Digital Formations of the Powerful and the Powerless: The Case of Informal Political Knowledge

Saskia Sassen
Especialista en asuntos urbanos. Profesora de Sociología en la Universidad de Chicago, profesora invitada en la London School of Economics, Reino Unido. En la Actualidad desarrolla el proyecto denominado: "When Territory exits Existing Framings", con la Harvard University Press.

Abstract

In this article, the author elaborates on the construction and distribution of knowledge in a world in which the rise of digital technologies contrasts with digital possibilities. The relationship of the knowledge is not limited to these developments, it becomes more complex when to this dynamic contemporary reality, draw near other elements such as global mobility and retention in a territory; which space-timeorders coupled with socio environmental factors provide continuity to the distinction between global and national.

Formaciones digitales de los poderosos y los débiles: el caso del conocimiento político informal

Resumen

En el presente artículo la autora discurre sobre la construcción y distribución de conocimiento en un mundo en el que el auge de las tecnologías digitales contrasta con la posibilidades no digitales. La relación del conocimiento no queda limitada a dichos desarrollos, sino que se hace más compleja cuando a esta dinámica realidad conteporánea se allegan otros elementos como la movilidad global y la permanencia en un territorio; órdenes espaciotemporáles que aunados a los factores socioculturales dan continuidad a la distinción entre lo global y lo nacional.

The rapid proliferation of global computer-based networks and the growing digitization of knowledge, which allows it to circulate in those global networks, unsettle the standard meanings of knowledge (Benkler, 2006; Bollier, 2009; Borgman, 2010; Castells, 2009; Mansell et al., 2009). This in turn problematizes the effectiveness of current framings for understanding what is knowledge. It makes legible the particularity or embeddedness of the putatively "natural" or "scientific" categories through which formal institutions organize "their"

knowledge —knowledge that has been defined as pertinent to their aims. In this process, network technologies have the potential to open up the categories of formalized knowledge and formalized knowledge practices. These bodies of knowledge can exit or go beyond hierarchical institutionalized controls. They can get disassembled and navigate the distributive potential of digital networks. And what were once unitary bodies of knowledge ensconced in specific categories can now get redeployed in bits and pieces and across diverse institutional orders (Sassen, 2008: chs. 7 & 8).

Critical to this potential is the informalizing of such bodies of knowledge, and their reassembling into novel mixes which are also likely to be informal, at least initially. The second critical dimension is that these reassembled and informalized bodies of knowledge can feed into novel and existing conditions —including political, economic, technical, cultural, subjective. Opening up established categories and informalizing particular components of formal knowledge can be seen both in positive terms —for example, it can help the democratizing of spheres once subject to hierarchical controls— and in negative terms —for example, it has fed the increasingly unregulated power of global finance.

In this chapter, I examine these two critical dimensions in order to understand their variable articulations. A basic proposition is the importance of capturing the diversity and specificity of 'socio-digital formations' (Benkler, 2006; Bollier, 2009; Latham & Sassen, 2005; Lovink, 2008; Wajcman, 2002), and hence the possibility of whole new types of articulation between politics and knowledge. In principle, the range of empirical cases we could use to examine some of these issues is vast. The specifics of each case allow us to identify particular patterns. Different kinds of socio-digital formations make legible different ways in which this articulation between informalized knowledge and political enablements can be constituted. Singling out informal types of knowledge allows one to capture what are often highly dynamic but not particularly legible moments in a trajectory that

9

may well wind up formalizing some of the informal. It allows us to capture a far broader range of instances than if we confined the focus to formalized knowledge and practices. It takes the analysis well beyond the more familiar notions of exiting state regulatory frameworks. Indeed, in my research I also find emergent informalities at the center of highly formalized systems.

The focus is on digital interactive domains. For analytical purposes I distinguish the technical capacities of digital networks from the more complex socio-digital formations that such interactive domains actually constitute. Intervening mechanisms that may have little to do with the technology per se can reshape network outcomes such as distributed outcomes (with their strong connotations of democracy and participation). The fact of this re-shaping by the social logics of users and digitized actors carries implications for political practices, including governance and democratic participation.

Digital Formations of the Powerful and the Powerless

The technical properties of electronic interactive domains deliver their utilities through complex ecologies that include non-technological variables, such as the social and the subjective, as well as the particular cultures of use of different actors. One synthetic image we can use is that these ecologies are partly shaped by the particular social logics embedded in diverse domains[1]. When we look at electronic interactive domains as such ecologies, rather than as a purely technical condition, we make conceptual and empirical room for informal knowledge and knowledge practices.

The technology can accommodate multiple particularities and still encompass them into a "whole" through horizontal dynamics, such as for instance, recurrence,

10

---

[1]. For a full development of these various issues, see Sassen (2008: chs. 7 & 8).

rather than vertical integration (Sassen, 2008: ch. 7). Recurrence of conditions/ situations constitutes that knowledge as a multi-sited whole. These possibilities and systemic drives undermine generalization, and bring to the fore the difficulty of formalizing these emergent types of knowledge. The greater velocities that digitization makes possible further drive the informalizing of whole bodies of knowledge, or some of their components. Velocity also makes legible, or helps us realize, the fact that a given knowledge might be in a trajectory that can include the use of that knowledge in political practices which in turn can generate emergent types of knowledge —that is, knowledge that is as yet informal, though it may eventually become formalized. One way of saying this is that what becomes legible is the experimental or circumstantial moment in the making of knowledge, and, when pertinent, in the making of the political. The particular applications, the velocity of uploading particular types of knowledge into new political practices and into new broader emergent knowledges, generalization is difficult. Marking/recognizing the recurrence of particularities is one form of generalizing.

The two cases used to develop the argument empirically are electronic financial networks and electronic activist networks[2]. Both cases are part of global dynamics and both have been significantly shaped by the three properties of digital networks —decentralized access/distributed outcomes, simultaneity, and interconnectivity. But these technical properties have produced strikingly different outcomes in each case. In one case, these properties contribute to distributive outcomes: greater participation of local organizations in global networks. Thereby they help constitute transboundary public spheres or forms of globality centred in multiple localized types of struggles and agency. In the second case, these same properties have led to higher levels of control and concentration in the global capital market

11

[2].   The particularities of these two cases serve to address several larger research agendas now under way. They include specifying, among others, advancing our understanding of the actual socio-digital formations arising from these mixes of technology and interaction (Barry & Slater, 2002; Bartlett, 2007; Howard & Jones, 2004; Latham & Sassen, 2005; Lovink, 2008; Lovink & Dean, 2010), the possible new forms of sociality such mixes may be engendering (for example, Castells, 2009; Elmer, 2004; Himanen, 2001; Latham & Sassen, 2005; Olesen, 2005; Whittel, 2001), the possible new forms of economic development and social justice struggles enabled by these technologies (Avgerou, 2002; Gurstein, 2000; Mansell et al., 2009), and the consequences for state authority of digital networks that can override many traditional jurisdictions (Drake & Williams III, 2006; Klein, 2005; The Internet and the Sovereign State, 1998; Rosenau & Singh 2002).

even though the power of these financial electronic networks rests on a kind of distributed power, that is, millions of investors distributed around the world and their millions of individual decisions.

