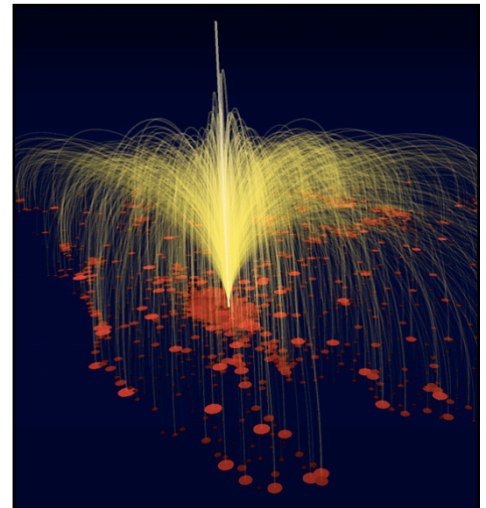


‘The economic crisis that erupted in 2008 will bring the dominance of London and New York as global financial centres to a end’. Discuss.

For the purpose of this essay, I visualise the city as an abstract, spinning top (Figure 1) constituted by the collisional dynamism of centripetal (“internalities”<sup>1</sup>, magnetism) and centrifugal (externalities, connectivity) forces constantly in momentum and commutation. Indeed as Perulli (2010) writes, ‘the city forms a system of dynamic networked organisation, evolving in space and time [...] a provisional order in a constant, chaotic movement. But also, fabric of relations always in the balance, a creation of spontaneous orders in perennial adaptation, conscious of sociality mixing with a sub-stratus almost biological.’ The hypnotic “spin” of the city as such is generated by two distinct but related urban processes that produce externalities, or the ‘positive bonus of locating economic activity in the city’ (Taylor, 2010). First there are dense patterns of intra-city relations (the ‘little movements in the hubs’ (Jacobs, 1970)) that create agglomeration effects and cluster advantages (internal cluster externalities). Second, there are strong flows of inter-city relations (‘the great wheels of economic life’) that create network effects and connectivity advantages (external network externalities).

Sagaram et. al (2005) concretise these ideas, identifying five key infrastructural elements that draw momentum into the spin of the city: (i) a favourable regulatory regime, (ii) competitive taxation structure, (iii) the presence of various socio-cultural factors (spaces of consumption/habitation) to draw and retain talent pools, (iv) the presence of financial variables (critical market depth and turn-over volume), and (v) the existence of sufficient levels of economic activity as a means of undergirding a viable commercial banking sector. Momentum, Porteous (1995) further suggests is absorbed by the presence of (vi) soft institutional structures and social networks that intermediate knowledge transfer and information flows and, (vii) in combination with the formal regulatory and institutional structures, create information economies that broker the orderly dissemination of information and create information transparencies necessary to the functioning and efficient spinning of the city.

Framing the city as this fluid, momentum-laden/driven mass naturally draws itself to the recent idea of “flow-place” in which the city is understood as a process ‘not because it constantly mixes flows [Castells’ argument], but because it is a communicational nexus in which flows and places are always being interconnected and *commutated*’ (Halbert et. al, 2013). Visualising the city therein as this space of collision and commutation of fluid (flow) and static (place/stock) substances, I explore how the ‘NY-LON axis’ (Wojcik, 2013) retains its prominence in the global city network. Fundamentally I suggest it is by effectively sustaining its extensive flow-space (GFNs, OFs) and intensive stock-space (stock markets, LSE, NASDAQ) through time such that liquidity and information is constantly either being grounded in or



**Figure 1.** *The spin of the city* - a city never stops or ends per se but unfurls as a chaotic and complex system (high dependence on initial conditions and subsequent existence between order and randomness (BOAR)). It can however spin with atrophic (slow, lethargic) or hypertrophic (rapid, energetic) tendencies and with intensive or extensive character.

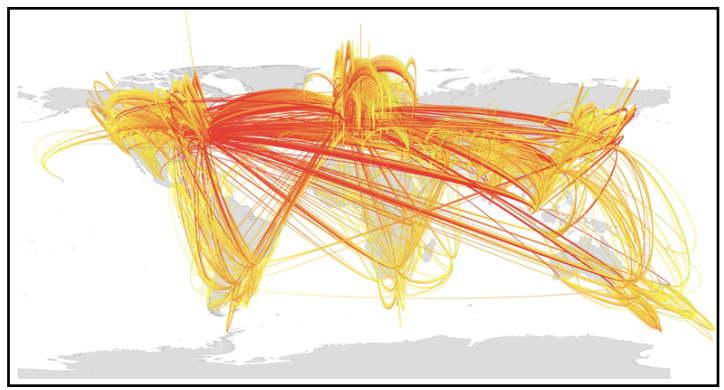
I explore later the potentials of the economic crisis to (dis)energise the “spins” of several financial centres. I approach several key questions, framed around the fracture line between the hierarchy/competition and network/cooperation schools of IFC studies. As such, is the erosion of spin in one city the addition of spin in another (a zero-sum game) and to what extent? Conversely, does the emergence of atrophic and intensive spin in a clique such as NY-LON, erode in totality all spins, or the average spin, of the network?

