

# Digital Networks and the State

## Some Governance Questions

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THE RAPID proliferation of digital networks and the growing digitization of a broad array of economic activities have raised a number of questions about the state's capacity to regulate this domain and about the latter's potential for undermining sovereignty. Most of the focus has been on the Internet.<sup>1</sup> The major lines of the debate in general commentaries are increasingly polarized among those who believe that the Internet undermines, or at the least weakens, state authority and those who believe that it strengthens liberal democracy and thereby the liberal state. Not unrelated to these two positions is the more technical debate between those who find that the notion of governments regulating the Internet does not carry much meaning (Post, 1995; Mueller, 1998) and those who maintain that there are various legal instruments and technical standards through which states can directly or indirectly regulate the Internet (Lessig, 1999; Reidenberg, 1998).

My concern here is with the broader theoretical and political implications of the characterization of the two fundamental concepts in the debate. Among the issues I want to focus on concerning the Internet are (a) the confusion between privately owned digital networks and digital space available to 'the public' even if for a fee, specifically the Internet, and (b) the possibilities for regulating the Internet (see also Perritt, 1999).

Very briefly, my argument will be that it is the enormous growth of private digital networks – especially the case of the global financial markets – rather than the Internet, which is having the greater impact on national sovereignty and indeed transforming particular features of it. More generally, economic globalization and technology have brought with them significant transformations in the authority of national states. Especially important here is the growth of new non-state-centered governance mechanisms which have transformed the meaning of national territorial sovereignty independently

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from whatever impact the Internet has so far had. Second, there are features of the Internet today which suggest that regulation is possible. But it is a radically different version of regulation from that we have associated with the modern state over the last half century.

### **Economic Power and State Power in the Internet**

The condition of the Internet as a decentralized network of networks has contributed to 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.<sup>2</sup> Yet, while in principle many of the key features of the Internet do indeed have this capacity to enhance democracy, its openness and its technology also contain possibilities for significant control and the imposition of limitations on access. Here I want to discuss briefly three aspects of this contrarian argument.

In my own research I have come to regard the Internet as a space produced and marked through the software that gives it its features and the particular aspects of the hardware mobilized by the software.<sup>3</sup> There are significant implications attached to the fact that the leading Internet software design focus in the last few years has been on firewalled intranets for firms and firewalled tunnels for firm-to-firm transactions.<sup>4</sup> Both of these represent, in some sense, private appropriations of a 'public' space.<sup>5</sup> Further, the growing interest in e-commerce has stimulated the development of software linked to identity verification, trademarks protection, billing. The rapid growth of this type of software and its use in the Internet does not necessarily strengthen the public-ness of the Net. This is especially significant if there is less production of software aimed at strengthening the openness and decentralization of the Net as was the case in the earlier phases of the Internet. Further, this newer type of software also sets up the conditions for copyrighting, including the possibility of charging for what can be set up as copyrighted use/access, including per use charge. In my reading, far from strengthening the Internet's democratic potential as many liberal and neoliberal commentators maintain, this type of commercialization can threaten it.

Along these same lines of analysis – though with another type of norm in mind – Lessig (1999), for instance, has pointed out that since 1995/6 the work of political entities and technicians has brought about what may be interpreted as an increase in controls. Prior to 1995 the architecture of the Internet inhibited 'zoning' – any technique that facilitates discrimination in access to or distribution of some good or service.<sup>6</sup> Users could more easily maintain their anonymity while online and it was difficult to verify user identity, thereby ensuring better privacy protection. Since then, with the drive to facilitate e-commerce, this has changed: the architecture of the Internet now facilitates zoning.<sup>7</sup>

Coming from a different angle but based upon a similar understanding, Boyle (1997) has examined how the built-in set of standards that constitute the Internet undermines claims that the state cannot regulate the Internet. Indeed, he argues that the state's regulatory agenda is already

partially contained in the design of the technologies. Thus the state can regulate in this case even though it is not via sanctions. Boyle in fact alerts us to the fact that privatized and technologically based rule enforcement would take policing away from the scrutiny of public law, freeing states from some of the constitutional and other constraints restricting their options. This can be problematic even in the case of states that operate under the rule of law, as examples of abuse of power by various government agencies in the US make clear.

