Governance and Politics of the Internet Economy: Historical Transformation or Ordinary Politics With A New Vocabulary?

John Zysman and Steven Weber

BRIE Working Paper 141
August, 2001
Berkeley Roundtable on the International Economy (BRIE)
University of California, Berkeley

August 2001

Forthcoming in: N.J. Smelser and P.B. Baltes, eds., *International Encyclopedia of the Social & Behavioral Sciences.* Oxford: Elsevier Science Limited, 2001.

Abstract

Driven by two fundamental processes, rapid technological change as well as social innovation and reorganization, a new digital economy, the E-conomy, is emerging. Rather than merely adding an Internet sector to the economy, the E-conomy has brought about tools for thought, tools that transform every sector of the economy by amplifying brainpower the way steam engines amplified muscle power during the Industrial Revolution. For analytic purposes, the rise of the E-conomy can be told as a story composed of 1) networks and tools, 2) e-business and e-society, 3) the productivity dilemma resolved, and 4) governance and politics. In the short run, the transformative processes unleashed by the E-conomy are likely to lead to new bargains among existing coalitions and interest groups. In the long run, the changes underway promise to fundamentally alter the political sociology of vast communities, give rise to new interests and coalitions, and transform the institutional foundation of social, economic and political life.

Stories about the digital economy, the E-conomy, have moved from specialty journals to the business pages and from there to the front pages of mainstream newspapers. The issues have evolved from the narrowly technical discussions of how best to configure a data network and the narrowly legal issues of patents and copyrights into significant policy battles over taxes, privacy, and intellectual property that have significance for the character of the marketplace and the polity. At the same time, the discussion has evolved from contrasting futurist presentations, a new Jeffersonian era of frontiersmen freed from government constraint set against a neo-Orwellian technology enabled "big brother," into a more sophisticated and pragmatic debate about issues such as surveillance and control, private and public.[1] The policy issues raised in the Internet economy will not be easily fixed by simple technical tinkering, adding new digitally sensitive wording to old rules. Rather, they portend fundamental struggles about the nature of the polity and the economy. The resolutions will not be a matter of policy management, but of political choices about basic values.

At a minimum the collection of networks, computers, and information tools that has emerged in the last decade represent a new leading economic sector. Since the first industrial revolution there has been a sequence of such leading sectors, each bringing its "explosion of invention and innovation that revolutionizes productivity in a narrow slice of the economy."[2] But is there more? A case can be made that the emergence of an E-conomy represents the creation of a new set of general tools that is fundamentally transforming *each* sector of the economy. This perspective sees a shift in the very terms and dynamics of market competition. Stephen Cohen, Brad DeLong and John Zysman

have suggested that the new technologies "do not just amplify productivity in one sector but give all economic sectors new 'tools.' They are tools for thought that amplify brainpower in the way the technologies of the Industrial Revolution amplified muscle power."[3]

Two processes drive this revolution. Certainly *one process* is technological advance. The conventional measure of this advance throughout the 1980s and the first half of the 1990s was advance in semiconductor technology with the successive iterations of the memory chip or microprocessor reflecting the amount of information that could be stored or processed.[4] Now, particularly since 1997-98, it is tracked by the expanding network bandwidth that measures the amount of information that can be transmitted. The two technological advances together create a vector of information capacity.

The *second process* is one of social innovations and reorganizations. Together those innovations have constructed the networked business system, which includes digitally enabled reductions in transaction costs, but more importantly involves quite fundamental innovations. The Silicon Valley system, which rests on repackaging and redirecting people and technology and backing them with risk capital, provided new answers to real problems of industrial innovation and production.[5]

No revolution happens without substantial dislocation and uncertainty over the meaning of measures and indicators. Critically, though, the structural transformation of the economy we are watching needs to be separated from any debates about the valuations of stock prices. [6] The debates around these points are maturing toward more

substantive questions, such as how does the digitalization of the economy change, if at all, the major causal forces of the macro-economy.

