

One City, Many Networks: Brisbane's Global Position within Multiple Flows

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Abstract: Interurban connectivity is a key theme within urban research. Cities mediate myriad flows through the actors and institutions within them, with 'relational' perspectives framing cities as sites of network convergence. Of particular interest has been the international dimension of interurban connectivity, and many researchers have sought to understand the interface between globalisation and urbanisation in the wake of neo-liberal and post-industrial restructuring that has fundamentally altered the global urban landscape. Taking inspiration from Brisbane's recent marketing campaign which has positioned it as 'Australia's New World City', this paper investigates multiple dimensions of Brisbane's global networks. Innovating upon established theory in the 'global cities' tradition, Brisbane's global position is analysed by quantifying various flows, including physical flows through Brisbane's port, knowledge flows through exogenous research linkages, and human capital flows through Brisbane's universities. Together, these networks provide a broad perspective on Brisbane's global position and serve to advance understandings of how 'global' or 'worlded' claims might be substantiated through an empirical understanding of multiple flows. Although 'global city' status is elusive for Brisbane and other medium-sized cities, this paper makes the case that such cities are in fact global in many ways and that the specific connectivities of each should be better understood with regard to internationally oriented development policy.

Introduction

The global position of cities has been studied from a number of scholarly perspectives (Acuto, 2013). The concepts of 'global' and 'world' cities have emerged to explain the transformative changes that have occurred in the socio-spatial structures of many urban spaces (Sassen, 1991, Brenner, 1998, Marcuse and Van Kempen, 2011). Various approaches have been employed in attempts to capture structural changes to urban labour markets, infrastructures, and social organisation with the objective of better understanding the implications of macroeconomic restructuring. Cities are thus identified as key sites of transformation, and the global dimensions of change are fundamental to explaining numerous processes.

In applying a network-focussed approach to the established 'global city' concept, this paper serves to reorient the way that the global role of cities is conceptualised and articulated. By concentrating on multiple global flows that are constitutive of the city, emphasis is shunted from *if* cities are 'global' to *how* so. The specific case of Brisbane is investigated so as to unpack some of the nuance underlying how goods, human capital, and knowledge all converge to 'globalise' the city. This is accomplished through an unorthodox and hybrid framework investigating three distinct types of flows, namely goods (port imports and exports), knowledge (joint scholarly publications), and human capital (international students). Though each has been extensively investigated in its own right, this paper brings the three disparate domains together in order to show how globalisation affects cities in multiple ways simultaneously. Thus, counter to claims that some cities are global and others are not, the intention is to demonstrate that even cities which are typically not atop global hierarchies can be highly globalised, and that this internationalising dimension differs starkly from sector to sector.

Cities and Flows

One of the key theses explaining the globalisation process in cities has been deployed around the concept of flows. In *The Rise of Network Society*, Manuel Castells (1996) famously argued that society has been reorganised by a large-scale shift from capitalism, underpinned by industry, to a new form articulated through information technology. Emerging digital technologies had become integral to mediating flows of capital, information, media, organisational interaction, and technology. The implication of this was a severe disruption of space and time, allowing for asynchronous communication, and productivity was thus determined by flows rather than physical spaces. This observation, which coincided with broad neo-liberal and post-industrial shifts in the cities of the 'Global North' (as well as equally significant demographic and industrial shifts in the 'Global South'), served to corroborate complementary arguments that cities were 'basing points' (Friedmann, 1986, Taylor *et al*, 2014) and/or command-and-control centres acting as critical nodes of connectivity and power with a globalised system.

Drawing upon this focus of international flows and networks in complement with the relational framework of world-systems theory (Smith and Timberlake, 1995), the 'global cities' literature initially connected cities and globalisation through a focus on the world's pre-eminent cities (Hall, 1966, Sassen, 1991). This was merely heuristic, and served to illustrate processes which manifest primarily in the world's largest cities. However, this had the unfortunate effect of dichotomising urban outcomes into global and non-global categories (Robinson, 2002). Though research in the past decade has led to the now widespread consensus that all cities are in some way 'global' through their exogenous networks (Taylor *et al*. 2014), internationalising strategies have broadly entered urban policy circles in both Australia (Sigler, 2012) and beyond (Bunnell, 2013) so that being 'global' is now an explicit aspiration of many urban governments (Thornley and Newman, 2011).