These three analyses, different as they are in the origins and end results of the argumentation, do intersect on one point: that simply leaving the Internet to its own evolution is not necessarily going to strengthen the forces of democracy. The differential economic power of different types of users is shaping the development of privatizing dynamics that remain unaccountable, and the indirect incorporation of state powers in the design of technical standards is creating a domain for state power that falls outside the public sphere where state action can be subjected to public accountability. All three views would seem to suggest that it is misguided to think that leaving this evolution to the market is somehow going to ensure freedom and democracy.

Although the Net as a space of distributed power can thrive even against growing commercialization, and today's non-commercial uses still dominate the Internet, the race is on. Considerable resources are being allocated to invent ways of expanding electronic commerce, ensuring safety of payment transactions and implementing copyright. These are not easy tasks. At the 1997 Aspen Roundtable on Electronic Commerce, an annual event that brings together the CEOs of the main software and hardware firms as well as the key venture capitalists in the sector, it was once again established by these insiders that there are limits to the medium as a venue for commerce and that it will probably tend to cater to particular niche markets, with a few possible exceptions. In this regard, the reawakened recognition among non-commercial digital organizations and digital activists of the viability of open-source systems is worth noting, as is the commercial interest in Linux, one of the hottest open-source systems at this time. We are seeing the rapid growth of a new generation of alternative organizations and of individuals knowledgeable about digital technologies who are working on the public dimensions and free access questions.<sup>8</sup> This signals that the Internet may continue to be a space for *de facto* (i.e. not necessarily self-conscious) democratic practices. But it will be so partly as a form of resistance against overarching powers of the economy and of the state, rather than the space of unlimited freedom which is still part of its representation today in many milieux.<sup>9</sup>

One aspect important to the positive democracy effect of the Net is that there has been a proliferation of non-commercial uses and users. From struggles around human rights, the environment and workers' strikes around the world, to genuinely trivial pursuits, the Net has emerged as a powerful medium for non-elites to communicate, support each other's struggles and

create the equivalent of insider groups at scales going from the local to the global. The political and civic potential of these trends is enormous. It offers the possibility for interested citizens to act in concert.<sup>10</sup> The possibility of doing so transnationally at a time when a growing set of issues is seen as escaping the bounds of national states makes this even more significant. We are also seeing a greater variety of subcultures on the Net in the last decade after it having been dominated, at first, by young white men, especially from the US. Finally, insofar as the growth of global corporate actors has pressured governments to support the interests of global capital, it has become even more important to use the Internet as a force through which a multiplicity of public interests can raise critical issues and demand accountability (Perritt, 1999).

### **State Regulation and the Internet**

A different issue about sovereignty is raised by the possibilities of states regulating the Internet. It seems to me that if there is to be some kind of regulation it is going to be very different from what we have usually understood by this term. It is certainly the case that in many ways the Net escapes or overrides most conventional jurisdictions (Post, 1995). Again, much of the commentary operates at two very different levels. One is a generalized set of notions that is still rooted in the earlier emphasis of the Internet as a decentralized space of freedom where no authority structures can be instituted. The other is a rapidly growing technical literature, in good part stimulated by the growing importance of Internet addressing, and the domain name system registry generally, with the associated legal and political issues this has engendered.

One fact that is too often left out of generalized commentaries about the Internet is that there is a kind of central authority overseeing some of the crucial features of the Net, having to do with addresses and numbers granting and the domain name system.<sup>11</sup> This does not mean that regulation is ipso facto possible. It merely signals that the representation of the Net as escaping all authority is simply inadequate.<sup>12</sup> The nature of this authority is not necessarily akin to regulatory authorities but it is a gate-keeping system of sorts and raises the possibility of oversight capacities. Even though these oversight capacities would entail considerable innovation in our concepts about regulation, they signal that there are possibilities overlooked in a faulty characterization of the architecture of the Internet.

