Pathways of change: shifting connectivities in the world city network, 2000-08

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Abstract

This is an empirical paper that measures and interprets changes in intercity relations at the global scale in the period 2000-08. It draws on the network model devised by the Globalization and World Cities (GaWC) research group to measure global connectivities for 132 cities across the world in 2000 and 2008. The measurements for both years are adjusted so that a coherent set of services/cities is used. A range of statistical techniques is used to explore these changes at the city level and the regional scale. The most notable changes are: the general rise of connectivity in the world city network; the loss of global connectivity of US and Sub-Saharan African cities (Los Angeles, San Francisco and Miami in particular); and, the gain in global connectivity of south Asian, Chinese and eastern European cities (Shanghai, Beijing and Moscow in particular).

1. Introduction

This is an empirical paper that measures and interprets changes in intercity relations at the global scale in the period 2000-2008. To this end, we employ the network model of intercity relations detailed in Taylor (2001). This network model has been the fundamental tool for the quantitative researches of the Globalization and World Cities research network (GaWC)[i] and is based on advanced producer service (APS) firms 'interlocking' cities through their worldwide distributions of offices. The rationale for establishing GaWC was that research on globalized urbanization has long been hampered by data deficiencies. More specifically, in our empirical research, we have focused on one particular criticism of this literature in the 1980s and 1990s: a severe empirical deficit as regards intercity relations (e.g. Smith and Timberlake, 1995a,b; Taylor, 1997, 1999; Beaverstock et al., 2000a,b). This evidential crisis has been averted in the last decade through detailed analyses of transnational intercity relations. Two separate and distinctive solutions to this problem have been developed in the literature (Derudder, 2006): (i) analyzing worldwide corporate organization (e.g. Taylor et al., 2002b; Derudder et al., 2003; Alderson and Beckfield, 2004; Wall and van der Knaap, 2010) and (ii) describing the infrastructure that has enabled that organization to go global (e.g., Smith and Timberlake, 2001; Malecki, 2002; Derudder and Witlox, 2008; Devriendt et al., 2008).

A first major application of the GaWC model was the measurement (Taylor et al., 2002a) and subsequent empirical analysis (Taylor et al., 2002b; Derudder et al., 2003) of the world city network (WCN) in the year 2000. In practice, the analyses were based on information on the (importance of the) presence of 100 leading APS firms in 315 cities for the year 2000[ii]. Continuing GaWC's decade-long concern for mapping the global economy through the networking practices of APS firms in cities, in 2007 we joined forces with the Global Urban Competitiveness Project (GUCP) at the Chinese Academy of Social Sciences (CASS) to carry out a new large-scale data collection exercise for 2008 (Taylor et al., 2009a,b; 2010). We garnered information on 175 office networks of firms across 525 cities in the first half of 2008. This implies that we have detailed cross-sectional snapshots of the WCN in 2000 and 2008, and the purpose of this paper is to report and interpret the changes that have occurred in this period.

The remainder of the argument is developed in two main sections. First, the paper briefly provides a summary of GaWC's world city network (WCN) model, i.e. its conceptual rationale and data requirements. We also describe the problems involved in comparing the 2000 and 2008 data collection exercises, and detail how we have transformed the data to deal with these issues. The second section discusses the results at the network, the city and the regional level respectively, after which the paper is concluded with an overview of our major findings and some avenues for further research.

2. Data and Methodology

2.1 Conceptual Rationale of the GaWC Model

Drawing on Saskia Sassen's (1995, 2001) work on place and production in an increasingly globalized economy, GaWC has undertaken a theoretically grounded endeavor of data acquisition for measuring WCN-formation. Sassen's research emphasizes the self-accelerative transformation of the economic bases of cities from manufacturing to business services. This conversion can be traced back to the observation that a growing number of manufacturing and service industries, unable to cope with the accelerated pace of structural change and the increasing pressure for product innovation on their own, are becoming more and more dependent on specialized business services, such as financial services, accountancy, management consultancy, advertising, etc. In most, if not all of these advanced producer services (APS) firms, clients purchase customized knowledge, expertise and skills. APS firms have increasingly become multinational firms in their own right as they look for a foreign presence in an international market to service existing clients and find new ones (see Aharoni and Nachum, 2000; Warf, 2001; Harrington and Daniels, 2006). Sassen's (1991, p. 126) basic argument in relation to cities, now, is that a number of metropolitan centres have secured "a particular component in their economic base" which gives them a "specific role in the current phase of the world economy": they have become prime centres for the production and consumption of business services in the organization of global capital. As locales for service innovations in such areas as multi-jurisdictional law and new financial instruments, these metropolitan centres constitute concentrations of information and knowledge necessary for new service productions by business service firms.

For the purpose of our large-scale empirical analysis, the salient point is that business services are in and of themselves an indispensable production factor that has a growth potential of its own, as opposed to other domains of service sector growth that is the strict result of derived demand in other sectors. The reason for this is that 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: service firms have always clustered in cities to provide such services to their clients, but under conditions of contemporary globalization, multiple offices are required in major cities around the world to provide a seamless service, thereby protecting global brand integrity by keeping all work in-house (see Figure 1). Each firm has its own locational strategy – which cities to have offices in, what size and functions those offices will be, and how the offices will be organized. It is the work done in these offices that 'interlock' various cities in projects that require multiple office inputs. Thus the intercity relations in these servicing practices are numerous electronic communications – information, instruction, advice, planning, interpretation, strategy, knowledge, etc., some teleconferencing as required, and probably travel for face-to-face meetings at a minimum for the beginning and end of a given project. These are the working flows that combined across numerous projects in many firms constitute the world city network (WCN) as specified in the GaWC model (Taylor, 2001, 2004).

Figure 1 about here

2.2 Model Specification

The GaWC specification of the WCN can be formally represented by a matrix $\mathbf{V}_{ij}$ defined by n cities x m firms, where v_{ij} is the 'service value' of city i to firm j. This service value is a standardized measure of 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. The global network connectivity GNC_a of city a in this interlocking network is defined as follows:

$$GNC_a = \sum_{i,j} v_{aj}.v_{ij} \qquad (a \neq i) \qquad (1)$$

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 below (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 1.

2.3 Data Gathering

Precise specification guides our data collection: data are required on the city office networks of large professional, financial and creative service firms. These exercises in data collection are described in detail in Taylor et al. (2002a) for the year 2000 and in Taylor et al. (2009b) for the year 2008, and will be summarized here as it is the input to our subsequent analysis.

In 2000, global APS firms were defined as firms with offices in 15 or more different cities, including at least one in each of the prime globalization regions: northern America, western Europe and Pacific Asia. Firms meeting this criterion were selected from rankings of leading firms in different service sectors. The other key criterion was purely practical - whether adequate information could be found on the firm's website. 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 315 cities were selected. The end result is a 315 cities x 100 firms matrix of 31,500 service values.

