

The Multidimensionality of World Cities and Global Firms

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“Remember, there is nothing keeping us in the simple, boring realm of two dimensions”
-Elvin Wyly

Introduction

Global cities are fascinating because they are multidimensional entities, and as one moves through these dimensions, new facets of these cities are revealed. Global firms are an ideal medium through which one can explore different cities at their various dimensions because these firms, unlike cities, are not bound to physical space, but are incredibly mobile. As globalization gradually erases the significance of distance, these connections allow us to classify cities in a more globally-relevant sense.

As exciting as these concepts are, one still needs to start in the simplest dimension, **the zeroth dimension**. This dimension, expressed as a single point, involves studying individual firms and cities and selecting those that are appropriate for the study. The points that represent global firms are then swept across different cities in their movements, forming **the first dimension**, a line. These trajectories and the individual cities that they join are then compared to each other relative to the other trajectories and cities on **the two-dimensional** world map. **The third dimension** is then constructed from the frequency of the movements and the comparison of movement-patterns between three types of firms. A limitation to Peter Taylor and his colleagues' research¹ is that their data is taken from only one point in time, a snapshot. This analysis will explore how firms and cities change over **the fourth dimension**, time, and see how historical events affect and disrupt these patterns.

¹ <http://www.lboro.ac.uk/gawc/datasets/da6.html>

The Zeroth Dimension : Individual Firms and Cities

Three types of firms are chosen: Banking and Finance, Advertising and Law. These choices provide a wide variety and there is a relatively equal amount of firms in each category, so that any generalizations and observations would not be biased. Individual firms within each category are then selected for their purity (relatively few mergers), and the accuracy and amount of details in their histories.

Banking & Finance	Advertising	Law
HSBC	Grey	Baker & McKenzie
Barclays	DMB&B	White & Case
Standard Chartered Group	JWT	Lebeuouf, Lamb, Greene & MacRae
Dresdner Bank Group	Ogilvy	Bryan Cave
Compagnie Financiere de Paribas	Dentsu	Dorsey & Whitney
Banker's Trust	Young & Rubicam	Joes, Day, Reavis & Pogue
ABN-AMRO		Clifford Chance

Cities are first chosen if they contain 30 or more global firms according to Peter Taylor's data². There were, however, several exceptions, as some of these cities contain fewer than 30 global firms, but are mentioned frequently in firm histories. Frequent appearance in the history of the firms is the second filter.

Alpha	London	NewYork	Tokyo					
Beta	Amsterdam	Bangkok	Beijing	Berlin	Brussels	Chicago	Frankfurt	HongKong
	LosAngel.	Montreal	Paris	Sao Paolo	Singapore	Toronto	Zurich	
Gamma	Atlanta	Barcelona	Boston	Budapest	BuenosAir.	Geneva	Istanbul	Jakarta
	Johannes.	Kuala L.	Madrid	Manila	MexicoCity	Milan	Moscow	Munich
	Prague	S.Francisco	Santiago	Shanghai	Sydney	Taipei	Warsaw	Wash D.C.

² Available at the GaWC Website

The First Dimension : Trajectories

This dimension allows us to observe firms as they move vertically between different tiers of the World City hierarchy, and these patterns allow us to infer the psychology of global firms and what they value. Occasionally, the firm histories that are made available list the countries instead of cities. If the country only has one main city, that city will be placed in brackets.³

Prior to the research, assuming that firms aspire to have an office in one of the three global cities, simple reasoning will conclude that a majority of firms will start in smaller cities, as the start-up costs would be less. As profits increase, the firms will then move up the tiers until they reach World Cities such as London, New York and Tokyo, and then remain there, as the firms have reached their goal.

Bank/Finance	HS HongK.	BA LOND.	ST (LOND.)	CR Vienna	DR Dresden	PA Antwerp	BT NY	AB Amstdm.
Advertising	GR NY	DM Atlanta	TH NY	OM NY	DE TOKYO	YR NY		
Law	BM Chicago	WC NY	LL NY	SK NY	BC St.Louis	DW Minnea.	JD Cleveland.	CC Amstdm.

³ For example, if the firm history states that an office opened in the "Philippines", it is assumed that the office is located in Manila, the only significant city in the country. In this case, Manila would be in brackets to indicate that only the country was given, but this is the most likely city.