This centrally managed function of the Internet involves the control and assignment of the numbers that computers need to locate an address.<sup>13</sup> It therefore can instruct all the top 'root servers' of the Net – the computers that execute address inquiries – and these will accept these instructions. This is, clearly, a power of sorts. For a long time it was not formalized, in good part because its origins lie in the first phase of the Internet. It is the power held by the group of computer scientists who invented the communication protocols and agreed on the standards that make the Net work today. They have worked at debugging the systems over the last 20 years and did

so not necessarily under contract by any agency in particular. It is a *de facto* group which has worked at making the Net workable since its beginnings. The particular function of assigning addresses is crucial and was for many years under the informal control of one particular scientist who named this function the ‘Internet Assigned Numbers Authority’.

In the summer of 1998, the Internet Corporation for Assigned Names and Numbers (ICANN), the group now assigned to oversee the Net’s address system, was established.<sup>14</sup> It represents a formalization of the earlier authority.<sup>15</sup> It was basically started as a group of insiders with fairly loose and ineffective by-laws. By early 1999 it had implemented conflict-of-interest rules, opened up some board meetings and worked towards developing a mechanism to elect board members, in an effort to build in more accountability. It is today the subject of growing debate among various digital sub-cultures (e.g. see *Nettime* for summaries of the debates).

The US government’s ‘Framework for Global Electronic Commerce’, a blueprint for Internet governance, argues that because of the Internet’s global reach and evolving technology, regulation should be kept to a minimum. It also suggests that in the few areas where rules are needed, such as privacy and taxation, policy should be made by quasi-governmental bodies such as the World Intellectual Property Organization (WIPO) or the OECD.

One of the issues with this type of proposal is the absence of transparency and the problems it brings with it. These become evident in one of the first big Net policy dilemmas: cybersquatting, that is, private speculators seizing valuable corporate brandnames on the Internet and selling them back, at an enormous price, to the firms carrying those names. Net addresses are important for establishing an identity online. So companies want to establish a rule that they are entitled to any domain names using their trademarks. But the Net is used for more than e-commerce, so consumer advocates say this rule would unfairly restrict the rights of schools, museums, political parties and other noncommercial Net users. However, in the deliberations that have taken place at WIPO, it is mostly the large firms who are participating, in meetings that take place mostly behind doors. This privatizes the effort to design regulations for the Net.

While the purpose of these governing mechanisms is not about regulation as we have known it, their existence and, perhaps more importantly, the necessity for some such bodies, represents a significant operational opening for some sort of regulation/governance. This is often overlooked in discussions about the Net and its freedoms. As the Internet has grown, become more international and gained in economic importance, there appears to be growing concern that a more organized and accountable system is necessary. This signals the presence of sectors that want to strengthen and develop this central authority.

Participants in the debate about the Internet and its governance are somewhat divided on the question of whether it can be governed at all.<sup>16</sup> Simplifying what is a partially overlapping set of positions, for some the

Internet is an entity that can be subjected to a governance mechanism while for others there is no such entity but rather a decentralized network of networks that at best can lend itself to coordination of standards and rules.

Among those who consider the Internet as a single entity, much of the concern has focused on the establishment of a system of property rights and other such protections and the means for enforcing these. The disagreement has centered on how to administer and enforce such a system. For some (e.g. Foster, 1996) it would be necessary to attach such a system to a multilateral organization, notably ITU and WIPO, precisely because there is no global trademark law, only national law, while the Internet is a global entity. This would ensure recognition from member governments. For others, the mechanisms for governance would come from the institutions of the Internet itself. Gould (1996), for example, argues that there is no need for outside institutions to be brought in but rather that Internet practices could produce a sort of constitutional governance pertaining exclusively to the realm of the Internet. A third type of proposal was developed by Mathiason and Kuhlman (1998) who suggested the need for an international framework convention agreed upon by governments; such a framework convention could parallel the UN Framework Convention on Climate Change.

On the other hand, those experts who consider there is no such entity as the Internet, but only a decentralized network of networks, argue that there is no need for any external regulation or coordination. Further, the decentralized nature of the system would make external regulation ineffective. But there tends to be agreement with the proponents of governance mentioned above as to the need for a framework for establishing a system of property rights. Gillett and Kapor (1996) argue for the functionality of diffused coordination mechanisms; further, the authority of such coordination, they posit, could be more easily legitimated in distributed network environments like the Internet, and increasingly so given a stakeholder community which is becoming global. Mueller (1998) strongly argues against an Internet regulatory agenda and against the policing of trademark rights. He is critical of the very notion of the term 'governance' when it comes to inter-networking, as it is the opposite of what ought to be the purpose which is that of facilitating inter-networking. He argues that too much debate and effort has focused on restricting the ability to inter-network.

