geographies, Perth is again in the largest and most prominent cluster connected to other mining regions in West Africa (Accra, Ouagadougou, Monrovia, Yaoundé) and South America (Rio de Janeiro, Santiago, Lima, Brasilia). These connections are shown in Figure 4b. This reflects perhaps the longer, more-established and significant role Perth has played in global materials markets compared to any other industry sector on the ASX (cf. Martinus & Tonts, 2013). Sydney's role in the second-largest cluster is linked largely to Asia and commodity consumption markets through

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manufacturing hubs in Japan and China. The presence of tax havens (Cayman Islands, Bermuda) in these two major sub-groups suggests the central role of offshore banking in commodity to manufacturing market transactions (Haberly & Wójcik, 2014). Melbourne's substantial role in the materials sector is primarily manifest through a few large locally headquartered firms, such as BHP Billiton, Rio Tinto, Newcrest and Orica, reflecting its legacy in capital markets and gold extraction.

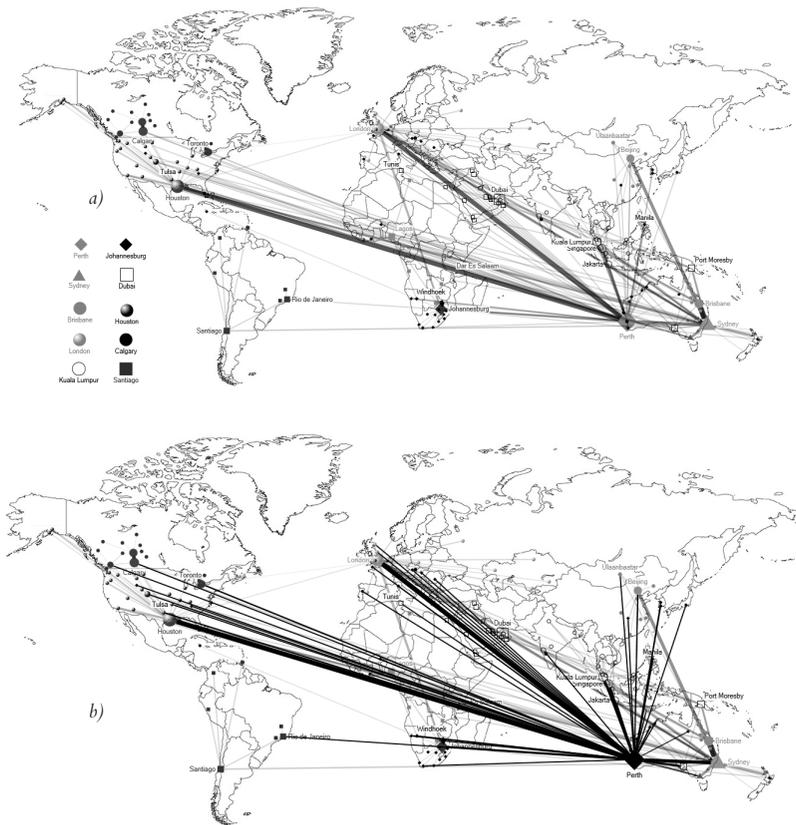


Figure 4: a) Sub-networks of all Australian cities using network of ASX-listed material firms, b) direct connections to Perth (size of circles indicates relative importance of that city to the network, thickness and darkness of lines \ indicates strength of connection between two cities).

CONCLUDING COMMENTS

Perth's global orientation plays a fundamental role in the city's development trajectory, both past and present. As a centre for commodity exports and resource-based services, the city is the hub for the Western Australian economy, being the most well-connected resource city in Australia by any significant measure. As such, despite various efforts to diversify away from an over-reliance on resources into tourism and other sectors, as suggested in chapter 11, Perth's livelihood remains strongly tied to the geo-economic whims of global commodity markets with a history marked by resource booms and busts (Table 1).

The discovery of gold catalysed its rapid population growth and the development of key infrastructures setting the stage for later developments. Commercial circuits were often anointed through colonial connections, forging early relationships with London and Singapore. Perth's contemporary development was greatly hindered by the aftermath of two world wars and the Great Depression and it was only after the 1960s that modern-day prosperity was forged, as nickel and iron booms buoyed a previously stagnant economy. Connections throughout the Indian Ocean Basin and to the adjacent Asia-Pacific region slowly supplanted colonial ties and emerged as critical in the post-neoliberal period.

The benchmarking of cities has become an important measure of a city's capacity to attract and retain quality human capital and, in turn, economic global competitiveness. As the world's 'most remote large city', Perth stands to benefit tremendously from understanding and cultivating its position in the global economy as well as its global connections. The contemporary state of Perth's economy is strongly tied to its resource industries of materials (principally mining) and energy, with ASX corporate links to West Africa, South America and South East Asia globalising the city and the state through resource commodity circuits. Further, its high connectivity to key global hubs represents not only the Western Australian extractive industry, but agglomerative advantages in complementary services – London for energy and finance,

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	Company	GICS Sector		Company	GICS Sector
1	Wesfarmers	Food & Staples Retailing	16	Sundance Resources	Materials
2	Woodside Petroleum	Energy	17	Automotive Holdings Group	Retailing
3	Fortescue Metals Group	Materials	18	Paladin Energy	Energy
4	Iluka Resources	Materials	19	Silver Lake Resources	Materials
5	Regis Resources	Materials	20	CGA Mining*	Materials
6	Monadelphous Group	Capital Goods	21	Mount Gibson Iron	Materials
7	Seven West Media	Media	22	Medusa Mining	Materials
8	Mineral Resources	Commercial & Professional Services	23	Ausdrill	Capital Goods
9	Navitas	Consumer Services	24	Perseus Mining	Materials
10	Aurora Oil & Gas*	Energy	25	Mermaid Marine Australia	Transportation
11	Atlas Iron	Materials	26	Western Areas	Materials
12	BWP Trust	Real Estate	27	Clough*	Capital Goods
13	Sandfire Resources	Materials	28	Resolute Mining	Materials
14	Aquila Resources*	Energy	29	iinet	Telecommunication Services
15	Independence Group	Materials	30	Beadell Resources	Materials

* de-listed between 2013 and 2015

Table 1: Top 30 ASX Perth headquartered companies, 2013

Houston for oil and gas, Santiago for copper and Johannesburg for gold, iron and diamonds. Western Australia's global ties will evolve as the resource industry diversifies, new consumptive markets emerge and trade relations are fostered.

Perth's global network as described in this chapter is not the result of random multinational activity, but the product of historic geo-economic linkages manifest through commercial interest and political willpower. Understanding these connections provides the basis for further development of international relationships and Perth's continued advancing role as a national and global leader in the materials and energy sectors. There are significant opportunities to consolidate and build on its current competitive advantages within the Asia-Pacific region and African resource cities. This includes using the connections and experiences of overseas-based Australian companies to open new markets of opportunity for a range of knowledge-based and skilled services. Future connectivity will undoubtedly involve further integration with the Asia-Pacific region as a new middle class is formed and is

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likely to be consolidated with Africa and Latin America through complementarity resource interests.

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NOTES

1. The Clauset-Newman-Moore (CNM) algorithm separates the network into sub-groups of cities which are more connected to each other than to cities in other sub-groups (Clauset et al., 2004).

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