BEYOND FRIEDMANN'S WORLD CITY HYPOTHESIS:
TWENTY TWO URBAN ARENAS ACROSS THE WORLD

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with 2 fig. and 5 tab.

CONTENT

Abstract

We go beyond FRIEDMANN's world city hierarchy through an empirical investigation of how financial and business service firms use cities across the world in their provision of services to global capital, and thereby create a world city network. We explore in detail the configuration of this network through an analysis of 234 cities ordered into 22 urban arenas. The latter reflect an intertwining of hierarchical and regional tendencies in the servicing of global capital. Our findings include the presence of a trilateral core, the distinctive profiles of US cities, the high degree of trans-regional 'hybridity' of European cities, and the marginal position of (sub-Saharan) African cities. More specific patterns include the particular distinctiveness of the London-New York dyad, the extra-regional tendencies of Mumbai and Nairobi, and Miami's particular role as a gateway between Anglo- and Latin America.

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Zusammenfassung

Über Friedmanns „World-City"-Hypothese hinaus: Weltweit zweiundzwanzig „städtische Arenen"
    Mit einer empirischen Studie über die Frage, wie finanz- und geschäftsweltorientierte Dienstleistungsfirmen weltweit Städte für die Bereitstellung ihrer Dienste für das globale Kapital nutzen und so ein Städtenetzwerk formen, gehen wir über Friedmanns „world-city-Hierarchie" hinaus. Durch die Analyse von 234 Städten in 22 „Arenen", die die Verflechtung von hierarchischen und regionalen Tendenzen im Dienst des globalen Kapitals reflektieren, untersuchen wir die Gestaltung dieses Netzwerks im Detail. Unsere Ergebnisse zeigen unter anderem das Bestehen eines trilateralen Kerns, die Sonderstellung von US-amerikanischen Städten, den hohen Grad einer transregionalen „Hybridität" europäischer Städte und die Randposition der (subsaharischen) afrikanischen Städte. Speziellere Muster zeigen etwa die Dyade London–New York, die extraregionalen Tendenzen Mumbais und Nairobis und Miamis besondere Rolle als ein Bindeglied zwischen Anglo- und Lateinamerika.

1   World cities under conditions of contemporary globalization

1.1   Introduction: The World City Hypothesis

Friedmann's (1986) paper on what he termed the 'world city of hypothesis' is commonly interpreted as the founding text of the world city literature (Knox & Taylor, 1995). One of the theses put forward in this seminal paper stated that world cities are the 'basing points' of global capital, while the ensuing linkages between world cities make it possible to order them into a 'complex spatial hierarchy' (Friedmann 1986, p. 71). Friedmann's suggestive hierarchy was formed by taking into account a number of characteristics: the importance of the city as a finance centre, corporate headquarters, international institutions, business services, manufacturing, transportation, and population size. From this information, Friedmann identified two levels of hierarchy, which he termed primary (such as London) and secondary (such as Milan). These were then geographically arranged in two ways. First, there is a 'horizontal' division (north – south) defining core and semi-periphery cities showing nine primary cities in the former and only two in the latter (São Paulo and Singapore). Second, there are 'vertical' divisions (east-west) defining three core continental sub-systems, i.e. Pacific Asia, North America, and Western Europe. The resulting schematic map entitled 'The hierarchy of world cities' has probably been the most potent pedagogic instrument in teaching and researching world cities. Moreover, eminently plausible, this hierarchical structure remains a common basis for envisaging how world cities relate to each other at the global scale. Although world city studies have advanced immensely since the 1980s, there is thus one area where Friedmann's original ideas still hold sway: his global configuration of a world city hierarchy (see, for instance Dicken 1998, Allen 1999).

1.2 Three limitations to cope with

Although FRIEDMANN's initial contribution is still widely quoted for its pedagogic and heuristic value, there are three important limitations associated with the largely indicative character of his spatial configuration. First, it was immediately recognized that FRIEDMANN's hierarchy lacked an evidential basis (KORFF 1987). This dearth of suitable data has resulted in a situation where FRIEDMANN's spatial configuration has been generally accepted rather than empirically investigated. This problem has been widely reported (SHORT et al. 1996, TAYLOR 1997, 1999), and the on-going data deficiency problem can be traced back to the fact that nearly all easily accessible data is inter-state rather than trans-state in nature. Quite simply, public statistics are produced by states so that states are naturally the subjects of observation. In the present paper, we will address this problem through an assessment that is based on a unique trans-national dataset (TAYLOR et al. 2002a).

A second limitation with the spatial outline suggested by FRIEDMANN is that its apparent complexity has induced a focus on the higher levels of the hierarchy, a problem that is of course related to the dearth of suitable data. Thus FRIEDMANN suggested 18 core and 12 semi-peripheral world cities, but he has been reluctant to bring less important cities into his hierarchy (FRIEDMANN 1995). In this paper, we will tackle this problem by presenting an assessment of intertwining hierarchical, regional and functional tendencies in a total of 234 cities. Following TAYLOR et al. (2002b and c), but dealing with over one hundred extra cities, this very detailed taxonomy results in a uniquely thorough coverage of all regions across the world. For instance, we include 12 African cities outside South Africa and the Arab north. This very large number of cities stems from the observation that it is misleading to identify a small subset of 'world/global cities' as the cities in which global processes are concentrated. Although globalization is indeed a very uneven process, it is evident that every city operates as an integral part of the global system as a producer and marketplace for global goods and services, and as a hub in the flow of people, remittances, finance and ideas. A lower amount of global capital served does not imply a lack of global connections, and we will therefore conceive world cities as 'globalizing cities' rather than as a distinct class of cities (see, for instance, MARCUSE & VAN KEMPEN 2000).