In what is at this time one of the most systematic examinations of these various perspectives, Pare (2000) argues that neither of these two types of approaches offers much insight into the processes actually shaping the governance trajectory of the Internet addressing system. Nor can these approaches account for the operational structures of the organizations currently responsible for managing the core functions of inter-networking (both at the national and at the international level), or the likelihood of their survival.<sup>17</sup>

One important issue, also emphasized by Pare (2000: ch. 3) in his examination of the debates, is the role of the actual features of the technology in shaping some of the possibilities or forms of governance or coordination.

Post (1995) and Johnson (1996) argued that transnational electronic networks create a whole set of different jurisdictions from those of territorially based states, and hence there is little purpose in trying to replicate regulatory forms of the latter for the Internet. These authors maintain that various dimensions of inter-networking, including Internet addressing, could be governed by decentralized emergent law that eventually could converge into common standards for mutual coordination.

For others emphasizing the technology question, the Internet has been a regulated environment given the standards and constraints built into the hardware and software. Thus Reidenberg agrees that the Internet undermines territorially based regulatory governance (1998). But new models and sources of rules have been and continue to be created out of the technical standards and their capacity to establish default boundary rules that impose order in network environments (see also Lessig, 1999). Technical standards can be used as instruments of public policy, and in this regard Reidenberg (1998) posits the emergence of a *Lex Informatica*. This is clearly reminiscent, for those of us working on the global economy today, of the older *Lex Mercatoria*, a concept that is now being revived in the context of economic globalization and privatization (Dezalay and Garth, 1996; Biersteker et al., 2000).<sup>18</sup>

But the Internet is only one portion of the vast new world of digital space, and much of the power to neutralize sovereignty attributed to the Internet actually comes from the existence of private digital networks, such as those used in international finance. To this I now turn.

### **Distinguishing Private and Public Digital Space**

Many assertions about digital dynamics and potentials are actually about processes happening in private digital space and have little to do with the Internet. I consider this a serious, though fairly common, confusion. Most financial activity and other significant digital economic activities take place in private digital networks.<sup>19</sup>

Private digital networks make possible forms of power other than the distributed power we associate with public access digital networks. The financial markets illustrate this well. The three properties of electronic networks – speed, simultaneity and interconnectivity – have produced orders of magnitude far surpassing anything we had ever seen in financial markets. In 1999 the worldwide value of traded derivatives reached over US\$65 trillion – a figure that dwarfs the value of cross-border trade and investment. The consequence has been that the global capital market now has the power to discipline national governments, as became evident with the 1994–5 Mexico ‘crisis’ and the 1997–8 Asian ‘crisis’, when investors were capable of leaving *en masse* taking out well over US \$100 billion over a short period of time. The foreign currency markets had the orders of magnitude to alter exchange rates radically for some of these currencies and overwhelm each and all of the central banks involved and their futile attempt to defend their currencies against the onslaught.



*The Global Capital Market: Power and Norm-Making*

What I want to emphasize here is that the formation of a global capital market represents a concentration of power that is capable of influencing national government economic policy and, by extension, other policies. A key issue here has to do with questions of normativity – the fact that the global financial markets are not only capable of deploying raw power but have also produced a logic that is now seen as setting the criteria for ‘proper’ economic policy. IMF conditionality has some of these features.<sup>20</sup> These markets can now exercise the accountability functions associated with citizenship: they can vote governments’ economic policies down or in; they can force governments to take certain measures and not others.

The deregulation of domestic financial markets, the liberalization of international capital flows, computers and telecommunications, have all contributed to an explosive growth in financial markets. Since 1980, the total stock of financial assets has increased two and a half times faster than the aggregate GDP of all the rich industrial economies. And the volume of trading in currencies, bonds and equities has increased about five times faster. The global capital market makes it possible for money to flow anywhere regardless of national origin and boundaries. There are some countries that are, of course, not integrated.