In 2008, we carried out a much larger and complete data collection of APS firms. In order to put the data collection on a sustainable future trajectory, firms were chosen by their ranking in lists of the largest firms in each sector. We combined the banking/finance and insurance categories from 2000 and included the top 75 such firms as ranked in the Forbes composite index, a measure that combines rankings for sales, profits, assets and market value lists. For the other four of the previously studied services – accountancy, advertising, law and management consultancy – we included the top 25 firms: for law the Chambers list of Corporate Law firms was used;[iii] for advertising agency networks we used Advertising Age's ranking of 'marketing organizations' by revenues;[iv] for accountancy firms' networks we used the ranking by revenues of World Accounting Intelligence;[v] and for management consultancies we used the 2007 edition of the Vault Management & Strategy Consulting Survey, which ranks firms in terms of their 'prestige' based on a large survey of professionals.[vi] In all cases the lists of firms selected are the latest available at the planning of the research project in 2007 and these tended to be based upon 2006 data. There was no way to overcome this two year delay: one year was because planning the project takes time and the second year was because of a one year time lag in reporting such data. For all lists substitute firms were identified (ranked just below 75 and 25) to cover for situations where a firm had disappeared (e.g. been taken over) in the two years before the actual data collection. Overall, the number of firms was increased from 100 to 175. In addition, we carried out a thorough review of cities and added many new cities from emerging markets to create a list of 525[vii]. The end result is a 525 cities x 175 firms matrix of 91,875 service values.

In both data gatherings, assigning service values to city/firm-pairs focused on two features of a firm's office(s) in a city as shown on their corporate websites: first, the size of office (e.g. number of practitioners), and second, their extra-locational functions (e.g. regional headquarters). Information for every firm was simplified into 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 1. Particularly large offices were scored 3 and those with important extra-territorial functions (e.g. regional headquarters) scored 4. All such assessments were made firm by firm.

2.4 Consistency in the Data Gathering Exercises

The only longitudinal GaWC analyses to date are by Taylor et al. (2003) for 2000-2001 changes and Taylor and Aranya (2008) for 2000-2004 changes (for an interpretation of the patterns of change documented in the latter paper, see Orozco-Pereira and Derudder, 2010). Both papers take the 2000 data gathering as a starting point, and basically look at how the office networks of the 100 service firms have shifted in 2000-2001 and 2000-2004 respectively. However, particularly in Taylor and Aranya (2008), it became clear that this approach would turn out to be increasingly problematic as the time period becomes longer. The reason for this is that the comparison of city connectivities over time requires a certain consistency in the data structure. However, the dynamic nature of the global economy implies that the relevance of invoking the geography of the office networks of the initial APS firms becomes increasingly problematic as time passes. For instance, in Taylor and Aranya (2008), of the 100 firms used in 2000, 20 had to be deleted because the firms were liquidated, had merged with other firms in the data, or simply because the authors were unsure of the comparability of new data with old data (see also Orozco-Pereira and Derudder, 2010). Since measurement of differences should represent changing urban geographies rather than data collection change, it was clear that this approach was not tenable in the long run: ever-lower number of firms would reduce the robustness of the dataset, while changes in the sectoral composition of the dataset may influence the results. Furthermore, new firms may enter the fray as their global presence/importance rises. The rationale behind the altered data gathering strategy should be understood in light of these problems. The new methodology allows for a more flexible approach: using a predefined number of firms from each sector (e.g. 75 in financial services and 25 in law) selected via independent rankings of their importance as detailed above. This puts the data collection on a new and sounder footing: there will be statistical robustness in future research as the same large number of firms is used for each sector, while we will include the leading firms from each sector.

However, for the present case, special modifications need to be made to compare the 2000 and 2008 measurements. This requires maintaining as much consistency as possible in the data structure. In terms of cities, consistency is relatively straightforward in that we only retained the 307 cities that feature in both analyses and have a GNC ≠ 0 for both 2000 and 2008 (Baghdad, for instance, had zero connectivity in 2000 and is excluded). Of these 307 cities, we only retained the 132 cities with a GNC of at least one fifth of the most connected city in either year. GNCs were then recomputed based on these 132 so that a coherent set of inter-city relations is being compared. One major consequence of this decision is that the GNC measures and rankings used in the remainder of this paper may be slightly different than those reported in other GaWC publications. In terms of firms, our main concern was that changes in the sectoral composition of the dataset might influence the results. For instance, in Taylor and Aranya (2008), the number of firms in the accountancy sector was almost reduced by a half between 2000 and 2004. As a consequence, this implies an increased influence of, say, law and management consultancy in dictating network structures. To avoid this situation in the present analysis, the measurements for the year 2000 were adjusted so that the same 'service mix' is used as in 2008 (see Table 1). This was especially relevant given the larger number of financial services firms in the 2008 data gathering (75 out of 175), which would – in relative terms – artificially boost the connectivity levels of clear-cut international financial centres such as New York when comparing unadjusted GNC levels in 2000 with GNC levels in 2008. To deal with this potential problem, the connectivity measurements in 2000 were transformed to match the 2008 sectoral distribution (i.e. the last column of Table 1). For instance, the connectivity generated in the office networks of the 15 advertising firms in the 2000 data gathering now makes up 25/175 = 14,3% of a city's revised 2000 GNC rather than the initial 15/100 = 15%, while the connectivity generated in the office networks of the 23 + 11 = 34 financial/banking/insurance firms in the 2000 data gathering now makes up 75/175 = 42,9% of a city's revised GNC rather than the initial 34/100 = 34%. As a consequence, the GNC figures for 2000 used in this paper will be slightly different from those reported in other GaWC publications.

Table 1 about here

Figures 2 and 3 illustrate the WCN in 2000 and 2008 respectively as a pattern of nodes (city codes are given in the Appendix). The 132 cities included in both figures have a global network connectivity of at least one fifth of the most connected city in either 2000 (London) or 2008 (New York). Obviously this is an arbitrary cut off point, it has been chosen because it still provides us with a large number of cities that are distributed across all parts of the settled world. The next section provides a detailed account of the major changes in the WCN between 2000 and 2008.

Figures 2-3 about here

3. Changes in the WCN

3.1 Preliminary Analysis: Shifting Ranks, Rising Connectivities

Table 2 presents an overview of the 20 cities with the largest global network connectivity (GNC) in 2000 and 2008, and the major changes in ranks in this time period. Although New York and London change positions, the most notable feature is the stability at the apex of the WCN: London, New York, and Hong Kong remain the most connected cities with NY-LON as the undisputed dominant dyad, and Paris, Singapore and Tokyo follow, albeit with different rankings. Below the top 6, there have been some major changes with 8 cities entering the 14 positions between 6 and 20: cities such as Chicago, Los Angeles and Amsterdam lose out in favour of the likes of Shanghai, Beijing and Seoul in an 'east-west swap'. More specifically, the plummeting of US cities and the concomitant rise of Chinese cities is a more fundamental feature of this analysis. This obviously points to an overarching 'world-regional' trend, as the 20 most connected cities in 2000 included 5 North American cities and 5 Asian cities, whereas in 2008 only 3 North American cities (New York, Toronto, and Chicago) make the top 20 as opposed to 9 Asian cities. It has frequently been suggested that the world-system is in the midst of a major geographical transformation from 'West' to 'East' (e.g. Arrighi, 1994, 2007; Frank, 1998), and these changes – even just before the current financial crisis got underway – suggest that this shift is indeed unfolding in terms of urban connectivity.