These two cases also illuminate an emergent problematic about the extent to which the combination of decentralized access and multiple choices will tend to produce power law distributions regardless of the social logics guiding users. Thus civil society organizations may well produce outcomes similar to finance in that a limited number of organizations concentrate a disproportionate share of influence, visibility, and resources. One way of thinking about this is in terms of political formats (for example, Arquilla & Ronfeldt, 2001; Benkler, 2006; Dean, Anderson & Lovink, 2006; Mansell et al., 2009; Tennant 2007). Many civil society organizations have been subjected to constraints that force them into a format —akin to that of incorporated firms with conventional accountability requirements— that keeps them from using the new technologies in more radical ways. Thus I would argue that finance succeeds in escaping conventional formats when two or more financial exchanges merge and thereby constitute a networked platform, allowing them to maximize the utilities of network technologies (Sassen, 2008: chs. 7 & 8). In this sense, I would argue that finance has been far ahead of civil society in the use of networked technologies. It has actually invented new formats to accommodate its use: multi-sited networked platforms, where each financial centre is a node in the network. Civil society organizations have had many obstacles put in their way towards these types of networked arrangements. In many ways they have been forced to take the form of incorporated firms rather than networked platforms. There is, in my analysis, a political issue here that is yet another variable that contributes to produce diverse socio-digital formations even when based on similar network technologies.

Electronic interactive domains are inherently distributive given their technical properties. But once we recognize that social logics are at work in such interac-

tive domains it is not necessarily the case that those distributive outcomes will be present every time. In politics, this distributive potential has led commentators to say that these electronic networks push towards democratizing outcomes. Again, this is partly an empirical question —it depends on what social logics (i.e. political project) is driving that network. In another finding that goes against much commentary, I have found that the higher the speed and the interconnectedness of the network in global finance, the greater the importance of informal systems of trust and cultures of technical interpretation (Sassen, 2008: ch. 7).

The condition of the Internet as a decentralized network of networks has fed strong notions about its built-in autonomy from state power and its capacity to enhance democracy from the bottom up via a strengthening of both market dynamics and access by civil society. In a context of multiple partial and specific changes linked to globalization, digitization has contributed to the ascendance and greater weight of subnational scales, such as the global city, and supranational scales, such as global markets, where previously the national scale was dominant. These rescalings do not always parallel existing formalizations of state authority. At its most general these developments raise questions about the regulatory capacities of states, and about their potential for undermining state authority as it has come to be constituted over the last century.

13

But there are conditionalities not even these technologies can escape. Some that has received attention since the beginning are the social shaping of technology (for example, Bowker & Star, 1999; Coleman, 2004; Latour, 1996; Lievrow & Livingstone, 2002; Mackenzie & Wajcman, 1999; Seely Brown & Duguid, 2002), the limits of what speed can add to an outcome (for example, Mackenzie & Elzen, 1994; Sassen, 1999, 2008: chap.7), the role of politics in shaping communication (for example, Dean, 2002; Howard, 2006; Imbert, 2008; Lovink, 2002; Mansell et al., 1998), the built-in stickiness of existing technical options (for example, Chen & de'Medici, 2010; Shaw, 2001; Woolgar, 2002), and the segmentations within digital space (Lessig, 1996; Koopmans, 2004; Monberg, 1998; Sassen, 1999).

Thus while digitization of instruments and markets was critical to the sharp growth in the value and power of the global capital market, this outcome was shaped by interests and logics that typically had little to do with digitization per se. This brings to the fore the extent to which digitized markets are embedded in complex institutional settings (for example, Knorr Cetina & Preda, 2004; Mackenzie & Millo, 2003; Sassen, 1991/2001), cultural frames (Lovink & Dean, 2010; Pryke & Allen, 2000; Thrift, 2005; Zaloom 2003) and even intersubjective dynamics (Fisher, 2006; Knorr Cetina & Bruegge, 2002). And while the raw power achieved by the capital markets through digitization also facilitated the institutionalizing of finance-dominated economic criteria in national policy, digitization per se could not have achieved this policy outcome —it took actual national institutional settings and actors (Helleiner, 1999; Pauly, 2002; Sassen, 2008: ch. 5; Harvey, 2007; for cases beyond the financial markets see, for example, Barfield, Heiduk & Welfens, 2003; Bollier, 2009; Waesche, 2003).

In short, the supranational electronic market, which partly operates outside any government's exclusive jurisdiction, is only one of the spaces of global finance. The other type of space is one marked by the thick environments of actual financial centres, places where national laws continue to be operative, albeit often profoundly altered laws. These multiple territorial insertions of private economic electronic space entail a complex interaction with national law and state authority. The notion of 'global cities' captures this particular embeddedness of various forms of global hypermobile capital —including financial capital— in a network of well over forty financial centres across the world[3]. This embeddedness carries significant implications for theory and politics, specifically for the conditions through which governments and citizens can act on this new electronic world

---

[3].   For instance, the growth of electronic network alliances among financial exchanges located in different cities makes legible that electronic markets are partly embedded in the concentrations of material resources and human talents of financial centres, because part of the purpose is to capture the specific advantages of each of the financial centres (Sassen, 2008: ch. 7). Thus, such alliances are not about transcending the exchanges involved or merging everything into one exchange.

(for example, Latham & Sassen, 2005; Roseneau & Singh, 2002; Sassen, 2008: chs. 5, 8 & 9), though there are clearly limits (Daniels, 2009; Fernando, 2010; Lovink, 2008; Olesen, 2005; Robinson, 2004; Wajcman, 2002).

Producing capital mobility takes capital fixity: state-of-the-art environments, well-housed talent, and conventional infrastructure —from highways to airports and railways (Chen & de'Medici, 2010; Debrah, McGovern & Budhwar, 2010; Sassen, 1991/2001). These are all partly place-bound conditions, even when the nature of their place-boundedness differs from what it may have been a hundred years ago when place-boundedness was far more likely to be a form of immobility. But digitization also brings with it an amplification of capacities that enable the lique-fying of what is not liquid, thereby producing or raising the mobility of what we have customarily thought of as not mobile, or barely so. At its most extreme, this liquefying digitizes its object. Yet the hypermobility gained by an object through digitization is but one moment of a more complex condition.

In turn, much place-boundedness is today increasingly —though not completely— inflected or inscribed by the hypermobility of some of its components, products, and outcomes (Sassen, 2008: chps. 5, 7 & 8). More than in the past, both fixity and mobility are located in a temporal frame where speed is ascendant and consequential. This type of fixity cannot be fully captured through a description confined to its material and locational features. The real estate industry illustrates some of these issues. Financial firms have invented instruments that liquefy real estate, thereby facilitating investment in real estate and its 'circulation' in global markets. Even though the physical remains part of what constitutes real estate, it has been transformed by the fact that it is represented by highly liquid instru-ments that can circulate in global markets. It may look the same, it may involve the same bricks and mortar, it may be new or old, but it is a transformed entity[4].