The foreign exchange market was the first one to globalize, in the mid-1970s. Today it is the biggest and in many ways the only truly global market. It has gone from a daily turnover rate of about US\$15 billion in the 1970s, to US\$60 billion in the early 1980s, and an estimated US\$1.3 trillion in 1999. In contrast, the total foreign currency reserves of the rich industrial countries amounted to under US\$1 trillion. Just to make it more concrete, foreign exchange transactions were ten times as large as world trade in 1983; only ten years later, in 1992, they were 60 times larger and by 1999, 70 times larger. And world trade has itself grown sharply over this period.

According to some estimates, we have reached only the mid-point of a 50-year process in terms of the full integration of these markets. The financial markets are expected to expand even further in relation to the size of the real economy. It is estimated that the total stock of financial assets traded in the global capital markets is equivalent to twice the GDP of OECD countries – that is, the 23 richest industrial countries in the world. The forecast is that this value will rise to US\$83 trillion by the year 2000 to represent three times the aggregate OECD’s GDP. Much more integration and power may lie ahead for capital markets.<sup>21</sup> What really counts is how much capital can be moved across borders in how short a period of time. It is clearly an immense amount.

How does this massive growth of financial flows and assets, and the fact of an integrated global capital market, affect states in their economic policy making? Conceivably a global capital market could just be a vast pool of money for investors to shop in without conferring power over governments. The fact that it can discipline governments’ economic policy making is a



distinct power, one that is not ipso facto inherent in the existence of a large global capital market.

There are important differences between today's global capital market and the period of the gold standard before the First World War. Let me just emphasize one for the purposes of this article: the difference that digital networks bring to the financial markets is instantaneous transmission, interconnectivity and speed. Gross volumes have increased enormously even when relative net flows between countries are not higher. And the speed of transactions has brought its own consequences. Trading in currencies and securities is instant thanks to vast computer networks. And the high degree of interconnectivity in combination with instantaneous transmission signals the potential for exponential growth (I discuss other differences in Sassen, 2000a: ch. 4).

Does this concentration of capital in unregulated markets affect national economies and government policies? Does it alter the functioning of democratic governments? Does this kind of concentration of capital reshape the accountability relation between governments and their people which have operated through electoral politics? In brief, does it affect national sovereignty? It does. Elsewhere (1996: ch. 2) I have examined the mechanisms through which the global capital market actually exercises its disciplining function on national governments and pressures them to become accountable to the logic of these markets.

Here I want to make just two observations. One is that national states have participated in its formation and implementation – a subject I have addressed elsewhere (Sassen, 1999a). There is a consensus among states to further the interests of this type of economic globalization (see Mittelman, 1996; Panitch, 1996). Second, there are what have been called the implicit ground rules of our legal system – matter which has not been formalized into rules of prohibition or permission, and constitutes a de facto set of rules of permission.<sup>22</sup> The ground rules on which economic globalization is proceeding contain far more permissions than have been formalized in explicit rules of permission and prohibition. Private firms in international finance, accounting and law, the new private standards for international accounting and financial reporting, and supra-national organizations such as the WTO, all play strategic non-government-centered governance functions.

### *The Embeddedness of Digital Networks.*

It is significant that, although in some ways the power of these financial digital networks rests on a kind of distributed power, i.e. millions of investors and their millions of decisions, it ends up as concentrated power. The trajectory followed by what begins as a form of distributed power may assume many forms, in this case one radically different from that of the Internet. It signals the possibility that digital network power is not inherently distributive. Intervening mechanisms can reshape its organization. To keep it as a form of distributed power requires that it be embedded in a particular kind of structure.

In addition to being embedded in some of the technical features and standards of the hardware and software, digital space, whether private or public, is partly embedded in actual societal structures and power dynamics. Its topography weaves in and out of non-electronic space. In the case of private digital space, this feature carries enormous implications for theory, for the results of the digitalization of economic activity and for the conditions in which governments and citizens can act on this new electronic world of the economy and power. The embeddedness of private economic electronic space entails the formation of massive concentrations of infrastructure, not only worldwide dispersal, and a complex interaction between conventional communications infrastructure and digitalization. The notion of 'global cities' captures this particular embeddedness of global finance in actual financial centers.<sup>23</sup>

There is no purely digital economy and no completely virtual corporation. This means that power, contestation, inequality, in brief, hierarchy, inscribe electronic space. And although the digitalized portions of these industries, particularly finance, have the capacity to subvert the established hierarchies, new hierarchies are being formed, born out of the existing material conditions underlying power and the new conditions created by digital space.