For now, the Internet economy, the intersection of the technological advances of processing and bandwidth with the business process innovations, rests principally on business applications and business reorganization. But as broadband networks capable of delivering streaming media and other new applications reach the home, consumer applications that are intimately entangled with social and community evolutions will become the drivers that induce the ongoing sequence of technical innovation. Will this be viewed as another mass media such as television and radio in the 20th century, as another communications instrument such as telephone and telegraph in the 19th century, or as with the book in the 15th century which became the base of the Renaissance?[7]

The dynamic, all encompassing nature of this transformation creates pitfalls for any brief discussion or any research strategy. First, traditional analyses or research strategies focus on particular threads, themes, and issues. They do so with good reason. Understanding relationships, specifying causal links, is difficult enough when dealing with limited, specific and fairly conventional arguments and issues. Weaving a broad pattern of relationships all too often produces not great insight but superficiality. Yet the more profound the transformation, the more difficult such a traditional strategy becomes. As context itself changes, what were once parameters become variables. Research problems cannot be so easily isolated nor causal relationships cleanly specified.

The issues, policy and political, present themselves in four packages. Each package is required to grapple with the whole; each constitutes in itself a set of social

science puzzles. The four packages are: 1) networks and tools; 2) e-business and e-society; 3) the productivity dilemma resolved; and 4) governance and politics.

1. Networks and Tools – the Infrastructure of the E-conomy

The paraphernalia of this new Internet economy rests on advanced data networks and is facilitated by new software tools. The transformation of network communications underpins and expresses the evolving e-commerce and e-society story. The new Internet-based economy grew extraordinarily quickly in comparison with earlier communications and transportation technologies. It took telephone technology 38 years to reach a penetration level of 30 percent of U.S. households. Television was faster, reaching 30 percent of households after about 17 years. The Internet, however, surpasses any previous communications technology in diffusion speed by accomplishing the same penetration in less than 7 years.[8]

One of the main reasons for this rapid diffusion is that the new technological system, the Internet/web system for linking and addressing computers, could be initially deployed over the older, existing infrastructure for voice communication, telephones. This technologically-driven transformation interacted with and fueled a move away from the older voice infrastructure, plain old telephones (POTS) over a switched analog, then later switched digital network, in a public utility, or regulated monopoly, model, and toward competing public providers, private data networks, and "networks of networks" linked by routing data.

The deployment of the new infrastructures to date has demonstrated three features that are critical to understanding this transformation. *First*, the American network revolution has been user driven – that is the products and architectures have been defined by large sophisticated users rather than by network providers. American data networks were defined, configured and often controlled, even owned, by the users.[9] The dominant American provider, AT&T, did not simply define the network rules to which customers adapted. It was competitive experimentation among user-defined networks that unlocked an avalanche of innovation. A primary difference between the European networks such as Minitel and the Internet is just that – the Internet is user controlled and developed. The Internet system that permitted and facilitated the new e-business strategies is now in turn being shaped by the emergence of e-business – its latest user constituency.

Second, the infrastructure of the E-conomy, the innovations and the evolving networks themselves have been developed and deployed by private companies in competitive markets. There has been intense and growing competition both amongst network providers – AT&T, Sprint, Deutsche Telekom, France Telecom and the like – as well as among the equipment suppliers to these networks, companies such as Lucent, Nortel Networks, Alcatel, and Ericcsson, and newly established firms from Silicon Valley, such as Cisco and Ascend, and newly important firms from other regions, such as Nokia of Finland. Because this competition rages both at the network levels, equipment level, and the software to operate the equipment, the battleground is very complicated.