15

---

[4].   I use the term imbrication to capture this simultaneous interdependence and specificity of each the digital and the nondigital. They work on each other, but they do not produce hybridity in this process. Each maintains its distinct irreducible character (Sassen, 2008: ch. 7).

Perhaps the opposite kind of articulation of law and territory from that of global finance is evident in a domain that has been equally transformed by digitization, but under radically different conditions. The key digital medium is the public access Internet, and the key actors are largely resource-poor organizations and individuals (for a range of instances see, for example, Daniels, 2009; Friedman, 2005; Imbert, 2008; Tennant, 2007). This produces a specific kind of activism, one centred on multiple localities yet connected digitally at scales larger than the local, often reaching a global scale. As even small, resource-poor organizations and individuals can become participants in electronic networks, it signals the possibility of a sharp growth in cross-border politics by actors other than states (Bartlett, 2007; Khagram, Riker & Sikkink, 2002; Warkentin, 2001). What is of interest here is that while these are poor and localized actors, in some ways they can partly bypass territorial state jurisdictions and, though local, they can begin to articulate with others worldwide and thereby constitute an incipient global commons.

We see here the formation of types of global politics that run through the specificities of localized concerns and struggles yet can be seen as expanding democratic participation beyond state boundaries. I regard these as non-cosmopolitan versions of global politics that in many ways raise questions about the relation of law to place that are the opposite of those raised by global finance.

16

From the perspective of state authority and territorial jurisdictions, the overall outcome might be described as a destabilizing of older formal hierarchies of scale and an emergence of not fully formalized new ones. Older hierarchies of scale, dating from the period that saw the ascendance of the nation-state, continue to operate. They are typically organized in terms of institutional level and territorial scope: from the international down to the national, the regional, the urban, and the local. But today's rescaling dynamics cut across institutional size and across the institutional encasements of territory produced by the formation of national states (Borja & Castells, 1997; Graham, 2003; Harvey, 2007; Mansell et al., 2009; Swyngedouw, 1997; Taylor, 2007).

Electronic Financial Markets: Making Informal Power Politics

Electronic financial markets are an interesting case because they are perhaps the most extreme example of how the digital might reveal itself to be indeed free of any spatial and, more concretely, territorial conditionalities. A growing scholarship examines the more extreme forms of this possibility, vis à vis both finance and other sectors (for example, Benkler, 2006; Bollier, 2009; Fernando, 2010; Korbin, 2001; The Internet and the Sovereign State, 1998). The mix of speed, interconnectivity, and enhanced leverage evinced by electronic markets produces an image of global finance as hypermobile and placeless. Indeed, it is not easy to demonstrate that these markets are embedded in anything social, let alone concrete, as in cement.

The possibility of an almost purely technical domain autonomous from the social is further reinforced by the growing role played by academic financial economics in the invention of new derivatives, today the most widely used instrument. It has led to an increasingly influential notion that if anything these markets are embedded in academic financial economics. The latter has emerged since the 1980's as the shaper and legitimator, or the author and authorizer, of a new generation of derivatives (Callon, 1998; MacKenzie, 2003; Barrett & Scott, 2004; Preda, 2009). Formal financial knowledge, epitomized by academic financial economics, is a key competitive resource in today's financial markets; work in that field thus also represents the 'fundamentals' of the market value of formal financial knowledge, that is, some of these instruments or models are more popular among investors than others[5]. Derivatives, in their many different modes, embody this knowledge and its market value.

17

[5]. The model designed for Long Term Capital Management (LTCM) was considered a significant and brilliant innovation. Others adopted similar arbitrage strategies, despite the fact that LTCM did its best to conceal its strategies (MacKenzie, 2003). MacKenzie and Millo (2003) posit that two factors ensured the success of option pricing theory (Black-Scholes) in the Chicago Board Options Exchange. First, the markets gradually changed (e.g. alterations of Regulation T, the increasing acceptability of stock borrowing, and better communications) so that the assumptions of the model became increasingly realistic. Second, the spread of a particular technical culture of interpretation in the context of globalized economic processes gradually reduced barriers to the model's widespread use. The performativity of this model was not automatic but 'a contested, historically contingent outcome, ended by a historical event, the crash of 1987' (MacKenzie, 2003: 138).

But these technical capabilities, along with the growing complexity of instruments, actually generate a need for cultures of interpretation in the operation of these markets, cultures best produced and enacted in financial centres —that is, very territorial, complex, and thick environments. Thus, and perhaps ironically, as the technical and academic features of derivatives instruments and markets become stronger, these cultures become more significant in an interesting trade-off between technical capacities and cultural capacities (Sassen, 2008: ch. 7). We can then use the need for these cultures of interpretation as an indicator of the limits of the academic embeddedness of derivatives and therewith recover the social architecture of derivatives trading markets. More specifically, it brings us back to the importance of financial centres —as distinct from financial 'markets'— as key, nested communities enabling the construction and functioning of such cultures of interpretation. The need for financial centres also, then, explains why the financial system needs a network of such centres (Budd, 1995; Sassen, 1991/2001). This need, in turn, carries implications for territorially bounded authority, and signals the formation of a specific type of territoriality, one marked by electronic networks and territorial insertions. Global cities are a more general, less narrowly technical instance of this same dynamic, including sectors other than finance. And beyond these types of formations there are other types of multi-sited global geographies —such as those binding Silicon Valley to Bangalore and kindred spaces. (See generally, Borja & Castells, 1997; Chen & de'Medici, 2010; Derudder et al., 2010; Graham, 2003; Taylor, 2007).

18

Yet alongside these territorial insertions that give national states some traction in regulating even the most global of financial markets (and other kinds of global firms and markets), the massive increases in values traded has given finance a good measure of power over national governments. This increase is probably one of the most significant outcomes of digitization in finance, with three of its capacities particularly critical (Sassen, 2008: chaps. 5 & 7). One is the digitizing of financial instruments. Computers have facilitated the development of these

instruments and enabled their widespread use. Much of the complexity can be contained in the software, enabling users who might not fully grasp either the financial mathematics nor the software algorithms involved. Further, when softwaring facilitates proprietary rights it also makes innovations more viable. Through innovations finance has raised the level of liquidity in the global capital market and increased the possibilities for liquefying forms of wealth hitherto considered non-liquid. The overall result has been a massive increase in the securitizing of previously untradeable assets, including various kinds of debt, and hence a massive increase in the overall volumes of global finance. Mediated through the specifics of contemporary finance and financial markets, digitization can then be seen as having contributed to a vast increase in the range of transactions.

Second, the distinctive features of digital networks can maximize the advantages of global market integration: simultaneous interconnected flows and decentralized access for investors and for exchanges in a growing number of countries. The key background factor here is that since the late 1980's countries have de- and re-regulated their economies to ensure cross-border convergence and the global integration of their financial centres. This non-digital condition amplified the new capabilities introduced by the digitization of markets and instruments.

Third, because finance is particularly about transactions rather than simply flows of money, the technical properties of digital networks assume added meaning. Interconnectivity, simultaneity, decentralized access, and software instruments, all contribute to multiply the number of transactions, the length of transaction chains (that is, the distance between instrument and underlying assets), and thereby the number of participants. The overall outcome is a complex architecture of transactions that promote exponential growth in transactions and value.