As expected, most firms⁴ started at a city that is on the lower levels of the World City hierarchy. However, when we look at advertising firms, three exceptions are noticeable. First of all, Advertising Firms do not conform to the rest of the data and initial expectations, as almost all of the advertising firms started in a World City. Second, London is the only World City that is not chosen as a point of origin. Furthermore, Advertising Firms do not seem to have London on their list of priorities, as London offices are opened fairly late in the histories, or London is forgotten altogether. Finally, DMB&B is the only advertising firm that started in a small city. Why all these exceptions? ⁵

One reason that Advertising Firms tend to begin in larger cities is because their client base, unlike banking & finance and law, are not comprised of private clients. Instead, advertising firms tend to cater to the needs of companies and corporations, which are usually found in larger cities. Secondly, London seems to have a lower demand for Advertising Firms because its proximity to other European cities facilitates the diffusion of innovations. Finally, DMB&B's choice to start in a smaller city is explained in its history. Advertising firms start in larger cities merely because they are going where their potential clients are. For DMB&B, their first client happened to be Coca-Cola, which was based in Atlanta,⁶ and current profit from Coca-Cola outweighed the potential profit that could result from a move to New York.

One prevalent pattern is, contrary to initial expectations, that global firms tend to move between different the different tiers of the World City hierarchy. Rather than working steadily up to the top of the World City hierarchy and remaining there, global firms tend to open offices in World Cities at equal intervals along their trajectory. This indicates that perhaps their goal is not to reach the very top of the hierarchy, but to maximize the amounts of their offices internationally to become global. Perhaps the firms attempted to open as many offices in different locations as their current capital is able to afford. Then, when they need a new source of capital, they will open an office in a larger city where business is thriving. After 'refueling', so to say, the firm now has enough financial backing to continue expanding.

⁴ 5/8 for both banking & finance, and law

⁵ The following are merely hypotheses to explain the above, and although these assumptions are based on inferences made from the course of the research, they may be incorrect.

⁶ <http://www.fundinguniverse.com/company-histories/DARcy-Masius-Benton-amp;-Bowles-Inc-Company-History.html>

Studying World City processes is usually the most effective when looking at the entire system, instead of focusing on just one individual point. This figure encourages us to do just that, as trying to make inferences from a single city will achieve very little.

Evidently, there are three distinct regions through which global firms move: the Americas, Europe/Africa, and Asia. The length of the shortest trajectory, the distance between the two closest connected cities (Brussels and Hamburg) is, in pixels

$$6^2 + 6^2 = 36 + 36 = 72 \rightarrow \sqrt{72} = 8.48$$

The longest trajectory, between Los Angeles and Sydney, is

$$324^2 + 936^2 = 10,4976 + 87,6096 = 98,1072 \rightarrow \sqrt{98,1072} = 990.4.$$

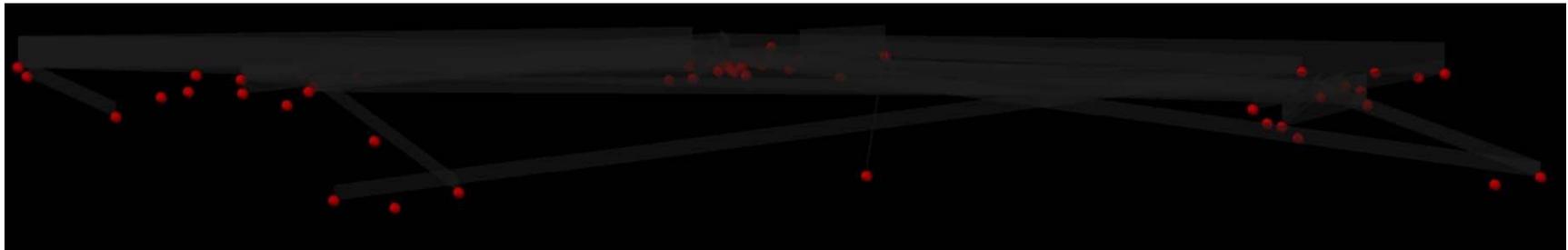
However, judging from a glance at the figure alone, a graph of the average connection length would be negatively skewed, with the average sitting on the higher end of the range (around the 600s). Firms appear to achieve global status by situating their branches as far away from each other as possible, and connections between adjacent cities are rare. By counting the number of within-region and between-region connections made by each firm, the following table was created to facilitate the comparison process:

