

Materialien

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The Role of Cities in the Process of Economic Globalization

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The role of cities in the process of economic globalization

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Prologue

The terms of reference for this Report relate to 'the economic dynamics between different world regions and cities' specified as seven 'central questions'. It is pointed out in commissioning that it is 'a very challenging task' to combine the subjects of the questions in a single Report. This demanding assignment is tackled as follows. First, the questions are listed and briefly answered but upon the broad knowledge of the author derived from two decades of studying cities in globalization. At this stage detailed evidence for answers given is not provided. Second, the difficulties of researching cities globally are discussed and this results in a narrowing down of the scope of the Report to provide required understanding of the economic prospects of cities using a strong evidential base. Third, the result is a main text in two parts that provide an operational model of the world city network enabling numerous analyses that inform the economic dynamics of cities and world regions in contemporary globalization. Fourth, a return to the central question in light of the analyses provides a concluding summary.

Central questions

1. How are processes of relocation influenced by globalisation, the increasing division of labour within the world economy and the economic structural change?

This is the key question reflecting successful firms growing across many locations as multinational or transnational corporations, thereby changing the global division of labour, and engineering structural change towards an information/knowledge dominated economy. The global dimension of the change has been indexed in two ways as the rise of 'emerging economies' across different regions, and specifically the rise of Pacific Asia. The latter encompasses the most rapid urban economic revolution in world history in China. We are clearly in a period of change from the long-standing world economy core (western European/northern America) of the world economy to a new economic globalization.

2. Which cities are winners and losers in the process of economic structural change (industrialisation, tertiarisation, knowledge-based society)?

The cities that have gained and lost from this structural change vary greatly but include the following (i) London and New York have emerged as leading global cities; (ii) there is a tendency to concentrate global economic process in one city per country to the relative detriment of the 'second city' such as Sydney over Melbourne, Toronto over Montreal, Sao Paulo over Rio de Janeiro, Tokyo over Osaka, and even Milan over Rome and Mumbai over Delhi; (iii) more generally, globalization has enhanced urban primacy within countries (often capital cities, and especially in smaller countries); in Pacific Asia Hong Kong, Shanghai and Beijing are quite recent 'winners' and in this they contrast with Tokyo (no longer combined with London and New York as one of the trio of major global cities); (iv) there are two types of industrial city declines, first the traditional industrial cities of the western core of the world economy that are frantically trying to

'reinvent' themselves, and second, the new industrial zones of the late twentieth century in the 'developing world' subsequently undermined by unprecedented industrial growth of Chinese cities.

3. Is the thesis or the assumption of the concurrence of urban growth (due to population increase) and economic growth correct?

The relationship between demographic and economic growth based upon rural-urban migration generated by employment opportunities in cities was broken in the twentieth century in poorer countries of the world. Quite simply, massive migration to cities outstripped the ability of those cities to generate enough jobs resulting in the largely informal economies of today's poor mega-cities with a concomitant raft of 'urban problems'. Meanwhile in the richer countries, the relationship has largely held up with traditional industrial cities either stagnating or declining in population. The urban revolution in China is a special case, avoiding the travails of other fast growing cities outside the western core, there has been huge creations of jobs to complement the huge rural-urban migration.

4. Which locations are chosen by international companies? Just "international cities" or other cities as well?

Historically the term international cities refers to large trading centres especially those housing international fairs. In contemporary globalization the major cities are commonly called global cities and the term world city is also used. However all cities are part of globalization since it is ubiquitous so that smaller cities will have been 'chosen', perhaps via takeover acquisition, by some companies with international reaches as part of their portfolio. Thus some economic activities that have traditionally been very local in scale, such as brewing, are now widely organized through worldwide corporations. One particular feature that attracts scientifically orientation companies is the presence of one or more prestigious universities.

5. Which industries / sectors move to or are set up in international cities and why?

Global/world cities are generally recognized through their advanced producer services (financial, professional and creative work) and by executive (command and control) functions (corporate headquarters). Whereas the former have become particularly centralized as part of economic globalization this is less so for executive functions where historical origins of firms are still commonly headquarter locations. However acquisitions and takeovers do tend to create centralization. But global/world cities are much more than just service centres, however advanced, and are usually seen as being 'well-rounded' in their array of urban activities such as higher education, myriad entertainment, high-value shopping, etc. Competition for international sporting events has become part of the process of major city branding.

6. How does the networking among international cities work (transport, information and communication, lifestyle, labour migration)?

In the information/knowledge economy electronic communication has enabled worldwide corporate organization but this has not lessened the importance of face-to-face business contacts so that transport passenger expansion, especially air travel, has grown with the world economy. Global/world cities attract two very different groups of migrants, the very rich with their expensive real estate and related lifestyles, and poor migrants attracted by the jobs servicing rich lifestyles. There is a debate on the degree to which this dual migration makes global/world cities exceptionally unequal urban places.

7. Does the economic growth of cities in the global south generate a growing middle class?

Even though the major cities of the global south have myriad urban problems with a large majority of the population very poor, they still house large numbers of people in formal employment with typical middle class consumption habits as indexed by occurrence of huge shopping malls. Thus a global south city of ten million may have the same modern shopping capacity as a global north city of two or three million. Whether the global south middle class is an important growing feature of the world economy varies across cities but it is most definitely part of China's massive economic rise.

The above are initial answers/comments that require support through reporting of detailed research findings upon which they are broadly drawn. However this is not as straightforward as it first appears: both economic globalization and cities are studied in various different ways producing contested results. This Report is not the place to rehearse these debates but it is important that the specific approach taken here is clearly set out and justified. Many problems arise because global-scale research is much more difficult than national-level research for both empirical and theoretical reasons. These are treated in the remainder of this Prologue.

Empirical difficulties in global urban research

It has become commonplace to lament the dearth of data for worldwide comparison of cities (Short et al 1996; Taylor 1997). There are data available for populations of cities but comparable economic data across cities worldwide is much harder to find. There are some commercial data collections but these are problematic for simple definitional reasons. Whereas data on countries is cleared demarcated geographically by the boundaries of states there is no such equivalent means of specifying cities (Brenner and Schmid 2014). Official data tends to focus on administrative areas but there is no agreed definition of city or city-region across countries. Commercial data collections do not seem to have properly recognized this and therefore have no solved the comparative problem.

The importance of this problem is shown by a simple example. The question of economic inequality in cities was broached above and it would be useful to explore this matter in cities across the world. And indeed, measures of the Gini coefficient of inequality are available from at least one data producer. But while this coefficient is salient for countries, its utility for studying cities is doubtful because the areal definition of a city tends to be strongly related to the results: a

city that is under-bounded (mainly central city and a few inner poor suburbs) will be measured as having a low level of inequality whereas a similar city more widely bounded (including all its richer suburbs) will be shown to have high inequality. However such a result does not reflect actual differences between the two cities but rather it is an artifact of boundaries. And as the spatial structures of cities become ever more complex, even separating neighbouring cities becomes impossible, which means a city's inequality just cannot be measured.

This areal definition problem cannot be 'solved' by improved research; cities are not suited to being neatly demarcated in the landscape, rather they are intrinsically dynamic, famously 'sprawling', and generally resisting any simple containing for data collection or for any other reasons. Accepting this stricture, cities can be approached from a different way, and one that is particularly suited to economic process. This involves investigating how a city is being used by people who reproduce the city through their everyday work. This moves the subject of the research from the city per se to the agents using/making the city. In the case of studying economic globalization, these are corporations. This functional focus bypasses the definition problem because it lets the firms decide what the city is in the process of choosing to locate there. This is the approach adopted in the empirical section of this Report.

Theoretical difficulties of global urban research

Cities are not simply abstract objects to be measured; they are complex places where people live and thereby form attachments to. When trying to understand cities at a global scale the latter can sometimes pit local pride against outside intrusion. At the heart of this local concern is a presumption that cities are competitive. Thus there are two public discourses on cities in globalization (Taylor and Derudder 2015). One that is hugely concerned with city rankings ranging from blogosphere rants about under-appreciated home cities through to mayor's offices asking for instructions on how to become a 'global city' or least go up a rung or two. The other consists of academic studies of world or global cities that profess to understand the seemingly enhanced role of cities under conditions of contemporary globalization. The discourses are not as distinctive as might be expected; there is a fuzzy boundary in the policy realm wherein branding is becoming important, and academic case studies often focus on the 'global prospects' of the studied city or cities. But are cities really intrinsically competitive? The ideas and results presented in this Report are built in opposition to this: mutuality is the essence of inter-city relations.

An anecdote will explain how I first broke free from the competitive presumption. When the Council of Ministers agreed to locate the European Central Bank in Frankfurt there was much speculation in the financial and business press that this might be the first step in Frankfurt replacing London as Europe's prime financial centre. Notwithstanding that London, being in the UK, was physically outside the Eurozone (the new bank's jurisdiction) and therefore hardly a credible ECB candidate, the decision was seen as a 'victory' for Frankfurt. On the basis of this competition discourse, some colleagues and I were able to get a project funded by the Anglo-German Foundation to test out whether

Frankfurt was indeed 'catching up' (Beaverstock et al 2001). However as soon as we started interviewing senior bankers and lawyers in both cities we found that they thought the whole idea of Frankfurt as a rival to London to be preposterous. Furthermore, nearly everyone interviewed worked for firms with offices in both cities, which meant that it was in firms' interests for both cities to be successful. London was 'obviously' the global centre but that did not mean Frankfurt was unimportant, its offices simply had different functions relating to EU, central Europe or eastern Europe business. As one respondent put it: what's good for London is good for Frankfurt and vice versa. Offices within the same firm worked together, each providing a different part of the firm's overall strategy. This was mutuality not competition. The situation had been falsely scripted as a national competition (German city versus British city) when in reality it was a case of the ECB properly going to Frankfurt to enhance existing functions, which was viewed as benefitting both Frankfurt and London.