That private competition was driven by two public policy initiatives: 1.) the push to deregulate telecommunications infrastructure, including the divestiture of AT&T, and

2.) a series of investments and policy decisions by DARPA, NSF, and other research agencies that nurtured packet-switching technology into an open infrastructure that could be freely exploited and commercialized in many different ways.[10]

Third, the network revolution may have been launched in the United States. However the next generation of advanced networking, particularly wireless, will include network configurations and technologies that are being developed outside the United States. Certainly, American companies such as Qualcomm and Motorola are major players in this wireless world, but advanced wireless networking, for example, is presently defined in European markets. The wireless revolution has been a story of Europe's conscious and effective use of standard setting as a development tool.[11]

In sum, the network revolution was generated by user-defined needs, private provision, and intense and increasingly international competition. In addition to accelerating innovation, the legacy of user-control has been enshrined in the culture and to a large extent in the technology, and is now becoming an issue of policy debate.[12] Legislation and indeed the culture that surrounds the Internet reinforce each other and make the social structure around the Internet quite robust.

2. E-business and E-society

Our society may ultimately be transformed by digital tools for thought and the data networks that connect the now omnipresent computers. It is important to remember that we are still in the earliest days of technological innovation, with only the first glimmers of the commercial and social implications to come. Although there is much

speculation on the subject, the question of how new communities will be shaped by the new technological possibilities is, inherently, unknowable – there are simply too many degrees of freedom.[13] The telephone was proposed to be a means of listening to symphonies, before switched signals made it a tool for social and business communication. We are still in a phase of rapid innovation where unforeseen technological change may undermine even the most far-seeing predictions about the social implications of communication.

What is clear is that the transformation, at least for the moment, is being driven by business applications. Business to business (B2B) and business to consumer (B2C) projects have induced the development of a new data communications infrastructure. If significant changes in the broad dynamics of the E-conomy emerge in the first half of the decade, it appears that they will begin with the transformation of business. This transformation goes far beyond the introduction of computers into the workplace: as Erik Brynjolssen and Lauren Hitt point out, for every dollar spent on computers or other information technology equipment, businesses spend about ten dollars to reorganize their information, production, and social systems in order to use the new technology most efficiently.[14] The real story is thus not about technology as such, but in the way technology enables and induces reorganization.

3. The Productivity Dilemma Resolved

It is this complex reorganization that impacts levels of productivity. And it is productivity, not technology per se, that ultimately determines what people are paid, the

types of skills and training required, and hence who can work and what schools must be like. Firms are the unit that will adjust to the new productivity dynamics and terms of competition and it is consequently on the level of the firm that we will first see the transformative capacity of the new digital technologies. The story of business transformation is, like the story of the network infrastructure on which it rests, central to understanding the community, policy, and governance issues. The phenomenon of e-commerce, or more broadly e-business, is unfolding extraordinarily rapidly. The conventional wisdom about its course and consequences shifts with equal rapidity. Because agreed upon "facts" and the terms of discussion change so quickly, it is essential, but difficult, to establish a stable framework for observing the emerging transformation of business strategy and practice.

How will e-commerce and digital networks change the organization of economic activity and market competition? We are, as noted, in an era of experimentation with the ultimate outcomes emerging both from a series of marketplace struggles that will change how sellers and buyers interact and policy struggles that will develop around questions of regulating and taxing those processes. A series of rapidly changing codewords point at these rival experiments; for example, disintermediation, the elimination of actors who control information or goods in a value chain (a *filiere*, if you will), has given way to the notion of reintermediation, the introduction of new kinds of players.[15]

The flux that one sees in the language represents not just fad and fashion but real, fundamental uncertainty. The rapid churn of venture capital funding is not a surprise – it represents a series of bets in a setting where efficiency and competitiveness are hard or

impossible to predict because the marketplaces in which those characteristics will emerge are still in flux. Theories of industry organization and competition policy already are shifting their emphasis and focus from issues of scale to scope, from the economies of production to the economics of networks and standards.[16] But these categories can only take us so far. The marketplaces themselves are being altered fundamentally as decentralized auctions (such as eBay) and reverse auctions with buyers setting the terms (such as priceline.com), change the ways prices are set and goods are sold. Significant parts of the markets for information products (from finance to media) have moved entirely online – and the limits to that move have not yet been seen.[17]