		same region	diff. region
Bank	HS	19	16
	BC	0	4
	SC	31	21
	CS	3	1
	DR	15	10
	CP	11	4
	BT	2	1
	AB	6	3
		87	60
Adv	GR	14	17
	DB	28	7
	JW	4	1
	OG	1	2
	DS	15	20
	YR	1	2
		63	49
Law	BM	22	37
	WC	10	11
	LL	8	6
	SA	2	0
	BC	4	2
	DW	4	3
	JD	13	15
	CC	6	1
		69	75
TOTAL		219	184

The results are rather perplexing, as they appear to disagree with the expansionist tendency of global firms. One explanation is that initially, firms adhered to the expected pattern of attempting to establish a branch in each region. After an office is planted firmly in each region, perhaps the firms then begin to expand in a concentric manner, with offices radiating out of the central large city and springing up in nearby smaller cities. This would actually make sense, because concentric expansion is economically efficient. There is a solid client base to build upon, communication and transportation would cost less (no long-distance bills), and employees could be shifted to the new office, saving hiring and training costs. Since smaller cities outnumber the larger cities by a wide margin (the ratio is 13 to 1), connections between the smaller cities in the same region will eclipse the dramatic initial inter-continental connections. Another explanation is that the regions were too general. If sub-regions were to be created between nodes that were classified as one region but are, in reality separated by vast distances (Pacific-North America, Atlantic-North America, for example), more inter-regional connections would appear, and then the initial hypothesis would have better representation from the data.

The Third Dimension : Trajectory Frequency

The map displaying all the connections between the various cities is then given a new dimension, by extruding connections according to the frequency of that particular trajectory. The figure is then simplified by eliminating connections with a frequency of one or less⁷.