The erroneous thesis of competition between London and Frankfurt encompassed what Jacobs (2000) has called the "Thing Theory of Development". This assumes that economic development is made up of an assemblage of things, and cities with more of the relevant things will be the more successful. Therefore adding things automatically enhances a place's development. The paucity of this approach can be seen in state development failures in both the Second and Third Worlds through the second half of the twentieth century. In the example above the ECB might be considered a rather 'big thing' but simply adding it to Frankfurt's assemblage is not a game-changer. What matters for development is how things are connected; what are the mechanisms through which development occurs? This relational approach identifies mutual inter-city relations; of course this does not mean we found no competitive relations in this study, but that these were between firms, not cities. More generally, competition between cities is a contingent matter, and is typically found in intra-state situations as previously suggested in answers to the Central Questions.

The lesson of the anecdote is that we cannot treat inter-city relations as intrinsically competitive; how we consider mutuality and competition is dealt with below. This example shows that it is important to set out clearly the conceptual grounding of the Report and this is the concern of Part A. Part B then presents some key empirical findings. The topic of this Report is a very concrete matter and therefore I provide manifold examples of different analyses of cities in globalization. However the way in which cities are viewed within globalization is considered of equivalent worth and therefore both substantive parts of the Report are meant to be understood as equally important.

Part A Conceptual grounding: globalizations, cities and states

I set out the Report's basic terms of discussion: first how I interpret economic globalization with particular reference to the changing status of states; second I show how cities fit into this globalization in terms of networks and hierarchies; and third I provide a framework for analysis as a global space-economy in which

economic globalization develops as corporations operating through a world of city/state contradictions.

Economic globalization

Economic globalization is defined as a set of economic transactions that are worldwide in scope and integrated to create a world economy. Viewed this way there have been three such processes creating distinctive world economies.

1. Imperial globalization. This was the culmination of European imperialism so that by the end of the nineteenth century there was an integrated world economy whose global scope was defined by imperial relations, both formal (political control) and informal (dominant economic influence), whereby the rest of the world provided European countries (and latterly USA and Japan) with agricultural commodities and raw materials. In effect this world economy was a global functional region with simple commodity flows from the periphery servicing a North Atlantic industrial core.
2. American globalization. The USA emerged from the Second World War with an expanded economy when all rivals had different degrees of severely war-damaged economies. This enabled American firms to dominate the world economy in an 'Americanization' that restored European and Japanese economies in the 'post-war boom'. This had two elements: (i) leading American firms grew to become 'multinational corporations' through having production units located in different countries; and (ii) leading European firms emulated American management practices and technological advances.
3. Corporate globalization. This is an extension of Americanization through numerous non-US firms becoming multinational corporations, with Japanese and German firms in particular, initially challenging American economic dominance. But this is much more than a diffusion of American practices, some leading firms become 'transnational corporations' and later 'global corporations' through realizing the new organizational potential of the technology merger between the communication and computer industries in the 1970s. This brought the integration of the world economy to unparalleled levels, firmly establishing corporations as the dominant players.

Corporate globalization is our contemporary globalization, an ongoing process of economic integration originally focused upon three main 'globalization areanas': northern America (USA plus Canada), western Europe, and Pacific Asia (led by Japan and not including China). Now it involves corporations from countries across the world, importantly including China.

Although my focus will be on corporate globalization it is important to note that there are vestiges of previous globalization processes that remain relevant: various imperial connections are still discernable in today's world economy and American corporations remain the largest national group. But corporate globalization is very distinctive. This was initially recognized in technocratic terms with the communication-computer merger heralding 'the end of geography' in a new 'borderless world' (Brown 1973) both implying the demise

of states as major players in the world economy. But this is very misleading: states are not disappearing; rather how they relate to the encompassing world economy is being radically transformed.

The two earlier globalizations were international with inter-state relations at the heart of the worldwide economic relations. In contrast, corporate globalization is premised on transnational transactions, with myriad economic relations surpassing states. This does not mean that states have become irrelevant, all economic activity is ultimately grounded whatever the technology, but that their unrivalled dominance of the world economy is no more. This can be seen in trade policy where free trade/protection debates of imperial globalization gave way to GATT promotion of free trade in American globalization – both were international practices – that contrasts with the current World Trade Organization which provides for corporate transnational practices. In legal terms, in American globalization there was a focus on human rights protecting individuals from actions of home states, in corporate globalization the focus is on corporate rights protecting firms from actions of foreign states. In political terms, American globalization operated through social compacts within countries - in the USA the compact between 'big capital' and 'big labour', in Europe the creation of welfare states – whereas in corporate globalization these national compacts are replaced by unequal relations between huge transnational capital and multiple little 'national labours'. This transnational world is the habitat of the resurgence of cities as major players in a global economy.

Cities as local-global nexus

The importance of cities in corporate globalization has been understood in three steps. First the rise of multinational corporations was identified with cities as new centres of power by Hymer (1972); second this was seen to be operationalized as the New International Division of Labour whereby industrial production, traditionally the mark of 'developed countries' (Frobel et al 1979), was being transferred to poorer countries; and third this new economic decentralization requiring a new organizational centralization in the form of a world city hierarchy (Friedmann 1986) or new global cities (Sassen 1991). This research trajectory ran parallel with a urban policy reactions to social and economic change whereby cities were initially seen as part of 'the problem' in the 1970s and two decades later were commonly heralded as part of 'the solution'. Hence cities are now generally seen to have crucial roles in economic globalization.

Recently there have been a large number of academic books on cities and their roles in contemporary economic development (e.g. Taylor et al 2011b; Glaeser 2011; Scott 2012; Derudder et al 2012; Storper 2013; Batty 2013; Neale 2013; Taylor 2013; Brenner 2014; Taylor and Derudder 2015). These include a variety of approaches; in this Report I will develop ideas derived from Jacobs' (1969, 1984, 2000) theory of urban economic development. The reason for this choice is that her approach directly addresses the local-global nexus that is the essence of successful contemporary cities. In this her work engages directly with the process of economic globalization by uniquely combining internal relations of

cities (agglomeration) (Fujita and Thisse 2002) with external relations of cities (connectivity) (Taylor 2004). These are the special economic assets of cities, cluster externalities and network externalities respectively (Hicks 1969). Both relations are realized in terms of communications; agglomeration provides dense communication and connectivity provides diverse communication (Taylor 2013). Therefore cities are inherently knowledge-rich milieu and never more so than under conditions of contemporary globalization.

Jacobs (1969) provides a generic process of economic development. Economic change is the result of two master economic processes, innovation and import replacement, which are both features of city creativity. In this argument innovation is a function of the size and complexity of cities, where urban problems generate new demands that only these creative places can satisfy through new production and consumption. Import replacing derives from the diffusion of innovations through city networks of creative places, where innovations can be improvised for local production and consumption. Both processes generate new work thereby increasing the complexity of a city's division of labour. It is this that defines economic development as a special case of economic growth. An economy can grow by just increasing what is already being produced – adding more old work to existing old work such as doubling the output of a factory – but this does not diversify a city's division of labour and hence does not qualify as development. Thus cities are special settlements because of complex dynamic divisions of labour resulting from their innovations and import replacements. It is this special-ness that has been both a cause and a consequence of globalizations during the unprecedented urban expansion of the last 200 years.

It has been noted that the emergence of corporate globalization derived from the new instantaneous global communication opportunities opening up in the 1970s. Initially, firms developed production strategies whereby they could take advantage of low-cost transport and cheap labour to forge global commodity chains for secondary sector production. This stimulated a globalization of tertiary services by firms providing financial, professional and creative services for their globalizing corporate clients; in the 1980s they followed clients to new markets and thereby exported their services through new offices across the world. By the early 1990s service firms' intranets criss-crossed the world as flows of expert knowledge to support corporate globalization. Very quickly these service firms moved on from being corporate followers to becoming corporate players in their own right: finding themselves in new markets they soon produced their own global office strategies. By the turn of the new century these knowledge flows in and through cities reached new levels of density and diversity; according to Castells (1996) we are living in an 'informational world', a global network society where these 'advanced producer services' had become part of a new 'quaternary sector' of the corporate world economy.

The corporations providing advanced producer services are to be found in the internal agglomeration of major cities across the world in their hallmark clusters of skyscrapers connected by satellite dishes in worldwide infrastructure networks. The result is a dynamic world city network of global service centres

enabling economic globalization. In Sassen's (1991) global cities thesis service production and consumption come together: markets for advanced producer services (corporate headquarters) in global cities are serviced by financial, professional and creative corporate providers in global cities. But since both sets of corporations pursue global strategies it is the network of cities as global service centres that constitute the global framework to make economic globalization possible. Thus most of the empirical material that follows will focus on service corporations and how they use cities in their everyday work. It should be noted that this choice of economic sector is based on its strategic importance not on corporate size – except in financial services most service corporates are relatively modest in size. One way of looking at them is to interpret advanced producer services as the 'indicator sector' in the current world economy. By analogy with an 'indicator species' in ecological habitats, the success of this indicator sector in the today's city habitats is a pointer to successful economic development.