In an attempt to measure 'global city' or 'world city' status, cities are placed within exogenous urban hierarchies—the product of an increasing number of indices capturing various elements of commercial, political, and social connectivity, which are increasingly embedded within urban branding campaigns (Clark, 2006). Claims to global-ness or worldliness therefore abound, not only as the result of such league tables, but in response to a need to be perceived as internationalised by footloose resources. One of the primary outcomes of neo-liberalising policies is the increasingly mobile nature of capital, firms, and talent (Porter, 2000, Beaverstock, 2002), and concurrent devolutionary practices have meant that urban governments – rather than states or other territorial units – are increasingly tasked with providing the resources to secure these (Turok, 2009). The desire to remain or become internationally competitive is thus articulated through a focus on 'knowledge' and 'innovation', and on both hard and soft infrastructures (Malecki, 2002) that support globally oriented policy frameworks.

Brisbane: Australia's New World City

Brisbane is a city of 1.1 million inhabitants located on the eastern seaboard of Australia. It is the largest urban centre within the state of Queensland, and the third largest in Australia. The city's economic drivers are relatively diversified, with a strong command function in Queensland's agricultural, energy, and mining industries (Queensland Treasury and Trade, 2013). Brisbane's central business district is comprised of the state's primary agglomeration of advanced producer services (APS), as well as a host of multinational corporations, including consultancies and international mining interests. The metropolitan area is part of the greater Southeast Queensland (SEQ) region, which includes the Sunshine Coast, Gold Coast, and a number of adjacent districts and numbers approximately three million in total population.

Brisbane has gradually transitioned from its Anglo roots, both in terms of its resident population and its exogenous trade relations. The 2011 census recorded that 29.7% of Greater Brisbane was born outside of Australia, largely in line with national trends. This reflected a broader movement in Australian urbanisation, as cities became more culturally diverse and industrial configurations increasingly 'globalised' under pressure from neoliberal imperatives. This restructuring has had profound implications on the Australian economy (Fagan and Webber, 1994), decimating formerly protected domestic industries (O'Neill and McGuirk, 2005, Beer, 2012), and at the same time enhancing Australian demand for international talent to fill positions in the expanded service economy (Tang *et al.* 2014).

Since the large-scale economic shifts of the 1980s to the present day, Brisbane's transition follows several specific trends in the internationalisation of Australia. First, migration from Europe has diminished and has been largely replaced by migration from Asia, initially Vietnam and more recently India and China. New migration schemes have been gradually implemented to position Australia to attract highly skilled migrants (Hugo, 2006). Second, wider trade relations have opened up as import substitution industrialisation was abandoned in favour of a more liberal trade model (Webber, 2000). High wages and regulation led to the offshoring of many industries, fostering trade relations with new partners for imports, especially in the Asia-Pacific region. New export markets were also developed for agricultural and raw material exports and Australia's balance of trade trends toward deficit, with occasional spikes in coal, gold and iron ore driving relative increases in exports and concomitant urban expansion (cf. BITRE, 2014). Australia is also a large service exporter, the most significant categories being education and tourism. Third, innovations in telecommunications and the globalisation of media more generally have slowly reoriented Australian cultural norms. This involves a two-way channel of the influence of film, international web applications, migration, music, and television, and the export of 'Aussie' culture overseas (O'Regan, 1996).

Bearing in mind these large-scale globalising processes manifesting in Australia over the past four decades, the global positionality of Australian cities has become a primary focus of both scholars (Searle, 1996, 2013, Hu, 2012) and policymakers. Global position has been embedded within urban policy (Sigler, 2012), both as an aspirational target (e.g. to *become* global) as well as a development platform (NSW Government, 2014, Brisbane City Council, 2015).

Several cities have adopted the idea of 'global' or 'world' cities within their planning documents. Despite not appearing on the majority of international 'global' league tables, Brisbane's slogan is now 'Australia's New World City' as per a 2009 marketing campaign devised by the administration of then-mayor Cr Campbell Newman (who later went on to be the Premier of Queensland), formulated by urban brand consultants (Darchen and Greenop, 2015). The 'Australia's New World City' platform is deployed primarily as an urban branding slogan by Brisbane Marketing – a subsidiary corporation of Brisbane City Council – as part of the city's image, appearing on brochures, buses, and information kiosks, among others. Greenop and Darchen (2015) have recently critiqued the campaign, noting that there is a disconnect between the branded image of Brisbane and the suburban realities of daily urban life. Notwithstanding, Brisbane has clearly been subject to much globalisation in one form or another, and investigating the specific ways in which it *is* global serves as a valuable means by which to understand its international positionality, as well as providing a framework for the investigation of other cities. The most recent policy document to emerge from this platform, the *Brisbane 2022: World City Action Plan*, outlines specific goals for the city-region with an international focus, including global recognition in commercial investment and visitation, and the development of at least one key industry.