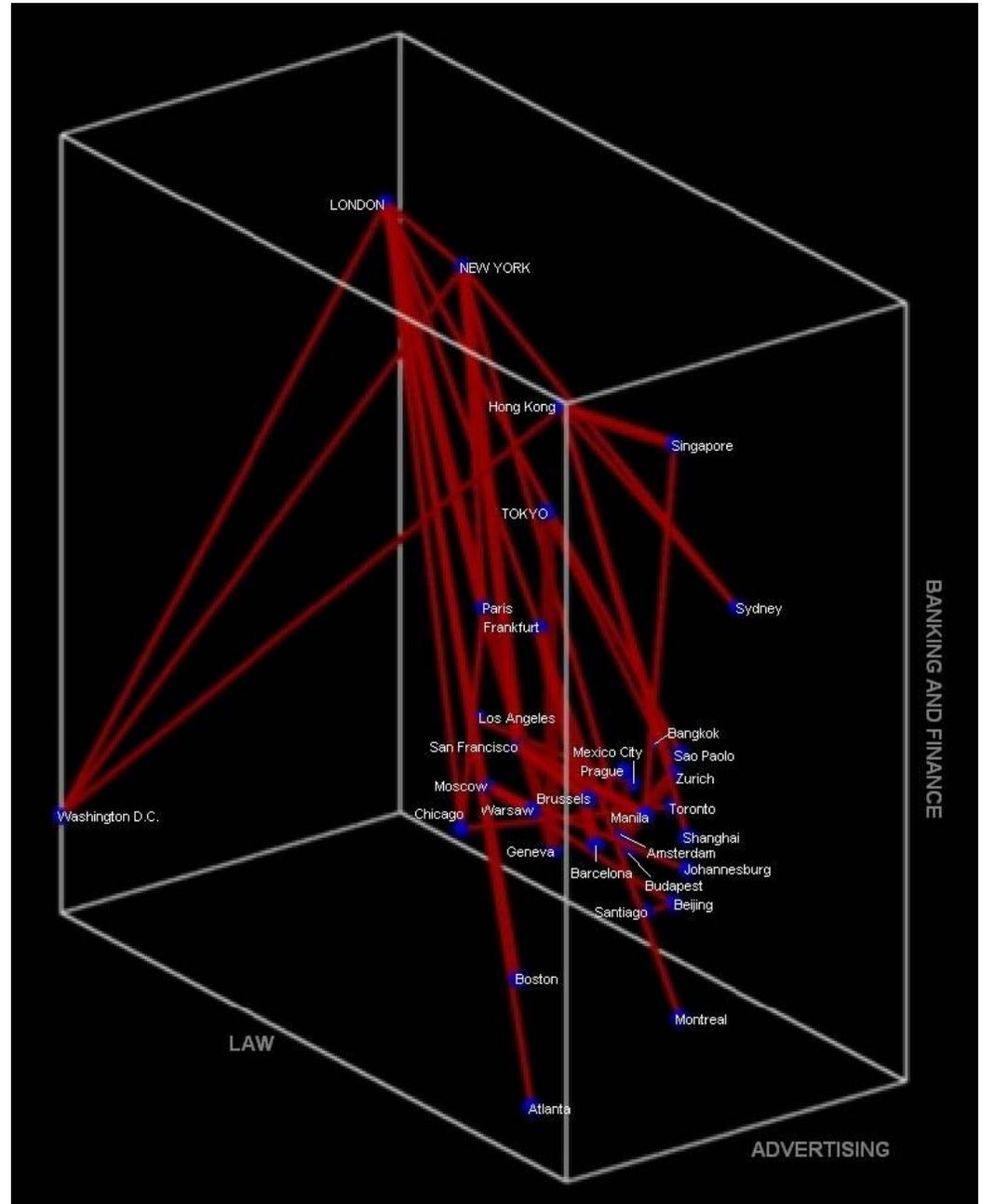


To further clarify the data (and partially for the sake of curiosity), a prism was created, with advertising firms on the x-axis, banking & finance firms on the y-axis and law firms on the z-axis. Cities were then positioned inside the cube based on the number of times the city was mentioned in each of the firm-categories in the history⁸. For example, Washington D.C. was never mentioned by advertising firms, so it does not move along the x-axis. It was mentioned 3 times in the histories of banking & finance firms, therefore it moves 3 units up the y-axis. Washington D.C. is also mentioned 21 times in law firms, and so it moves towards the back 21 units. Connections are then drawn between cities, and as connection frequency increases, so does the trajectory thickness:

⁷ pathways that were only chosen by one firm, or not chosen at all

⁸ found at the end of the document

Cities	Adv	BaFi	Law	TOTAL
Amsterdam	5	8	4	25
Atlanta	1	1	3	6
Bangkok	7	10	5	32
Barcelona	4	8	4	24
Beijing	6	6	3	21
Boston	2	4	5	15
Brussels	7	5	10	27
Budapest	6	7	5	25
Chicago	3	7	9	26
Frankfurt	5	13	8	39
Geneva	3	10	3	26
Hamburg	3	4	0	11
Hong Kong	8	18	11	55
Johannesburg	5	8	1	22
London	9	20	17	66
Los Angeles	8	7	15	37
Manila	5	9	3	26
Mexico City	6	9	5	29
Montreal	4	4	0	12
Moscow	4	8	9	29
New York	10	20	22	72
Paris	6	12	12	42
Prague	5	10	4	29
San Francisco	5	9	9	32
Sao Paulo	7	10	4	31
Santiago	5	6	3	20
Seoul	5	13	0	31
Shanghai	5	9	1	24
Singapore	9	18	7	52
Taipei	7	14	5	40
Tokyo	6	16	9	47
Toronto	6	9	3	27
Warsaw	4	8	7	27
Washington, DC	0	3	21	27
Zurich	6	10	3	29
TOTAL	187	333	230	1083



If we were to make inferences based on previous sections of this analysis, we would expect the most closely joined cities to be the geographically furthest away from each other and have the most differences. This is indeed true. Take a look at San Francisco: all three cities connected to it are thicker than the average connections. The three countries that it shares the most intimate connections with (London, Brussels and Manila) and are all in a different region. Notice also that that even though Los Angeles bears the most resemblance to San Francisco in terms of the proportion of firms⁹, the connections are not frequent enough to be accounted for in this figure. The opposite pattern can be seen as well, in the Hong Kong-Singapore and Warsaw-Moscow connections, proving that possibility of successful intra-regional connections.