Finally, there are three related consequences of the approach I am taking in this Report. First, note that the network makers in my argument are firms carry out their corporate servicing work and NOT the cities per se, as represented by their local governments or administrations. The Report does not envisage a 'mayors ruling the world' scenario, the process of economic globalization is not a result of local political policy making but rather it is the outcome of global corporate location decision making. Second, there is the question of economic specialization versus diversity in cities. Sector and geographical concentration of economic knowledge has both advantages and dangers for cities. In the case of advanced producer services all major cities engage in the process but in two different ways. A few cities, Sassen calls then 'global cities', specialise deeply in the production of these services but in addition there is a much larger number of cities – numbered in hundreds – that have a sufficiency in this service provision so as not to be too dependent of the 'global cities'. There is no clear and simple line between these two servicing roles of cities. However it should be noted that global city formation does not produce specialization in the way Detroit specializes in car making; in other words, advanced producer services generally fit into a much broader and diverse urban economy. Third and following on from the last point, the development of advanced producer services is just one process among a myriad of processes that constitute a dynamic economically successful city. It is highlighted here because it informs cities' role in economic globalization, but there are important on-going processes at other scales notably national capital functions for most major cities across the world, and regional central place functions (retail and culture) are ubiquitous for all cities. This Report deals with cities' global roles, whose importance will vary across major cities in relation to other roles.

Global space-economy

The roles of cities in economic globalization cannot be studied solely as global servicing of corporations in a pure commercial landscape. To be sure global law firms draw up contracts for their clients to make agreements as if being in the fabled 'borderless world': multinational contracts by corporate lawyers bring

together different national law codes and convert them into one of two master codes (English common law or New York state law). But equally, different service providers, accountants and other financial advisors, design 'tax efficiency' strategies for clients that use political boundaries to separate sales from profits, which at the criminal end of the spectrum is called money laundering. Corporate globalization may be premised on transnational practices but that does not mean states and their boundaries do not remain important. My way of dealing with this political dimension in economic globalization is to consider the roles of cities within a global space-economy.

The global space-economy is conceived as a city-centric economic process but one in which states have an important role to play. States remain economic powers but in a very different way to cities. Modern states are territorial political entities that are able to control flows of economic factors through their boundary, regulate economic factors within their territory, and manage a budget that attempts to balance the effects of these extra- and intra-territorial practices. Thus states do not directly generate economic development like cities, but they do wield critical economic authority; for instance, the activities of all advanced producer service firms are regulated state by state. I refer to these territorial powers as state economic jurisdictions (SEJs), which, along with economic development through cities, is a necessary component of the global space-economy.

The global space-economy consists of the interaction of two spaces: spaces of flows centred on cities and spaces of places constituted by SEJs. This is a bi-layered model with a mosaic map of political places set upon a route map of economic flows. The dynamic of the former consists of policies such as tariff rates and labour laws enacted by governments; the dynamic of the latter is agglomeration and connectivity processes engaged by firms. I use the hyphenated 'bi-layered' instead of the simpler 'two layers' to emphasize the integral links between the maps; the model consists of three mega-processes: (i) mosaic space construction and maintenance, (ii) connectivity space construction and maintenance, and (iii) their interaction as an entwining of both constructions and maintenances. The former two exhibit great varieties in practice – different deployments of both public and private powers characterising states (Rokkan 1980); different types of flows as networks, chains, and circuits crossing borders (Coe et al 2010; Derudder and Witlox 2010) – but the essence of the model is the critical interaction of place and flow. This is what both the lawyers and accountants referred to above are both engaging with using their professional knowledge to advantage their corporate clients.

The operation of the bi-layered model is shown in Figure 1. Derived from a study commissioned by Mastercard this graph compares the relative commercial attractiveness of individual cities to that of their respective countries. Using 90 different measures across 75 leading cities, there are different measures for both city and country attributes. For instance, indices relating to 'livability' were for cities but legal framework was indexed by country. In all there were 50 measurements on countries, 30 measures on cities and 10 mixed. From these data each city's individual measures can be separated from the attributes of the

country it is located in: Figure 1 arrays these two measures for each city. The resulting distribution of cities shows a peculiar pattern with the bottom right of the graph empty: there are no cities considered good for business to be found in countries considered bad for business. The leading world cities are located in the top right of the graph - these all have the best of both worlds: they are attractive cities in countries attractive to commerce. In contrast, in the bottom left there are cities unattractive to business both individually and because of the country they are in. However the top left is the most interesting part of the graph. Here are found two types of cities; those whose attractiveness is largely due to the country they are in, and other cities that are relatively attractive despite the country they are in. This is easily interpreted geographically. It is in poorer parts of the world, where state structures are relatively weaker and less amenable to commerce, that cities are held back by their countries in terms of attracting business. For understanding global location decision-making this produces the intriguing suggestion that firms' location decisions in richer parts of the world will be based upon city attributes whereas decisions in poorer parts of the world are likely based on state attributes. In other words city and state have different saliences in different parts of the global space-economy.

The above study confirms the relative importance of states in the global space-economy but should not be interpreted as undermining the city-centric nature of corporate globalization. The case of Hong Kong's remarkable economic success over the last half-century is relevant here. Certainly its political circumstances do not appear to be at all auspicious as a platform for economic success. Until 1997 it was a British colony, after which its political control was transferred to China. From an imperial relict to becoming part of a communist state is not a political path expected of a very successful city in corporate globalization. But it was successful – why? For cities to be successful a key need is relative economic autonomy, irrespective of the prevailing political organization. And this is precisely what Hong Kong has experienced. Under the British there was the 'pomp and ceremony' of imperial rule while the local Chinese concentrated on making money. And the Chinese communists were simply pragmatic: why kill a goose laying a golden egg? They gave Hong Kong separate administrative status in their 'one country, two systems' formula, reserving political power to Beijing but otherwise leaving the economic process alone. Thus curiously, Hong Kong's unusual political path has actually been ideal in providing a key economic space for corporations to locate and create a globally connected city.

Part B Main text: cities in the world city network

The empirical results below are compiled from an on-going research programme carried out under the auspices of the Globalization and World Cities (GaWC) Research Network (www.lboro.ac.uk/gawc) since 1998. The subject of these studies is inter-city relations and therefore the focus is on connectivity rather than agglomeration in the specific economic advantages of cities. This is entirely appropriate for this Report since results highlight the worldwide roles of cities in contemporary globalization.

The research is premised on an interlocking network model whereby advanced producer service firms 'interlock' cities through their work-flows (of ideas involving information, knowledge, professional knowhow, plans, strategies, direction, etc.) across worldwide office networks (Taylor 2001; Derudder and Parnreiter 2014). Since data on this commercial work is impossible to access (for both confidentiality and sheer scale reasons) direct measurement of work-flows is impossible; the model enables indirect measurement of work-flows in the form of estimates of potential flows between individual offices within firms. These are simply based on the idea that more important offices generate more work-flows; there are more flows within a firm between two cities with important offices than between two cities with less important offices. Importance is measured by size and function of a firm's office in a given city. The work-flows through a single firm's office network are estimated; the aggregation of many firms' flows constitute the world city network as estimates of gross flows between cities servicing corporations across the world. A basic outline of the model is provided in the Appendix.

This strategy of indirect measurement relies on there being easily available data to operationalize the model. In this case information from firms' websites about their offices (i.e. in selling their 'global capacity' to clients) is used. For each firm the question asked is how the firm 'uses' a given city: a scale from 0 (no presence) to 5 (headquarter location) has been devised with intervening scores being 2 for a typical office of a firm, 1 where there is something less than typical service (usually small size), 3 is an unusually large office, and 4 indicates an office with non-local functions (e.g. regional HQ). These scores are termed the service values of cities for firms. Such data has been collected in 2000, 2004, 2008, 2010 and 2013, originally for 100 firms in 315 cities and since 2008 for 175 firms in 526 cities. Thus the latest service values matrix arrays 175 firms against 526 cities featuring 92,050 pieces of information. The roster of firms is made up of the largest firms in financial services (75), accountancy (25), advertising (25), law (25) and management consultancy (25).

This Report presents three types of results from analyses of these data

1. The basic measure is the aggregate of all potential work-flows of a city, which defines its global network connectivity. In all this research London is found to have the highest level of connectivity. For ease of comparison, results for other cities are presented as percentages of London's score.
2. Within the aggregate result there are myriad city-dyad connections as sums of office work-flows between pairs of cities. From these results, each city's geographical orientation can be illustrated – where (which cities) it is strongly connected to, and where it is weakly connected.
3. The service values matrix can be simplified using a principal components analysis to indicate the underlying structure of the work-flows. Such analyses have indicated resilient regional structures within the overall economic globalization.

In what follows I draw on results presented in Taylor (2004), Taylor et al (2011b, 2013, 2014a, 2014b) and Taylor and Derudder (2015). This compilation does tend to focus on the roles of major cities in economic globalization but, as

the size of the service values matrix indicates, smaller cities are also featured not least to contrast with their more important peers.

Global network connectivities of cities, 2000-2013

The initial result of world city network analyses are the global network connectivities (GNC) of cities. These provide a ranking of cities in terms of their degrees of integration into the network. Although use of such results commonly focuses on the position of a given city of interest, the real value of the analyses is to be found in the possibilities for numerous comparisons between cities. Given that this measurement exercise has been carried out since 2000, longitudinal comparisons can be made to show the trajectories of cities in the developing network. Here I focus on the top 20 cities in terms of GNC in 2000 and 2013: Table 1 lists the leading cities in 2000 and 2013; Table 2 shows changes in GNCs for these cities from 2000 to 2013.

The following statements can be derived from these results

- **The world city network appears to be very resilient. Despite major movements in the world economy over the period in question (dot.com bubble – rapid expansion – severe crisis – austerity), there are only five changes in the top 20s**
- **This resilience is especially marked at the top of the ranking. London and New York remain by far the most connected cities, followed by Hong Kong and Paris in both lists**
- **Cities from ‘emerging markets’ are among these leading cities: Sao Paulo and Mexico City appear in both lists and they are joined by Mumbai, Shanghai, Moscow and Beijing in 2013**
- **The latter represent important changes that are occurring in the world city network: a ‘west’ to ‘east’ shift. This is especially shown in the changes with western European and US cities showing relative decline compared to Asian cities. The swapping of positions between Toronto and Sydney is part of this broader pattern**
- **A key outcome of this shift is the remarkable position of Chinese cities in the top echelons of the network with three of the top 8 cities in 2013**
- **In total contrast there are two Pacific Asian cities that have the largest relative decline: Tokyo and Taipei. The former reflects the Japanese economy’s opposite trajectory to that of China; the latter is a special case of a Chinese city politically separate from China and thereby suffering as a consequence**
- **Finally mention should be made of Dubai that records by far the highest relative increase in GNC. Partly due to a low starting point, this is nevertheless a remarkable trajectory that will warrant further consideration**

Discussion

These findings are consistent with what we know from other analyses and commentaries on recent changes in the world economy. What is added by Tables 1 and 2 are specific measurements of stabilities and movements of leading cities.