The transition can be monitored by looking not at one but all four of the following processes: 1) competing business strategies, and the tools on which those strategies rest; 2) evolving market structures, boundaries of the firm that contribute to market structure, and the parameters that shape the types of firms that will win; 3) changes in how the marketplace works as e-tools change the ways that buyers and sellers interact; and 4) the creation of cyber-market places in sectors such as media and finance and perhaps others where the entire industry moves its goods and interchanges onto networks.

Studying this transformation of markets by the tools of E-commerce reopens a series of traditional social science problems. Let us consider two. Put simply, will there be one E-conomy or several? Will the new economics of communication and information finally sweep away national boundaries creating the long awaited but never quite arriving convergence of national systems under an electronic manifestation of globalization? This question recapitulates older debates over whether there is one

capitalism or several.[18] .[19] A single E-conomy view builds on the common understanding of the world as comprised of technological leaders and followers. No matter which country or region leads the world market, the powerful communications instruments of the digital technology will produce a single global market and similar business models under the governance of convergent, presumably neo-liberal regulatory regimes. Other forms of regulation and protectionism will either be circumvented, swept aside, or else doom the offending jurisdiction to technological backwardness.

The "techno-determinist" view is partially right in suggesting that new capabilities erode or at least alter inherited market and regulatory structures.[20] However, this initial story is much too simple. A second view is that globalization becomes a matter of playing out on a large stage nationally rooted innovations. Historical perspective is important here. The first chapter in the e-globalization story was Japanese production innovation.[21] A second chapter consisted of American technological revival built around innovation in computing, networks, and contract manufacturing to neutralize the Japanese advantage in production.[22] A third chapter, the Internet story, was launched by and rooted in American technology and deregulation.

Leading-edge users of the Internet and e-commerce are beginning to emerge in Europe and Asia as well as the United States. As new e-commerce technologies, usage patterns, business models, and legal frameworks develop outside the U.S., they will challenge the early dominance of American policy and market leadership. Regionally- and nationally-based lead users, with regionally specific market needs and operating in

distinct policy environments, will drive distinctive lines of technology development in which local firms may have competitive advantages.

The distinction between these two perspectives is ultimately an empirical one. Convergence can be measured over time, if not precisely, and divergent paths of development will be visible in familiar forms: distinct technologies and applications, differentiated market structures and business models, different structures of comparative advantage, and ultimately distinct policy and legal frameworks.

The second problem is that the manner in which technology is embedded by law and practice into society shapes the trajectory of technical evolution. This is dramatically clear in the case of open source software. Instead of retaining private ownership of the source code (the list of instructions in a programming language that comprise the basic recipe for a piece of software), open source software projects such as Linux, Apache, and others distribute source code freely, permit modification by users, and allow redistribution of modified versions without royalties or licensing fees to the author. Open Source inverts the standard logic of intellectual property rights. It is built collaboratively by a geographically dispersed community who work in a highly parallel, relatively unstructured way and without direct monetary compensation. Because open source software is non-rival, non-excludable, and subject to collective creation, it looks like an 'impossible public good' from standard perspectives.[23] But in fact it is successful both technically (producing software that is as good or better, technically, than proprietary software) and in a social sense (sustaining a community of developers whose commitment to the collective project is extraordinary). The political economy of open

source is ultimately a story about both economics and culture – but an economic and cultural logic that have each been modified, in specific ways, by the Internet.[24] The question of how the model scales and whether it can be extended to other areas of knowledge production generates dramatic arguments about business models, which are ultimately arguments about the structure of economic production in a digitizing economy and society.