<sup>1</sup> Conceptually perhaps, this neologism of internality (in relation to the externality) might further deepen our understanding of the fluid and constitutive collisions of the city. In particular, when visualizing the “spinning top” and how liquidity and information are grounded in (stock) and/or channeled out (flow) of the city, internalities (in-terra: “into the ground”) and externalities (“ex-terra”: out of the ground) raise to the fore ideas of the centripetal and centrifugal in a hypnotic dance of impulsion and expulsion.

channeled out of the axis. Here, I argue, it is the dwelling of flow and stock substances - however fleeting - that draws momentum into the spin or 'flow-place' of the New York-London dyad.

Throughout I use city dyad analysis rather than individual, attribute analysis (i.e. London has this, Hong Kong has that) specifically because the emergence of cities and the reproduction of spin thereafter is an inherently relational and imitative process, indeed as Jacobs (1970) writes, 'cities do not arrive singly, rather than come in "packs" [...] as [subsumable regional] city networks in which horizontal inter-city relations are central and hierarchical relations, contingent.' This is not, however, to suggest that competition and hierarchy are redundant. That would rupture the fundamental basis of this discussion. Rather, at any one time while some cities are relatively economically stagnant (lethargic spin; producing no new work), others continue to generate wealth (energetic spin; producing new network) that - contrary to a zero-sum game - provide the reproductional conditions for the stagnant to become dynamic again through a new round of "import replacement"<sup>2</sup> (Jacobs, 1984). Indeed as Wojcik (2010) contends 'congestion applies to agglomerations in space, but not to networks.' The network rather has buoyancy and rebound after its lethargies. It is this conceptualisation - of evolving mutualities, imitations and "rising-fallings" then, within the network and not beyond it - that forms the foundation of this discussion.

Fundamentally, if network processes (central flow theory) are universal and hierarchical processes (central place theory) contingent, the economic crisis that erupted in 2008 can be observed as an exercising of this contingency. I suggest that the eruption effectively produce(d/s) different accelerative and decelerative momentums - energies and lethargies respectively - to the spinning tops in the east (HONG-SHANG-JING) and west (NY-LON-WASH<sup>3</sup>) of the world city network. This orientalist framing - though seemingly crude and caricatured - draws on extensive research by Aalbers (2010) into the 'reOrientation' and Lai (2010) into the 'new, emerging centralising tendencies [that] challenge previous centralising (NY-LON)'. I follow Wojcik (2013) then, in exploring the several areas of finance in which the concrete tensions between extending and challenging the NY-LON axis are likely to play out. These include: (i) the access of



**Figure 2.** *Liquidity and information flows.* Conceptualising flow-space (extensive) as the horizontal lines and stock-space (intensive) as the vertical, note the vertical depth and density of Europe's stock-space relative to Asia's. Furthermore, observe the deep, horizontal Atlantic flow-space (Ny-Lon axis) relative to the Eurasian flow-space (Hong-Lon dyad).

- 1) There is a contrast between the China cities and Dubai in terms of major dyad links despite similarities in their capital investments in real estate (where the high cranes are). Has this made China cities more resilient and if so exactly how?
- (2) Beijing's dyads appear to be more political than Shanghai's. What specifically is this political process within world city network formation?
- (3) Beijing is particularly well connected to other western Pacific cities. Does this indicate initial signs of dependency relationships and if so what forms might this take?
- (4) Shanghai has stronger relations with more important cities than Beijing. Does this make Shanghai's position more resilient and what might this mean?
- (5) Shanghai has more rapid growth in connectivity than the other two China cities. How sustainable is this - are we at the beginning or near the end of the process?
- (6) Hong Kong appears to have been successfully repositioning itself. What exactly does this mean for the firms operating through Hong Kong?

**Figure 3.** *Dyadicity as diffuse* (Taylor, 2012) Note, along with figure 4, how connectivity is not concentrated to mere NY-LON-WASH - HONG-SHANG-JING collisions and mutualities such that Shanghai is more strongly connected to London and New York than Beijing, and Beijing, with stronger links to political world cities such as Washington and Brussels, and to other Pacific Asian cities, than Shanghai.