But this is only the starting point of world city network analyses, really just the tip of an iceberg about roles of cities in economic globalization.

Cities in global regions

One consistent finding in analyses of the service values matrix is that economic globalization is highly regionalized. This is in keeping with the fact that transnational firms have typically expanded the scope of their business initially from national origins to neighbouring countries and this is still reflected in today's office networks (Dicken 2010). The result is a complex global regional structure of service provision. Here I report on a very interesting regionalization derived from the 2010 data (Taylor et al 2013).

A principal components analysis of these data reduces the service values of 175 firms into components scores of just 10 common regional patterns of service provision. But these servicing regions do not make up the typical mosaic pattern we expect in regional analyses; our global regions are created by firms that are making networks not boundaries. Thus there are unusual features such as some overlapping. Figure 2 is a cartogram showing the regions and their overlaps indicated by dotted lines, for instance Chinese cities are located in both the Pacific Asia region and the China region. The regions vary in overall importance; two are dominant, there are three other important regions and five lesser regions all identified by varying font size on Figure 2. The two dominant regions share the same regional identification that has been coined specifically for this analysis: USAL refers to the "USA plus London" because London is so closely integrated to the USA in very many firms' provision of transnational services. In Figure 2 it is London only that creates the overlap between Europe and the two USAL regional frameworks. In this analysis USAL is home to two different regional patterns of service provisioning (i.e. there is a complete regional overlap). This is possible because of the key and unique feature of this regionalization: each regional structure is constituted in two parts: cities in the home region (which provides the region's name shown in Figure 2) and cities in a global outreach (which confirms each region having a worldwide span). Thus the two USAL regions share a home-region but have contrasting outreaches.

The ten regions are briefly described in Table 3 where the leading cities in home-regions and global outreaches are given. These are all largely as might be expected. In addition, the table divides the regions into two groups in terms of the relationship between their respective home-regions and global outreach. In four regions more cities feature in the home-region than in global outreach with consequent more servicing in the home-region compared to global outreach. This is interpreted as an intensive globalization process. The opposite arrangement shows an extensive globalization process defining six regions, the five lesser regions plus USAL Extensive. The latter is an almost perfect mirror image of USAL Intensive and this dominant pair of regions shows how the two different globalizations are being constructed. The intensive process results from global law firms and investment banking where office location tends to be focused on key cities, whereas the extensive process results accountancy

especially, but also advertising and some other financial services and management consultancies, where offices are broadly spread across the world.

What does all this mean for understanding the roles of individual cities in economic globalization? This analysis enables measurement of the geography of a city's position amongst the various regional frameworks. Specifically it enables identification of the varying strengths of a city in servicing in different regions. These are shown in Table 4 for the top 20 GNC cities in 2010. Not all regions are listed for each city; the focus is on specifically strong and weak orientations. These results can be interpreted as where a city's service complex is biased and where there appears to be dearth in servicing. For instance, corporations in Dubai doing business in Europe will have better and more services to draw on locally than when doing business in China. This presumably reflects current demands for servicing but it also has implications for future business since regions served will have different growth potentials.

The following statements can be derived from these results

- **Fifteen of the twenty cities record a strength in at least one of the USAL regional frameworks confirming the overall importance of these two structures**
- **The three leading cities, London, New York and Hong Kong, are the only ones to show no weak regional links**
- **Neither London nor Hong Kong are leading cities in a regional framework whereas New York is the leading city in two frames; however London and Hong Kong record more regional strengths, eight and six to New York's five**
- **Of the 42 weaknesses recorded, only five are with intensive regions: Chicago in Pacific Asia, Sydney in Europe, Mumbai with USAL Intensive, Los Angeles in Europe and Moscow in the Americas**
- **By definition all cities should be strong in their home-region but this has a variety of implications: Dubai and Mumbai have no global home-region in this framework, whereas London and US cities have three (but New York and Los Angeles do not show strengths in the Americas region)**
- **Three cities stand out for having few regional strengths: both Tokyo and Los Angeles have just two, including a home-region; Chicago, Sydney, Frankfurt and Mexico City have only three strengths, for Chicago they are all home-regions, for Mexico City there are two home-regions, and there are one each for Sydney and Frankfurt**
- **There are four cities strong in both USAL regions: London, New York and Chicago as home-regions plus Paris, but not including Los Angeles which is not strong in USAL Extensive**
- **There are three cities with four or more regional weaknesses: Chicago with six, and Sydney and Los Angeles with four**
- **Apart from the three China cities (Hong Kong, Shanghai and Beijing), there are no cities with strengths in both Pacific Asia and China regions; the two other Pacific Asia cities (Tokyo and Singapore) do not show China strengths**

- **London and New York have stronger China links than with Pacific Asia, a feature shared only with Chicago and Mumbai; Paris, Dubai, Sydney, Toronto, Sao Paulo, Madrid, Los Angeles, Moscow and Frankfurt are all reported as having a bias towards Pacific Asia compared to China**

Discussion

The results show the provenance of corporate globalization from Americanization with the domination of the two USAL regional frameworks. The integration of London into this frame derives from London's role in the move from an international to transnational globalization through its leading role in the postwar Eurodollar market culminating in liberalizing the City ("Big Bang") in the 1980s. Perhaps less likely but not unexpected given earlier analyses, corporate globalization is also shown to have an imperial legacy with two 'Commonwealth' frames through Sydney and Toronto, in which London and Mumbai feature strongly in both, and Hong Kong and Singapore in one (i.e. six out of the top 20 cities include this imperial heritage link).

The results further engage with the changes happening in Pacific Asia. The latter region is reported in initial regional analyses (from 2000) and is joined by a separate overlapping China region in 2010. The Pacific Asia region led by Tokyo was an initial key component of corporate globalization beyond the North Atlantic economic core so that Tokyo was one of the three archetypal 'global cities' identified by Sassen (2001). This arrangement is being superseded by the rise of China cities confirming Hong Kong as Asia's 'global partner' of London and New York. This makes the Pacific Asia/China link comparisons very interesting with London and New York more strongly related to China cities compared to other cities outside the region who remain more Pacific Asia in orientation. Tokyo now joins US cities Los Angeles and Chicago in being relatively parochial, a feature that is also reflected in the other US city, New York, having many fewer regional strengths than London, as well as less than Hong Kong.

Finally, the 'third pillar' of contemporary globalization, Europe, has been mainly present in the discussion through mentions of London. It is represented in these results by its own regional framework plus a small region, separate and not overlapping, in its northern fringe. The former is extremely intensive at the level of USAL Intensive, but without the compensation of a parallel USAL Extensive – Scandinavia although extensive is both small and separate. This nature of Europe's cities in the world city network will be explored more specifically later.

Global strategic places

In introducing the concept of global cities, Sassen (1991) viewed them as 'strategic places' in the world economy. The previous results have hinted at this eventuality and this is explored specifically here. However Sassen viewed global cities in a hierarchical structure drawing partly on Friedmann's (1986) 'world city hierarchy' where New York, London and Tokyo were viewed as the 'primary' control and command centres atop the hierarchy. However, as Pred (1977) showed long ago, the way businesses interact with cities is never that simple:

there are myriad criss-crossings of intra-firm directives that belie a simple hierarchical structure. For instance, in today's world economy London is the leading European city but there is no general sense of London directing other European cities. French advertising agencies in Paris direct the strategy of their London offices, as similarly German banks in Frankfurt have overall authority over their London branches. This complexity is better accommodated by the network approach adopted in this Report; as argued in Part A the world city network is best viewed as a network with hierarchical tendencies. This has an important implication for analysis: networks are constituted as nodes and links, which require equal consideration. Thus as well as focusing on cities (nodes), there should be corresponding treatment of city-dyads (links). This is particularly apposite for studying strategic places since the places (cities as nodes) are only strategic because of their connections (city-dyads as links).

The relative strategic-ness of cities can be viewed through the standings of a city's main partners. In Table 5 the top twenty cities for 2010 in terms of GNC are listed in terms of the number of times they are members of the forty most important city-dyads. This is a basic measure of dyadic strategic-ness: it shows which cities have more or less salient connections within the world city network. The results are quite stark in identifying which cities appear strategic and which do not. There is a general trend for cities with higher GNC to be more strategic, exemplified by New York and London. But the trend is not a smooth one: Dubai records no strategic links despite a GNC rank of 9th whereas Frankfurt ranked 19th by GNC has eight such links. These differences between strategic-ness and GNC have been explored through two different analyses.

In the first place, the idea of there being two globalization processes through cities, intensive and extensive, was first identified in a city-dyad analysis of the 2008 service values matrix (Taylor et al 2014b). A principal components analysis conducted on a 27,966 city-dyads x 5 service sectors produced the two globalizations. Focusing on the city-dyads with the highest 50 component scores in each globalization, cities are arrayed by their frequency of membership of these dyads in Table 6. As usual London and New York dominate each list; other cities confirm differences between the two globalizations previously reported. The Frankfurt/Dubai contrast is repeated with the former important in intensive globalization while the latter does not appear in either globalization. In general, intensive globalization includes city-dyads featuring more important cities, whereas extensive globalization bring in a range of less important cities. However there are seven cities that appear in both lists; this straddling the two globalizations can be thought of as a preliminary indication of a strategic-ness interceding across globalizations.