The final observation that this figure makes clear is that the Big 3 (London, New York and Tokyo) are not connected at all, not only because their connection frequencies are low, but also because in the actual data, no firms chose to open two consecutive offices in two World Cities. There are also no connections between the Little 4 (Montreal, Boston, Atlanta, and Washington D.C.), which is logical, since firms usually have more to gain by moving up the World City tier. These two observations are congruent with the conclusions made in the 2-dimensional section of the analysis.

⁹ The ratio of banking/finance firms, advertising firms and law firms in the city

The Fourth Dimension : Changes over Time

Attempting to capture the essence of a city in 'a snapshot' has its limitations. Cities are constantly shifting, and observing a city at one point of time will provide nothing more than a fleeting glimpse at its dynamics. After a few decade or so, the city will have slipped into a different relative position on World City hierarchy, and the previous findings will no longer be valid. When the element of time is introduced into the study, one can have a better image of where cities are at the moment, why they are there, and, based on the movements of firms, where their momentum might bring them in the future. Many homepages of firms have a section called 'Our History', dating the specific years in which the firm opened a new office in a new location. This data allows us to create a timeline¹⁰ of the cities that were considered popular in each era, general trends and their changes over time, and the length of years in between office openings in one of the three World Cities. Unfortunately, some of the data provided are vague, as firms usually state that in a certain year (or, even worse, in a certain *decade*), they opened an office in several cities, without stating the order. For example, the JWT timeline¹¹ states that in between 1877 and 1927 (half a century!) they have opened an office in every country that General Motors (their primary client) operates in. In less extreme cases cities were placed in the order that resembles the trend found in other firms of the same category. Please keep in mind that errors are likely, even though all effort has been made to minimize inaccuracies.

¹⁰ Found at the end of the document

¹¹ All the sources for each timeline can be found in the bibliography

Banking and finance firms stand out as the earliest firms to be founded, as most of them has histories tracing all the way back to the Renaissance era, some even further. Although many of these firms originated from European cities, they were remarkably global, which indicates that globalization is not a modern and recent concept, but has existed for centuries. The early global nature of banking and finance firms shows traces of colonial patterns, as office sprung up all over the world in the colonies of the firm's home country. This is particularly true for banking and finance firms that were founded in London, and followed the British Empire around the globe. **Advertising firms** began to appear in the early 1990s, but they were the most active in the 1960s and 1970s, the prosperous post-war decades in which mass-consumerism was rising. **Law firms** began to expand globally and flourished in the 1980s, possibly because of the rise of multinational corporations, resulting in the high demand of corporate law firms that were able to operate internationally.

History had a significant effect on these firms as well, as significant events had an obvious impact on firm trajectories. The pre-1990 era of colonialism has already been discussed in the previous paragraph, so we will begin in the twentieth century. World War I in the **1920's** resulted in very little expansion in firms, and European cities that were extremely popular prior to the war were now war-zones to be avoided. North American cities were now favored by global firms. World War II in the **1940s** shifted the economic world from the Atlantic Age to the Pacific Age, as the United States were involved in this war. Since trans-Atlantic connections became dangerous and unstable, firms began to focus on the other side of the world, which resulted in the rise of popularity of Pacific-Rim (especially Asian) cities. The trends begin to blur after this, since most firms had already settled into all the cities that they wanted, and the movements now merely involve filling in the gaps, placing an office in a city is not yet part of the firm's global network.

Conclusions

The analysis reveals a vast amount of information about the relationship between global cities and global firms by taking a multidimensional approach. Firms and cities were analyzed not individually, but through their relationships with each other, and these relationships were not taken in one point in time, but over many decades. Through this we are able to observe the movement patterns of global firms, the preferred trajectories, and how firms have changed over the vastness of time and space.