A third limitation with the body of research that draws upon FRIEDMANN's initial ideas is that world cities are generally conceived as constituting a hierarchy. This assumption relates to the way cities were conceived as forming hierarchies in the study of 'national urban systems', the paradigm that dominated inter-city research before the world city literature. However, even in the former literature it was shown empirically by PRED (1977) that, in terms of economic organization, cities within countries did not automatically fit a simple hierarchical pattern. If not within countries, then it would seem highly implausible that trans-national patterns should be simply hierarchical (TAYLOR 1997). Basically, the common practise of ranking world cities (e.g. SASSEN 2000) in terms of 'importance', whatever the measure, does not of itself provide evidence that the world cities form a hierarchy. Ranking is merely ordering by size, while defining a hierarchy requires more than just counting attribute measures – it needs to show a 'line of command' (LUKERMANN 1966, p. 18). With contemporary use of

instantaneous worldwide communication, there is the potential for both concentration and dispersal of economic functions and therefore a global urban hierarchy cannot be just assumed. We take the view that an urban hierarchy has to be empirically shown rather than appear as a presumption in world city studies.

To summarize, the purpose of this paper is to investigate the spatial configuration of cities across the world with a view to producing a comprehensive and detailed taxonomy of the contemporary global patterning of world cities. Our starting point is to accept that there are indeed worldwide inter-city relations under conditions of contemporary globalization that we need to empirically describe, but we will assume they take the form of a network. From this basic position we can search for 'hierarchical tendencies' within the data. But the key point is that these are not the only tendencies that may occur. Continuing in the spirit of FRIEDMANN's (1986) initial contribution to use hypotheses as a framework to direct our thinking, we shall preface our empirical investigation of world cities by outlining five initial hypotheses.

1.3   Five hypotheses to begin with

We use hypotheses to elaborate initial ideas from other recent analyses (TAYLOR et al. 2002b and c) and to illustrate the direction that the subsequent analyses take. Not for strict testing in the statistical sense, like FRIEDMANN (1986) we use the hypotheses to focus ideas and act as an organizing aid for subsequent interpretation of findings.

Hypothesis 1 – Although we assume world cities do not form a hierarchy but constitute a complex network, there will be hierarchical tendencies in this global urban network. SASSEN (1991, 2000), for instance, has suggested a triad of dominant cities (New York, London and Tokyo), while FRIEDMANN (1986) has put forward that the strongest connections are likely to be found among core cities (e.g. London and Milan) and a limited number of semi-peripheral cities that articulate extensive national/regional economies (e.g. Singapore and São Paulo).

Hypothesis 2 – Cities with similar patterns of service provision to global capital form regional clusters. In other words, spatially proximate cities are likely to be similar in the ways they service global capital, thus articulating national/regional specialisations in this global urban network. This hypothesis thus suggests that globalization is by no means some sort of homogenizing power, but asserts that the global space retains an important regional order.

Hypothesis 3 – Hierarchical and regional tendencies tend to interact: globalization has a very uneven nature, resulting in a limited number of core globalization regions. FRIEDMANN (1986), for instance, suggested that the hierarchical tendencies in the world city network were regionally expressed in a trilateral organisation around Pacific Asia, North America and Western Europe. Furthermore, these primary zones may be conceived vis-à-vis less connected regions, thus possibly creating pan-regions, as suggested in TAYLOR (2000, Fig. 1).

Hypothesis 4 – Hierarchical and regional tendencies interact in a second way: cities that are less thoroughly connected in the world city network will assume regional roles, while the upper rungs of the network will have global specificities that prevent
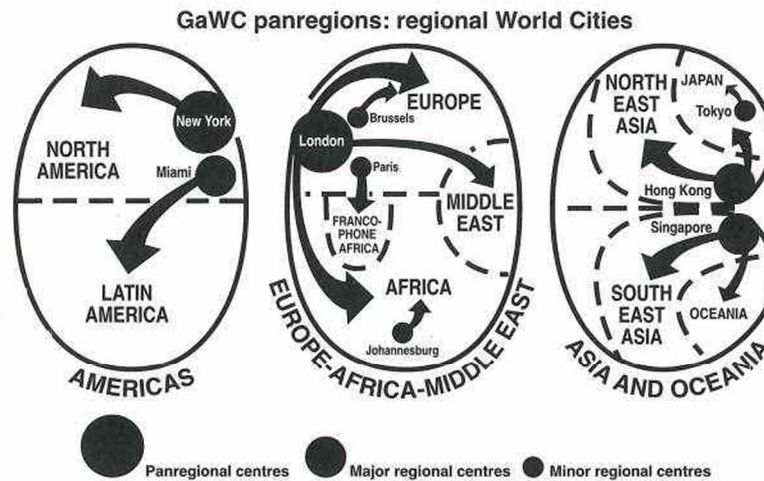
GaWC panregions: regional World Cities

Fig. 1: Suggested pan-regions in the world city network (TAYLOR 2000)

them being very similar to nearby cities. For instance, in a previous analysis, which focused on the spatial order of European cities under conditions of contemporary globalization (TAYLOR & HOYLER 2000), it has been shown that British cities are very similar in the way they respond to globalization, but with the exception of London, which had a totally different profile as one of the most connected cities in the world city network. London appears 'un-British' (and, indeed 'un-European').