In a second, later, analysis using the 2010 service values matrix, this idea was followed up by a new consideration of the network makers themselves, the advanced producer service firms (Taylor et al 2014a). Twenty-five such firms with sizeable contributions to both globalizations were identified as having interceding strategic office networks. A new measure of connectivity was computed using just the strategic firms resulting in strategic network connectivity (SNC). In Table 7 SNC is listed for the top 20 GNC cities as 'absolute

strategic-ness'. GNC and SNC are related; the higher GNC, the more likely a city will include the selected strategic firms in its service mix. But the relationship is far from perfect and standardized residuals from a regression between the two measures are used to compute a relative strategic-ness (this removes the GNC effect). Cities in Table 7 are ordered by relative strategic-ness and are grouped into five groups.

The following statements can be derived from these results

- **The fundamental point is that global network connectivity does not automatically translate into the strategic-ness of cities. Dubai and Frankfurt illustrate this with the former having more GNC but the latter being more strategic**
- **Strategic-ness is related to the division into intensive and extensive globalizations through cities, with key strategic cities combining strengths in both globalizations**
- **Although London and New York are usually coupled together in world city network analyses, through exploring strategic-ness they can be separated, with New York the more strategic**
- **In another reversal compared to GNC lists, Shanghai and Beijing appear to be more strategic than Hong Kong (and Singapore)**
- **US cities and western European cities (but not London) are the five most strategic cities. This includes Frankfurt**
- **At the other end of the new rankings, cities with low strategic-ness tend to be from outside the main globalization arenas of USA, western Europe and Pacific Asia. This includes Dubai**

Discussion

There is a range of results differentiating GNC from strategic-ness in slightly different ways but a single economic process can be discerned behind the changes. This is most clearly seen in the relationship between London and New York, the only city-dyad that actually has a name: NYLON sometimes seen as being a single transnational city (Smith 2012). This indicates that the two cities are not in competition, quite the opposite: they display complementarities based upon their dissimilarities (Sassen 1999; Wojcik 2011). Basically London provides a unique transnational platform for global servicing operations while New York is the unrivalled innovation centre for global service products. Both these roles are most acute in financial services. Although both roles are necessary for the functioning of economic globalization there is a hierarchical element in their relationship in the sense that London is 'used' by New York; firms in the latter city use the former city to market their new work globally. Thus the development dynamism resides in New York, the more strategic city.

This distinction between production of new work and its wider marketing is broadly found in other comparisons. In China the mutualities between Hong Kong and Shanghai are functionally similar to NYLON structure. Shanghai is the innovative centre developing new products and markets, such as financial derivatives and futures markets, while Hong Kong is the conduit connecting global capital to China (Lai 2012). In this way dynamic Shanghai uses Hong Kong, and is thereby more strategic. Parnreiter (2010) finds a similar dependence

pattern operating in Mexico City whereby the servicing firms are largely enabling new work emanating from other more central cities like New York. This example is illustrative generally of the lesser strategic cities from outside the main centres of globalization. And this is what has been happening in the stark differences between Dubai and Frankfurt. Put simply, Dubai, in a region of large capital surplus, has grown massively as a market for London service products (Bassens 2013), whereas Frankfurt is a strategic innovative service hub for Europe's largest national economy (Hoyler et al 2008).

European cities in a global context

This final section has three purposes. First, the concentration on Europe is undertaken because its cities have appeared to be underperforming in previous analyses compared to cities in rival economic core zones, for instance compared to Pacific Asia in Table 1 and USA in Table 3. And even the supposed global dominance of London has been compromised in the strategic cities analysis (Table 7). Second, the world city network data cover many more cities than the small coterie of leading cities discussed above. Although some cities might be labeled global cities, this does not mean other cities are 'non-global cities'. Economic globalization is ubiquitous, albeit very uneven. Lesser cities in globalization are considered using European examples. Third, states are brought into the analyses at this regional level; Europe is a region of many countries and therefore study of its cities can inform the interface between world city network and state economic jurisdictions (SEJs) in the global space-economy.

In Table 8, 15 European cities are listed at three levels of GNC in 2008: leading cities, middle ranking cities, and cities with relatively low network connectivities. These groups represent different degrees of dependence on other cities for advanced producer service: the first five cities are global service centres; the middle group includes cities that have a reasonable degree of sufficiency in these services but are dependent in some circumstances; the third group have the basic services but are commonly dependent in many circumstances. The question asked is what do these differences amongst cities mean in terms of their worldwide patterns of connectivities? For each city their total connectivities to other cities in the three main globalization arenas, Europe, North America and Pacific Asia are computed and regressed against their respective GNCs. Standardized residuals from this exercise are shown as geographical orientations: positive residuals indicate relative over-linkage, negative residuals indicate relative under-linkage. Thus Barcelona is shown to be over-linked to other European cities relative its under-linkage to North American and Pacific Asian cities. The highest and lowest orientations are indicated for each region showing that Utrecht's service links are heavily concentrated in other European cities, while London's links in Europe are relatively neutral, neither over- or under-linked. In terms of North America, Europe's 'oil and gas capital', Aberdeen, has the highest over-linkage with Utrecht this time being least linked; and for Pacific Asia, Frankfurt has the highest relative link, Arhus the lowest.

In Table 9 the focus is on a specific set of European cities, largely middle ranked in terms of GNC, capital cities. The twenty-seven capitals of countries in the European Union are listed; all but the top five have not been previously listed in tables above. Advanced producer service firms will locate offices in capital cities specifically for two reasons: first, as seats of governments capital cities are markets for service products in areas such as privatization and advice on 'efficiency' savings (downsizing); second, as state regulators of economic process, these cities are centres for lobbying activities by service firms representing both clients and their own interests. Looking beyond the top five in Table 9, it appears that small cities in smaller countries in eastern European, for instance Prague, Bucharest, Bratislava and Riga, have higher levels of services than might be expected. But the main surprise is the relatively low rankings of Rome, and especially, Berlin; capital cities of two large European countries, their economic service linkages are quite meager for such major cities.

The latter finding is further explored in Table 10 where the leading seven cities in terms of GNC are listed for each of Europe's four largest countries. This shows the contrast between France and the UK as classic 'primate city' countries, whereby Paris and London totally dominate economically, and Germany and Italy where economic power of cities is more evenly spread. In Italy this is a duopoly with the capital city, Rome, economically second to Milan. However in Germany, the city distribution of GNC is spread in a relatively even way. Thus whereas Frankfurt has the lowest GNC of cities ranked first in Table 10, from ranks two through to seven German cities have highest GNC for each rank. The capital city, Berlin, is ranked fifth in Germany but its GNC is higher than cities ranked second in both primate countries.

The following statements can be derived from these results

- **The global network connectivity of European cities is reflected in their geographical orientations: as connectivity declines European orientation increases but orientation to North America and Pacific Asia reduces.**
- **These trends are clearer for Pacific Asia orientations than for the other two regions**
- **However there are specific examples that buck these trends notably London with its very low, basically neutral, Europe orientation, Brussels with its high European orientation, Frankfurt with its high Pacific Asia orientation, and Basel and Aberdeen with their high North America orientations**
- **The importance of the global space-economy is shown through cities that are quite small globally but as capital cities have relatively strong global network connectivities**
- **The ranking of capital cities does not accurately reflect the sizes of their respective countries, which is best represented by Rome and Berlin compared to Amsterdam and Brussels**
- **The strength of the global network connectivities of the two leading cities, London and Paris, is in part promoted by their respective national primacies**

- **But these two primate distributions are quite different; France's lower ranking cities tail off like Italian cities below the Milan-Rome duopoly; the UK's cities are closer to Germany's flatter city distribution although consistently lower in connectivity**

Discussion

The findings above begin to make some collective sense in the context of the geographical development of economic globalization (Taylor et al 2011). The latter emerged from Americanization largely influencing western Europe, through the rise of Pacific Asia led by Japan, followed by the end of the Cold War initially indexed by eastern Europe rejoining western Europe economically. These latter two moves provided new market opportunities to advanced service firms. In Pacific Asia this created a new expanding region where financial services dominated; in eastern Europe it led to a wider range of services facilitating privatization of state assets. The former process is shown in Table 8 where Pacific Asia's smoother trend across different levels of city connectivities reflects the later and less complicated relations with European cities. The latter process is shown in Table 9 where the vacuum of local service firms in former communist countries was filled largely by foreign firms resulting in relatively high levels of transnational links for eastern European cities.

Continuing discussion of London from the previous section, these further results reflect London's dominant connectivity position as necessary platform but not as strategic innovative node. In fact London's neutral orientation mirrors New York equivalent orientation for North America at 0.00 suggesting a sort of common NYLON hinge linking Europe and USA through global network servicing. The reason why London is consistently just ahead of New York in all global network connectivities (i.e. in this Report and beyond) is likely due to the former's primacy, as capital city, in one of the larger national economies in the global space-economy.

Explanations for the other positive exceptions above are all quite straightforward: Brussels as Europe's 'political world city' (Elmhorn 2001); Frankfurt as financial centre linked to Pacific Asia as region of cities most based on financial services; the latter city contrasts with Basel a traditional service centre still linked strongly to Europe and North America but not Pacific Asia. Note that the other specialist financial centre in Table 8, Geneva has the only positive value leaning towards Pacific Asia outside the top five group suggesting more attention to recent global trends than Basel. Aberdeen's links to North America are related to oil/gas activities in links to Houston and Calgary.