	TOTAL	Advertising						Banking / Finance									Law						
		GR	DM	TH	OM	DE	YR	HS	BA	ST	CR	DR	PA	BT	AB	BM	WC	LL	SK	BC	DW	JD	CC
Amsterdam	17	1	1	1	1	1	0	2	2	0	0	1	2	0	1	3	0	0	0	0	0	0	1
Atlanta	5	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3	0
Bangkok	22	1	1	1	1	3	0	2	2	3	0	0	1	1	1	3	1	0	0	0	0	0	1
Barcelona	16	1	1	1	1	0	0	1	3	0	0	0	3	0	1	3	0	0	0	0	0	0	1
Beijing	15	0	1	1	1	3	0	1	1	1	0	0	1	1	1	2	0	0	1	0	0	0	0
Berlin	4	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2	0	0	0	0	0	0	0
Boston	11	0	0	0	0	2	0	2	0	0	0	1	0	1	0	0	0	2	3	0	0	0	0
Brussels	22	1	1	1	1	2	1	0	2	0	0	0	2	0	1	3	1	1	1	0	1	2	1
Budapest	18	0	1	1	1	1	2	1	1	0	0	0	2	2	1	2	2	0	0	0	0	0	1
Buenos Aires	16	1	1	1	1	0	1	2	1	1	1	0	1	1	1	3	0	0	0	0	0	0	0
Caracas	14	1	1	1	1	0	2	1	1	0	0	0	1	1	1	3	0	0	0	0	0	0	0
Chicago	19	0	0	1	1	0	1	2	2	0	0	0	1	1	1	3	0	0	3	0	0	3	0
Copenhagen	7	1	1	1	1	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Dallas	10	0	0	1	0	0	0	2	0	0	0	0	1	0	0	3	0	0	0	0	0	3	0
Dusseldorf	10	1	1	0	0	3	0	2	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Frankfurt	26	1	1	1	1	0	1	1	2	0	0	3	3	3	1	3	0	0	1	0	0	3	1
Geneva	16	1	1	0	0	0	1	2	2	0	0	1	2	2	1	2	0	0	0	0	0	1	0
Hamburg	7	1	1	1	0	0	0	0	1	0	0	2	0	0	1	0	0	0	0	0	0	0	0
Hong Kong	37	1	1	1	1	2	2	3	3	3	1	1	3	3	1	3	2	0	2	1	1	1	1
Houston	9	0	0	1	0	0	0	2	0	0	0	0	1	1	1	1	0	0	2	0	0	0	0
Istanbul	17	0	1	1	1	2	1	2	0	0	1	0	1	2	1	0	2	0	2	0	0	0	0
Jakarta	20	0	1	1	1	2	0	1	2	2	0	0	2	3	1	3	1	0	0	0	0	0	0
Johannesburg	14	0	1	1	1	0	2	2	0	2	1	0	1	1	1	0	1	0	0	0	0	0	0
Kuala Lumpur	18	1	1	1	1	2	0	3	3	3	0	0	1	1	1	0	0	0	0	0	0	0	0
London	46	1	1	1	1	3	2	3	3	3	3	1	3	3	1	3	3	3	3	1	1	2	1
Los Angeles	30	1	1	1	1	3	1	2	0	2	0	0	1	1	1	0	3	3	3	3	3	3	0
Madrid	22	1	1	1	1	1	2	2	3	0	0	0	3	2	1	3	0	0	0	0	0	0	1
Manila	17	1	1	1	1	1	0	2	1	2	0	0	1	2	1	3	0	0	0	0	0	0	0
Melbourne	14	1	0	1	0	2	1	2	2	1	0	0	0	0	1	3	0	0	0	0	0	0	0
Mexico City	20	1	1	1	1	0	2	2	1	1	0	1	1	2	1	3	2	0	0	0	0	0	0
Miami	13	0	0	1	1	0	2	0	0	2	0	0	0	1	0	3	3	0	0	0	0	0	0
Milan	23	1	1	1	1	1	3	1	2	0	1	1	3	2	1	3	0	0	0	0	0	0	1
Minneapolis	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
Montreal	8	1	1	1	0	0	1	2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Moscow	21	0	1	1	0	1	1	2	1	0	3	0	1	0	1	3	2	2	1	0	0	0	1
Munich	6	0	0	0	0	0	0	0	2	0	1	1	0	0	1	1	0	0	0	0	0	0	0
New York	52	1	1	1	1	3	3	3	3	3	2	2	3	3	1	3	3	3	3	3	3	3	1
Osaka	3	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Paris	30	1	1	1	1	2	0	2	3	0	0	0	3	3	1	3	3	0	2	0	0	3	1
Prague	19	0	1	1	1	0	2	2	1	0	3	0	1	2	1	1	2	0	0	0	0	0	1
Rome	10	0	1	1	0	0	0	1	2	0	0	0	1	0	1	2	0	0	0	0	0	0	1
San Francisco	23	1	1	1	0	0	2	2	2	0	1	1	1	1	1	3	0	3	3	0	0	0	0
Sao Paulo	21	1	1	1	1	0	3	2	2	0	1	0	2	2	1	3	1	0	0	0	0	0	0
Santiago	14	1	1	0	1	0	2	2	1	0	0	0	1	1	1	3	0	0	0	0	0	0	0
Seoul	18	0	1	1	1	2	0	2	2	2	0	0	3	3	1	0	0	0	0	0	0	0	0
Shanghai	15	0	1	1	0	3	0	2	0	3	0	0	3	0	1	0	0	0	0	0	0	0	1
Singapore	34	1	1	1	1	3	2	3	3	3	1	1	3	3	1	3	2	0	1	0	0	0	1
Stockholm	14	1	1	1	1	0	2	2	0	0	0	0	0	0	1	3	2	0	0	0	0	0	0
Sydney	27	1	1	1	1	3	2	2	3	2	0	1	2	3	1	3	0	0	1	0	0	0	0
Taipei	26	1	1	1	1	3	0	2	2	3	0	0	3	3	1	3	0	0	0	0	0	2	0
Tokyo	31	1	1	1	1	0	2	2	3	2	1	1	3	3	1	3	3	0	1	0	0	1	1
Toronto	18	1	1	1	1	1	1	2	2	0	0	1	2	1	1	3	0	0	0	0	0	0	0
Warsaw	19	0	1	1	1	0	1	1	1	0	3	0	1	1	1	3	3	0	0	0	0	0	1
Washington,	24	0	0	0	0	0	0	2	1	0	0	0	0	0	0	3	3	3	3	3	3	3	0
Zurich	19	1	1	1	1	0	2	2	1	0	0	2	1	3	1	3	0	0	0	0	0	0	0
TOTAL		33	43	47	37	55	55	89	79	44	25	22	75	70	48	112	45	20	36	11	12	33	20