4. Governing, or at Least Steering, the E-conomy

All market economies rest on rules.[25] Just as there were never separate rules for a fax economy or a telephone economy, there will not be separate rules for an internet economy – rather, the decisions we make about the E-conomy, rules both for the networks of information technologies that are defining new market relationships and for the new business system that has helped generate it, will be critically important for the 'traditional' economy. We are beyond the point where simple tinkering will suffice. We are also beyond the point where we can sustain the illusion that the Internet can exist apart from and independent of the rest of the economy and society.[26] The cyber world is intertwined with, not independent of, the 'traditional' world. Libertarian fantasies about the Internet economy have been left behind. Regulation in this new era ultimately is a story about how political decisions interface with technical possibilities. Lawrence Lessig's recent work differentiates between "West Coast Code," the code that defines how the networks and the programs work in a technical sense, and "East Coast Code," the laws and regulations drawn up by policy-makers.[27].[28] The key debates will ultimately

be about what regulation can and should do to modify the technical possibilities that shape what kind of network world we have, what kind of code-constructed realities and businesses we develop, and hence what kind of economy we build.

The process of translating values for a new era, or creating new rules that encompass new values, is intertwined with qualitative changes in business and social life that re-open established policy bargains. And the choice of rules will often have major outcomes in terms of private gain. It is hard to imagine a higher set of stakes as a new governance 'system' is simultaneously being created at home, domestically, and as a bargain amongst several national systems. Framing the initial policy debates is difficult enough. Perhaps because it was carried out mainly among technologists, the early debate was punctuated by libertarian conceptions that government and perhaps even traditional forms of political contestation somehow could be excluded from something loosely called cyberspace.[29] There is now broad recognition that technical choices about the marketplace touch the character of our communities and polities in fundamental ways.[30] And that, conversely, the choices we seek to make about community in an epoch of data networks in turn shape the marketplaces.[31] The resulting political debate is not simply one of advantage and interest, but rather it concerns fundamental values and basic choices about markets, community, and democracy. These kinds of debates recast political alliances and reshape the character of the polity as actors redefine their interests in the New Economy. [32]

There is a set of profound issues already on the agenda today: competition policy, taxation, intellectual property rights, and privacy. They open debates about what kind of

E-conomy, about what rules for Internet facilitated business reorganization, about what sorts of virtual communities with what rights of speech and anonymity, about what types of network arrangements, about which architectures of code are called for. For example, basic issues of competition policy are now being fought out over the fate of Microsoft.[33] More broadly, how the network and other key elements of infrastructure (such as operating systems, as in the case of Microsoft) are regulated will shape who can participate in the new E-conomy, and on what terms. It will powerfully influence national patterns of e-commerce, both the speed of the transformation and the models which are adopted, which is why decisions about Microsoft are ultimately much more important than simply deciding the future of that one company.

A second issue set touches on more traditional questions of governance and the state, such as taxation. Though the numbers are still small, there is little doubt that a few years hence quite significant portions of commerce will take place over electronic networks.[34] The question of whether and how to tax the Internet will become ever more a debate about how and where to tax overall, rather than a sideshow. The intensity and urgency of the new debate will depend directly on the influence that the shifting locus of transaction has on government revenue streams and their capacity to deliver services to their community.

But the most basic issues are about information – who owns it, and what to do with it. At a minimum, these are questions about intellectual property, privacy, and speech. Here, new technologies will stretch familiar debates out into new territories of political values and the political theories that lie behind those values. Privacy is one

dramatic example. Extraordinary amounts can be known about us by monitoring our activity in a computer-based economy. The bank or credit card company knows what we buy and may monitor spending patterns for risks of default, such as possible divorce suggested by unexpected patterns of flower or jewelry purchase. The grocery store knows what you eat. An Intelligent Transportation System that manages traffic flows may know where you are, where you go, and when. How may the data be used? Can it be combined? Or sold to an insurance company? Or provided to the IRS?