Hypothesis 5 – A third way that hierarchical and regional tendencies interact is through identification of particular cities as 'gateways'. This may produce very distinctive 'hybrid' capital servicing functions. The classic case is Miami. BROWN et al. (2002), for instance, have suggested that Miami performs a very specific role in the world city network: while it is not a major world city overall, it performs nonetheless a crucial role as Central America's gateway connection to the global economy. Note that our analysis can assert this global role, in contrast with NIJMAN's (1996) assessment of Miami's position in a so-called national urban system.

With these hypotheses as our guides, we can now describe our methodology.

2 World cities as global service centers: theory, specification and data

In a previous paper, we have tried to tackle the narrow conceptualisations of world cities by outlining the creation of a global ordering of 234 cities into 22 urban arenas (DERUDDER et al. 2003). We will summarize the main ideas here, as they are crucial to understand how the five hypotheses posited above fare under empirical investigation.

2.1 Specifying the world city network through advanced producer firms

The rationale for specifying a world city network through a focus on financial and business firms' use of cities in their provision of services to global capital can be traced back to SASSEN's (1991, 1995, 2000) work on place and production in a global economy. World cities are hereby conceived as the production sites for the leading service industries of our time, while these services themselves are usually understood in terms of their specialized outputs rather than the production process involved. Service industries firms provide knowledge-based (expert/profession/creative) services to other corporations to facilitate their business activities. Such corporate service firms have benefited immensely from the technological advances in computing and communications that have allowed them to broaden the geographical distribution of their service provision. For instance, law firms have been traditionally associated with a particular city and its local client base – a 'New York law firm', a 'Boston law firm' and so on – but under conditions of contemporary globalization a few firms have chosen to pursue a strategy of providing legal services across the world (TAYLOR et al., 2002a). SASSEN (1995, p. 63) thus contends that '(...) a focus on the production process in service industries allows us (...) to examine the proposition that there is a producer services complex which, while catering to corporations, has distinct locational and production characteristics. It is this producer services complex more so than headquarters of firms generally that benefits and often needs a city location.' It has been argued elsewhere that new technologies, heavily used by advanced producer services firms, may neutralize distance as an impediment in locational decision making (e.g. O'BRIEN 1992), but the reality of the locational strategies of these service industries seems to imply a new form of concentration in the face of economic globalization (SWYNGEDOUW 1997). The fact that these firms explicitly offer their global networks to possible clients, underpins that locational decisions are of the utmost importance to students of world cities. In other words, analyses of the concentration of these services in specific places may serve as the basis for specifications of the outline of the world city network

2.2 Theoretical specification and empirical model

Drawing on SASSEN's work on the role of advanced producer services in world city formation, a theoretically grounded endeavour of data acquisition has been undertaken by the Globalization and World cities Group and Network (GaWC, *http://www.lboro.ac.uk/gawc*). In GaWC research, the world city network is formally specified as an inter-locking network (TAYLOR 2001). An inter-locking network has three levels: a network level, in this case cities connected in a world economy, a nodal level, the cities, and a sub-nodal level, which are the firms providing the advanced producer services. It is at the latter level that world city network formation takes place. Through their attempts to provide a seamless service to their clients across the world, financial and business service firms have created global networks of offices in cities around the world. Each office network represents a firm's global strategy for

dispensing its services, it is an outcome of location decision making at the scale of the world-economy. The world city network is therefore defined as the aggregate of the many service firms pursuing a global location strategy. The 'office towers' within world cities are the nodes between which there are flows of information, knowledge, ideas, personnel and instructions that connect the cities.

This theoretical specification can be translated in an empirical model, formally represented by a matrix V_{ij} defined by n cities x m firms, where v_{ij} is the 'service value' of city i to firm j. This 'service value' is the importance of a city to a firm's office network, which depends upon the size and functions of an office or offices in a city. Thus every column denotes a firm's global strategy and every row describes each city's mix of services. The ensuing data requirements for measuring this network are thus quite straightforward: a matrix of n firms with information about their offices across m cities, where the information in each cell has to describe the importance of city y to firm x's global service provision (TAYLOR et al 2002a). In the event 100 firms were identified in six sectors: 18 in accountancy, 15 in advertising, 23 in banking/finance, 11 in insurance, 16 in law, and 17 in management consultancy. Selecting cities was much more arbitrary and was based upon previous GaWC experience in researching global office networks. Capital cities of all but the smallest states were included plus many other important cities in larger states. A total of 316 cities were selected, and the 234 most connected cities are used as the input for our analysis. Data collection focused on the size of offices (e.g. number of practitioners) and their extra-locational functions (e.g. regional headquarters). The exact nature of the information collected for each firm differed to that for every other firm, hence a standardization to provide 'service values' ranging from 0 to 5 as follows. The city housing a firm's headquarters was scored 5, a city with no office of that firm was scored 0. An 'ordinary' or 'typical' office of the firm resulted in a city scoring 2. With something missing (e.g. no partners in a law office), the score reduced to one. Particularly large offices were scored 3 and those with important extra-territorial functions (e.g. regional offices) scored 4. The end-result was a 234 x 100 matrix Vij where vij ranges from 0 to 5. It is these 23,400 pieces of information that constitute the data analysed below.