## **Conclusion**

The Internet is only one portion of the vast new world of digital space. If we are going to consider issues of sovereignty and democracy, then we must ask a critical question about what actors are gaining influence under conditions of digitization and whose claims are gaining legitimacy. For instance, it could be argued (and it is my argument) that private digital space has had a far sharper impact on questions of sovereignty than the Internet. The globalization and digitization of financial markets have made these markets a powerful presence. Indeed, the logic of the global capital markets is today not merely a condition of raw power but one with normative potential. The logic of these markets has contributed to the elaboration of a set of criteria for what is proper government conduct on the economy. This new power of the financial markets is partly a consequence of the orders of magnitude they have reached, in good part through their digitalization and the fact that they are globally integrated, two conditions that are mutually reinforcing. The capacity of these markets to affect existing meanings of sovereignty is considerable and, in my view, thus far has been greater than that of the Internet.

When it comes to the Internet's capacity to undermine state authority and the state's capacity to regulate the Internet, two issues stand out in my reading. One is that the state has instruments through which it can exercise a certain kind of authority, especially through the venue of technical standards in the hardware and software, through the protection of property rights and, quite likely, through some of the features of the Internet addressing system and domain registry. The second is that much of the work of

developing the instruments through which the state can exercise this authority is dominated by a limited number of countries, and, in some aspects, largely by the US, certainly until recently. This leaves most states in the world in the position of having to implement and enforce standards and property rights developed elsewhere if various digital networks in their countries are going to be connected to the Internet, which they mostly are already today.

The greatest challenge comes from the lack of accountability built into many of the capabilities that can be deployed by powerful actors, be they private or governmental, in the pursuit of their interests. This gives such unaccountable actors the power to shape potentially key features of Internet use and access. In the case of private actors, this brings up the question of which actors can claim legitimacy for their interests (e.g. in ‘cybersquatting’), and in the case of governments, it raises the issue of ensuring public scrutiny of government actions. There are strong parallels here with some of the challenges for accountability raised by the growth of economic globalization and the ascendance of the so-called competitive state.

#### Notes

This is based on a larger project on ‘Governance and Accountability in a Global Economy’ (Department of Sociology, University of Chicago, on file with author).

1. A good example in the legal scholarship is the recent special issue of the *Indiana Journal for Global Legal Studies*.
2. The Internet is a dynamic condition subject to a variety of pressures. In earlier articles I have discussed how, notwithstanding its brief history, the Internet can already be thought of as having had three phases (Sassen, 1999c, 2000b). To this I would add that it is now entering a fourth phase, characterized by the privatizing of much of the backbone and a development of software aimed at protecting private property, including intellectual, rights and verification and billing. In the same articles I also discussed the different types of interpretation of the Internet and its positive and negative potentials, e.g. utopian and dystopian perspectives.
3. There are capabilities in the hardware that are not utilized by the software that is being designed. In that regard, the software is truly the domain for examining use and applications. A broader concept is that of the architecture of the Internet, which includes all the protocols and other features that make the system work. But these are embedded in the software as well. Operationally, when researching the changes one might detect in the features of the Internet, I use the types of software being produced as an indicator of these changes.
4. This saves companies the cost of private computer networks, with the requisite staffing and servicing, and the cost of frame relay connections or the costs of using intermediaries for firm-to-firm transactions.
5. An additional issue, one which I am not referring to here, is the privatization of infrastructure that has also taken place over the last two years (see Sassen, 1998a: ch. 9). Since the mid-1990s the backbone has been privatized where before it was financed by the US government, that is to say, taxpayers. This in turn changes the discussion of cyberspace as a public space, but only partly: it can remain public

even if there is a fee to be paid for access. For a resource to be public it need not necessarily be free.