Table 2 about here

Merely considering (notable) changes in ranks is, however, not the best approach when discussing WCN change. An exclusive focus on ranks implicitly entails the adoption of a competitive approach to studying urban change. This approach can, for instance, be observed in Friedmann's (1995, p. 23) statement that world cities are "driven by relentless competition, struggling to capture ever more command and control functions that comprise their very essence," even to the degree that "[c]ompetitive *angst* is built into world city politics." In the GaWC approach, however, firms not cities are the agents of change and this means that the 'essence' of intercity relations is interurban cooperation within office networks of globalized service firms rather than crude interurban competition for capital, resources, knowledge, etc,… (Beaverstock et al., 2001). This is not to say that there is no competition between cities (see Begg, 1999, p. 807), but in this paper's argument, the cooperation process is prioritized because it entails the basic reproduction of the intercity relations: cities exist in city networks and networks can only exist through collective complementarities (Taylor, 2004). This position is consistent with general organization theory wherein competition and hierarchy are deemed to be different from network and cooperation (Powell, 1990; Thompson, 2003; for an application to cities see Taylor et al., 2010). All this implies that, from our perspective, change is much more than a matter of cities 'rising' or 'falling'. This can be readily observed when looking at Chicago in Table 2: in the period under investigation, the city has retained more or less the same overall level of GNC, but it nonetheless loses 12 places in the ranking because other cities have become relatively more connected. In other words: rather than some cities dropping in the 'ranking' per se, the first notable feature of our analysis is the overall rise of connectivity in the WCN in the period 2000-2008. This is evident from a number of related indicators: the average connectivity in the WCN has risen from 0.20 to 0.22, while in 2008 the number of cities with a connectivity larger than 20% of the leading city has risen from 110 to 125. Overall, 179 out of 307 cities are more connected to the WCN at large than they were in 2000. This indicates that the globalization of services has been a dynamic and growing economic sector expanding offices in many cities and extending office networks to new cities in the period under investigation. Although the NY-LON dyad still dominates the network, its structure has become more horizontal between 2000 and 2008 indicating a worldwide diffusion of globalization processes. The result has been an increasingly integrated world city network.

3.2 Change in the WCN

Figure 4 shows the geography of global urban connectivity change for the most connected cities in the WCN, with rising connectivities for 97 out of 132 cities. The regional pattern suggested in Table 2 is confirmed, with connectivity losses for Western European, Australasian and especially North American cities, and connectivity gains in other parts of the world in general and specifically in Eastern Europe and Pacific Asia/China.

Figure 4 about here

The degree of change in absolute global network connectivity is useful for observing some of the most notable shifts in the WCN, but it has some severe limitations as a way of understanding change. This is because GNC_a is a closed number system that distorts the measurement of change. However much more connected it becomes, the leading city cannot show additional connectivity through its GNC_a measure of unity. In more general terms, there is a problem of possible underestimation of change at the higher ends of the scale. This problem consists of two components: (i) a measurement problem in that higher ranked cities have less leeway to increase their connectivity because they are nearer the limit of the measurement scale (i.e. a city with a GNC_a of 0.95 can only increase its connectivity with 0.05); and (ii) a conceptual problem in that the markets of higher ranked cities are closer to saturation in that they have less leeway to acquire more/larger/more important offices (i.e. a city where all major service firms have a major office can hardly become more important in the office networks of these firms). We therefore developed an alternative way of measuring change, which takes into account both problems.

The measurement problem is tackled by generating standardized measures of sectoral connectivity change SCC_a.To this end, we first compute standardized global network connectivities $SGNC_a$ for both 2000 and 2008 as follows:

$$SGNC_a = \frac{(GNC_a - GNC_{average})}{\sigma_{GNC}} \qquad (2)$$

where $$GNC_{average} = \frac{\sum_i GNC_i}{n} \qquad (3)$$

and $$\sigma_{GNC} = \sqrt{\frac{\sum_i (GNC_i - GNC_{average})^2}{n}} \qquad (4)$$

For both cross-sections, this produces an open number sequence pivoting on zero. Second, change in connectivity is first measured by comparing both standardized global network connectivity $SGNC_a$:

$$CC_a = SGNC_{a(2008)} - SGNC_{a(2000)} \qquad (5)$$

And, thirdly, for analysis of the distribution of change, CC_a is further standardized to obtain our standardized measure of connectivity change SCC_a, which is defined as:

$$SCC_a = \frac{(CC_a - CC_{average})}{\sigma_{CC}} \qquad (6)$$

where $$CC_{average} = \frac{\sum_i CC_i}{n-1} \qquad (7)$$

and $$\sigma_{GNC} = \sqrt{\frac{\sum_i (CC_i - CC_{average})^2}{n}} \qquad (8)$$

This leaves us with the conceptual problem of market saturation (see also Orozco-Pereira and Derudder, 2010). Figure 5 presents a scatter plot in which the Y axis represents SCC in the period 2000-08 and the X axis GNC in 2000 for each of the 132 cities. While the figure provides an immediate and compelling picture of the most upwardly and downwardly mobile cities, it also shows that there is indeed a small but statistically significant negative correlation (r = -0.21) between both indicators. The straightforward solution to the ensuing interpretation problem is to use the standardized residuals from this regression $SRESID_a$ as our actual measures of change. In other words, $SRESID_a$ measures can be understood as the actual level of SCC after accounting for the possible underestimation of change in major service centres because of small but statistically significant processes of market saturation.

Figure 5 about here

This double transformation of GNC_a change into $SRESID_a$ measures produces an open number sequence pivoting on zero. Figure 6 plots the distribution of $SRESID_a$, which conforms to a standard normal distribution in that its average is 0, its standard deviation equals 1, while the application of a Kolmogorov-Smirnov test reveals that this distribution can indeed be considered as a normal distribution. As a consequence, $SRESID_a$ can basically be understood as a z-score, which implies that the measures can be interpreted as such (e.g., cities with an absolute value of $SRESID_a \geq 2$ have witnessed exceptional connectivity change). However, it needs to be emphasized that $SRESID_a$ needs to be interpreted as a *relative* measure (i.e. relative vis-à-vis the entire distribution): it is possible that, in the face of an overall rise of connectivity in the WCN, a city that has been gaining in connectivity in recent years has a negative $SRESID_a$ value because other cities in the distribution have – on average – been gaining more connectivity (after taking into account the effect of the initial level of connectivity in 2000). Referring back to the Chicago example, for instance, this implies that the city will have a fairly substantial negative value for $SRESID_a$ despite retaining the same overall level of connectivity.