3 Framework for analysing V_{ij}

3.1 Connectivity

Based on the input matrix V_{ij}, elementary network analyses can be conducted of the world city network. Assuming there is no actual information on inter-office flows for firms across cities, the most basic indicator is the relational element $r_{ab,j}$ for each pair of cities a, b in terms of a firm j, which is derived from the initial matrix V_{ij} as follows:

$$r_{ab,j} = v_{aj} \cdot v_{bj}$$

The conjecture behind conceiving this elemental interlock link 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. This approach is reasonable when the following assumptions are made. First, offices generate more flows within a firm's network than to other firms in their sector. This has not yet been empirically tested but is inherently plausible. For instance, drawing up an inter-jurisdictional contract by a law firm will involve flows of information and knowledge between offices of that firm to achieve the ideal seamless service. Second, the more important the office, the more flows are generated and these have a multiplicative effect on inter-city relations. The first part of this assumption is obviously very plausible again. The second part reflects the hierarchical nature of office networks where larger offices have special functions like control and provision of specialised knowledge. Without evidence of actual flows there is no easy means of estimating this effect, a multiplicative process is a reasonably simple way to reflect the importance of major offices in the world city network.

Each city a has such an interlock link with every other city i for every firm j, and aggregating all the inter-lock links of this city produces the global network connectivity of a city:

$$GNCa = \sum_i \sum_j r_{ai,j} \quad (a \neq i)$$

The limiting case is a city that shares no firms with any other city, so that all of its elemental links are 0 and it has zero connectivity. These overall GNC measures are used in section 3 to order cities hierarchically, whereby GNC measures will be expressed as proportions of the largest computed connectivity in the data, thus creating a scale from 0 to 1. Although it can readily be seen that the required data input for this specification follows SASSEN's rather narrow conceptualisation of world cities as global service centers, it has a distinct advantage when compared to the attributional approaches taken in previous assessments. That is, this approach entails a relational specification: a city that harbours a large amount of advanced producer service firms that have a limited global reach will not be deemed as an important world city in this approach.

3.2 Exploratory fuzzy set analysis

Apart from the overall connectivity measures, a wide range of multivariate data analysis techniques can be used to explore the patterns present in V_{ij}, but in the event we have chosen to apply a fuzzy cluster analysis. The choice for this fuzzy set approach can be traced back to the hypotheses we posited in the introduction to this paper: different cities fulfil different functions within the world-system and will differ in both the nature and the degree of world city-ness (KNOX 2002), and any classification scheme used to unravel the patterns in our world city database should take into account that patterns will never be clear-cut. Classifications where the results are presented as disjoint

gatherings of the dataset are hence unlikely to provide much insight, since they cannot cater for these various sources of complexity. A fuzzy classification scheme computes grades of membership in different clusters rather than providing information on mere membership, and can thus reflect the expected complexity of multiple and intertwined patterns (for a more detailed elaboration see DERUDDER & WITLOX 2002).

Different numbers of clusters can yield different salient results, and hence there is no firm theoretical basis for selecting the number of clusters from the classification analyses. Here, we will focus on the results for C=22. This is a pragmatic choice after assessing several solutions of different classes. With 22 clusters we find a broad diversity in hierarchical and regional patterns in the world city network, which provides a particularly insightful interpretation.

3.3 Towards a systematic presentation of the results

It is clear that the complexity of the network and the thoroughness of our world coverage requires systematic presentation of the results. We will do this by guiding the reader through this multifarious urban geography by (i) presenting a designation scheme for cities' affiliations in the different clusters, and by (ii) addressing the hypotheses posited in the introduction of this paper.

For each cluster/arena we have searched for four sets of cities, based on their affiliations in different clusters:

- The cluster nucleus is made up of those cities with affiliations above 0.7. Cities in the cluster nucleus are unambiguously assigned to this cluster.
- Singular members are cities with affiliations between 0.3 and 0.7 and with no membership higher than 0.3 in another cluster. Singular members cities are unambiguously assigned to the cluster, albeit that their profile differs somewhat from the 'typical' profiles of the cities in the cluster nucleus.
- Hybrid members are cities with a membership degree of over 0.3 in more than one cluster, and are therefore not unambiguously assigned to the profiles set out in the cluster nucleus. Rather, they have an in-between profile that bears similarities with both clusters.
- Near isolates are cities that have no affiliation as high as 0.3 in any cluster. Near isolates have thus very distinct profiles, here we assign them to the cluster in which they have the highest affiliation.