6. Lessig labels the architecture of the Internet 'code' and he means by this the software and hardware that constitutes it and determines how people interact or exist in this space.

7. Elsewhere I have made a similar argument using the notion of the emergence of cybersegmentations (see e.g. Sassen, 1999c, 2000b).

8. See for instance the March 1999 Next Five Minutes meetings in Amsterdam and Rotterdam, especially the technical workshops, and the Wizards of OS meeting in Berlin (July 1999). For reports on these and other such initiatives see Nettime (continuous online reporting) and ADILKNO (1998).

9. For an elaboration of this issue of representation and a new literature that addresses it see Sassen (1999c, 2000b).

10. Several authors have examined the possibility of enhancing democratic practices through the formation of communities on the Net and the possible role of governments in supporting them (Nettime, 1997; ADILKNO, 1998; Calabrese and Borchert, 1996; Calabrese and Burgelman, 1999). See also my review of various web sites of this type in *Artforum* (Sassen, 1998b: 30).

11. There are also more specific issues that may affect the regulation of particular forms of digital activity through a focus on infrastructure. There are different types of infrastructure for different types of digital activities, for instance, financial markets versus consumer wireless phones. This is a subject I have elaborated elsewhere (see 'The State and the Global City' in Sassen, 1998a).

12. For the most extreme version of this representation see John Perry Barlow's 'Declaration of Independence of Cyberspace'.

13. One could consider the community of scientists who have worked on making the Net workable and who have had to reach many agreements on a broad range of technical matters, as a sort of informal central 'authority'. In most other cultural settings they would probably have become a formal, recognizable body – with, one might add, considerable power. There is an interesting sociology here.

14. This is but one of at least three separate regulatory frameworks that have been drafted and debated.

15. With the growth of business interest in the Net, the de facto authority of the early pioneers of the Net and their logic for assigning addresses began to be criticized. For instance, firms found that their names had already been assigned to other parties and that there was little they could do; the whole idea of brandnames and intellectual property rights over a name was not part of the early Net culture.

16. The distinctions noted here follow Pare's classification and research on the subject (2000: ch. 3).

17. Pare (2000) calls for and develops another kind of approach in the study of these questions of governance and coordination. He argues that an emphasis on end-results and on optimal governance strategies typical of the various authors briefly discussed here produces analytical blind spots. A crucial issue is the need to understand the dynamic relationship that exists between the institutional forms delivering technology and the network structures that emerge over time (see also Lessig, 1999).

18. This bundle of issues, both as they pertain to the Internet and to the global economy, are part of the larger project on 'Governance and Accountability in a

Global Economy' (Department of Sociology, University of Chicago, on file with the author).

19. The growing sector of direct online investment often uses the Internet. It is mostly retail and represents a minor share of the overall global financial market. Even factoring in its expected tripling in value over the next three or four years will not give it the type of power of the global financial market I am discussing here.

20. There is an emerging literature on this. I have discussed this issue and some of the literature in Sassen (1996: ch. 2).

21. For instance figures show that countries with high savings have high domestic investment. Most savings are still invested in the domestic economy. Only 10 percent of the assets of the world's 500 largest institutional portfolios are invested in foreign assets. Some argue that a more integrated capital market would raise this level significantly and hence raise the vulnerability to and dependence on the capital markets. It should be noted that extrapolating the potential for growth from the current level of 10 percent may be somewhat dubious; it may not reflect the potential for capital mobility across borders or a variety of other factors which may be keeping managers from using the option of cross-border investments. This may well be an under-used option and it may remain that way, no matter what the actual cross-border capacities in the system.

22. See Duncan Kennedy (1993); cf. the argument that these ground rules in the case of the US contain rules of permission that strengthen the power of employers over workers, or that allow for a level in the concentration of wealth under the aegis of the protection of property rights that is not necessary to that extent in order to ensure the protection of property rights.

23. I examine some of these issues in 'Global Financial Centers' (Sassen, 1999b). The growth of electronic trading and electronic network alliances between major financial centers is allowing us to see the particular way in which digitalized markets are partly embedded in these vast concentrations of material resources and human talents which financial centers are (see also Sassen, 2000a).

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