One City, Many Networks

Studies on the global role of cities in globalisation have conventionally relied on either case studies, which focus on one or two cities (Nijman 1996, Grant and Nijman, 2002, Parnreiter 2010), or more

quantitative techniques aimed largely at establishing hierarchies and networks (Beaverstock *et al.* 2000). This study adopts the former approach, focussing on Brisbane as a discrete node in the global urban system. Drawing upon relational urban geographic approaches (Ward, 2010) that focus on connectivity and relationships, Brisbane's spatial relationships are articulated through several distinct lenses. These include flows of physical goods through Brisbane's port, knowledge flows through exogenous research linkages, and international human capital flows through Brisbane's universities. All data were sourced for the most recent year available, reflecting various points between 2010 and 2015. Such an approach is novel and somewhat unique, as very few case-based studies incorporate several large datasets to demonstrate urban connectivity from multiple perspectives.

Data on port flows were sourced from the Port of Brisbane, which publishes a quarterly statistical report. Attributes contained within the set include information on origin of imports, destination of exports, and quantity of each aggregated by country and annual quarter. Further breakdowns are provided on the type of goods, separated into tonnage and container volumes. Data were drawn from 2014. Data on research linkages were sourced from the Web of Science bibliometric database. Griffith University, Queensland University of Technology (QUT), and The University of Queensland (UQ) were included in the analysis.¹ Measures included author's affiliation, journal name, subject category, and co-authors' institution and location. Data on human capital flows in the form of international students were derived from Universities Australia, indicating the composition of international students in Brisbane. The dataset includes attributes for country of origin, mode of enrolment (internal vs external), course (e.g. postgraduate coursework), and commencements vs prior enrolment.

Physical Flows: Goods to and from the Port of Brisbane

The Port of Brisbane is a multi-cargo port located at the mouth of the Brisbane River, approximately 20km northeast of the central business district (CBD). In contrast to other ports, particularly those in regional locations specialising in only one or two particular functions, the port is diverse and serves both import and export functions. As O'Neill (2013) and others have noted, ports represent critical infrastructures to mediate flow of goods, and serve an important role in connecting cities with global economic and financial circuits.

The Port of Brisbane's activities can be broken down into two fundamental categories – imports and exports – and then again by two classifications of goods—bulk and container. Bulk cargo is transported unpackaged, consisting of liquids (e.g. petroleum), solid materials (e.g. minerals) and goods (e.g. cars), as well as small bundles of irregularly sized freight. Container goods are those that are shipped in standard-sized metal shipping containers. The two most common dimensions are twenty and forty foot-long containers, measured in TEUs, or twenty-foot equivalent units.

In terms of bulk goods, East Asia is by far the most significant export destination, with the top trade partners being: Japan (coal), elsewhere in Australia (refined oil), China (coal) and Taiwan (coal). Comprising nearly half of the port bulk export tonnage, coal is the main bulk export category, brought to port by rail from the nearby West Moreton and Surat Basins. Refined oil is the second most significant, followed at a distance by iron & steel, woodchips, agricultural seeds and tallow. In contrast, Brisbane imports much more bulk tonnage that it exports, consisting primarily of crude oil, refined oil, cement, gypsum/limestone, and motor vehicles. Other Australian ports are the top source of goods imports, followed by Malaysia (crude oil), Indonesia (crude oil), China (iron & steel), Russia (crude oil), and Japan (motor vehicles).

When measured by TEUs, slightly different patterns emerge. China is by far the most significant source of imports at more than five times the volume of the following countries of Australia (the sum of other domestic ports), United States (machinery and diverse goods), New Zealand (food, beverages, and timber), Thailand (building products, electrical equipment and rubber), and Malaysia (building products and household items). This indicates China's role as being the 'world's workshop,' since its manufacturers export a diversity of manufactured goods, and also signifies Brisbane's enhanced trade relations with the Asia-Pacific region more broadly. The top imports of container goods are household items, building products, electrical equipment, iron & steel, machinery, and retail items. China is also the chief export destination, followed by South Korea, New Zealand (diverse goods), Japan (meat products), Singapore (empty containers), Malaysia (empty containers), and Taiwan (meat products and foodstuffs). 43% of TEU exports from Brisbane are empty containers, largely destined for China,

¹ Universities with a partial presence in Brisbane (with main campuses elsewhere) such as the Australian Catholic University, Central Queensland University, James Cook University, University of Southern Queensland, and the University of the Sunshine Coast could not be accurately disaggregated to reflect local figures. Though Griffith and UQ both have a physical presence outside the metropolitan boundary and all three major Brisbane universities have strong online offerings, all were fundamentally classed as Brisbane-based, as the majority of staff are located on campuses within Brisbane.