3.4 A polar diagram of the world city network

Based on the framework of analysis set out in the previous paragraphs, we have summarized this new complex global urban geography in Table 1 and Figure 2. The table highlights the hierarchical tendency in the results with arenas listed in terms of average global network connectivity for cluster members. These cluster connectivities are in turn used to denote five bands of arenas to represent the hierarchical tendency around Cluster A, which is by far the most important arena in terms of connectivity.
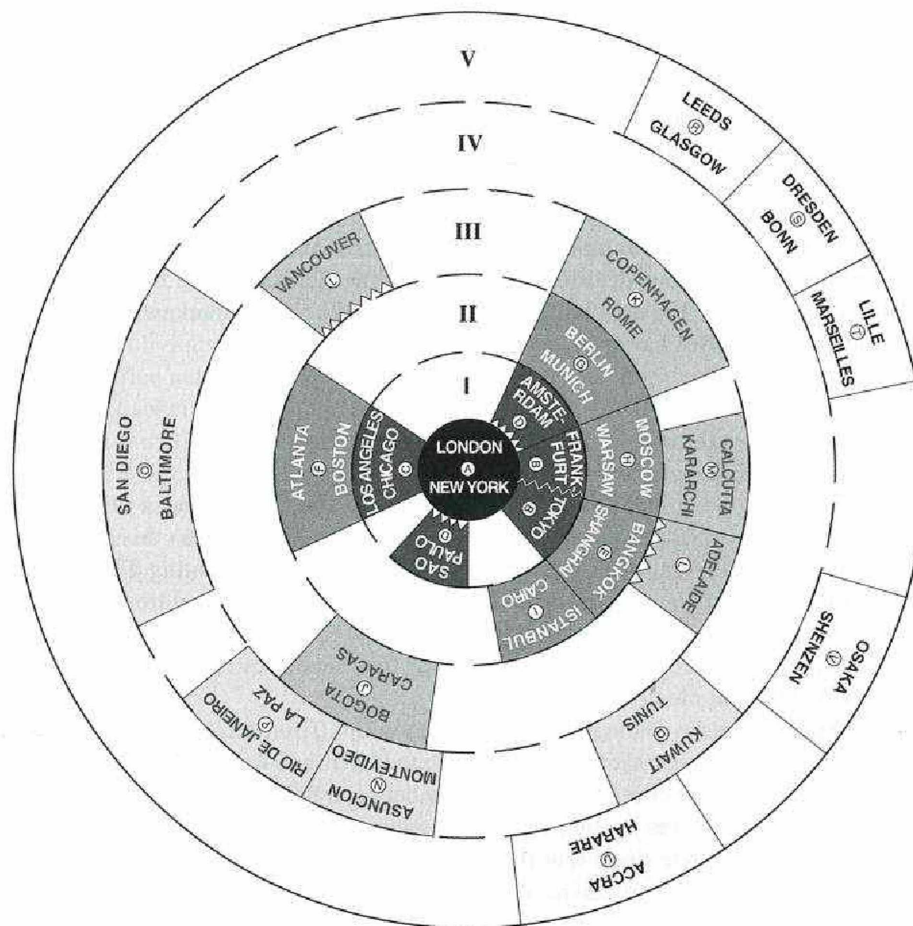
Fig. 2: Urban Arenas of the World City Network (DERUDDER et al. 2002)

The latter is called the 'center' of the bands for reasons that will become clear when we look at Figure 2. The largest gap in connectivity is between Cluster A and Band I but all the bands are identified using gaps in the levels of connectivity. To get a feel for the structure and geography of the fuzzy classification, Table 1 shows also the size of each cluster, including overlapping cities, and also the most typical city in each cluster.

The regional tendency in the results is added to the hierarchical tendency in Figure 2: arenas are depicted in their respective bands around the centre and in addition they are located in roughly their geographical position. The latter are articulated about a trans-Atlantic centre of London and New York. Two member cities are shown for all arenas to aid in initial reading of the cartogram. In addition to the center arena, there are only three other arenas that have strong trans-regional membership, two in Band I, and one, perhaps surprisingly, in Band IV. This means that 18 of the arenas

Cluster/ Arena	Average Connectivity	Band	No. of Members*	Typical City**
A	0.988	Centre	2(0)	London
B	0.613	I	7(2)	Frankfurt
C	0.574	I	3(0)	Chicago
D	0.539	I	11(2)	Amsterdam
E	0.438	II	8(0)	Bangkok
F	0.401	II	5(1)	Atlanta
G	0.384	II	4(0)	Berlin
H	0.379	II	6(0)	Warsaw
I	0.371	II	9(5)	Istanbul
J	0.297	III	7(4)	Caracas
K	0.297	III	12(8)	Copenhagen
L	0.231	III	23(6)	Adelaide
M	0.225	III	12(2)	Calcutta
N	0.201	IV	9(4)	Montevideo
O	0.193	IV	23(0)	Baltimore
P	0.180	IV	16(10)	La Paz
Q	0.179	IV	19(12)	Kuwait
R	0.158	V	14(5)	Leeds
S	0.157	V	8(0)	Dresden
T	0.148	V	13(3)	Lille
U	0.141	V	22(8)	Accra
V	0.121	V	13(3)	Osaka

* membership is defined as affiliation of 0.3 and above, figures in brackets refer to hybrid cities with membership of other clusters.
** member with the highest affiliation

Table 1: Bands of Arenas in the World City Network

have relatively clear-cut regional identities thus showing the strength of the regional tendency in these results. Starting from the general assessment in Figure 2 and Table 1, we can now tackle the spatial dimensions of the world city network in more detail by addressing our five initial hypotheses.