Figure 6 about here

Using the transformed measurements for 2000 and 2008 as input to the model allows for straightforward assessments of change in the WCN between 2000 and 2008. Figure 7 and Table 3 summarize the changing geography of global urban connectivity through this standardized measurement of change. Figure 7 plots the $SRESID_a$ of cities in their approximate geographical position, while Table 3 features the 10 cities that have witnessed the largest changes (both positive and negative).

Table 3 about here
Figure 7 about here

With this standardized measurement summarized in Table 3 and Figure 7, the relative decline of Western European, Australasian and especially North American cities becomes very clear, with not a single city in the latter region keeping up with change in the rest of the distribution in general and Pacific Asia in particular: the 10 cities with the largest relative connectivity decline are all located in Northern America and Germany (plus Hamilton and Nassau as offshore banking centres). In addition to the substantive interpretation of this pattern being an overall indicator of the 'reOrientation' of the global economy, there is also another – and perhaps less gloomy – possible reading of this trend. That is, it is simply possible that cities with long established service offices in Western Europe and Northern America are declining relatively (= standing still in comparison with the rest of the world) while other parts of world are catching up (see the Chicago example). Moreover, the USA is a special case with its cities already being reported as under-represented in the world city network in 2000 (Taylor and Lang, 2004) and 2004 (Taylor and Aranya, 2008). The 2008 results show a continuation and perhaps even an accentuation of this trend. This may in part be a result of the US home market for advanced producer services being far greater than for any other country, which has two key effects. First, foreign firms find it hard to penetrate the market and tend to represent clients through just a New York office. Second, US service firms have less reason to gamble on global expansion – compare a large Chicago company with a large Seoul company: the former can make better profits through domestic expansion; the latter can only expand through new cross-border work.

Shanghai and Beijing have witnessed the most substantial connectivity gains in the period 2000-2008. Although perhaps not surprising, this is in a way an important finding: although *all* cities in Pacific Asia in general and China in particular have become more connected in the period under investigation, size does seem to matter in that especially the major cities in this region have become the principal gateways for the channelling of transnational flows of capital, goods, knowledge and people (see also the connectivity gains of Moscow in the context of the Former Soviet

Union). China's evolution towards capitalism has been fast but in a way also gradual through the continuing imprint of the Party-state, resulting in a state-led transformation of the economy towards a unique variety of capitalism (see Ma, 2002, p. 1546). Within this context of enduring state-control, these results support the idea that China is now being opened up not only through the well-established gateway of Hong Kong, but also through Beijing and Shanghai. The latter cities are thereby developing along complementary lines, respectively as a political centre and as the mainland's premier business and financial centre (see Lai, 2009).

4. Conclusions

This paper has employed a network model of intercity relations based on advanced producer service firms 'interlocking' world cities through their worldwide distributions of offices. Based on data on the location strategies of producer services firms in 2000 and 2008, we have highlighted the major changes that have been taking place in the WCN during this time period. A little thought might lead to the idea that these findings are not actually very surprising: what makes New York and London so important in the world economy is their distinctiveness as massive global service centres, while the rising connectivities of Shanghai and Beijing are in line with commonsensical expectations. But such reasoning remains conjecture, to be convincing such a notion needs empirical verification in a broad comparative study. The value of the measurement exercise described here is that it can make such verification possible. In conclusion, we have tried to enhance insight into globalization through the depiction of the changing geography of the world city network. Very much in the spirit of a number of other papers in this special issue (e.g. Alderson et al., 2010; Matthiessen et al., 2010; Mahutga et al., 2010; Pirie, 2010), we have not restricted 'globalization forces' to just a limited set of 'world cities' but have incorporated a very large number of cities into a single global urban analysis. Contemporary globalization is not an end-product in itself but an on-going bundle of processes. We cannot know what future scenario 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.

When garnering the data for 2008, we obviously could not fully realize that this research was generating *instant history*. Given the usual lag time of about one year from preparing and carrying out data collection to the beginning of analyses, it seemed a reasonable assumption that we would have the latest, up-to-date results on the shape of the world city network. But much has happened since the new GaWC data were collected in the first half of 2008: place-based public finance has had to come to the rescue of network-based private finance. The nationalization (part, full or implicit) of financial services firms has brought territories and their boundaries back to the centre stage of the world economy at the expense of networks and their flows. Put another way, the relations between cities and states have seemingly been readjusted in the latter's favour. Neo-liberal globalization may be collapsing but firms operating through global spaces of flows have not been eliminated; we cannot now know what form this emerging globalization will take. So what we have been presenting here are the latest but not up-to-date results on the world city network. This can be interpreted as measurement of the world city network *prior to the effects of the current geoeconomic transition being realized*: it is the ‘before' position to be compared to subsequent research on the ‘after' position in, say, 2010 (Taylor et al., 2009a).

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Table 1 Sectoral distribution of GaWC data gatherings in 2000 and 2008

Sector	2000	2008	% 2008
Accountancy	18	25	14,3
Advertising	15	25	14,3
Law	16	25	14,3
Management consultancy	17	25	14,3
Finance	34	75	42,9

Table 2 The 20 most connected cities in the WCN in 2000 and 2008

2000			2008		
1	London	100.00	1	New York	100.00
2	New York	97.10	2	London	99.32
3	Hong Kong	73.08	3	Hong Kong	83.41
4	Tokyo	70.64	4	Paris	79.68
5	Paris	69.72	5	Singapore	76.15
6	Singapore	66.61	6	Tokyo	73.62
7	Chicago	61.18	7	Sydney	70.93
8	Milan	60.44	8	Shanghai	69.06
9	Madrid	59.23	9	Milan	69.05
10	Los Angeles	58.75	10	Beijing	67.65
11	Sydney	58.06	11	Madrid	65.95
12	Frankfurt	57.53	12	Moscow	64.85
13	Amsterdam	57.10	13	Brussels	63.63
14	Toronto	56.92	14	Seoul	62.74
15	Brussels	56.51	15	Toronto	62.38
16	Sao Paulo	54.26	16	Buenos Aires	60.62
17	San Francisco	50.43	17	Mumbai	59.48
18	Zurich	48.42	18	Kuala Lumpur	58.44
19	Taipei	48.22	19	Chicago	57.57
20	Jakarta	47.92	20	Taipei	56.07
22	Buenos Aires	46.81	21	Sao Paulo	55.96
23	Mumbai	46.81	22	Zurich	55.51
27	Shanghai	43.95	25	Amsterdam	54.60
28	Kuala Lumpur	43.53	28	Jakarta	53.29
29	Beijing	43.43	31	Frankfurt	51.58
30	Seoul	42.32	40	Los Angeles	45.18
37	Moscow	40.76	46	San Francisco	41.35