GR	DM	TH	OM	DE	YR	HS	BA	ST	CR	DR	PA	BT	AB	BM	WC	LL	SK	BC	DW	JU	CC
1690						1690	London							1690							
1771						1771				Dresden				1771							
1800						1800				Berlin				1800							
1810						1810			Vienna					1810							
1820						1820					Antwerp		The Hague Jakarta	1820							
1830						1830					Brussels			1830							
1840						1840					Paris			1840							
1850						1850		(London) Middle Ea. Chennai Bombay Calcutta Shanghai Singapore			Marseille		London	1850							
1860						1860	HK Shanghai London San Fran Yokohama India	HK Port. Eliz. South Af. Indonesia Pakistan			Shanghai Calcutta Bombay Saigon HK Yokohama Alexandria London Amsterdam		Amsterdam	1860							
1870			New York			1870	Manila Singapore Malaysia Myanmar Sri Lanka Vietnam	Philippines Malaysia Penang Yokohoma		Hamburg			Paris	1870				St. Louis			
1880						1880	New York Vancouver Lyons St. Paul Minnesota Hamburg Tehran Bangkok	Japan Johannes.			Melbourne Sydney			1880							
1890						1890	Chicago	Sri Lanka Zimbabwe Sierra Le. Thailand Gambia Ghana Botswana	Prague	Milan London Mannheim Chemnitz			Westphalia Detroit	1890							Cleveland
1900	New York	Atlanta		Japan		1900	Buen. Air.	New York Bangladesh Zambia		Frankfurt Munich Leipzig	New York	New York	1900		New York						
1910						1910		Kenya Uganda Nether. Canary Is. Liberia Eq. Guinea Tanzania		Bucharest		Chicago	1910						Minnea.		
1920		Cleveland	Canada		New York	1920		Bahrain Jordan Korea				Paris London	Chicago	1920	Paris		New York				
1930		New York	Chicago Toronto Los Ang.		Chicago	1930			Budapest	Belgrade			1930								
1940		Mexico C.		New York	Tokyo	1940	Mexico C. Osaka Nagoya Kyushu			Minsk Brussels Antwerp Tokyo			Sao Paolo	1940	Chicago		New York			Washing	

Sources

Peter Taylor's Data

GaWC Data Set 6. Peter Taylor. Oct 29 07.

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