4 Twenty-two urban arenas of the world

4.1 Hypothesis 1 – hierarchical tendencies.

A first glance at the 22 clusters in the fuzzy classification of 234 cities reveals there is indeed a hierarchical tendency in the results with arenas listed in terms of average global network. Table 1 lists the urban arenas in terms of average global network connectivity for cluster members, which are in turn used to denote five bands of arenas to represent the hierarchical tendency around Cluster A, which is by far the most important arena in terms of connectivity. The latter is called the 'center' of the bands for reasons that will become clear when we look at Figure 2. The largest gap in connectivity is between Cluster A and Band I but all the bands are identified using gaps in the levels of connectivity. To get a feel for the structure and geography of the fuzzy classification, Table 1 shows also the size (including overlapping cities) and the most typical city (highest membership degree) in each cluster.

The Center and Band I arenas define the 21 most important cities within this analysis of the world city network. They also suggest specific relations amongst these leading world cities. It is clear that New York and London dominate this network, since no other city – not even Tokyo as suggested by SASSEN (1991) – comes close to them in terms of connectivity. The three Band I arenas immediately beyond the center are also relatively small and simple. This is especially the case with Arena C which includes just the three US cities that rank below New York. It is a distinctive arena with no hybrids. The other two Band I arenas are cross-regional and link western European cities with cities in other parts of the world. Arena B links Paris and Frankfurt with the leading Pacific Asian cities. Arena D links other leading European cities with leading world cities outside the other two main globalization arenas (USA and Pacific Asia) in European-settler regions, notably Latin America. These two arenas share Brussels and Barcelona as members. The distinction between the two arenas is the particular dominance of banking/finance services in the arena including Pacific Asia.

The world regions that do not figure in the center and Band I are the Middle East, Africa, and Asia minus the Pacific. Cities from these world regions can be found in lower bands, especially the sub-Saharan African cities, which are located in the outermost reaches of the world city network (except for Nairobi).

4.2 Hypothesis 2 – regional tendencies

The regional tendency in the results is added to the hierarchical tendency in Figure 2 through locating the arenas in roughly their geographical position. The arenas are articulated about a trans-Atlantic center of London and New York, and two member cities are shown for all arenas to aid in initial reading of the cartogram. In addition to the center arena, there are only four other arenas that have strong trans-regional membership (Table 2). This means that 17 of the arenas have relatively clear-cut regional identities thus showing the strength of the regional tendency in these results.

Band	Center	Band I		Band III	Band V
Arena	A	B	D	L	U
Cluster nucleus	London New York	Frankfurt Hong Kong Paris Singapore Tokyo	Amsterdam Zurich Madrid Milan Sao Paulo Mexico City	Adelaide Brisbane Perth Vancouver Montreal	Accra Dar-es-Salaam Gaberone Kampala Lusaka Lagos Harare
Singular members			Sydney Buenos Aires Toronto	Auckland Hamilton (BD) Cape Town Winnipeg Calgary Ottawa Christchurch Edmonton Johannesburg Melbourne Hobart	Doula Abijan Dakar Doha Windhoek Maputo
Hybrid members		Brussels > D Barcelona > D	Brussels > B Barcelona > B	Canberra > P Monterrey > P Guadalajara > P Birmingham > R Manchester > R Southampton > R	Kingston > P Managua > P Port of Spain> P Tegucigalpa > P Colombo >M Santo Domingo >N San Salvador > N

Table 2: Urban arenas with important trans-regional affiliations

This regional feature means that our results show more than clusters in an abstract 'service space', they represent urban arenas in a geographical space that is the world city network. This is an important interpretation because it indicates that cities are not creating and reacting to a simple process of globalization leading to an overarching world city hierarchy. There is a multifaceted geography of arenas through which cities operate as service centers for global capital. Hence, as well as the commonplace notion that individual world cities represent critical local-global nexuses, there are also urban arenas that represent regional-global nexuses within contemporary globalization.

Table 2 lists the urban arenas that have a cross-regional geography, and the fact that three out of five of these non-regional clusters are amongst the most-connected urban arenas already suggests that these cities have global specificities that prevent them from being very similar to nearby cities, while less-connected cities will assume regional/national roles (see hypothesis 4 for a thorough elaboration on the regional clusters). Apart from the dyad New York-London and the two earlier identified non-regional urban arenas of Band I, there is a cross-regional urban arena in Band III (Arena L) and one in Band V (Arena U).

Arena L is a cross-regional cluster that covers the old British Commonwealth. This 'cultural' historical throwback arena replicates previous findings (TAYLOR et al. 2002b), and is in fact the only urban arena that adds a politico-cultural configuration by providing a slightly different historical twist to the story of the otherwise dominating hierarchical and regional tendencies in the world city network. Membership covers Australian, Canadian, New Zealand and South African cities not found in Band I arenas. Note the dearth of British cities, only three appear as hybrids. They link to a particular British arena in Band V.

Arena U brings together African and Central American cities that are only marginally connected in the world-economy. Closer inspection, however, reveals that this urban arena is in essence more regional than cross-regional, since all non-hybrid members with affiliations above 0.3 are African cities. All Central American cities have hybrid affiliations with urban Arenas N and P, which contain the least-connected South American cities (Band IV). This in-between pattern for Central American cities clearly suggests that Central America is less thoroughly connected to the world-economy than South America.

4.3   Hypothesis 3 – interaction between hierarchical and regional tendencies I: primary globalization arenas and panregions.