19

These three features of today's global market for capital are inextricably related to the new technologies. The difference they have made can be seen in two con-

sequences. One is the multiplication of specialized global financial markets. It is not only a question of global markets for equities, bonds, futures, currencies, but also of the proliferation of enormously specialized global sub-markets for each of these. This proliferation is a function of increased complexity in the instruments, in turn made possible by digitization of both markets and instruments.

The second consequence is that the combination of these conditions has contributed to the distinctive position of the global capital market in relation to several other components of economic globalization. We can specify two major traits; one concerns orders of magnitude and the second the spatial organization of finance. In terms of the first, indicators are the actual monetary values involved and, though more difficult to measure, the growing weight of financial criteria in economic transactions, sometimes referred to as the financializing of the economy. From 1980 to 2000, the total stock of financial assets increased three times faster than the aggregate gross domestic product (GDP) of the 23 highly developed countries that formed the Organisation for Economic Cooperation and Development (OECD) for much of this period; and the volume of trading in currencies, bonds, and equities increased about five times faster. This aggregate GDP stood at about US$30 trillion in 2000, while the worldwide value of internationally traded derivatives had reached over US$65 trillion in the late 1990s, a figure that rose to US$168 trillion in 2001. Since 2000 the different growth rates have diverged even faster, with finance reaching US$262 trillion in 2004 and US$640 trillion in 2007, right before the financial crisis broke in September 2008 (Sassen, 2011: chap. 4), compared with US$15 trillion for global trade in 2007 and US$11 trillion for global foreign direct investment (FDI) stock.

A second major set of issues about the transformative capacities of digitization has to do with the limits of technologically driven change, or, in other words, with the point at which this global electronic market for capital runs into the walls of its embeddedness in non-digital conditions. There are two distinct aspects here.

One is the extent to which the global market for capital even though global and digital is actually embedded in multiple environments, some indeed global in scale, but others subnational, that is, the actual financial centres within which the exchanges are located (Harvey, 2007; MacKenzie & Millo, 2003; Preda, 2009; Sassen, 2011: chaps. 4 & 5). A second issue is the extent to which it remains concentrated in a limited number of the most powerful financial centres notwithstanding its character as a global electronic market and the growing number of 'national' financial centres that constitute it (GAWC, 2005; Sassen, 2008: ch. 5; Taylor et al. 2007). The deregulation of finance could conceivably have led to wide geographic dispersal of this most electronic and global of markets.

The sharp concentration in leading financial markets can be illustrated with a few facts[6]. London, New York, Tokyo (notwithstanding a national economic recession), Paris, Frankfurt, and a few other cities regularly appear at the top and represent a large share of global transactions. This holds even after the 9/11 attacks in New York that destroyed the World Trade Center (though it was mostly not a financial complex) and damaged over 50 surrounding buildings, home to much financial activity. The level of damage was seen by many as a wake-up call to the vulnerabilities of sharp spatial centralization in a limited number of sites. London, Tokyo, New York, Paris (now consolidated with Amsterdam and Brussels as EuroNext), Hong Kong, and Frankfurt account for a major share of worldwide stock market capitalization. London, Frankfurt, and New York account for an enormous world share in the export of financial services. London, New York, and Tokyo account for 58 per cent of the foreign exchange market, one of the few truly global markets; together with Singapore, Hong Kong, Zurich, Geneva, Frankfurt, and Paris, they account for 85 per cent in this, the most global of markets. These high levels of concentration do not preclude considerable activity in a large number of other markets, even though the latter may account for a small global share.

21

[6].   Among the main sources of data for the figures cited in this section are the International Bank for Settlements (Basle); International Monetary Fund (IMF) national accounts data; specialized trade publications such as Wall Street Journal's WorldScope, Morgan Stanley Capital International; The Banker; data listings in the Financial Times and in The Economist. For a more detailed account and full bibliography, see Sassen (2011: chapters 2, 4 & 5).

This trend towards consolidation in a few centres, even as the network of integrated financial centres expands globally, also is evident within countries. In the United States for instance, New York concentrates the leading investment banks with only one other major international financial centre in this enormous country, Chicago. Sydney and Toronto have equally gained power in continental sized countries, and have taken over functions and market share from what were once the major commercial centres, respectively Melbourne and Montreal. So have Sao Paulo and Bombay, which have gained share and functions from respectively Rio de Janeiro in Brazil, and New Delhi and Calcutta in India. These are all enormous countries and one might have thought that they could sustain multiple major financial centres, especially given their multi-polar urban system. It is not that secondary centres are not thriving, but rather that the leading centres have gained more rapidly and gained disproportionately from integration with global markets. This pattern is evident in many countries, including the leading economies of the world.

In brief, the private digital space of global finance intersects in at least two specific and often contradictory ways with the world of state authority and law. One is through the incorporation into national state policy of types of norms that reflect the operational logic of the global capital market rather than the national interest. The second is through the partial embeddedness of even the most digitized financial markets in actual financial centres, which partly returns global finance to the world of national governments although it does so under the umbrella of denationalized (that is, global-oriented) components of the state regulatory apparatus. Global digitized finance makes legible some of the complex and novel imbrications between law and territory, notably that there is not simply an overriding of national state authority even in the case of this most powerful of global actors. There is, rather, both the use of national authority for the implementation of regulations and laws that respond to the interests of global finance (with associated denationalizing of the pertinent state capacities involved), and

the renewed weight of that authority through the ongoing need of the global financial system for financial centers.

These conditions raise a number of questions about the impact of this concentration of capital in global markets that allow for accelerated circulation in and out of countries. The global capital market now has the power to 'discipline' national governments, that is to say, to subject to financial criteria various monetary and fiscal policies that previously may have been subject to broader economic or social criteria. Does this trend alter the functioning of democratic governments? While the scholarly literature has not directly raised or addressed such questions, we can find more general responses, ranging from those who find that in the end the national state still exercises the ultimate authority in regulating finance to those who see in the larger global economy an emergent power gaining at least partial ascendance over national states.

Even the Immobile and Bearers of Local Knowledge Can Be Part of Global Politics

Digital media are critical for place-centred activists focused on local issues that connect with other such groups around the world. This is cross-border political work centred on the fact that specific types of local issues recur in localities across the world[7]. These are politics which are partly embedded in non-digital environments that shape, give meaning to, and to some extent constitute the event, and in this regard are to be distinguished from the politics posited in the foundational theorizing about hacktivism (Denning, 1999) and cyberwar (Der Derian, 2001). But they all share the fact of being forms of activism that contribute to an incipient unbundling of the exclusive authority, including symbolic authority, over territory

[7]. This parallels cases where use of the Internet has allowed diasporas to be globally interconnected rather than confined to a one-to-one relationship with the country or region of origin.

and people we have long associated with the national state. This unbundling may well happen even when those involved are not necessarily problematizing the question of nationality or national identity; it can be a de facto unbundling of formal authority, one not predicated on a knowing rejection of the national.