The cases of Berlin and Rome as capital cities superseded economically by other cities in their respective countries is well known. Milan's economic dominance in Italy as innovative centre compared to Rome international political role is well documented (Perulli 2012). The Berlin example is more interesting since it only regained its capital city status with the demise of the Cold War and thus after corporate globalization was established. Attempts in the 1990s to 'catch up' and enhance its global importance through reasserting pre-Cold War economic roles in Europe proved to be impossible (Krätke 2001). This is a good example of

political will not being able to simply create global roles for cities. Although city mayors across the world may admire the most successful global cities, policies of emulation are ill advised. The world city network does not consist of many 'mini-Londons' and 'little New Yorks' ready for hierarchical lift-off; rather there are multiple cities differently positioned economically in the world city network in myriad national, regional and global roles. Further discussion of the four major countries featured in Table 10 can be found in Catalano (2011), Hoyler (2011), Pain and Ardinat (2011) and Taylor (2011).

Finally, how do these results relate to the political construction of the European Union and its creation of a 'single market' covering most of Europe? In fact national markets continue to prevail in general consumption so the extensive globalization, especially as promoted by advertising agencies, is ongoing across Europe. Advertising is customized and created for separate national languages and cultures in each country largely through the main city, usually capital city, where national TV networks are located. Thus despite the single market policy, European cities tend to have a wider representation of advanced producer services in the global space-economy, specifically in comparison with the USA and China, where services can be concentrated in more cohesive large single national markets.

Before leaving this Europe section it is worth making a final comparison with the other two main globalization arenas, USA and Pacific Asia. In the regional frameworks shown in Table 3 Europe does not feature strongly. In fact there is an operational city-triad process to be found in the other two regions that appears to have no equivalent in Europe. The idea of USAL was discussed in relation to Table 3, here we can specify it as a city-triad where New York is the financial centre, Washington the political centre, and London the autonomous off-shore platform beyond US jurisdiction allowing for corporate maneuvering in the global space-economy. In China, Shanghai is the financial centre, Beijing the political centre and Hong Kong the the autonomous off-shore platform under the one country, two systems policy that China adopted after the incorporation of Hong Kong in 1997. The USAL city-triad has been extremely successful at the heart of economic globalization and the China city-triad has also been successful in developing an alternative emerging new centre of economic globalization. Where does this leave Europe? In between - up the creek with no paddle? Certainly there appears to be no evidence for a coherent European city-triad in the same format such as Frankfurt as financial centre, Brussels as political centre, and Zurich as autonomous off-shore platform, which in any case would miss out Europe's two leading global cities, London and Paris.

Concluding comments

Given that numerous results have been laid out clearly and discussed in the main body of this Report I will not go over this ground again as a repetitive summary. Rather I focus on two matters. First, because the global analyses have focused upon the world city network model based upon advanced producer servicing I have neglected consideration of the global infrastructure networks that have

grown concurrently to facilitate global servicing of corporations. I briefly describe leading cities as nodes within Internet, airline, and trade fair networks and compare them to the global network connectivity results. Second, I use these comparisons of different networks to draw broad conclusions on the nature of the contemporary world city network.

Global infrastructure networks

It has been argued that the rise of corporate globalization is related to the merger of the computer and communication industries in the 1970s that made possible organization of business transnationally at a global scale. Today this communication revolution is represented by familiar Internet networks that constitute the key infrastructure for the everyday work of global servicing through cities. But it was also argued that these inter-city relations were necessary but not sufficient for advanced producer service firms; face-to-face contact remains vitally important and grew globally with the servicing. This is reflected in massive expansion in airline networks; every global/world city has its renowned airport(s). The top twenty cities in each of these networks are displayed in Table 11. In addition the top twenty trade fair cities are also listed; this is a network process that precedes corporate globalization but remains important and provides a complete contrast to all results presented hitherto. In each of the three lists measurements are given as percentages of the highest ranked city to facilitate comparison with the top twenty cities in terms of global network connectivity shown in Table 1.

The Internet cities in Table 11 are measured by interconnection points for 23 major content and backbone networks (Malecki 2012, 123). This shows a domination by western European and US cities indicating the largely trans-Atlantic nature of the Internet in 2009. Clearly this infrastructure network has extended less across the world than the servicing networks: compared to sixteen western Europe/USA cities in Table 11, there were only 12 from this core in world city network for 2000, reduced to just eight in 2013 in Table 1. In addition the city rankings differ from the service networks; although London is at the top it is followed by two European cities, Amsterdam and Frankfurt (Paris is ranked much lower) and then followed by eight US cities before Hong Kong, including San Francisco and Miami above New York. The reasons for these differences are straightforward: they represent outcomes of different network making processes and reflect different histories of supply and demand. The latter in the form of intensive use of the Internet by banks seems to have produced a bias towards major financial centres.

With the airline network cities there is yet another pattern of leading cities. In this case the measure used is the number of direct flights a city has within a roster of fifty leading cities in the world (Grubestic and Matisziw 2012, 106-7). This listing in Table 11 shows a western Europe bias led by four cities, this time with Paris at the top. The process of network formation in this case is specifically influenced by the nature of the supply with national airlines using their country's main city, usually the capital, as their network hubs. Thus only three US cities

feature compared to nine western European cities. This process also features a wider spread of cities across the world than the Internet network.

The third network listed as trade fair cities in Table 11 is quite different. It is measured by the capacity of the node rather than actual connections – the amount of indoor exhibition space (Bathelt 2012, 180). This represents a very different process of making networks of ‘temporary clusters’ of rich knowledge milieu that have a very different provenance than other networks. Long predating corporate globalization, nevertheless these cities provide a specialist function in the contemporary world economy for numerous sector needs. And this distinctive process is reflected in a very different listing of cities in Table 11 in which London, New York and Hong Kong are missing. Again dominated by western European cities (fifteen in all), there are several medium cities that appear in the Report for the only time, not least Hanover ranked first, and Las Vegas and Guangzhou as top ranked North American and Asian cities respectively. The purpose of including this network is to show a contrasting pattern of cities that indicate the complexity of cities and their interrelations in globalization. The world city network as presented in Part A may be a crucial network for corporate globalization as argued in Part B but it is still only a small part of the ‘blizzard’ of inter-city connections that constitute today’s world economy.

Overall Table 11 suggests that European cities are doing particularly well in these infrastructure networks. This is counter to the message received from the world city network analyses derived from advanced producer service providers. Unraveling this geographical contrast provides the final concluding remarks.

Resilience and change in the world city network

The difference between the world city network results and those of the infrastructure networks is much more than the alternative lists of cities that are revealed. Networks can be arrayed on a scale from simple to complex in terms of their formation. The infrastructure network formations are relatively simple in the sense that investments are made by a small coterie of decision makers that can result in important changes to the network. A city government can decide to build a huge arena to attract trade fairs and thereby alter the current network; a national airline might go bankrupt and the global airline network is modified; and infrastructure development is notoriously dynamic and volatile. All this contrasts with the world city network whose ongoing formation is a ‘mega-process’ of myriad everyday work practices in multiple firms. Particular decisions such as moving a headquarters will generate some change but its importance to the firm will be largely lost in the complexity of the overall network. This was the lesson learned and reported in the Prologue: the simple decision to locate the European Central Bank in Frankfurt was undoubtedly important for the development of the ‘eurozone’, but this had much less salience for the world city network and London’s position therein.

What this means is that the world city network is likely to be resilient and this is precisely what was found at the beginning of the analysis: Table 1 shows

surprisingly few changes despite the economic upheavals of the world economy from 2000 to 2013. But in order to make such statement requires both a strong empirical basis and theoretical understanding of the mega-process. Thus drawing on large data sets whose collection is customized to a relevant urban growth theory has resulted in a Report rich in statistical findings to provide a plethora of evidence-based results. This has meant that the resilience of the system is shown but without obscuring the real changes that are occurring: the rise of cities beyond the traditional core of the world economy. Furthermore, both the resilience and change are not merely broad features of the world city network, both encompass subtleties within the network formation that is picked up through individual cities arrayed in the result tables.

So the roles of cities in corporate globalization are variegated and multiple but their overall importance cannot be denied. In the bi-layered global space-economy the importance of cities has been enhanced as transnational economic processes have been enabled and proliferated. But political power is still concentrated in a mosaic geography of states. This mismatch is the challenge for global governance fit for purpose in the twenty first century.

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Appendix

All connectivity measures are based on a model that calculates the strength of inter-city connections based on the co-presences of advanced producer service firms in cities. The data input consists of a service values matrix, V , which arrays cities against firms. Service values indicate the importance of a city in a firm's office network and are collated in a range from 0 (no presence) to 5 (headquarter location). Data are collected for financial services, accountancy, advertising, law, and management consultancy.

The interlocking network model is the means employed to compute network connectivities. From input matrix V , the global network connectivity GNC_a of any city a , is an aggregation of all its city-dyad connectivities CDC_{a-b} with all other cities b , and can be defined as follows:

$$GNC_a = \sum_b CDC_{a-b} = \sum_{bi} V_{aj} \cdot V_{bi} \quad a \neq b \quad (1)$$

The conjecture behind conceiving the product of service values as a surrogate for actual flows of inter-firm information and knowledge between cities is that the more important the office, the more connections there will be with other offices in a firm's network. The limiting case is a city that shares no firms with any other city so that all of its service value products in equation (1) are 0 and it has no connectivity. To make GNC measures manageable in our use (i.e. independent from the number of firms/cities), we express connectivities as proportions of the largest computed connectivity in the data, thus creating a scale from 0% to 100%.

The model was originally specified in Taylor (2001). Global network connectivity is the basic measure of world city network analyses; for further extensions (change, disaggregation, principal components) reference should be made to sources given on the relevant table.