Table 3 Major positive/negative values of SRESID, 2000-08

Major negative changes		**Major positive changes**	
Los Angeles	-2,52	Shanghai	2,76
Miami	-2,31	Beijing	2,64
San Francisco	-1,91	Moscow	2,62
Cologne	-1,76	Seoul	2,12
St Louis	-1,74	Rome	1.89
Montreal	-1,73	Tel Aviv	1,84
Nassau	-1,68	Bucharest	1,44
Hamilton	-1,63	Riyadh	1,39
Düsseldorf	-1,63	Kuwait	1,38
Frankfurt	-1,48	Kuala Lumpur	1,37

Figure 1 Deloitte advertisements at Schiphol Airport

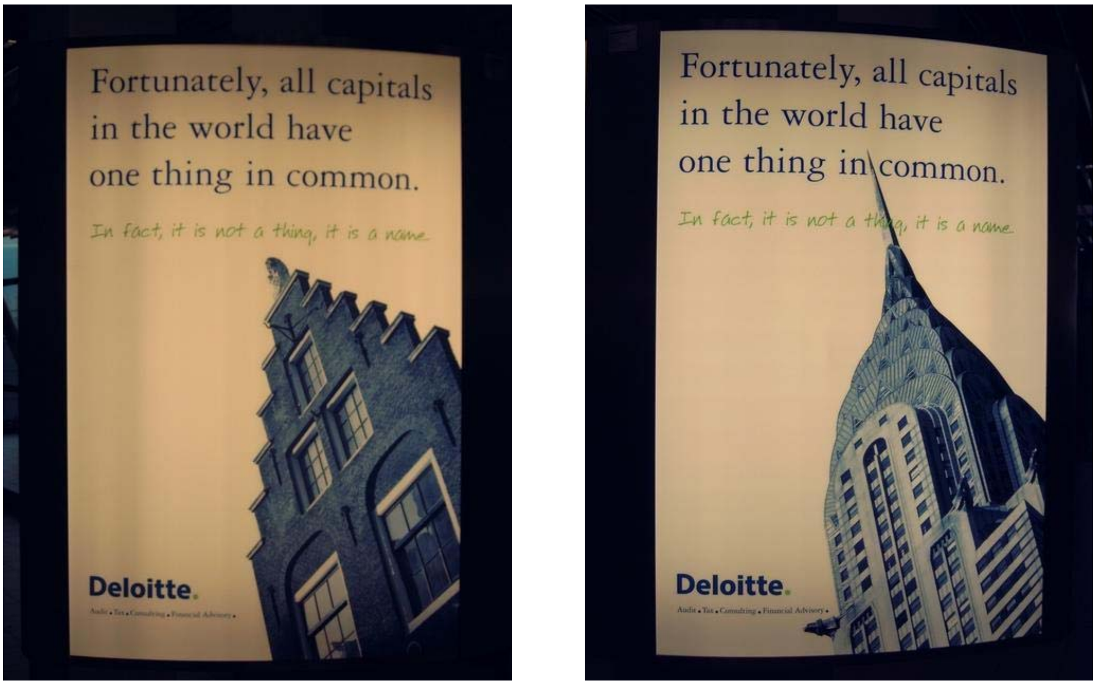


Figure 2 GNC for 132 cities in 2000

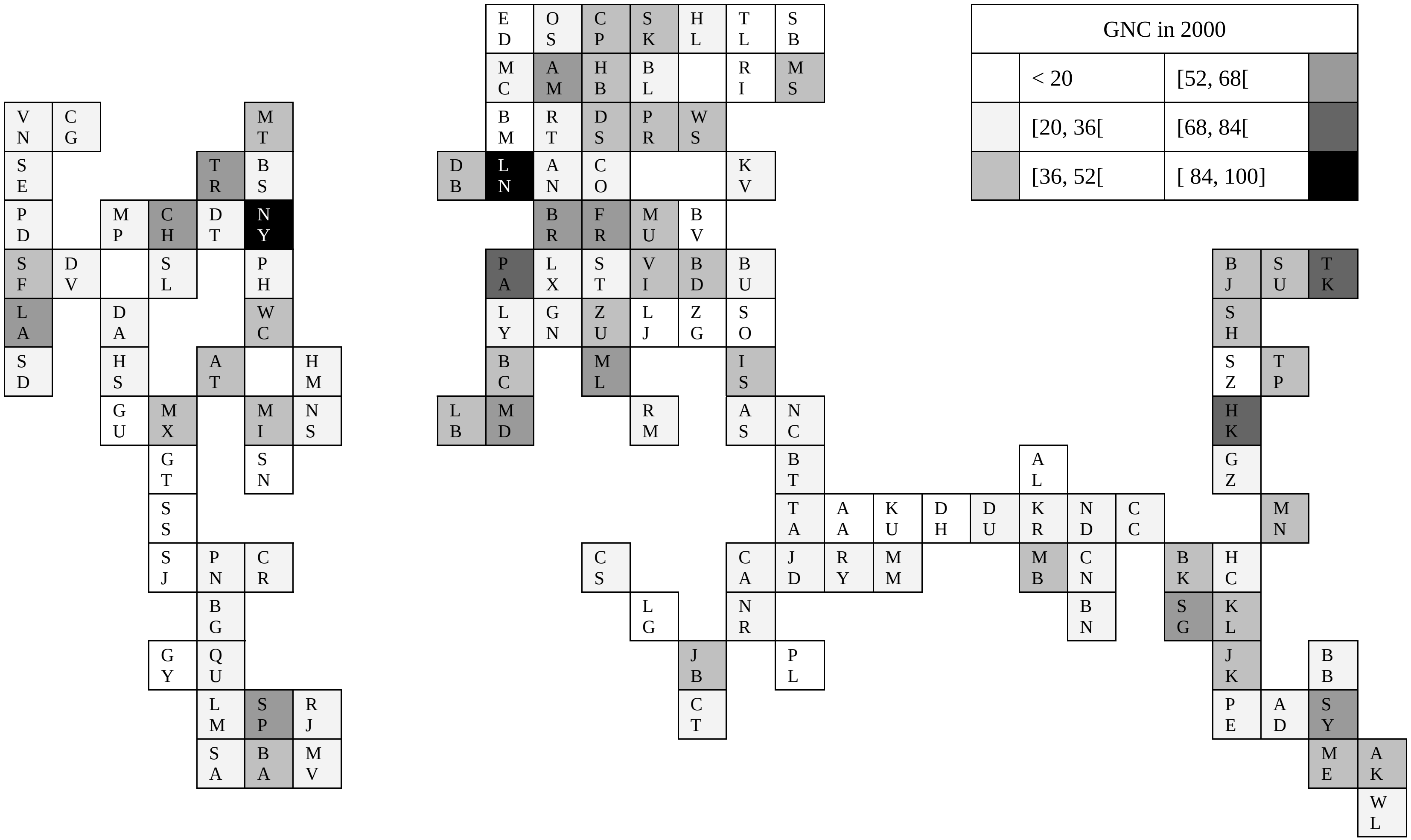


Figure 3 GNC for 132 cities in 2008

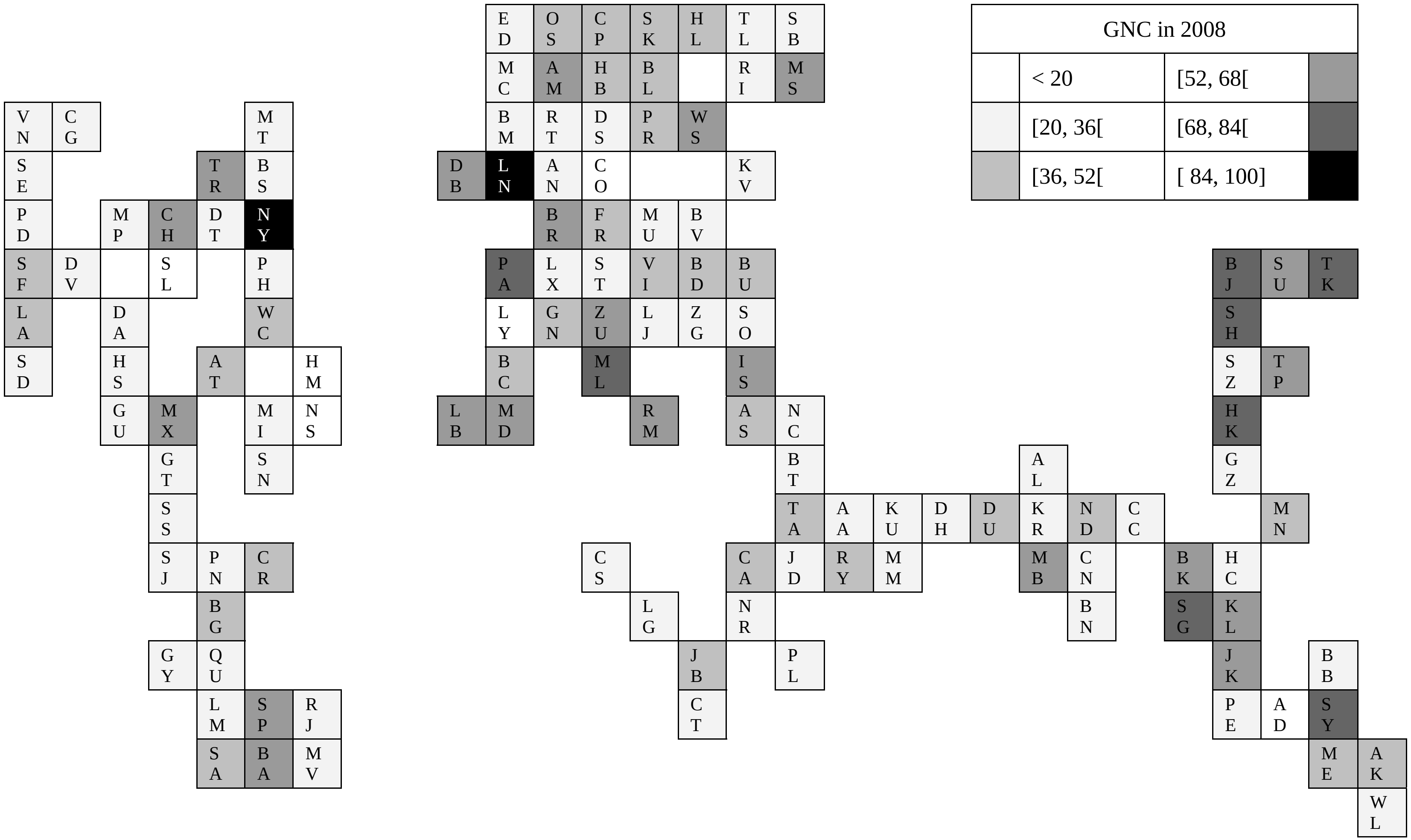


Figure 4 Absolute GNC change for 132 cities

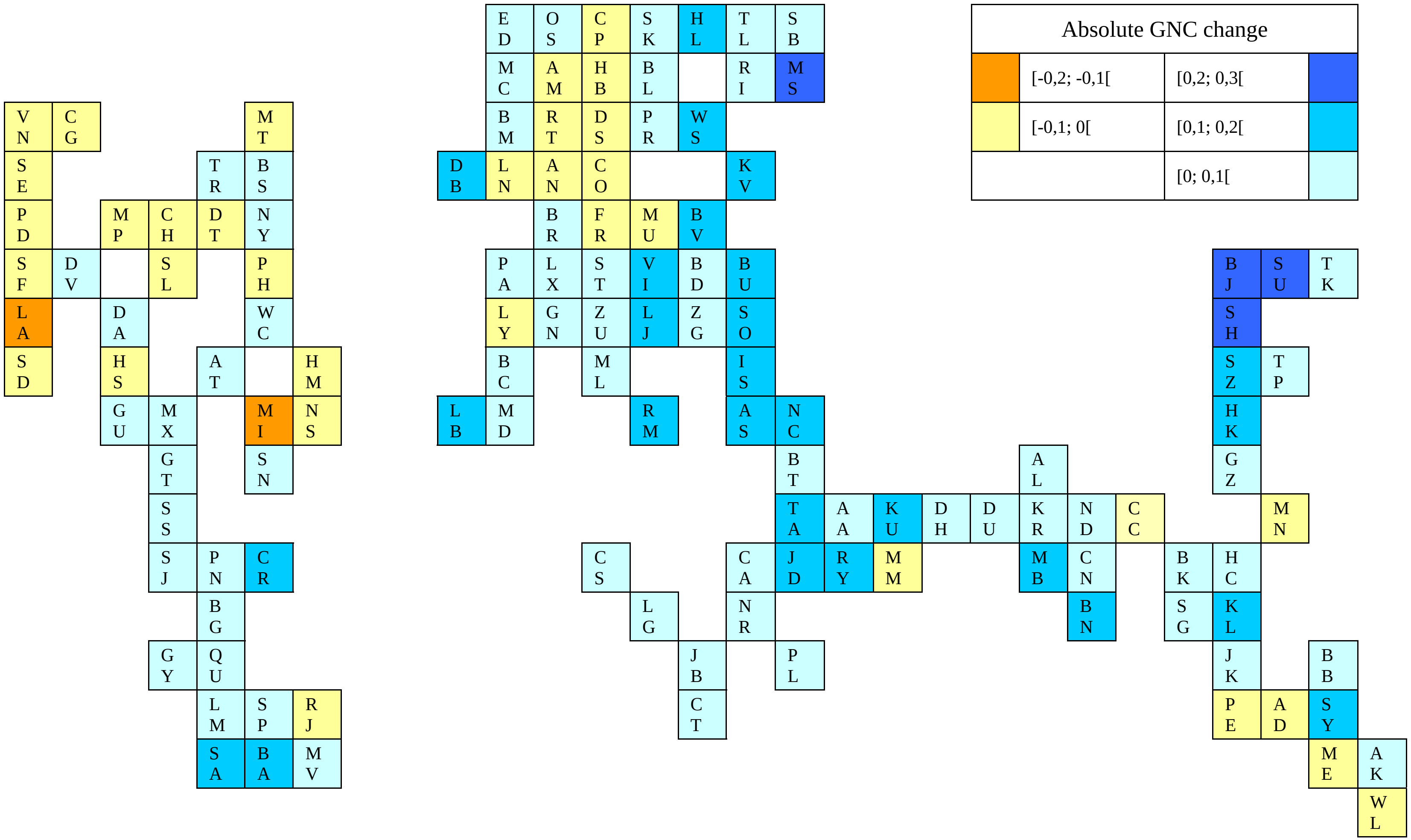


Figure 5 GNC in 2000 versus SCC in 2000-08 for 132 cities

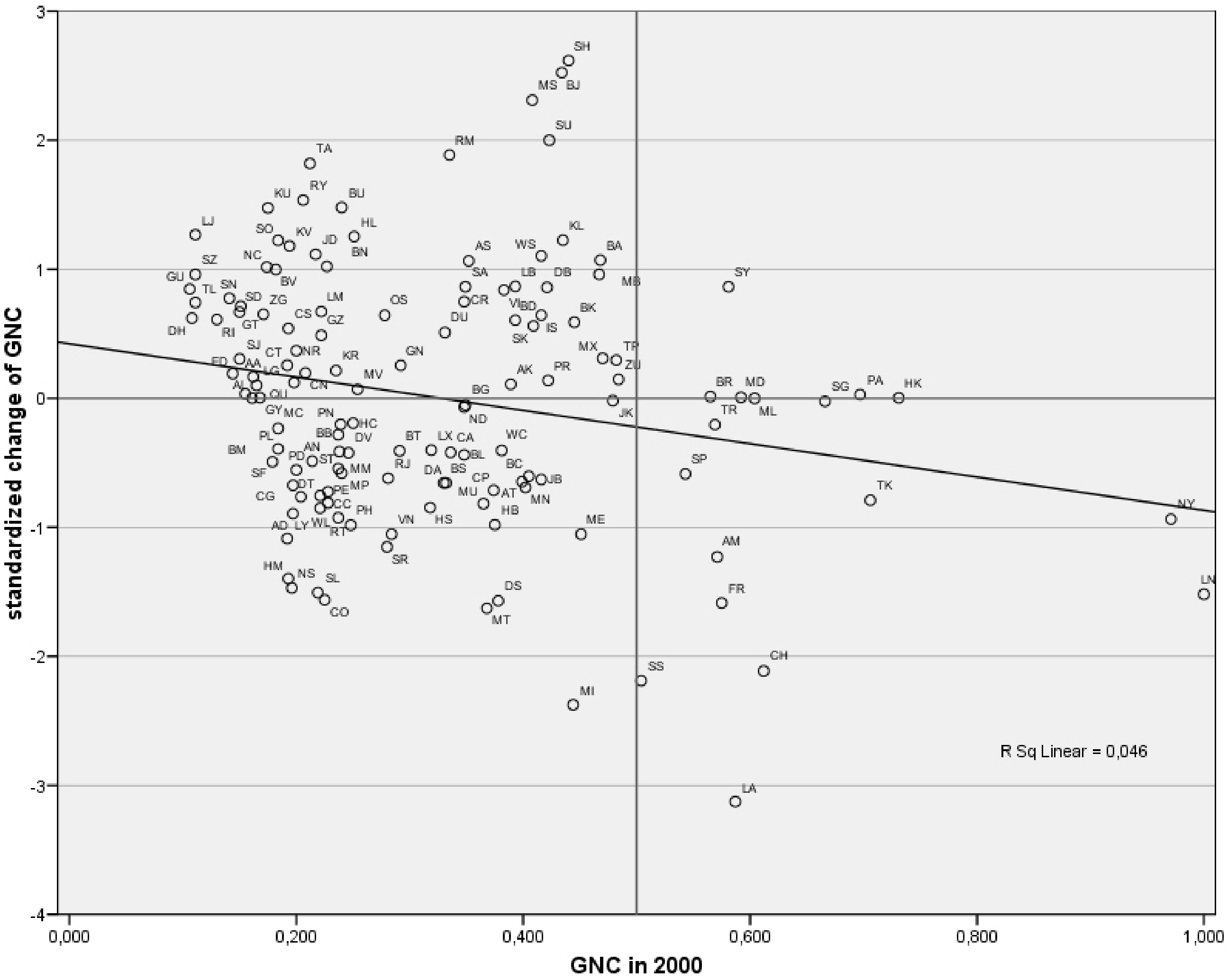


Figure 6 SRESID for 132 cities, 2000-08

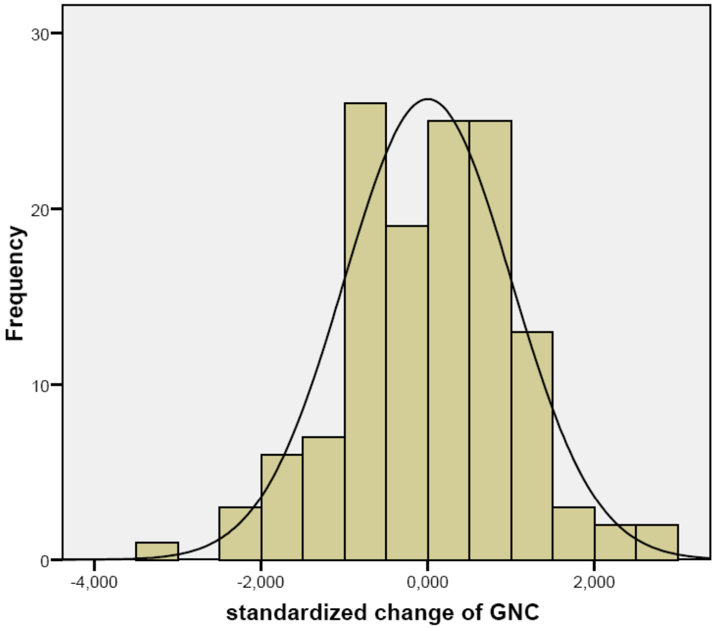