None of this is historically new. Yet there are two specific matters that signal the need for empirical and theoretical work on their ICT enabled form. One is that much of the conceptualization of the local in the social sciences has assumed physical or geographic proximity, and thereby a sharply defined territorial boundedness, with the associated implication of closure. The other, partly a consequence of the first, is a strong tendency to conceive of the local as part of a hierarchy of nested scales amounting to an institutionalized hierarchy, especially once there are national states. Even if these conceptualizations hold for most of what is the local today, the new ICT's are destabilizing these arrangements and invite a reconceptualization of the local able to accommodate instances that diverge from dominant patterns. Key among these current conditions are globalization and/or globality, as constitutive not only of cross-border institutional spaces but also of powerful imaginaries enabling aspirations to transboundary political practice even when the actors involved are basically localized and not mobile.

24

Computer-centred interactive technologies facilitate multiscalar transactions and simultaneous interconnectivity among those largely confined to a locality. They can be used to further develop old strategies and to develop new ways of organizing, notably electronic activism (Bartlett, 2007; Bollier, 2010; Denning, 1999; Rogers, 2004; Smith, 2001; Yang, 2003). Internet media are the main type of ICT used, especially email, for organizations in the global south confined by little bandwidth and slow connections. To achieve the forms of globality that concern me in this chapter, it is important that there be a recognition of these technical constraints among major transnational organizations dealing with the global south. This is what activists began to do in the 1990s, for instance, making

text-only databases, with no visuals or HTML, no spreadsheets, and none of the
other facilities that demand considerable bandwidth and fast connections (Pace
& Panganiban, 2002: 113; Electronic Frontier Foundation, 2002).[8]

As has been widely recognized, new ICT's do not simply replace existing media
techniques. The evidence is far from systematic and the object of study is con-
tinuously undergoing change. But we can basically identify two patterns. One
is of no genuine need for these particular technologies given the nature of the
organizing, or, at best, underutilization. Another is creative utilization of the new
ICT's along with older media to address the needs of particular communities,
such as using the Internet to send audio files to be broadcast over loudspeakers
to groups with no Internet connectivity, or that lack literacy. The M. S. Swami-
nathan Research Foundation in southern India has supported such work by setting
up Village Knowledge Centres catering to populations that even when illiterate,
know exactly what types of information they need or want; for example, farmers
and fishermen know the specific types of information they need at various times
of the seasons. Amnesty International's International Secretariat has set up an in-
frastructure to collect electronic news feeds via satellite, which it then processes
and redistributes to its staff workstations.

Use of these technologies also contributed to forming new types of organizations
and activism beginning in the 1980's. Yang (2003) found that what were originally
exclusively online discussions among groups and individuals in China concer-
ned with the environment, evolved into active non-governmental organizations
(NGO's). The diverse online hacktivisms examined by Denning (1999) are made

25

[8]. There are several organizations that work on adjusting to these constraints or providing adequate software and other facilities
to disadvantaged NGOs. An early example is that of Bellanet (2002), a nonprofit set up in 1995 that played a critical role in Latin America. It
helps poor NGO's gain access to online information and with information dissemination to the south. To that end it has set up Web-to-email
servers that can deliver Web pages by e-mail to users confined to low bandwidth. It has developed multiple service lines. Bellanet's Open
Development service line seeks to enable collaboration among NGO's through the use of open source software, open content, and open
standards; so it customized the Open Source PhP-Nuke software to set up an online collaborative space for the Medicinal Plants Network.
Bellanet adopted Open Content making all forms of content on its Web site freely available to the public; it supports the development of an
open standard for project information (International Development Markup Language - IDML). Such open standards enable information sharing.

up of mostly new types of activisms. Perhaps the most widely known case of how the Internet made a strategic difference, the Zapatista movement, became two organizational efforts; one a local rebellion in the mountains of Chiapas in Mexico, the other a transnational electronic civil society movement joined by multiple NGO's concerned with peace, trade, human rights, and other social justice struggles. The movement functioned through both the Internet and conventional media (Arquilla & Ronfeldt, 2001; Cleaver, 1998; Oleson, 2005), putting pressure on the Mexican government. It shaped a new concept for civil organizing: multiple rhizomatically connected autonomous groups (Cleaver, 1998).

Far less known is that the local Zapatistas lacked an email infrastructure (Cleaver, 1998) let alone collaborative workspaces on the Web. Messages had to be hand-carried, crossing military lines to bring them to others for uploading to the Internet; further, the solidarity networks themselves did not all have email, and sympathetic local communities often had problems with access (Mills, 2002: 83). Yet Internet-based media did contribute enormously, in good part because of preexisting social networks, a fact that is important in social movements initiatives (Khagram, Riker & Sikkink, 2002; Tennant, 2007) and in other contexts, including business (see Garcia, 2002). Among the electronic networks involved, LaNeta played a crucial role in globalizing the struggle. LaNeta is a civil society network established with support from a San Francisco-based NGO, the Institute for Global Communication (IGC). In 1993 LaNeta became a member of the Association for Progressive Communications (APC) and began to function as a key connection between civil society organizations within and outside Mexico. A local movement in a remote part of the country transformed LaNeta into a transnational information hub.

All of this facilitates a new type of cross-border politics, deeply local yet intensely connected digitally. Activists can develop networks for circulating place-based information (about local environmental, housing, political conditions) that can

26

become part of their political work, and they can strategize around global conditions —the environment, growing poverty and unemployment worldwide, lack of accountability among multinationals, and so forth. While such political practices have long existed with other media and with other velocities, the new ICT's change the orders of magnitude, scope, and simultaneity of these efforts. This inscribes local political practice with new meanings and new potentialities. These dynamics are also at work in the constituting of global public spheres that may have little to do with specific political projects (Krause & Petro, 2003; Sack, 2005), though they do not always work along desired lines (Cederman & Kraus, 2005).

Such multiscalar politics of the local can exit the nested scalings of national state systems, an option that begins to emerge strongly already in the 1980's (for example, Bartlett, 2007; Drainville, 2005; Tennant, 2007; Williamson, Alperovitz & Imbroscio, 2002). They can directly access other such local actors in the same country and city or across borders. It is important not to forget the early, often arduous history of activists adapting the technology to their needs. One Internet-based technology that reflects this possibility of escaping nested hierarchies of scale is Thus the now familiar online workspace, mostly associated with office work, and used for Internet-based collaboration (Bach & Stark, 2005), was developed by activists also as a way of escaping nested hierarchies of scale: to constitute a community of practice or knowledge network. An early example of such an activist online workspace was the Sustainable Development Communications Network (Kuntze, Rottmann & Symons, 2002) set up by a group of civil society organizations in 1998. It is a virtual, open, and collaborative organization to inform broader audiences about sustainable development, and build members' capacities to use ICT's effectively. It has a trilingual Sustainable Development Gateway to integrate and showcase members' communication efforts. It contains links to thousands of member-contributed documents, a job bank, and mailing lists on sustainable development. It is one of several NGO's whose aim is to promote civil society collaboration through ICT's; others include the Association

27

for Progressive Communications (APC), One World International, and Bellanet. The types of political practice discussed here are not the cosmopolitan route to the global. They are global through the knowing multiplication of local practices. These are types of sociability and struggle deeply embedded in people's actions and activities. They also involve institution-building work with global scope that can come from localities and networks of localities with limited resources, and from informal social actors. Actors 'confined' by domestic roles can become actors in global networks without having to leave their work and roles in home communities. From being experienced as purely domestic and local, these 'domestic' settings become microenvironments on global circuits. They need not become cosmopolitan in this process; they may well remain domestic and particularistic in their orientation and continue to be engaged with their households, and local community struggles, and yet they are participating in emergent global politics. A community of practice can emerge that creates multiple lateral, horizontal communications, collaborations, solidarities, and supports.