Malaysia, and Singapore. The Port's main container exports are meat products, cotton, agricultural seeds, and paper & wood pulp, reflecting the abundant land resources in Southeast Queensland and environs relative to population.

Knowledge Flows: Joint publications with Brisbane universities

Scientific research is critical to ensure competitiveness in an advanced global economy. Cities are sites of a number of institutions hosting advanced research facilities, including dedicated research institutes, government agencies, non-governmental organisations, private enterprise, and universities. Research provides a number of direct and ancillary benefits to host locations, including the production of knowledge, fostering a highly educated workforce, capacity building in critical areas, and adding value to local industrial knowledge, as well as the spillover effects of innovative ideas to other realms of society. Collaborative research, in particular, amplifies these benefits, as researchers share knowledge and ideas, often across large distances and between institutions of various sorts.

University research is a fundamental component of any knowledge economy, and in Australia a number of research-intensive universities provide the infrastructure and resources for large volumes of research, both experimental and applied. Brisbane's three primary universities comprise a large component of this research in the city-region, alongside dedicated medical research facilities and government-affiliated research centres run by CSIRO and other organisations (cf. Yigitcanlar and Velibeyoglu, 2008). This paper considers research at Brisbane's three primary universities, which between 2010 and March 2015 (most recent data available) published 52,396 peer-reviewed articles recorded in the Web of Science database. Though a large number were sole-authored and/or published with Australian colleagues, 38,184 international citations also appeared on publications alongside Griffith, QUT, or UQ authors. Top categories were environmental sciences, public environmental occupational health, and biochemistry & molecular biology, of 248 Web of Science categories were included. The top 10 research collaborations are concentrated in North America, Europe and East Asia, with over half of the countries in the Top 30 in Europe. Top countries for research collaboration were USA (18% of international publication collaboration), UK (13%), China (10%), Germany (5%), Canada (5%), and New Zealand (4%). Of Brisbane's three largest universities, UQ's staff co-published with the greatest number of international collaborators, and researchers at QUT, Griffith, and UQ co-published with others in 155 countries. These findings suggest a certain path dependency to research collaboration, as the Australian university system is in large part a derivative of British and American systems. This also suggests that the large amounts of research funding and strong research infrastructures in the USA, Europe, and increasingly East Asia dictate the geographic scope of joint research.

Human Capital Flows: International Students in Brisbane

In the contemporary 'knowledge economy', a city's capacity to attract, train, and retain a high-skill labour force is critical. As per human capital theory, educated populations lead to enhanced productivity and better overall social outcomes (Schultz, 1961). Numerous visa schemes have been established to both attract international students and ensure that they are able to stay in Australia post-graduation (Birrell and Perry, 2009; Tang *et al.*, 2014). This pathway provides a variety of perceived benefits to the host country, notably the fact that students trained 'onshore' are more likely to obtain the hard and soft skills desired by local employers (Gribble and Blackmore, 2012). There has been a significant increase in the number of overseas students enrolled in Australian universities over the past decade, such that Australia is now the fourth ranked country in international tertiary enrolments (UNESCO, 2015).

Between 2001 and 2012 (the most recent year for which Universities Australia data were available), international tertiary enrolments in Australia increased from 156,991 to 299,961—more than 1% of the national population. Brisbane's three major universities – Griffith, QUT, and UQ – recorded 41,543 international enrolments in 2012, an increase from 13,288 in 2001. Of these, UQ has the most enrolments (11,324) in 2012, though far fewer than national leaders Royal Melbourne Institute of Technology (RMIT) (26,613) and Monash (22,057), both in Melbourne. Across Brisbane's three universities, the largest numbers of international students are from China, Singapore, Malaysia, Hong Kong and the US. China has become the largest source of international students in Australia (7757 enrolments in 2012) by a large margin, overtaking Singapore (1513) and Malaysia (1643) in 2005. Brisbane universities also attract relatively large numbers of students from Papua New Guinea (PNG), Saudi Arabia, Iran, Indonesia, and the United Arab Emirates (UAE).

Thus, tertiary education, as a service, is primarily ‘exported’ to Southeast Asia and East Asia, with a number of countries such as South Korea and Hong Kong seeing large increases over the past decade. Although the North Atlantic countries such as United States, Canada, and Norway also send large numbers of students to Brisbane’s tertiary institutions, the temporary nature of enrolments (i.e., non-award programs) indicates that this is mainly ‘study abroad’, and a post-2007 decline suggests that a high Australian dollar or weaker global economic conditions may have limited such opportunities.