<sup>2</sup> 'Import replacement theory' developed by Jacobs (1984) suggests that the economic expansion of the network, or the increase in 'intensity, extensity, velocity and impact' (Held, 1999) of the average spin occurs in the moment where 'an advanced service firm opens an office in a new city and replaces imports [the city] had previously relied on' transforming them into endogenously produced exports. Furthermore, this is not a zero-sum game because the generation of new exports to replace lost exports, and conversion of import replacements to become new exports, both lead to a dynamic city network based upon evolving mutualities and imitations in an overall expansion of spins or economic life.'

<sup>3</sup> Hong Kong-Shanghai Beijing and New York-London-Washington

leading western investment banks to the Chinese stock market, and their relations with sovereign wealth funds; (ii) cross-listing of Chinese companies in London and New York, intermediated mainly by US investment banks, and often routed via OFCs like British Virgin Islands, triggering negative reactions from Beijing; and (iii) the response of Asian exchanges to the growing power of New York and London exchanges in the global stock market.

The latter two in particular reiterate the idea that network prominence as a “spin-state” (or, more accurately a “spinning state”), is reproduced through effective governance of one’s intensive stock-space (stock market magnetism, foreign listings) and extensive flow-space (Offshore Jurisdictions, recycling channels). In other words, network prominence

is conditioned by a spinning top’s capacity to involve *and* evolve itself within other spin paths of the network. At a level of abstraction then, my orientalist framing turns to China and its gradual ‘opening up’ to the (capitalist) world city network (Lai, 2009). I suggest that the stock-space (HSE, SSE<sup>4</sup>, “dual listings”) and flow-space (SWFs<sup>5</sup>) of the HONG-SHANG-JING triad is growing, particularly in terms of depth, density and dyadicity (inter-city connectivity). Indeed as an independent report of the City of London (2009) states, ‘Asia is now amongst the most important sources of liquidity, credit and investment capital within the global financial system.’ Significantly however, I frame the Asian emergence in relational terms, cognisant of the resilient and reproductional capacities of individual “spinning tops” and the incumbent network (i.e the one with NY-LON at its ‘clique’ core) as a whole. The same report continues:

‘however, despite assuming this increasingly important function at a time when questions have been asked about the long-term durability of the current global financial architecture, it is striking that Asian investors have continued to recycle most of their surpluses through traditional centres such as London and New York rather than through the region’s own financial centres’ (City of London, 2009).

This perhaps illuminates the misleading elements in the conceptualistic, orientalist framing I have undertaken. Indeed rather than the ‘stock-space’ and ‘flow-space’ of NY-LON-WASH and HONG-SHANG-JING existing independently and therefore easily in opposition to one another, they are deeply and processually enmeshed and fused. Indeed, although the “spinning-top” city or Global Financial Centre forms the abstract core of this discussion, the “real” inter-city relations I am concerned with occur through the infinitesimal collisions of financial actors, predominantly within global Advanced Business Services (ABS; headquarter-subsidiary

<sup>4</sup> The Hong Kong Stock Exchange (HSE) and Shanghai Stock Exchange (SSE)

<sup>5</sup> Sovereign Wealth Funds (SWFs)

City-dyads	Dyad connectivity
1 London-New York	1,731
2 Hong Kong-London	1,390
3 Hong Kong-New York	1,372
4 New York-Paris	1,363
5 London-Paris	1,356
6 New York-Tokyo	1,237
7 London-Singapore	1,234
8 New York-Singapore	1,219
9 London-Tokyo	1,193
10 London-Shanghai	1,132

Figure 4. Dyadicity as diffuse (Taylor et. al, 2012)

PRIME ATTRIBUTES	MARKETS	HIERARCHIES	NETWORKS
Social structure	De-centralized	Pyramidal	Horizontal
Agents	Independent	Dependent	Interdependent
Enabling action	Contracts/law	Custom/rules	Reciprocity/trust
Social relations	Equal competitive	Unequal competitive	Cooperative
Key attribute	Price mechanism	Bureaucratic	Mutuality
Antithesis	Monopoly	Anarchy	Atomization
Major sphere of activity	Economics	Politics	Social

Figure 5. The network as increased opportunities (Thompson, 2003). Note how the competitive process as hierarchy is much simpler than the cooperative process as network. For instance writes Taylor (2012): ‘with a roster of 15 cities arranged as a hierarchy (1, 2, 4, 8) links are restricted to just 14 possible inter-city relations; a network of 15 cities encompasses a complete 105 possible links. Thus in this case, a hierarchical presumption would eliminate 91 links from consideration, that is to say, 87% of inter-city relations are ruled out of play before analysis begins.