Conclusion

These two cases illuminate specific aspects of the capacities of digital technologies to override existing relations of law to territory with their ensconced formalized systems of knowledge. One notable emergent trend is the possibility even for resource-poor actors partially to exit national encasements and emerge as global political actors. But these cases also illuminate the specific conditionalities under which this takes place: the digital and the nondigital moment in the often complex processes wherein these new technologies are deployed. This signals the formation of spatio-temporal orders that need to be distinguished from those of the national and, further, also construed as distinct from the global; in short, these are orders that can cut across the duality of global/national.

Using these two cases helps illuminate the very diverse ways in which this partial
overriding can happen. They are extreme cases, one marked by hypermobility and
the other by immobility. But they show us that both are subject to particular types
of embeddedness and to particular types of novel potentials for global operation.
Financial markets and electronic activism reveal two parallel developments as-
sociated with particular technical properties of the new ICT's. They also reveal a
third, radically divergent outcome, one I interpret as signaling the weight of the
specific social logics of users in each case.

First, perhaps the most significant feature in both cases is the possibility of expan-
ded decentralization and simultaneous integration. That local political initiatives
can become part of a global network parallels the articulation of the capital mar-
ket with a network of financial centres. That the former relies on public access
networks and the latter on private dedicated networks does not alter this technical
outcome. Among the technical properties that produce the specific utility in each
case is the possibility of being global without losing the articulation with specific
local conditions and resources. In fact, this articulation is not only simultaneous,
but also constitutive of each of these distinct formations. As with the global capi-
tal market, there is little doubt that digital networks have had a sharp impact on
resource-poor organizations and groups engaged in cross-border work.

29

Second, once established, expanded decentralization and simultaneous integra-
tion enabled by global digital networks, produce threshold effects. Today's global
electronic capital market can be distinguished from earlier forms of international
financial markets due to some of the technical properties of the new ICT's, notably
the orders of magnitude that can be achieved through decentralized simultaneous
access and interconnectivity, and through the softwaring of increasingly complex
instruments which enables far more traders to use these instruments. In the second
case, the threshold effect is the possibility of constituting transboundary publics
and imaginaries rather than being confined to communication or information

searches. Insofar as the new network technologies strengthen and create new types of cross-border activities among nonstate actors, they enable the constitution of a distinct and only partly digital condition variously referred to as global civil society, global publics, and commons.

Third, the significant difference lies in the substantive rationalities, values, objectives, and conditionings to which each type of actor is subject. Once we introduce these issues, we can see a tendency in each domain toward cumulative causation leading to a growing differentiation in outcomes. The constitutive capabilities of the new ICT's lie in a combination of digital and nondigital variables. It is not clear that the technology alone could have produced the outcome. The nondigital variables differ sharply between these two cases, even as digitization is crucial for constituting the specificity of each case. The divergence is evident in the fact that the same technical properties produced greater concentration of power in the case of the capital market, and greater distribution of power in public access civil society oriented networks.

The issues introduced in this chapter point to the enormous capabilities of these technologies, but also to their limitations. It is in good part the social logics of users and actors that contribute to the outcomes, and hence to the 'distortion' of technical properties. The logics of users may not correspond to the engineer's design. The outcome of their interaction is a hybrid, an ecology that mixes technical properties and social logics. The fact of this re-shaping by the social logics of users and digitized actors carries implications for governance and democratic participation. They will not necessarily allow users to escape state authority, nor will they necessarily ensure democratic outcomes. They will not inevitably globalize users and eliminate their articulation with particular localities, but they will make globality a resource for users as diverse as the two examined here. The outcomes are not unidirectional and seamless. They are mixed, contradictory, and lumpy.

Bibliography

Arquilla, J. & Ronfeldt, D. F. (2001). *Networks and Netwars: The Future of Terror, Crime, and Militancy*. Santa Monica, CA: Rand.

Avgerou, C. (2002). *Information Systems and Global Diversity*. Oxford University Press.

Bach, J. & Stark, D. (2005). Recombinant Technology and New Geographies of Association. In: Latham, R. & Sassen, S. (eds.), *Digital Formations: IT and New Architectures in the Global Realm* (pp. 37-53). Princeton, NJ: Princeton University Press.

Barfield, C. E., Heiduk, G. & Welfens, P. J. J. (eds.). (2003). *Internet, Economic Growth and Globalization: Perspectives on the New Economy in Europe, Japan and the USA.* New York: Springer.

Barrett, M. & Scott, S. (2004). Electronic Trading and the Process of Globalization in Traditional Futures Exchanges: A Temporal Perspective. *European Journal of Information Systems, 13*(1), 65-79.

Barry, A. & Slater, D. (2002). Introduction: The Technological Economy. *Economy and Society, 31*(2), 175-93.

Bartlett, A. (2007). The City and the Self: The Emergence of New Political Subjects in London. In: Sassen, S. (ed.), *Deciphering the Global: Its Spaces, Scales and Subjects* (pp. 221-242). New York and London: Routledge.

Bellanet, A. (2002). Report on Activities 2001-2002. Recuperado de: http://home.bellanet.org.

Benkler, Y. (2006). *The Wealth of Networks: How Social Production Transforms Mar-kets and Freedom*. New Haven: Yale University Press.

Bennett, W. L. & Entman, R. M. (eds.). (2001). *Mediated Politics: Communication in the Future of Democracy*. Cambridge: Cambridge University Press.

Bollier, D. (2009). *Viral Spiral: How the Commoners Built a Digital Republic of Their Own*. New York: New Press.

Borgman, C. L. (2010). *Scholarship in the Digital Age: Information, Infrastructure, and the Internet*. Cambridge, MA: The MIT Press.

Borja, J. & Castells, M. (1997). *The Local and the Global: Management of Cities in the Information Age*. London: Earthscan.

Bousquet, M. & Wills, K. (eds.). (2003). *Web Authority: Online Domination and the Informatics of Resistance*. Boulder, CO: Alt-x Press.

Bowker, G. C. & Star, S. L. (1999). *Sorting Things Out: Classification and its Con-sequences*. Cambridge, MA: MIT Press.

Budd, L. (1995). Globalisation, Territory, and Strategic Alliances in Different Fi-nancial Centres Source. *Urban Studies, 32*(2), 345-360.

Callon, M. (1998). *The Laws of the Markets*. Oxford. Blackwell Publishers.