A new relationship between privacy vis-à-vis the government, and privacy vis-à-vis commercial interests is emerging. Is the law in the United States – originally crafted to protect the citizen against the state and state actions such as wiretap – appropriate in an era in which privately controlled data may provide a precise picture of our life, far more detailed than anything the government can know? What rights should government have to access this privately collected data? One proposed policy approach would provide property rights in data about ourselves that we as individuals can sell or withhold. But that property right, it appears, may not include genetic data about us obtained by physicians or surgeons in medical practice. A second approach would propose that privacy is a function of the community's needs, that there must be limits on the personal data that can be gathered or dispensed for the sake of security of the community. The questions of privacy blur quickly into questions of security of communication and transaction, and in turn to a balance between privacy and community safety and protection. The complexity of the values involved in these kinds of decisions ensures that the debates will be tortuous.

What issues such as privacy, intellectual property, free speech, consumer protection or taxation have in common is that the debate about the kind of communities we would prefer becomes entangled with the way we will run our new electronic marketplaces. Consider the question of security and encryption. Once again the balance between personal privacy and national security as well as police purposes has to be reset. Similarly the question of jurisdiction, which political entity is responsible, for matters such as taxation and consumer protection have to be rethought. Consider the balance between free speech and the protection of minors against inappropriate content. Should the solutions be technical – filtering devices that block access to what parents would reject? Or should we instead seek solutions that require public rules? Some issues simply will be forced onto the political agenda as network-based transactions multiply. Whatever your views on taxation on the net, simply speculate how the debate would work if a majority of commercial transactions were on the net, but untaxed. Public services from roads to schools would not end; but the structure of taxation would be forced to change in a profound manner.

Complicating each of these debates tremendously is that they cannot be settled definitively in one country. If privacy rules are different in Europe and the United States, how do companies from AOL to IBM operate?[35] While particular issues are thought out and fought out, care must be taken to assure that diverse national solutions are sufficiently reconciled to assure the operations of the global information system. An era in which national monopoly telephone systems could be imagined as closed almost watertight systems provisioned by a national cartel of suppliers and connected at the

borders or halfway across an ocean has given way to the era of interconnected data systems, global service providers, and global equipment companies. Connection at the borders of separate systems will be difficult; more likely rules may be harmonized, that is made identical, or made interoperable. But a solution will have to be found.

The evolution of the e-conomy is a remarkable opportunity for the further development of empirical and theoretical social science. This is not a separate research domain for a few observers interested in technological evolution and the politics of technological change. Information technology is penetrating every aspect of business, the economy and society as a whole. Just as expressions such as "e-commerce" and "Internet economy" will be meaningless in light of the large share of commercial transactions and economic activity carried out over digital networks, differentiating between research on "Political Economy" and "Political E-conomy" is likely to become pointless. Understanding the way technological, organizational and political-legal changes interact in shaping a future characterized by ubiquitous digital networks connecting countless nodes globally will be essential for our understanding of political economy, whether domestic, comparative or international, and for our understanding of society as a whole.

Keeping track of these changes will be difficult, to say the very least. In the short run, bargains will most likely be struck by existing coalitions or new coalitions comprised of familiar interest groups in an existing institutional environment. But in the long run, the political sociology of communities of all kinds will change dramatically. Individuals will come to define their interests differently, new interest groups will emerge, new

coalitions will rise and new bargains will be struck and embodied in entirely new or fundamentally altered institutions. Indeed, the changes underway have the potential to radically change the very configuration and orchestration of social and political life. And we are only starting to study the very beginning of this transformation.

---

[1] François Bar, Stephen Cohen, Peter Cowhey, Brad DeLong, Michael Kleeman and John Zysman (2000), "Access and Innovation Policy for the Third-Generation Internet," *Telecommunications Policy*. Fall 2000, pp. 489-518.

[2] Stephen Cohen, Bradford De Long and John Zysman (2000), *Tools for Thought: What is New and Important about the "E-conomy"?*, Berkeley Roundtable on the International Economy (BRIE) Working Paper 138.