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 São Paulo	54.26	16 Buenos Aires	60.62
17 San Francisco	50.43	17 Mumbai	59.88
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
21 Buenos Aires	46.81	21 São Paulo	55.96
22 Mumbai	46.81	22 Zurich	55.51
23 Shanghai	43.95	23 Amsterdam	54.60
24 Kuala Lumpur	43.53	24 Jakarta	53.29
25 Beijing	43.43	25 Frankfurt	51.58
26 Seoul	42.32	26 Los Angeles	45.18
27 Moscow	40.76	27 San Francisco	41.35

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 6. Pathways of Change: Shifting Connectivities in the World City Network even prior to the crisis, 2000–2008 (Derudder et. al, 2010). The authors at GaWC suggest that, ‘although the NY–LON dyad still holds prominence in the network, its structure has become more horizontal between 2000 and 2008, indicating a world-wide diffusion of globalisation processes. ‘The result’, they write, ‘has been an increasingly integrated world city network.’ Derudder et. al (2010) further note that Shanghai and Beijing witnessed the most substantial connectivity gains during this period as ‘China is slowly being opened up [...] not only through the well-established gateway of Hong Kong, but also through Beijing and Shanghai; the latter cities therein developing along complementary lines respectively as a political centre and as the mainland’s premier business and financial centre’

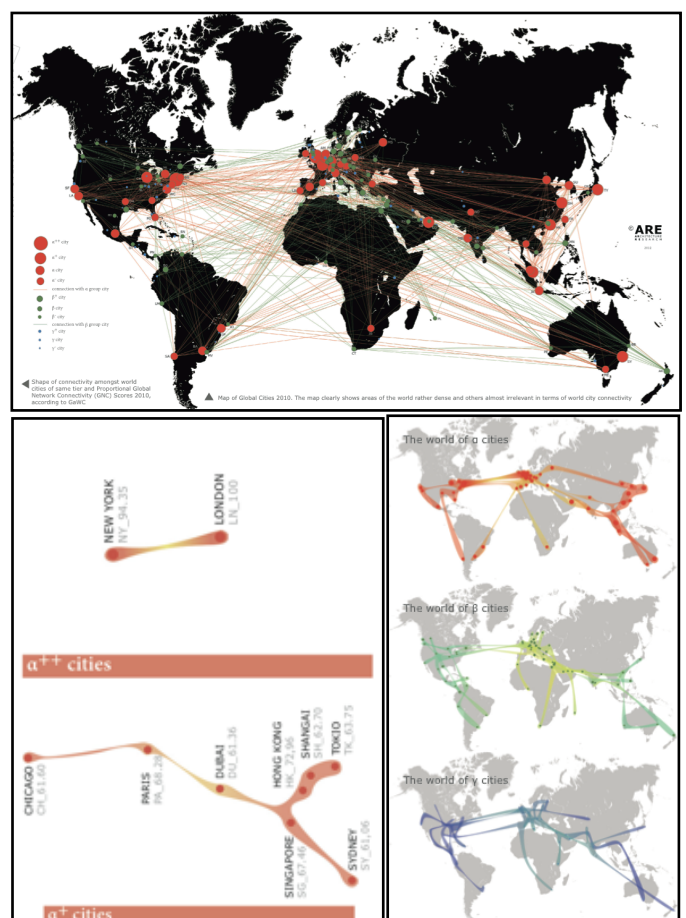
operations). The dilemma of world cities research in this sense is as much methodological as it is ontological. Dyadicity is diffuse, multi-directional and non-linear. As such, I argue that the growing depth and density of the HONG-SHANG-JING triad is not a zero-sum game with the NY-LON axis but rather a “reOrientational” shift or convergence upon the prominent spinning-state occupied by the latter within the network. “Prominence” here replaces “dominance” precisely in order to highlight the subtlety and relationality of these changes in the world city network as vertical momentums and rupturings (“ends”) constantly fuse and blur with horizontal mutualities and dyadicities (“becomings”) to alter spinning-states across space and time.

Focusing on the imitative elements of the world city network, Taylor (2012) suggests that its recent historical development seems to have involved the creation of two city-triads - NY-LON-WASH and HONG-SHANG-JING - each related to key stages of network formation and reproduction. Out of the ‘initial globalising impetus for network formation’, the NY-LON-WASH triad emerged with each city having a distinctive, dyadic relation to one another. Taylor argues that momentum in these early stages was (and still is) largely conditioned by these mutualities, he writes:

New York is the leading financial centre and Washington, the leading political centre (including finance governance of the IMF and World Bank) both located within the leading state. London has the role of being the global platform outside the state's jurisdiction. The latter allows for certain processes that cannot occur in the leading state, for instance the creation of a ‘Euro-dollar’ market in London as an early step towards globalization (Taylor, 2012).