Table 1 Top 20 cities in the world city network, 2000 and 2013

2000			2013		
Rank	City	GNC	Rank	City	GNC
1	London	100.00	1	London	100.00
2	New York	97.64	2	New York	92.66
3	Hong Kong	70.71	3	Hong Kong	78.31
4	Paris	69.92	4	Paris	71.62
5	Tokyo	69.08	5	Singapore	65.62
6	Singapore	64.54	6	Shanghai	63.66
7	Chicago	61.57	7	Tokyo	63.63
8	Milan	60.36	8	Beijing	62.09
9	Los Angeles	59.94	9	Sydney	62.06
10	Toronto	59.48	10	Dubai	61.33
11	Madrid	59.45	11	Chicago	59.63
12	Amsterdam	59.03	12	Mumbai	58.81
13	Sydney	57.86	13	Milan	58.58
14	Frankfurt	56.71	14	Moscow	57.20
15	Brussels	55.72	15	Sao Paulo	57.19
16	Sao Paulo	54.10	16	Frankfurt	56.88
17	San Francisco	50.75	17	Toronto	55.06
18	Mexico City	48.49	18	Los Angeles	54.90
19	Zurich	48.49	19	Madrid	54.44
20	Taipei	47.73	20	Mexico City	53.20
Cities in the 2013 list			Cities in the 2000 list		
21	Mumbai	47.67	21	Amsterdam	52.68
31	Shanghai	42.78	23	Brussels	51.98
34	Moscow	42.17	28	San Francisco	47.87
36	Beijing	42.00	31	Zurich	47.42
54	Dubai	36.26	41	Taipei	43.14

Source: calculated from GaWC data

Table 2 **Connectivity changes of top 20 cities, 2000-2013**

Rank	City	Change
1	Dubai	4.45
2	Shanghai	2.94
3	Beijing	2.65
4	Moscow	2.44
5	Mumbai	1.57
6	Hong Kong	0.86
7	Mexico City	0.70
8	Paris	0.65
9	Sydney	0.60
10	London	0.52
11	Sao Paulo	0.31
12	Singapore	0.20
13	New York	0.16
14	Frankfurt	-0.14
15	Toronto	-0.21
16	Zurich	-0.22
17	Chicago	-0.32
18	Milan	-0.37
19	Brussels	-0.70
20	San Francisco	-0.73
21	Madrid	-0.84
22	Amsterdam	-0.87
23	Los Angeles	-0.88
24	Tokyo	-0.97
25	Taipei	-1.33

Source: Taylor and Derudder (2015)

Table 3 Regional framework of cities in economic globalization

Globalization process	Regional framework	Leading cities		City distribut	
		Home-region	Global outreach	Home-region cities	G ou c
INTENSIVE REGIONS	USAL Intensive	New York	Brussels/ Frankfurt	16	
	Pacific Asia	Tokyo	Los Angeles	16	
	Americas	Toronto	Singapore	25	
	Europe	Milan/Paris	Shanghai	28	
EXTENSIVE REGIONS	USAL Extensive	New York	Johannesburg	5	
	Australia/ Commonwealth	Sydney	London	5	
	Latin America	Sao Paolo	New York	10	
	Canada/ Commonwealth	Toronto	London	4	
	Scandinavia	Stockholm	Singapore	5	
	China	Shanghai	New York	5	

Source: Taylor et al (2013)

Table 4 Global regional strengths and weaknesses of leading cities, 2010

CITY	GLOBAL HINTERWORLD	
	Strong	Weak
LONDON	<i>USAL intensive, USAL extensive</i> <i>Europe, Australian CW</i> <i>Latin America, Canada CW</i> <i>Scandinavia, China</i>	
NEW YORK	<i>USAL intensive, USAL extensive</i> <i>Latin America, Scandinavia</i> <i>China</i>	
HONG KONG	<i>USAL intensive, Pacific Asia</i> <i>Europe, Australian CW</i> <i>Scandinavia, China</i>	
PARIS	<i>USAL intensive, USAL extensive</i> <i>Europe, Latin America</i> <i>Scandinavia</i>	Canada CW China
SINGAPORE	<i>Pacific Asia, Americas</i> <i>Australian CW, Scandinavia</i>	Canada CW
TOKYO	<i>Pacific Asia, Latin America</i>	Canada CW, Scandinavia China
SHANGHAI	<i>Pacific Asia, Americas</i> <i>Europe, China</i>	Scandinavia
CHICAGO	<i>USAL intensive, USAL extensive</i> <i>Americas</i>	<i>Pacific Asia, Europe,</i> <i>Australia CW, Latin America,</i> <i>Scandinavia, China</i>
DUBAI	<i>USAL extensive, Pacific Asia</i> <i>Europe, Latin America</i>	<i>Scandinavia, China</i>
SYDNEY	<i>USAL Extensive, Americas</i> <i>Australian CW</i>	<i>Europe, Latin America</i> <i>Canada CW, China</i>
MILAN	<i>USAL extensive, Americas</i> <i>Europe, Latin America</i>	Scandinavia
BEIJING	<i>Pacific Asia, Europe</i> <i>China</i>	Latin America
TORONTO	<i>USAL Extensive, Pacific Asia</i> <i>Americas, Canada CW</i> <i>Scandinavia</i>	<i>Europe, Australia CW</i> <i>China</i>
SAO PAULO	<i>Pacific Asia, Americas</i> <i>Europe, Latin America</i>	<i>Australia CW, China</i>
MADRID	<i>USAL Extensive, Americas</i> <i>Europe, Latin America</i>	<i>Australia CW, Canada CW</i> <i>China</i>
MUMBAI	<i>USAL Extensive, Australian CW</i> <i>Canada CW, China</i>	<i>USAL Intensive, Scandinavia</i>
LOS ANGELES	<i>USAL intensive</i> <i>Pacific Asia</i>	<i>Europe, Latin America</i> <i>Scandinavia, China</i>
MOSCOW	<i>USAL extensive, Pacific Asia</i> <i>Europe, Scandinavia</i>	<i>Americas, China</i>
FRANKFURT	<i>USAL intensive, Pacific Asia</i> <i>Europe</i>	<i>Latin America, Canada CW</i> <i>China</i>
MEXICO CITY	<i>USAL extensive, Americas</i> <i>Latin America</i>	<i>Australia CW, Scandinavia</i>

Cities' home regions are shown in italics

Source: derived from the original analyses for Taylor et al (2013)

Table 5 Frequency of leading dyad partners of the top 20 cities, 2010

GNC rank	City	Number of top 40 dyad-partners
1	<i>London</i>	9
2	<i>New York</i>	10
3	<i>Hong Kong</i>	8
4	Paris	6
5	<i>Singapore</i>	8
6	Tokyo	6
7	<i>Shanghai</i>	8
8	Chicago	3
9	Dubai	0
10	Sydney	1
11	Milan	0
12	Beijing	6
13	Toronto	0
14	Sao Paulo	0
15	Madrid	1
16	Mumbai	0
17	Los Angeles	4
18	Moscow	0
19	<i>Frankfurt</i>	8
20	Mexico City	0

8 and above are italicised; 0 is emboldened

Source: Taylor et al (2014a)

Table 6 Leading cities in the two globalizations from a city-dyad analysis

City-dyad membership in extensive globalization			City-dyad membership in intensive globalization		
Rank	City	Frequency	Rank	City	Frequency
1	New York	17	1	London	17
2	London	15	2	New York	16
3=	Hong Kong	8	3	Paris	11
3=	Seoul	8	4	Frankfurt	9
5	Singapore	6	5	Hong Kong	7
6=	Mumbai	5	6=	Tokyo	5
6=	Sydney	5	6=	Washington	5
8=	Buenos Aires	4	8=	Beijing	4
8=	Kuala Lumpur	4	8=	Brussels	4
10=	Taipei	3	8=	Munich	4
10=	Toronto	3	11=	Moscow	3
12=	Athens	2	11=	Shanghai	3
12=	Dublin	2	13=	Chicago	2
12=	Istanbul	2	13=	Madrid	2
12=	Jakarta	2	13=	Milan	2
12=	Johannesburg	2	13=	Singapore	2
12=	Lisbon	2	13=	Düsseldorf	2
12=	Mexico City	2	18=	Amsterdam	1
12=	Paris	2	18=	Los Angeles	1
12=	Tel Aviv	2			
21=	Jeddah	1			
21=	Shanghai	1			
21=	Tokyo	1			
21=	Zurich	1			

Frequencies refer to the number of top 50 dyads a city belongs to. Cities located in both lists are emboldened

Source: Taylor et al (2014b)

Table 7 **Interceding strategic cities, 2010**

City	Absolute strategic-ness	Relative strategic-ness
New York	100	2.53
Chicago	76	2.26
Los Angeles	63	1.36
Frankfurt	56	0.74
Paris	70	0.63
Sydney	62	0.47
Milan	57	0.11
Shanghai	60	0.01
Tokyo	61	0.00
Moscow	52	-0.01
Beijing	56	-0.02
London	93	-0.31
Hong Kong	67	-0.32
Singapore	61	-0.46
Sao Paulo	50	-0.47
Madrid	47	-0.77
Mexico City	43	-0.92
Mumbai	44	-1.18
Dubai	49	-1.24
Toronto	44	-1.50

Source: Taylor et al (2014a)

Table 8 European city orientations, 2008

City	Global network connectivity	Orientations		
		Europe	North America	Pacific Asia
London	100.00	<u>-0.01</u>	0.10	1.86
Paris	78.24	1.17	-0.06	1.41
Milan	68.55	0.80	0.07	0.76
Brussels	62.59	2.20	-0.87	0.32
Frankfurt	50.03	1.75	-0.23	2.46
Barcelona	42.45	2.14	-1.20	-1.24
Geneva	38.36	0.14	-1.14	0.34
Antwerp	23.35	0.11	2.29	-1.39
Rotterdam	23.05	2.03	-0.09	-0.48
Porto	21.33	1.12	1.03	-2.47
Basel	12.96	3.24	3.28	-1.66
Valencia	12.44	2.43	-0.66	-1.87
Aberdeen	12.08	1.66	4.59	-2.04
Utrecht	10.31	8.18	<u>-3.52</u>	-2.13
Arhus	9.71	4.69	-1.91	<u>-3.28</u>