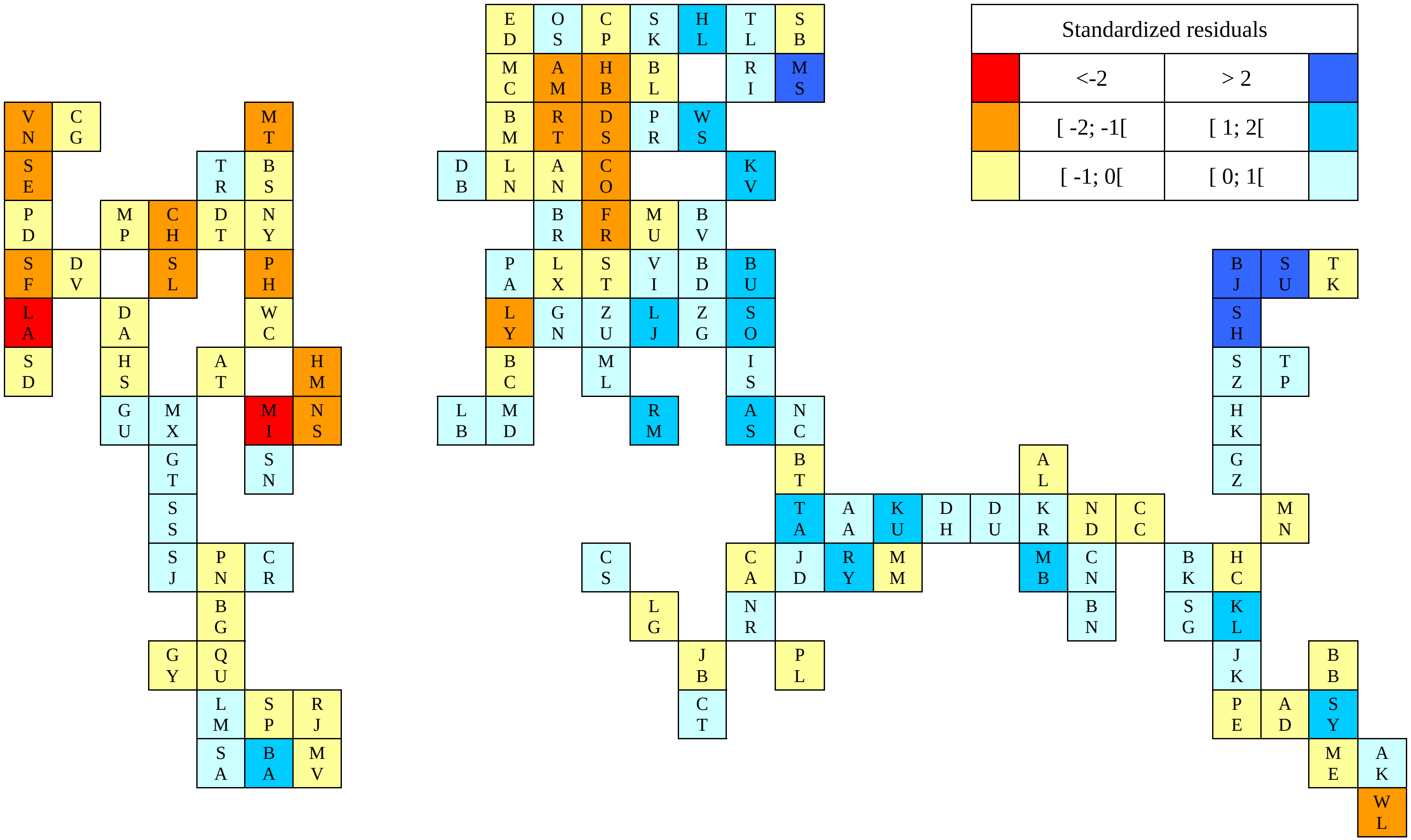


Figure 7 Standardized residuals for 132 cities, 2000-08



Appendix List of Abbreviations

AA	Amman
AD	Adelaide
AK	Auckland
AL	Almaty
AM	Amsterdam
AN	Antwerp
AS	Athens
AT	Atlanta
BA	Buenos Aires
BB	Brisbane
BC	Barcelona
BD	Budapest
BG	Bogota
BJ	Beijing
BK	Bangkok
BL	Berlin
BM	Birmingham
BN	Bangalore
BR	Brussels
BS	Boston
BT	Beirut
BU	Bukarest
BV	Bratislava
CA	Cairo
CC	Calcutta
CG	Calgary
CH	Chicago
CN	Chennai
CO	Cologne
CP	Copenhagen
CR	Caracas
CS	Casablanca
CT	Cape Town
DA	Dallas
DB	Dublin
DH	Doha
DS	Düsseldorf
DT	Detroit
DU	Dubai
DV	Denver
ED	Edinburgh
FR	Frankfurt am Main
GN	Geneva
GT	Guatemala City
GU	Guadalajara
GY	Guayaquil
GZ	Guangzhou
HC	Ho Chi Minh City
HK	Hong Kong
HL	Helsinki
HB	Hamburg
HM	Hamilton
HS	Houston
IS	Istanbul
JB	Johannesburg
JD	Jeddah
JK	Jakarta
KL	Kuala Lumpur
KR	Karachi
KU	Kuwait
KV	Kiev
LA	Los Angeles
LB	Lisbon
LG	Lagos
LJ	Ljubljana
LM	Lima
LN	London
LX	Luxembourg
LY	Lyon
MB	Mumbai