The latest impetus for network development however seems to have created a very similar triad with the emergence of HONG-SHANG-JING. Shanghai as such is the fastest growing finance centre and Beijing the fastest growing political centre (including finance governance of state banks) both within the fastest growing country. Hong Kong then, like London, has the role of being a global platform and post-jurisdictional space in which certain processes are performed that cannot occur within the state. Lai (2009) propositions that these relations underlie China’s ‘one country, two systems policy’ and why, more so how, Hong Kong continued to prosper after independence in 1997 when many had envisioned its demise. Drawing Taylor’s (2012) reproductional ideas into the conceptual map of stock-space and flow-space, I suggest that HONG-SHANG-JING as a sub-network, or emergent axis of the WCN produces intensive momentums that challenge the NY-LON axis in its prominent spinning-state. Specifically, I frame the idea of an eastern stock-space growing in depth and dyadicity around Wojcik’s (2010) proposition:

with the drought of capital available for corporations on equity markets in North America and Europe [following the crisis], stock markets in the BRIC countries and other emerging markets may for the first time have a chance of attracting foreign issuers to their own financial centres.’



**Figure 7.** NY-LON-(WASH) and HONG-SHANG-JING - The existent and the emergent? (GaWC, 2010). The authors write: ‘if the world is observed from the point of view of the connectivity of the world cities, a new image emerges, where each city is virtually oriented to other cities of the same level of inter-connectivity. National or continental maps give way to a new world configuration intended as an archipelago, where each city appears utterly separated from its geographical surrounding and closer to other cities of same level. The leading parameters for the new configuration are based on mutual connections, primarily in the global economic system.’

The emergent positive mutualities between the Hong Kong Stock Exchange (HKSE) and Shanghai Stock Exchange (SSE) suggest a deepening and densifying of the Chinese stock-space. Lai (2010) observes the increasingly common corporate strategy of dual listing on the SSE and HKSE that frames them as less competitors markets than complementary ones. Specifically, each present different opportunities and advantages to mainland Chinese companies due to the divergent ways in which liquidity and information are grounded in (centripetal) and channeled out (centrifugal) of their respective cores. Lai furthermore suggests that there is a chronology to such strategy wherein ‘companies gain experience in public listings, improve corporate governance, information disclosure and accounting standards, and receive some capital injection from domestic investors through the SSE, which then puts them in a stronger position to meet higher regulatory standards and attract foreign investors through the [deeply liquid] HKSE’ (Lai, 2010).

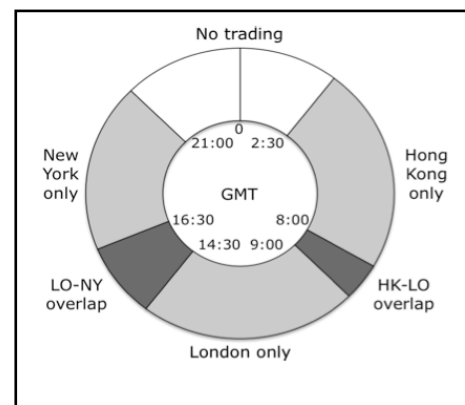
Just as the Chinese ‘stock-space’ is reproduced through these “internal” mutualities, the triad draws a spinning momentum from “external” mutualities it holds with the NY-LON axis. In observing these relations however the line, albeit conceptual, separating an intensive ‘stock-space’ from extensive ‘flow-space’ becomes considerably more blurred. Wojcik (2010) posits the existence of a global triadic mutuality, what he terms the ‘tri-city of NY-LON-KONG [in which] the leading English-speaking business centres are threaded together across each 8-hour time zone’ enabling constant flow of (intra and inter-firm) liquid and information across the 24-hour period. Interestingly however and in line with this discussion, he observes how the financial crisis of 2008 (as an “exercising of contingency and awakening of pre-existent hierarchy) isolated New York and increased the significance of collaboration between London and Hong Kong. In particular, Wojcik relays the value of private information relative to public information on stock markets and how this value varies depending on market conditions, he writes:

with a bull market still in place in 2006 and early 2007, New York was confident in information it was receiving about HSBC and its power to interpret this information. It was in late 2007 that the problems building up in the financial sector [however] turned public information about banks much less valuable, and eventually (at the peak of the crisis in September 2008) worthless. It was exactly in this period that the [private] informational advantage of London and Hong Kong [particularly the HK-LO overlap (Figure 9)] over New York increased (Wojcik, 2010).