A Truly Global Brisbane

Brisbane’s diverse flows, indicated a multiplicity of global connections, position it within networks determined by economic, political, and resource-based considerations. Flows of goods reflect the relationship between the resource-rich Australian landmass and the industrial nations to its north. While Brisbane does import a number of primary products – chiefly oil – it also imports a range of semi-finished and finished goods from Asia and the Pacific Rim. Queensland’s coal resources are exported to Asia, as are foodstuffs from the city’s hinterland. In contrast, knowledge flows primarily to and from Europe, the United States and East Asia. This suggests that collaborative research and its ideas flow between places with established globally recognised universities, and that the resource requirements for fostering knowledge flows are distinct from those in goods transactions. In terms of human capital flows, Brisbane’s universities benefit from circuits of tertiary education stemming largely from Asia, increasingly serving demand from China. This amplification nationwide is part of a larger effort to curb skills gaps and mitigate human capital shortages, particularly in the service sectors of the country’s larger cities such as Brisbane. As Table 1 details, these impacts have a variegated spatial character and are best explained through a combination of factors.

International Research Collaboration (2010-2015)	International Tertiary Students (2012)			Port of Brisbane International Data (2012)			
	Total Enrolments	Commencing	Continuing	Containers (TEUs)		Bulk (Tonnage)	
Joint Publications				Exports	Imports	Export	Imports
1 USA	China	China	China	China	China	Japan	Malaysia
2 United Kingdom	Malaysia	USA	Malaysia	South Korea	USA	Taiwan	Indonesia
3 China	Singapore	Hong Kong	Singapore	New Zealand	New Zealand	China	China
4 Germany	South Korea	Singapore	Hong Kong	Japan	Thailand	Singapore	Russia
5 Canada	Hong Kong	Malaysia	South Korea	Singapore	Malaysia	Thailand	Japan
6 New Zealand	USA	South Korea	Vietnam	Malaysia	Singapore	South Korea	PNG
7 France	UAE	Vietnam	Taiwan	Taiwan	Indonesia	USA	Nigeria
8 Netherlands	Canada	Canada	Canada	USA	South Korea	Indonesia	New Zealand
9 Japan	Vietnam	Norway	Saudi Arabia	Indonesia	Japan	Vietnam	South Korea
10 Sweden	Norway	Taiwan	India	PNG	Taiwan	New Zealand	Singapore

Table 1. Top International Partners in Knowledge, Human Capital, and Goods flows to/from Brisbane

Though the literature on ‘global’ and ‘world’ cities has provided considerable theoretical insights into how we understand the role of, and the processes within cities, vis-à-vis contemporary globalisation, the increasing awareness that to some degree *all* cities are global requires new modes of theoretical insight. This research has shown that Brisbane – a medium sized city that rarely ranks high in urban league tables – has extensive international networks, and that the city-region is in fact global in many ways. Brisbane is a conduit for various types of flows, including the physical (port) flows that connect Southeast Queensland’s hinterland with global commodity markets (and vice-versa) as well as knowledge and human capital flows that help anoint the region’s services sector.

And although much of the research evaluating global positionality (Hesse, 2010) looks either at one specific aspect of connectivity through the lens of a particular industry or framework, this paper considers three distinct aspects in tandem. Furthermore, though most studies provide an exogenous perspective on global connectivity, this paper has provided the inverse—by examining a particular city’s outward linkages, a framework is established for examining the internationalized element of any city. As Taylor (2014) and others have noted, all cities are in some way global and understanding how this manifests is resolutely more important than if a city ‘makes the cut’ amongst its urban peers. As such,

it is clear that Brisbane's claim to global-ness does indeed have substance, but perhaps in different ways than envisioned with regard to theoretical precedent.

Thus, while 'global city' status is elusive for Brisbane and other medium-sized cities, this paper makes the case that such cities are in fact global in many ways and that the specific connectivities should be applied to internationally oriented development policy. Policy with a highly internationalised dimension is both necessary and timely, and serves to enhance local competitiveness. However, this should be carefully weighed against local considerations, and as the pundits and critics of globalisation have noted (Sassen, 1998), over-exposure to the vagaries of global markets can have disastrous consequences for marginalised populations.

Globalisation as a process will continue to impact cities, and urban governments and policymakers must be prepared to adapt local strategies to international constraints and opportunities. This includes an enhanced global focus, with regard to the *specific* flows that are critical to sustaining and bolstering local outcomes. At the same time generic and/or general 'global' frameworks are to be avoided, particularly those advocating the implementation of policy that is potentially ill-fitted to local economic, political and social systems. All cities now fundamentally operate within a globalised realm, and understanding the nuanced dimensions of this connectivity will be critical to ensuring prosperous urban futures.

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