The myriad of contemporary processes which have come under the heading globalization are very patchy in their geographical distribution, recently described as being 'uneven in terms of cross-national intensity, geographical scope, and national and local depth' (HOLM & SORENSEN 1995: 1). Hence despite the sense of universality which the term evokes, in practice many globalization processes have been concentrated in a few zones of the world-economy largely by-passing many world regions. Our brief overview of the overall hierarchical tendencies has already revealed that cities from North Africa, the Middle East, Asia minus the Pacific, and especially African cities

are to be found in the outer reaches of the world city network. The absence of these world regions is in sharp contrast with Europe, North America and Pacific Asia, which have urban arenas across virtually all the connectivity bands we identified in Table 1 and Figure 2. We can thus more or less observe a trilateral organisation around these world regions, as FRIEDMANN (1986) originally suggested.

The one world region that is missing from this rather clear-cut core-periphery structure at the level of the world-economy is Latin America, which has in fact a very mixed pattern. A very limited number of Latin American cities (Mexico City, Sao Paulo, and Buenos Aires) do indeed figure among the strongest connected world cities beyond the center, but this does not necessarily mean that Latin America as a whole is strongly connected in the world-economy. It is clear from Table 3 that there is a significant connectivity gap between São Paulo, Mexico City and Buenos Aires and

	Europe	Latin America
Centre	London	
Band I	Frankfurt Paris Barcelona Brussels Amsterdam Zurich Madrid Milan	Buenos Aires São Paulo Mexico City
Band II	Geneva Berlin Dusseldorf Munich Hamburg Budapest Vienna Warsaw Prague	
Band III	Rome Stockholm Helsinki Copenhagen Dublin Lisbon Athens Riga Vilnius Tallinn	Caracas Bogota Medellin Lima Santiago San Jose

Table 3: European and Latin American globalization compared

other Latin American cities. This is in stark contrast with for instance Europe, which has a distribution of cities across all bands. This suggests that the thorough connectivity of these three cities derives from their role as semi-peripheral outlet nodes for surplus in the core of the world-economy. As a result, a limited number of cities may indeed figure at the same level of say Zurich and Brussels, but their significant connectivities are embedded in a totally different regional context, as Table 3 shows.

The second part of the third hypothesis, which asserted the potential existence of pan-regions in the world city network, is not supported by our analysis. Although cities like Miami, whose role will be addressed in hypothesis 5, do perform specific gateway roles between different world regions, there are no suggestions of specific and systematic dominance of one world region by another. The geographical unevenness at the level of the world-system seems therefore to be truly 'global' rather than being based on specific dependencies.

4.4   Hypothesis 4 – interaction between hierarchical and regional tendencies II: regional tendencies beyond the dominant world cities.

The observation that three out of five cross-regional urban arenas can be found at the very top of the world city network shows that below these top echelons important cities tend to be very regional in the focus of their global service provision. The Band II and III arenas are thus regional clusters of important world cities. There are three classic examples in Band II: Arena E is a distinctive cluster that includes all the important Pacific Asian cities not in Band I arenas; Arena G is a distinctive cluster that includes all important German cities not in Band I arenas; and Arena H is a distinctive cluster that includes all the important eastern European world cities. The latter has a near isolate, relatively unimportant city but appropriately located geographically for this arena, Kiev. Not quite distinctive but otherwise similar to the above arenas, Arena F includes the important US cities not in the Center or Band I. Arena I brings together important Asian cities outside the Pacific Rim, but it has the lowest connectivity of all Band II arenas and it has also links to a lower band arena of Asian cities (Arena Q) and to Arena K which is a cluster of important 'outer' European cities. This odd combination combining northern, south-eastern and south-western European cities replicates previous findings based on just European cities (TAYLOR & HOYLER 2000). Arena M is more distinctive than the others and is clearly a south Asian arena with just two hybrids. Comparing this arena to Arena E, which features all the important Pacific Asian cities, clearly unveils that south Asia comes nowhere near the role pacific Asia has come to play in the contemporary world-system (Table 4).

In Bands IV and V we come to cities that are rarely if ever mentioned as world cities. This does not mean, of course, that they are not involved in the same globalization processes as the cities we have dealt with above, but they are less intensively connected to the world city network. Given our conclusion concerning Band II and III arenas, we would expect the arenas in these two lower bands to be even more regional in their memberships. And this is indeed the case: there are three European arenas, two each from Asia and Latin America and one from the USA. The latter, Arena O, is distinctive and large and incorporates all remaining continental US cities if the near

	Pacific Asia	South Asia
Band I	Singapore (B) Tokyo (B) Hong Kong (B)	
Band II	Bangkok (E) Jakarta (E) Kuala Lumpur (E) Manila (E) Seoul (E) Shanghai (E) Beijing (E) Taipei (E)	Mumbai (I)
Band III		Calcutta (M) Karachi (M) Bangalore (M) Islamabad (M) Chennai (M) Dhaka (M) Riyadh (M) Jeddah (M) Lahore (M) New Delhi (M)

Table 4: Comparison between the globalization of Pacific Asia and South Asia

isolates are included. The lack of a US arena in Band III is interesting, especially given the large number of US cities within the data. There appears to be a gap created in the globalization of US cities between the likes of relatively important cities such as Boston and less important cities such as Baltimore. This certainly implies policy incentives for cities in Arena O to try and 'move up' and create a new US arena in a higher band. More generally, the US arenas are typified by their high levels of distinctiveness. New York, as half of the Center, and Miami as an important hybrid city linking to Latin America (see hypothesis 5), are the only continental US cities to share arenas outside their own country. This relates to the sheer scale of the US economy and its long-developed, massive market in financial and business services that provides less of an incentive for firms 'to go global' to the same degree as global service forms from other world regions. This highlighting of the ambiguous role of US cities in contemporary globalization is an important result of this research.