There are then in this respect imitative and reproductional elements within and between axes in the world city network. Indeed as Taylor’s (2012)

Advantages of listing on SSE	Advantages of listing on HKSE
<ul style="list-style-type: none"> <li>• Lower fees</li> <li>• Shorter listing process</li> <li>• Large RMB capital market and established brand reputation; possibility of obtaining better price per share</li> <li>• Politically motivated choice for listing on a mainland stock exchange</li> </ul>	<ul style="list-style-type: none"> <li>• Bigger and more liquid market, able to raise more capital (in foreign/convertible currency)</li> <li>• Improves international reputation and increases brand recognition for overseas expansion</li> <li>• More stringent listing process seen to boost corporate governance and company valuation</li> <li>• For private companies, a better option to queuing with SOEs on the mainland</li> </ul>

**Figure 8. Mutualities in the HONG-SHANG-JING triad** (Lai, 2010) Note that dual listing in the SSE and HKSE is not the only dyadic duality. Lai posits the existence of a dual headquarter structure between Beijing and Shanghai in which the former ‘continues to run policy-oriented operations related to monetary policy, financial research, note issuance, statistical data and anti-money laundering, while the Shanghai headquarter focuses on market-oriented and international activities such as conducting financial supervision, financial analysis and co-ordinating regional financial co-operation.



**Figure 9. HONG-LON trade overlaps** (Wojcik, 2010) The author notes, ‘price discovery appears particularly intensive when Hong Kong and London overlap, heterogenous information driving the market during it.’ Clark and Wojcik (2001) further stress how the performance of the US ‘stock-space’ during the Asian Crisis of 1997-98 was conditioned by dynamics of the flow-space (informational inflows, outflows, retention and loss) They documented ‘a less pessimistic attitude in New York than in London about the impact of the crisis, which was proved correct by the subsequent performance of the stock markets. They suggested that this advantage of New York was based on more heterogenous sources of information in New York (inflows from the high technology centres of Silicon Valley and Boston, as well as other large US financial centres like Chicago and Philadelphia).



**Figure 10. Rupture and fusion in the NY-LON-KONG triad during and after the financial crisis.** Note the thickness of the LON-HONG dyad relative to NY-HONG, in line with Wojcik’s research.

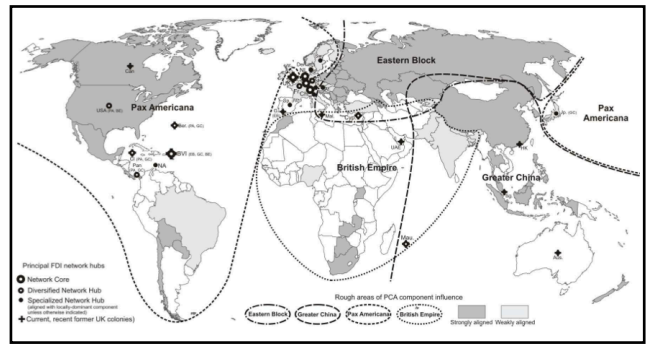
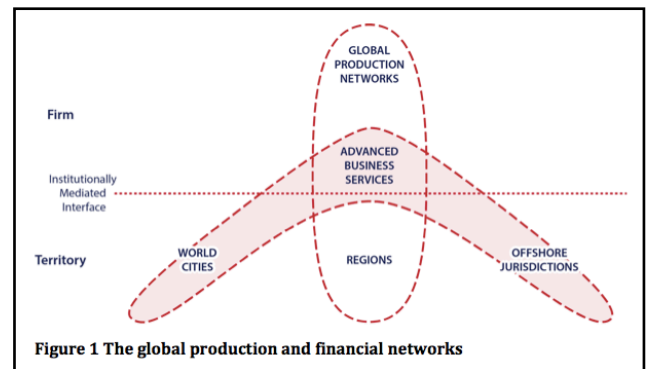
‘city dyad analysis’ (Figure 4) suggests, there are seamless mutualities, and collisions of lethargic and energetic spin, that constitute and reconstitute the network through time. (For instance, to take the top ten of his analysis, there is LON-NY, HONG-LON; HONG-NY; NY-PAR; LON-PAR; NY-TOK; LON-SING; NY-SING; LON-TOK; LON-SHANG.) Revisiting the idea of network prominence as conditioned by a city’s (spinning) capacity to involve and evolve itself *within* other spin paths of the network, I argue that London and New York still have a vast infrastructural hold (Figure 11) on the “global flow-space”. I further stress that this hold, or its “involvement and evolvement” in the liquid and informational spins of others, limits the emergence of HONG-SHANG-JING to that of a gradual ‘reOrientation’ rather than a zero-sum rupture. The pervasiveness of NY-LON’s Offshore Jurisdictional (OJ) infrastructure has its historical roots in the British Empire, Haberly et. al (2010) write:

acting as the principal nodes [within a global ‘flow-space’] are a network of formerly, and in some cases currently UK-controlled entrepot city-states ringing the world’s continents, typically established largely to control existing commercial networks—most importantly Arab, Indian and Chinese networks spanning the Indian Ocean and Southeast Asia [...] and while a similar mixture of local capital has once again come to overshadow British and western capital within this region, Principal Component Analysis suggests that it continues to flow through the network of strongpoints established by Britain, within which the City still plays the role of central financial command centre (Haberly et. al, 2010).