Castells, M. (1996). *The Rise of the Network Society*: *The Information Age: Eco-nomy, Society and Culture, Volume 1*. Oxford: Blackwell.

Castells, M. (2001). *The Internet Galaxy: Reflections on the Internet, Business, and Society.* New York: Oxford University Press.

Castells, M. (2009). *Communication Power*. Oxford: Oxford University Press.

Cederman, L. E. & Kraus, P. A. (2005). Transnational Communications and the European Demos. In: Latham, R. & Sassen, S. (eds.), *Digital Formations: IT and New Architectures in the Global Realm*. Princeton, NJ: Princeton University Press, pp. 283-311.

Chen, X. & de'medici, T. (2010). Research Note - The "Instant City" Coming of Age: Production of Spaces in China's Shenzhen Special Economic Zone. *Urban Geography, 31*, 1141-1147.

Cleaver, H. (1998). The Zapatista Effect: The Internet and the Rise of an Alternative Political Fabric. *Journal of International Affairs, 51*(2), 621-40.

Coleman, G. (2004). The Political Agnosticism of Free and Open Source Software and the Inadvertent Politics of Contrast. *Anthropological Quarterly, 77*(3), 507-519.

Dean, J. (2002). *Publicity's Secret: How Technoculture Capitalizes on Democracy*. Ithaca, NY: Cornell University.

Dean, J., Anderson, J. W. & Lovink, G. (2006). *Reformatting Politics: Information Technology and Global Civil Society*. London: Routledge.

Denning, D. (1999). *Information Warfare and Security*. New York: Addison-Wesley.

Der Derian, J. (2001). Virtuous War: Mapping the Military-Industrial-Media-Entertainment Network. Boulder, CO: Westview Press.

33

Drainville, A. (2005). *Contesting Globalization: Space and Place in the World Economy*. London: Routledge.

Drake, W. J. & Williams III, E. M. (2006). *Governing Global Electronic Networks: International Perspectives on Policy and Power*. Cambridge, MA: MIT Press.

Electronic Frontier Foundation. (2002). *Activist Training Manual.* Presented at the Ruckus Society Tech Toolbox Action Camp, 24 June-2 July.

Elmer, G. (2004). *Profiling Machines: Mapping the Personal Information Economy*. Cambridge, MA: MIT Press.

Fernando, V. (2010). Think Tank Warns that Hong Kong's Dangerous Dependence on Finance Could Result in Catastrophe. Retrieved Dec. 30, 2010. (http://www.businessinsider.com/hong-kong-financial-sector-too-big-2010-6)

Fisher, M. (2006). Wall Street Women: Navigating Gendered Networks in the New Economy. In: Fisher M. & Downey, G. (eds.), *Frontiers of Capital: Ethnographic Reflections on the New Economy* (pp. 209-236). Durham: Duke University Press.

Fisher, M. & Downey, G. (eds.) (2006). *Frontiers of Capital: Ethnographic Reflections on the New Economy*. Durham: Duke University Press.

Fraser, N. (2007). Transnationalizing the Public Sphere: On the Legitimacy and Efficacy of Public Opinion in a Post-Westphalian World. *Theory, Culture & Society, 24*(4), 7-30.

Friedman, E. J. (2005). The Reality of Virtual Reality: The Internet and Gender Equality Advocacy in Latin America. *Latin American Politics and Society, 47*, 1-34.

Garcia, L. (2002). Architecture of Global Networking Technologies. In: Sassen, S. (ed.), *Global Networks, Linked Cities* (pp. 39-70). London: Routledge.

GAWC (Globalization and World Cities Study Group and Network). (2005). Accessed 18/03/2006, http://www.lboro.ac.uk/gawc/

Glasius, M., Kaldor, M. & Anheier, J. (eds.). (2002). *Global Civil Society Yearbook 2002*. Oxford University Press.

Graham, S. (ed.). (2003). *The Cybercities Reader.* London: Routledge.

Gurstein, M. (ed.). (2000). *Community Informatics: Enabling Communities with Information and Communication Technologies*. Hershey, PA: Idea Group.

Harvey, R. (2007). The Sub-National Constitution of Global Markets. In: Sassen, S. (ed.), *Deciphering the Global: Its Spaces, Scales and Subjects* (pp.199-216). New York and London: Routledge.

Helleiner, E. (1999). Sovereignty, Territoriality and the Globalization of Finance. In: D. A. Smith, D. A., Solinger, D. J. & Topik, S. (eds.), *States and Sovereignty in the Global Economy* (pp. 138-57). London: Routledge.

Himanen, P. (2001). *The Hacker Ethic and the Spirit of the Information Age*. New York: Random House.

Howard, P. N. (2006). *New Media Campaigns and the Managed Citizen*. New York: Cambridge University Press.

Howard, P. N. & Jones, S. (eds.). (2004). *Society Online: The Internet in Context*. London: Sage.

35

Imbert, P. (ed.). (2008). *Theories of Inclusion and Exclusion in Knowledge-Based Sociietes*. Ottawa, Canada: University of Ottawa Press.

Khagram, S., Riker, J. V. & Sikkink, K. (eds.). (2002). *Restructuring World Politics: Transnational Social Movements, Networks, and Norms*. Minneapolis, MN: University of Minnesota Press.

Klein, H. (2005). *ICANN Reform: Establishing the Rule of Law.* Prepared for the World Summit on the Information Society (WSIS). Accessed 18/03/2006, http://www.ip3.gatech.edu/images/ICANN-Reform_Establishing-the-Rule-of-Law.pdf.

Knorr Cetina, K. & Bruegger, U. (2002). Global Microstructures: The Virtual Societies of Financial Markets. *American Journal of Sociology, 107*(4), 905-50.

Knorr Cetina, K. & Preda, A. (eds.). (2004). The Sociology of Financial Markets. Oxford: Oxford University Press.

Koopmans, R. (2004). Movements and Media: Selection Processes and Evolutionary Dynamics in the Public Sphere. *Theory and Society, 33*(3-4), 367-91.

Korbin, S. J. (2001). Territoriality and the Governance of Cyberspace. *Journal of International Business Studies, 32*(4), 687-704.

Krause, L. & Petro, P. (eds.). (2003). *Global Cities: Cinema, Architecture, and Urbanism in a Digital Age*. New Brunswick, NJ, and London: Rutgers University Press.

Kuntze, M., Rottmann, S. & Symons, J. (2002). *Communications Strategies for World Bank and IMF-Watchers: New Tools for Networking and Collaboration*. London: Bretton Woods Project and Ethical Media. Accessed 18/03/2006, http://www.brettonwoodsproject.org/strategy/commosrpt.pdf.

Latham, R. & Sassen, S. (2005). Introduction. Digital Formations: Constructing an Object of Study. In: Latham, R. & Sassen, S. (eds.), *Digital Formations: IT and New Architectures in the Global Realm* (pp. 1-34). Princeton NJ: Princeton University Press.

Latour, B. (1996). *Aramis or the Love of Technology*. Cambridge, MA: Harvard University Press.

Lebert, J. (2003). Writing Human Rights Activism: Amnesty International and the Challenges of Information and Communication Technologies. In: McCaughey, M. & Ayers, M. (eds.), *Cyberactivism: Online Activism in Theory and Practice* (pp. 209-32). London: Routledge.