[3] Cohen et al (2000), pp. 2, 5.

[4] The capacity of semiconductors has roughly doubled every eighteen months since its invention in the 1960s, a law-like relationship that has come to be known as "Moore's Law," named after Intel co-founder Gordon Moore. See: Moore, Gordan E. "Cramming More Components Onto Integrated Circuits" *Electronic*, Vol. 38, No. 8, April 19, 1965.

[5] On the "Silicon Valley system," see AnnaLee Saxenian (1994), *Regional Advantage: Culture and Competition in Silicon Valley and Route 128* (Cambridge: Harvard University Press), and Stephen Cohen and Gary Fields (1999), "Social Capital and Capital Gains, or Virtual Bowling in Silicon Valley," *California Management Review* Vol. 41, No. 2, pp. 108-130.

[6] See Steven Weber (1997), "The End of the Business Cycle?," *Foreign Affairs* (July/August, 1997), pp. 65-82.

[7] On the centrality printing with moveable type for the Renaissance, see Elizabeth Eisenstein (1980), *The Printing Press as an Agent of Change* (Cambridge: Cambridge University Press).

[8] These figures were taken from United States Internet Council (1999), *State of the Internet*, available at http://www.usic.org.

[9] François Bar and Michael Borrus (1994), *The Future of Networking in the U.S.*, E-conomy Project Working Paper 11.

[10] On the origins of the Internet see John Naughton (1999), *A Brief History of the Future: the Origins and Destiny of the Internet* (London: Weidenfeld & Nicolson); Katie Hafner and Mathew Lyon (1996), *Where Wizards Stay Up Late: the Origins of the Internet* (New York: Simon & Schuster); see also the excellent review essay by Roy Rosenzweig (1998), "Wizards, Bureaucrats, Warriors, and Hackers: Writing the History of the Internet," *American Historical Review* (December), pp. 1530-1552.

[11] David Bach (2000), "International Cooperation and the Logic of Networks: Europe and the Global System for Mobile Communications (GSM)" BRIE Working Paper 139, and Annina Ruottu (1998), "Governance within the European Television and Mobile Communications Industries: PALplus and GSM – A Case Study of Nokia," PhD. dissertation, University of Sussex.

[12] Consider for example the struggle at the FCC about whether cable networks must provide open access along the earlier data network models. See François Bar et al (2000).