Falconbridge (2011) reiterates this idea of mutuality in the global recycling of capital wherein conditions of the network (i.e the prominence of NY-LON) are reproduced, he writes:

the activities of SWFs might not simply lead to a zero-sum game whereby the rebalancing of power in the financial system leads to the erosion of the powerfulness of ‘incumbent’ centres such as London and New York. Indeed SWFs played a fundamental role in enabling the survival of the financial services system in many ‘incumbent’ centres during the financial crisis, both because of the bailouts provided to failing banks and because of the transactions SWF’s enabled at a time of reduced liquidity.

Stilling that which is moving is a particularly difficult, error-laden business. This essay from its abstract, conceptual undertakings has attempted to make sense of the fluid, relational dynamics producing and reproducing the world city network anew. In this respect I suggest that the HONG-SHANG-JING triad will continue emerging and converging upon the prominent “spinning state” of the NY-LON-(WASH) axis. As I stressed earlier and reiterate now, the stock-space (HKSE, SSE<sup>6</sup>, “dual listings”) and flow-space (SWFs<sup>7</sup>) of the Asian triad is growing, particularly in terms of its



**Figure 11. NY-LON’s “infrastructural hold on the global flow-space” - Global Financial Networks and Offshore Jurisdictions (Haberly & Wojcik, 2010).** Conceptually, OJs might be observed as the dominant checkpoints and/or channels of the flow-space. As the authors suggest however, their locations rather than sporadic follow a deeply temporal logic: ‘the only major constraint on the footloose quality of offshore finance is the premium which electronic communications places on time zone proximity, which tends to produce longitudinally oriented OJ clusters.’ As such Roberts (1993) identifies three major clusters centered on the London Euromarket and its imitators in New York and Tokyo, and two minor clusters centered on the Persian Gulf OJs and Mauritius, and the Pacific Island OJs respectively.

<sup>6</sup> The Hong Kong Stock Exchange (HKSE) and Shanghai Stock Exchange (SSE)

<sup>7</sup> Sovereign Wealth Funds (SWFs)

depth, density and dyadicity (inter-city connectivity). This growth however is not framed by a rupturous, isolating geopolitics, or some 'imperial thesis' (Clark, 2001) but by increasing linkage, dyadicity and convergence. In key, throughout this essay I have stressed the importance of "prominence" over "dominance". This was precisely in order to highlight the subtleties and relationalities of such change within the world city network, where vertical momentums and rupturings ("ends") constantly fuse and blur with horizontal process - mutualities and dyadicities ("becomings") - to alter the spins of its cities.

## **Bibliography**

Clark, G.L., Monk, A., Dixon, A., Pauly, L.W., Faulconbridge, J., Yeung, H. W-c., Behrendt, S. (2010) Symposium: sovereign fund capitalism. *Environment and Planning A* 42(9): 2271-91.

Derudder, B., Hoyler, M. and Taylor, P. (2011) Goodbye Reykjavik: international banking centres and the global financial crisis. *Area*, 43/2, pp. 173-182.

Faulconbridge, J.R. (2004) London and Frankfurt in Europe's evolving financial centre network. *Area* 36/3: 235-244.

Haberly, D., Wójcik, D. (2013) Regional blocks and imperial legacies: mapping the global offshore FDI network. [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2346091](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2346091)

Jarvis D (2011) Race for the money: international financial centres in Asia. *Journal of International Relations and Development* 14(1): 60-95.

Kreston, N., Wójcik, D. (2013) The resilience of economic sectors to financial crises. [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2257956](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2257956)

Lai, K. (2011) Differentiated markets: Shanghai, Beijing and Hong Kong in China's Financial Centre Network, *Urban Studies*.

Taylor, P.J. 2011. Competition and cooperation between cities in globalization. *GaWC Research Bulletin* 351.

Taylor, P.J., Ni, P., Derudder, B., Hoyler, M., Huang, J., Witlox, F. 2011a. *Global Urban Analysis: A Survey of Cities in Globalization*. London: Earthscan.

Sassen, S. (1999) Global Financial Centers. *Foreign Affairs* 78 (1): 75-87.