Lievrouw, L. A. & Livingstone, S. (eds.). (2002). *Handbook of New Media: Social Shaping and Consequences of ICTs*. London: Sage Publications.

Lessig, L. (1996). The Zones of Cyberspace. *Stanford Law Review, 48*, 1403-1412.

Lovink, G. (2002). *Dark Fiber: Tracking Critical Internet Culture*. Cambridge, MA: MIT Press.

Lovink, G. (2008). *Zero Comments: Blogging and Critical Internet Culture.* London: Routledge.

Lovink, G. & Dean, J. (2010). *Blog Theory: Feedback and Capture in the Circuits of Drive.* UK: Polity.

MacKenzie, D. (2003). Long-Term Capital Management and the Sociology of Arbitrage. *Economy and Society, 32*(3), 349-80.

37

MacKenzie, D. & Elzen, B. (1994). The Social Limits of Speed: The Development and Use of Supercomputers. *IEEE Annals of the History of Computing, 16*(1), 46-61.

MacKenzie, D. & Wajcman, J. (1999). *The Social Shaping of Technology*. Milton Keynes: Open University Press.

MacKenzie, D. & Millo, Y. (2003). Constructing a Market, Performing Theory: The Historical Sociology of a Financial Derivatives Exchange. *American Journal of Sociology, 109*(1), 107-145.

Mansell, R., Chrisanthi Avgerou, D. Q. & Roger, S. (eds.). (2009). *The Oxford Handbook of Information and Communication Technologies.* Oxford University Press.

Mansell, R., Chrisanthi Avgerou, D. Q., Roger, S. & Silverstone, R. (1998). *Communication by Design: The Politics of Information and Communication Technologies*. Oxford University Press.

Mills, K. (2002). Cybernations: Identity, Self-Determination, Democracy, and the 'Internet Effect' in the Emerging Information Order. *Global Society, 16*(1), 69-87.

Monberg, J. (1998). Making the Public Count: A Comparative Case Study of Emergent Information Technology-Based Publics. *Communication Theory, 8*(4), 426-454.

Newman, J. (2001). Some Observations on the Semantics of Information. *Information Systems Frontiers, 3*(2), 155-167.

Olesen, T. (2005). Transnational Publics: New Space of Social Movement Activism and the Problem of Long-Sightedness. *Current Sociology, 53*(3), 419-440.

Pace, W. R. & Panganiban, R. (2002). The Power of Global Activist Networks: The Campaign for an International Criminal Court. In: Hajnal, P. I. (ed.), *Civil Society in the Information Age* (pp. 109-26). Aldershot: Ashgate.

Pauly, L. (2002). Global Finance, Political Authority, and the Problem of Legitimation. In: Biersteker, T. J. & Hall, R. B. (eds.), *The Emergence of Private Authority and Global Governance* (pp. 76-90). Cambridge: Cambridge University Press.

Pryke, M. & Allen, J. (2000). Monetized Time-Space: Derivatives - Money's "New Imaginary"? *Economy and Society, 29*(2), 329-344.

Robinson, S. (2004). Towards a Neoapartheid System of Governance with IT Tools, SSRC IT & Governance Study Group. New York: SSRC. Accessed 18/03/2006, http://www.ssrc.org/programs/itic/publications/knowledge_report/memos/robinsonmemo4.pdf.

Rogers, R. (2004). *Information Politics on the Web*. Cambridge, MA: MIT Press.

Rosenau, J. N. & Singh, J. P. (eds.). (2002). *Information Technologies and Global Politics: The Changing Scope of Power and Governance* (pp. 275-87). Albany, NY: State University of New York Press.

Sack, W. (2005). Discourse, Architecture, and Very Large-scale Conversation. In: Latham, R. & Sassen, S. (eds.), *Digital Formations: IT and New Architectures in the Global Realm* (pp. 242-282). Princeton, NJ: Princeton University Press.

Sassen, S. (1999). Digital Networks and Power. In: Featherstone, M. & Lash, S. (eds.), *Spaces of Culture: City, Nation, World* (pp. 49-63). London: Sage.

Sassen, S. (1991/2001). *The Global City.* Princeton: Princeton University Press.

39

Sassen, S. (2008). *Territory, Authority, Rights: From Medieval to Global Assemblages*. Princeton NJ: Princeton University Press.

Sassen, S. (2011). *Cities in a World Economy*. 4th Updated ed. Thousand Oaks, CA: Sage/Pine Forge.

Seely Brown, J. & Duguid, P. (2002). *The Social Life of Information*. Cambridge, MA: Harvard Business School Press.

Shaw, D. (2001). Playing the Links: Interactivity and Stickiness in .Com and "Not.Com" Web Sites. *First Monday* 6. Accessed 18/03/2006, http://www.firstmonday.dk/issues/issue6_3/shaw

Swyngedouw, E. (1997). Neither Global nor Local: "Globalization" and the Politics of Scale. In: Cox, K. R. (ed.), *Spaces of Globalization: Reasserting the Power of the Local* (pp. 137-166). New York: Guilford.

Taylor, P. J. (2004). *World City Network: A Global Urban Analysis*. London: Routledge.

Taylor, P. J., Derudder, B., Saey, P. & Witlox, F. (eds.). (2007). *Cities in Globalization: Practices, Policies Theories*. London: Routledge.

Tennant, E. W. (2007). Locating Transnational Activists: Solidarity with and Beyond Propinquity. In: Sassen, S. (ed.), *Deciphering the Global: Its Spaces, Scales and Subjects* (pp.119-138). New York and London: Routledge.

The Internet and the Sovereign State: The Role and Impact of Cyberspace on National and Global Governance. (1998). Indiana Journal of Global Legal Studies, 5(2).

Thrift, N. (2005). *Knowing Capitalism*. Thousand Oaks CA: Sage.

Waesche, N. M. (2003). *Internet Entrepreneurship in Europe: Venture Failure and the Timing of Telecommunications Reform*. Cheltenham: Edward Elgar.

Wajcman, J. (ed.). (2002). Special Issue: Information Technologies and the Social Sciences. *Current Sociology, 50*(3).

Warkentin, C. (2001). *Reshaping World Politics: NGOs, the Internet, and Global Civil Society*. Lanham, MD: Rowman and Littlefield.

Whittel, A. (2001). Toward a Network Sociality. *Theory, Culture & Society, 18* (6), 51-76.

Williamson, T., Alperovitz, G. & Imbroscio, D. L. (2002). *Making a Place for Community: Local Democracy in a Global Era*. London: Routledge.

Woolgar, S. (ed.). (2002). *Virtual Society? Technology, Cyberpole, Reality*. Oxford University Press.

Yang, G. (2003). Weaving a Green Web: The Internet and Environmental Activism in China. *China Environment Series, 6*. Washington, DC: Woodrow Wilson International Centers for Scholars.

Zaloom, C. (2003). Ambiguous Numbers: Trading Technologies and Interpretation in Financial Markets. *American Ethnologist, 30*(2): 258-272.