MC	Manchester
MD	Madrid
ME	Melbourne
MI	Miami
ML	Milan
MM	Manama
MN	Manila
MP	Minneapolis
MS	Moscow
MT	Montreal
MU	Munich
MV	Montevideo
MX	Mexico City
NC	Nicosia
ND	New Delhi
NR	Nairobi
NS	Nassau
NY	New York
OS	Oslo
PA	Paris
PD	Portland
PE	Perth
PH	Philadelphia
PL	Port Louis
PN	Panama City
PR	Prague
QU	Quito
RI	Riga
RJ	Rio de Janeiro
RM	Rome
RT	Rotterdam
RY	Riyadh
SA	Santiago
SB	Saint Petersburg
SD	San Diego
SE	Seattle
SF	San Francisco
SG	Singapore
SH	Shanghai
SJ	San José
SK	Stockholm
SL	Saint Louis
SN	Santo Domingo
SO	Sofia
SP	São Paulo
SS	San Salvador
ST	Stuttgart
SU	Seoul
SY	Sydney
SZ	Shenzhen
TA	Tel Aviv
TK	Tokyo
TL	Tallinn
TP	Taipei
TR	Toronto
VI	Vienna
VN	Vancouver
WC	Washington D.C.
WL	Wellington
WS	Warsaw
ZG	Zagreb
ZU	Zurich

Notes

[i] See http://www.lboro.ac.uk/gawc

[ii] This data gathering was repeated in 2001 and 2004 (Taylor et al., 2003; Taylor and Aranya, 2008), but it became increasingly clear that a new way for gathering data was necessary to maintain a consistency in the data structure for fruitful longitudinal analysis.

[iii] See www.chambersandpartners.com/global/

[iv] See www.adage.com/images/random/lna2007

[v] See www.worldaccountingintelligence.com/

[vi] See www.vault.com

[vii] In practice, a number of overlapping criteria were used to select cities. All cities with a population of more than 2 million inhabitants were included, which led to the consideration of far more cities located in China, India, Pakistan and Iran. We also included a 'second city' of all but the smallest states plus other important cities in larger states. The latter selection was in part based on a systematic comparison with the airline data presented in Derudder and Witlox (2005). For instance, the most connected city in the global airline networks that is not included in our dataset is Nice, one of the major tourist centres and a leading resort on the French Riviera.