[13] See Marc A. Smith and Peter Kollock, eds. (1999), *Communities in Cyberspace* (New York: Routledge), and Sherry Turkle (1995), *Life on the Screen: Identity in the Age of the Internet* (New York: Simon & Schuster).
[14] Erik Brynjolssen and Lauren Hitt (2001), "Beyond Computation," *Journal of Economic Perspectives*, (Fall 2001) vol. 14, no.4, pp.23-48.
[15] See Carl Shapiro and Hal Varian (1999), *Information rules: a strategic guide to the network economy* (Boston: Harvard Business School Press).
[16] Shapiro and Varian (1999), op. cit.
[17] Nicholas Negroponte (1995), *Being Digital* (New York: Alfred A. Knopf).
[18] The classics are still Rudolf Hilferding (1923), *Das Finanzkapital: eine Studie ueber die juengste Entwicklung des Kapitalismus* (Vienna: Verlag der Wiener Volksbuchhandlung), Alexander Gerschenkron (1962), *Economic Backwardness in Historical Perspective* (Cambridge: Harvard University Press), Andrew Shonfield (1965*), Modern Capitalism: the changing balance of public and private power* (London and New York: Oxford University Press), and Peter Katzenstein, ed. (1978), *Between Power and Plenty: foreign economic policies of advanced industrial states* (Madison: University of Wisconsin Press).
[19] See John Zysman (1983), *Governments, Markets and Growth* (Ithaca: Cornell University Press), Peter Hall (1986), *Governing the Economy* (Cambridge: Polity), and David Soskice (1999) "Divergent Production Regimes: Coordinated and Uncoordinated Market Economies in the 1980s and 1990s" in Herbert Kitschelt, Peter Lange, Gary Marks and John D. Stephens, eds. (1999), *Continuity and Change in Contemporary Capitalism* (Cambridge: Cambridge University Press). For an excellent review of the literature, see Peter Hall (1999), "The Political Economy of Europe in an Age of Interdependence," in Kitschelt et al (1999) op. cit..
[20] For a very thoughtful and insightful discussion of how the new technologies and the organizational changes they enable might curtail state capacity, see Manuel Castells (1997), *The Power of Identity: The Information Age - Economy, Society and Culture* Information Age, Vol. 2 (Malden: Blackwell).
[21] On lean production, see, for example, James P. Womack, Daniel T. Jones and Daniel Roos (1991), *The Machine that changed the World* (New York: Harper Perennial).
[22] See Michael Borrus and John Zysman (1997), "Globalization with Borders: The Rise of Wintelism as the Future of Global Competition," *Industry and Innovation* Vol.4, No. 2 (December), pp. 141-166.
[23] Marc A. Smith and Peter Kollock (1999), eds., *Communities in Cyberspace* (London: Routledge), p. 230.
[24] Steven Weber (2000), "The Political Economy of Open Source," BRIE Working Paper 140, forthcoming.
[25] Karl Polanyi (1944), *The Great Transformation* (Boston: Beacon Press).
[26] Thanks to Peter Lyman for this cogent observation.
[27] See Lawrence Lessig (1999), *Code and Other Laws of Cyberspace* (New York: Basic Books).
[28] For an introduction to virtual communities such as WELL and LambaMoo, see Howard Rheingold (1993), *The Virtual Community: Homesteading on the Electronic Frontier* (Reading: Addison-Wesley Publishing Co.). On LamdaMoo in particular, see Elizabeth Reid (1995), "Virtual Worlds: Culture and Imagination," in Steven G. Jones, ed. *CyberSociety: Computer-Mediated Communication and Community* (Thousand Oaks: Sage Publications), pp. 164-183.
[29] The classic is John Perry Barlow's *A Deceleration of the Independence of Cyberspace* of 1996. See http://www.eff.org/~barlow/Declaration-Final.html.
[30] Lessig (1999), op. cit.
[31] See Robert C. Post (1995), *Constitutional Domains: Democracy, Community, Management* (Cambridge: Harvard University Press).
[32] An early example for sharp disagreements about which values should govern online transactions and how these values should be enforced is the case of privacy to which we return further down. For an excellent discussion of potential conflicts resulting from diverging privacy regimes in the U.S. and EU, see Robert E. Litan and Peter W. Swire (1998), *None of your business: world data flows, electronic commerce, and the European privacy directive* (Washington, D.C.: Brookings Institution Press).
[33] On the Microsoft anti-trust case see *U.S. v. Microsoft Corporation: Conclusions of Law and Final Order* of April 3, 2000, available at http://www.usdoj.gov/atr/cases/f4400/4469.htm, and the full brief, available at

http://www.usdoj.gov/atr/cases/ms_index.htm. For an early overview of the case see Robert H. Bork, "The Case against Microsoft," available at http://www.procompetition.org/research/bork.html. For a "neutral site," see Policy.com's coverage at http://www.policy.com/reports/dojvsms/index.html.

[34] In 1999, for example, business-to-consumer e-commerce in North America totaled $ 33.1 billion or 1.4 percent of all retail sales. The figure is expected to almost double to over $ 60 billion in 2000. See Shop.org/Boston Consulting Group, *The State of Online Retailing 3.0* at http://www.shop.org.

[35] This is exactly the question Litan and Swire ask in their study of the implications on the EU's Privacy Directive. See op. cit.