In contrast to this very distinctive US pattern, European clusters in Bands IV and V share a lot of hybrid members. The cluster of less important German cities, Arena S, includes some neighbouring European cities as singular members and near isolates. Both the UK (Arena R) and France (Arena T) have their own urban arenas of less important cities, the former including the Commonwealth arena hybrids, the latter other neighbouring European singular members, hybrids and near isolates.

Albeit still regional in focus, the Latin American and Asian clusters are much less clear-cut as geographical arenas than the US and European arenas. In particular, Arena N and Arena P both include less important Latin American cities from across the region with no obvious geographical division of the region. For instance, central American and Caribbean cities are found in both clusters. The Asian clusters, Arena Q and Arena V, have geographical concentrations in west and east Asia respectively. The former thus includes Middle Eastern cities not previously appearing in a cluster and the latter includes almost all the Pacific Asian cities not included in earlier clusters. Perhaps appropriately they share central Asian cities as hybrid members. Arena Q also shares less important outer European cities with arena K.

4.5   Hypothesis 5 – hybrids and isolates

The last hypothesis allows us to move beyond the conceptualisation of our urban arenas as global-regional nexuses by highlighting the affiliation and function of specific cities. Miami is the exemplary case here, being a hybrid between Arena F in Band II and Arena J in Band III. The former arena contains secondary US cities, the latter is the arena of leading Latin American cities that are not in Band I (Table 5). Although Miami is not a major world city according to BEAVERSTOCK et al. (1999), our analysis is picking up the suggestion that it does perform a very important regional role through its articulation role between the USA and Latin America. As a city it has indeed been designated as unusual before, the 'most foreign city' in the USA (NIJMAN 1997, p. 164), a contingent political (CIA) creation (GROSFOGUEL 1995), a sort of 'extra-mural capital' of Latin America (BROWN et al. 2002), with totally distinctive connections (TAYLOR & WALKER 2001), and our analysis lends further empirical support for these theses.

Nairobi is the only sub-Saharan city that is not a contained in a Band V arena. Its hybrid affiliation in Arena M (South Asian cities) and Arena Q (cities from North Africa and the Middle East) may seem quite odd from the perspective of the strong regional tendency of the arenas, but this position between Band III and Band IV none-

	Arena F	Arena J
Cluster nucleus	Atlanta Boston Dallas	Caracas Bogota
Singular members	Washington	Medellin
Hybrid members	Miami > J	Lima > P Santiago > P San Jose > N Miami > F
Near isolates		Curitaba

Table 5: Miami's profile in the world city network

theless suggests that this is the only sign of an African city that moves beyond being marginally connected to the wider world city network. Likewise, Mumbai is the only South Asian city that escapes the otherwise marginal position of this region through its affiliation of a Band II arena, which also indicates that Mumbai rather than New Delhi is the leading Indian city (see Table 4).

5 Conclusion

Recent conceptualisations of world cities focus on the diminution of state power and the associated 'release' of cities towards a more global destiny, which fits in well with globalization theories that predict the end of the state. We disagree with these suggestions as if cities will or can simply replace states as the key spatial institutional center of modern life today or in the near future. Nonetheless, the dialectical relation between states and cities seems to shift in favour of the latter, which underpins that we may enhance insight into the spatialities of globalization through the depiction of a new and detailed geography of a global urban network.

Although we specify world cities as an interlocking network to which we have applied a global level analysis, our results clearly reveal both hierarchical and regional tendencies within the data. Furthermore, hierarchical tendencies interact with regional patterns in two separate ways. First, a limited number of world-regions are clearly more thoroughly connected than others, suggesting a global core-periphery pattern as purported by WALLERSTEIN (1979). In support of FRIEDMANN's (1986) initial thesis our analysis thus suggests that the emphasis within the global level process of an urban network is confined to three world-economy core regions – northern America, western Europe and Pacific Asia. Within these core regions, US cities seem to be typified by high levels of distinctiveness (except for New York and Miami), while in contrast European cities are both linked into other arenas and continents, and cover all connectivity bands. Second, clusters with low average connectivity tend to be more regionally restricted in their membership, which suggests that our results show more than clusters in an abstract 'service space', they represent urban arenas in geographical space.

In this paper, we have not limited 'globalization forces' to the well-connected nodes in the world city network, but have incorporated a very large number of cities into a single global urban analysis. As a result, we have been able to shed some light on less-connected cities and hence provided an alternative to explore the underside of globalization. The patterns we have found are not 'definitive': contemporary globalization is not an end-product in itself but an on-going bundle of processes. This means that the gaps we have identified between different world-regions may be filled in the coming years as connectivity within the world city network intensifies. On the other hand the gaps may widen as global services become more concentrated in fewer cities. We cannot know which of these future scenarios will come to pass, but we do know that we will not be able to assess such changes unless we have a good empirical understanding of the contemporary world city network.

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