Source: Taylor et al (2011)

Table 9 Global network connectivities of EU capitals, 2013

World rank	Capital city	GNC
1	London	100.00
4	Paris	71.62
19	Madrid	54.44
21	Amsterdam	52.68
23	Brussels	51.98
27	Vienna	48.08
32	Warsaw	47.38
40	Dublin	43.53
43	Stockholm	41.38
44	Prague	40.71
47	Lisbon	39.43
48	Copenhagen	39.39
51	Rome	38.78
56	Athens	37.89
62	Budapest	36.22
63	Berlin	36.15
65	Luxembourg	35.76
68	Bucharest	35.20
81	Helsinki	31.36
92	Bratislava	28.50
101	Sofia	26.98
102	Riga	26.90
114	Nicosia	25.96
124	Zagreb	24.54
149	Vilnius	21.07
150	Tallinn	21.02
160	Ljubljana	19.73

Source: derived from GaWC data

Table 10 Global network connectivities in France, Italy, Germany and UK, 2013

City	GNC	City	GNC	City	GNC	City	GNC
Paris	72	Frankfurt	57	Milan	59	London	100
Lyon	29	Munich	41	Rome	39	Manchester	32
Marseille	21	Hamburg	38	Turin	18	Birmingham	26
Nantes	20	Düsseldorf	38	Florence	15	Edinburgh	25
Strasbourg	17	Berlin	36	Bologna	14	Bristol	23
Lille	16	Stuttgart	31	Genoa	12	Glasgow	22
Toulouse	15	Cologne	23	Naples	12	Leeds	21

Source: derived from GaWC data

Table 11 Top 20 cities in global infrastructure networks

Internet networks (Interconnections of 23 major content and backbone networks)		Airline networks (Direct flights to top 50 cities)		Trade Fairs (Indoor exhibition space)	
London	100	Paris	100	Hanover	100
Amsterdam	95	Frankfurt	96	Milan	93
Frankfurt	90	Amsterdam	92	Paris	87
San Francisco	86	London	89	Las Vegas	74
Miami	71	New York	87	Guangzhou	69
New York	71	Zurich	80	Moscow	65
Washington	71	Rome	76	Frankfurt	65
Chicago	62	Munich	76	Barcelona	64
Los Angeles	57	Milan	74	Cologne	57
Dallas	52	Moscow	72	Düsseldorf	53
Seattle	48	Bangkok	72	Chicago	50
Hong Kong	43	Tokyo	72	Valencia	47
Paris	43	Chicago	70	Birmingham	41
Tokyo	43	Toronto	67	Bologna	40
Milan	38	Madrid	67	Madrid	40
Singapore	38	Vienna	67	Toronto	39
Stockholm	38	Hong Kong	65	Orlando	39
Atlanta	33	Beijing	65	Munich	36
Madrid	33	Seoul	65	Basel	33
Sydney	33	Atlanta	63	Berlin	32
		Dubai	63	Nuremberg	32
		Istanbul	63		

Sources: Bathelt (2012); Grubestic and Matisziw (2012); Malecki (2012)

Figure 1 City attractiveness for business: country attributes versus city attributes

Source: derived from Mastercard project data

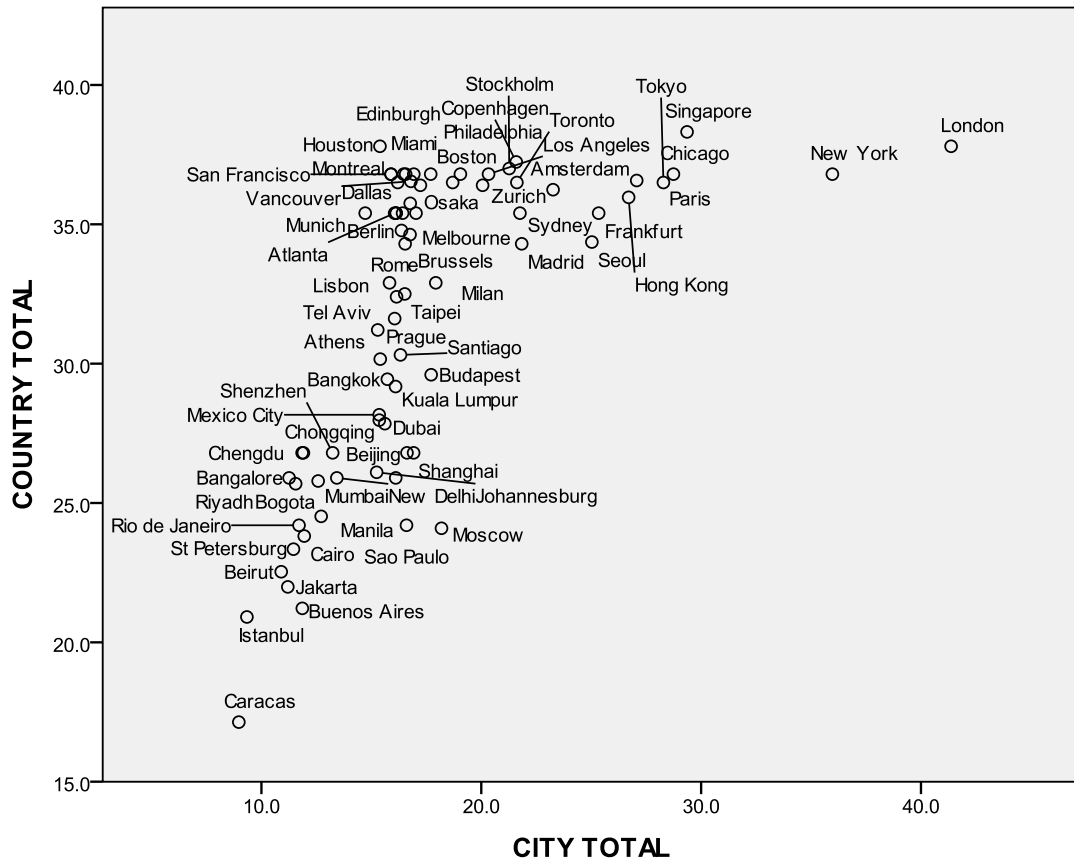
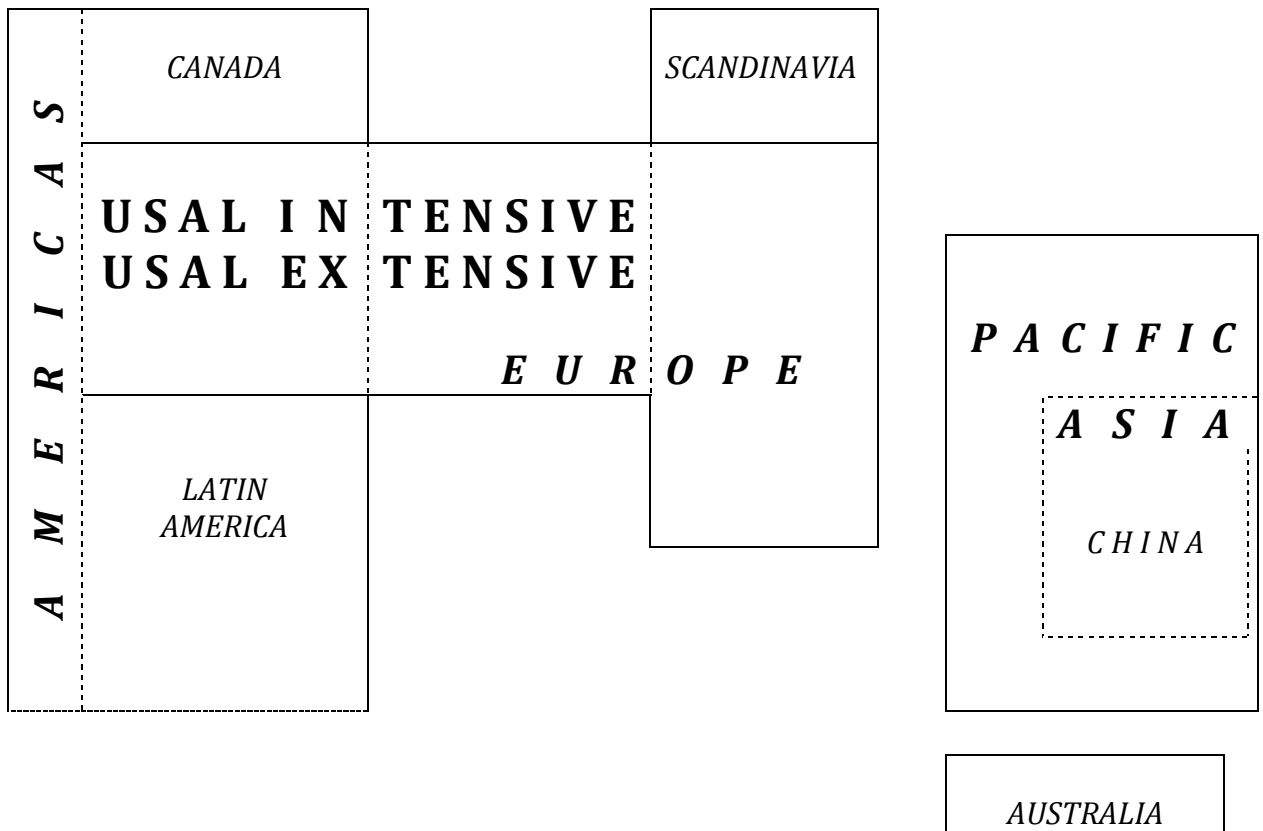


Figure 2 Global regional structure: ten home regions

Source: Taylor et al (2013)



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