Wójcik, D., Burger, C. (2010) Listing BRICs: Stock issuers from Brazil, Russia, India and China in New York, London, and Luxembourg. *Economic Geography* 86(3): 275-296. Also available on [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1431511](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1431511).

Wójcik, D. (2010) Stock market trading in space and time: information and HSBC share prices in New York, London and Hong Kong 2006-2009. Working Paper in Employment, Work and Finance No. 10-08. Available on: [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1585737](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1585737)

Wójcik, D. (2012) The end of investment bank capitalism: An economic geography of financial jobs and power. *Economic Geography*, 88:4, 345-368.

Wójcik D (2013) The dark side of NY-LON: Financial centres and the global financial crisis. Working Papers in Employment, Work and Finance 11-12. Oxford: School of Geography and the Environment. *Urban Studies* (forthcoming). Available on [www.ssrn.com](http://www.ssrn.com).

Wójcik D (2011) *The Global Stock Market: Issuers, Investors, and Intermediaries in an Uneven World*. Oxford: Oxford University Press.

## Appendix

The main purpose of developing a model is to open up new avenues of research. In this case this has occurred as follows:

1. *Applications of different techniques to global service value matrices:*
  - principal components analysis (Taylor et al 2002b; Taylor et al 2012a)
  - multidimensional scaling (Taylor et al 2001)
  - discriminant analysis (Taylor 2004)
  - fuzzy set analysis (Derudder et al 2003)
  - clique analysis (Derudder and Taylor 2005)
  - dyad analysis (Taylor et al 2010, 2012b)
2. *Disaggregation of inter-city connections:*
  - defining hinterworlds/orientations (Taylor and Walker, 2004; Taylor and Lang 2003; Taylor et al 2011)
  - measuring power differences (Taylor et al 2002c, Neal 2011)
  - comparing service sectors (Taylor et al 2004; Hanssens et al 2011)
  - identifying strategic networks and places (Taylor et al 2012c)
3. *Extensions to different agents:*
  - applying the model to network makers other than 'major APS' (e.g. NGOs) (Taylor 2004, 2005a, 2005b; Krätke and Taylor 2004; Lüthi et al 2010; Hoyler and Watson 2012; Roels et al 2012; Bassens et al 2010)
  - drawing on variations to the model using other network makers (Krätke 2011; Toly et al., 2012; Bassens et al., 2011)
4. *Extensions to different situations:*
  - application to mega city-regions (Taylor et al 2006 & 2008; Hoyler et al 2008a,b; Thierstein et al. 2008; Lüthi et al. 2010)
  - world-regional level analyses (Taylor and Derudder 2004; Taylor et al 2011; Schmitt and Smas 2012)
  - national-level analyses (Rossi and Taylor 2006, 2007; Taylor and Aranya 2006; Taylor et al 2009; Taylor et al 2011; Hoyler 2011; Grove and Blotvogel 2011; Lüthi et al 2012; Taylor et al 2012d, Taylor et al 2012b, Derudder et al 2012)
  - historical use of model (medieval and early modern Europe) (Verbruggen 2007)
5. *Comparisons with other spaces of flows:*
  - airline networks (Taylor et al 2007; O'Connor and Fuellhart 2012)
  - corporate structures (Taylor 2006; Alderson and Beckfield 2006; Liu and Derudder 2012a)
  - global commodity chains (Brown et al 2010; Parnreiter 2010)
  - central place theory (Taylor et al 2010a)
  - internet networks (Malecki, 2002)
  - rail networks (Niedzielski and Malecki 2011)
6. *Temporal comparisons allowing the monitoring of global changes:*
  - tracing city connectivity changes (Taylor and Aranya 2008; Derudder et al 2010; Hanssens et al 2011; Liu et al 2013a)
  - explaining connectivity changes (Pereira and Derudder 2010; Liu et al 2013b)
7. *Technical assessments/improvements of the model:*
  - checking the robustness of the model (Liu and Taylor 2011)
  - new measures of connectivity (Hennemann and Derudder 2013)
  - differentiating between forms of centrality (Neal 2011)
  - two-mode analysis (Neal 2008; Liu and Derudder 2013)
  - alleged determinism of the model (Neal 2012; Liu and Derudder 2012a)
  - assessing the model's merits viz. alternatives (Liu and Derudder 2012b; Meijers et al 2013)
  - visualization: spring embedding algorithm (Vinciguerra et al. 2010)
  - visualization: method-mediating algorithm (Hennemann, 2012)
  - statistical testing of links (Neal 2013)
  - identifying decision and service cities (Rossi et al 2007)
  - the need to add qualitative research (Pain and Hall 2006; Pain 2008; Beaverstock 2011; Parnreiter 2013; Beaverstock 2013)