

FRAMEWORKS FOR UNDERSTANDING THE
POLITICAL ECONOMY OF THE DIGITAL ERA

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In the spring of 2000 one might have asked: “Are the extraordinary expansion of computing intelligence, the pervasive spread of digital networks, and the recent arrival of the commercial Internet, the edge of an historical revolution, a transformation?” The sudden interconnection of disparate networks into a single “cyber world” and broad consumer participation in those networks through vehicles such as AOL or Yahoo seemed to augur a new era. The pace at which individuals, not just firms, were being connected to the Internet in the United States was explosive. Businesses were reorganizing and extending internal activities to capture the possibilities of the new network of networks. Together this rapid diffusion of networks and consumer engagement encouraged the fantasy that these information technologies could transform the terms of competition and restructure a broad range of the economy.

By the summer of 2003, the conventional question had become different: “Was this the revolution that never happened?” Dreams evaporated with stock values, first during the dotcom collapse and then in the telecoms debacle. It seemed that the digital revolution might have more in common with tulip speculation, pure ephemera, than with the railroad expansion and transportation revolution that took place at the dawn of the industrial era.¹

Now, in 2006, as this book goes to press, the crash itself is being reevaluated.² Despite the ebb and flow of technological exuberance, we believe that digital technology has dramatically altered political and economic dynamics. The primary goal of this book is to investigate the political economy of the digital era and, in turn, to better understand its implications for politics and markets.

The dominant conversation about how information technology (IT) has affected political economy focuses on technology’s role in constraining the

4 choices governments face when shaping their domestic economies. As digital networks facilitate international communication and virtual markets, the transaction costs of conducting global business fall. International firms can then leverage their mobility to constrain regulatory options. Politicians who attempt to aggressively steer their national response to the digital era confront the very real threat that business will locate abroad, taking with it electorally valuable jobs (Tonnelson 2000). Additionally, the decentralized, nonhierarchical character of technology complicates any attempt to intervene. The very nature of digital networks, according to this argument, is that they route around control. Nimble capital and the particular technological architecture of the Internet, it is argued, have thus severely weakened governments' ability to shape the political and social character of the digital era (Castells 1996; Rosenau 2002).

A central objective of this book is to reconsider this discussion. It proposes to construct a framework for analysis about the international digital era, one that examines the ability of political actors to innovate and experiment in spite of, or maybe because of, the constraints posed by digital technology. IT does more than just change the costs of transportation and communication: it alters the manner in which economic value is created, changes how international production is organized, and reopens basic societal bargains struck around individual liberty and economic rights. There is no inevitable political path driven by the technology; rather, evolving technology shakes up the political order, creating the foundations for fundamental fights over the organization of markets and politics.

In order to understand this profound transformation, the book builds four distinctive arguments about the interplay of digital technology, corporate strategy, government policy, and global marketplaces. First, we argue that rather than global forces sweeping away national structures and local traditions, distinctive national tales of development create and are an integral part of the global story. The digital era is one in which an increasingly global market coexists with enduring national foundations of distinctive economic growth trajectories and corporate strategies. As IT facilitates the interaction of national political economies in international marketplaces, political experimentation and innovation rooted in specific domestic institutional environments have global consequences. Second, the effective use of information technology, we all understand, requires investment in innovative business strategies and organizations. These corporate experiments drive the innovative core of the digital era. Firms and governments face the difficult task of encouraging this risky experimentation and recognizing the educational benefits of failure for future innovation. Third, the implementation of new

technologies and the adoption of new business models and strategies involve a complex market transition. The digital era forces us to understand those transitions as more than just a shift from one market equilibrium to another; rather they are indicative of a broader shift from one universe of policy and market signals to another. Alongside that transition, national and international policies, and the technological standards adopted by agreement or market place outcomes powerfully influence global competitive realities. Fourth, the choices made about digital policy shape the national polity and social community in significant ways. We therefore investigate whether, as the rules for the new digital era are being made, there is a fundamental and basic shift in the rules of society that alters the way economy and polity operate. The rest of the introduction builds on these four points and expands on the main argument of each section of the book.

PART I: NATIONAL STORIES AND GLOBAL MARKETS IN THE DIGITAL ERA

Certainly information technology expands communications capacities and reduces the costs of transaction over distance. These digital tools, and the networks that interconnect them, facilitate the communication and data exchange required for integrating operations and markets that are widely dispersed geographically into a single global marketplace. But technology does not unfold autonomously, playing out an inevitable logic. Nor does globalization lead to the ineluctable elimination of national systems of economic governance and technological development. Again and again the waves of innovation that disturb global markets emerge from enduring national structures. The national stories, the national innovations, are amplified and reverberate across global markets through information technology. Digital technology permits national political economies to more readily access and compete in international markets and thereby facilitates and demands national economic experimentation and innovation.

This view of globalization rests on a conception of the dynamics of national market systems and of their interactions (Zysman 1994). Let us sketch the outlines of this perspective. First, each economy consists of *an institutional structure* that is a function of that country's distinct political and industrial development. Many critical institutions, social arrangements, and social groups predate modern societies and market economies; others are given a modern character, often by force, in a struggle over a variety of non-market issues. These institutions and arrangements, which often shape modern markets, cannot be understood simply by a narrow analysis of economic calculus

6 (Evans, Rueschemeyer, and Skocpol 1985; Thelen and Steinmo 1992). Second, in a rather conventional step, the institutional structure of the economy, combined with its industrial structure in a more classic industrial-organization sense, *creates a distinct pattern of constraints and incentives*. This frames the interests of the actors as well as shaping and channeling their behavior.³ The interaction of the major players generates a particular “market logic” and “policy logic” (e.g., J. Levy 1999). Third, the national *market logic* shapes the particular character of strategy, product development, and production processes in a national system. Each market economy is defined by the institutions and rules that permit it to function; or, said differently, each national system can be defined by the “institutional structure” of the economy. Because the national institutional structures are different, there are, as a consequence, many different kinds of market economies (Streeck 1991; Hollingsworth 1997; Hall and Soskice 2001).

A specific market logic (and political logic) then induces distinct patterns of corporate strategy (and government policy) and therefore encourages internal features of companies (and the government) that are distinctive to that country. There are typical strategies, routine approaches to problems, and shared-decision rules that create predictable patterns in the way governments and companies go about their business in a particular political economy. Those institutions represent specific capacities and weaknesses within each system. The French case illuminates how the institutional structure acts to generate policy routines. French political-economic institutions produced constant policy responses to a diverse set of industrial problems from the end of World War II until the mid-1980s (Zysman 1977; Hall 1986).

The consequence, and central to this chapter, is that the global dynamic and trade dynamics must in significant part be understood as an *interaction of these national market logics*. Institutionally rooted differences in corporate strategy and access to markets influence patterns of international economic competition. As national strategies play out on the global stage, they force others to adjust. These adjustments proceed as institutionally rooted adaptations to changing international and technological environments.

In sum, a national institutional structure creates the foundation for nationally specific patterns of political and industrial development. Each particular structure sets a definable pattern of incentive and constraint for the actors within the system; the interaction of the actors creates distinctive national market logic. Nationally specific patterns of government policy and corporate strategy, distinctive routines that characterize one country and not another, are the result. These national logics forge particular patterns of *interaction*

between national systems. The resultant international environment may then challenge other national systems, opening up the possibility for institutional adaptation and innovation. National systems then evolve as they interact with one another in internationally competitive markets, with important consequences for national economic adjustment and the domestic political arena.

The Japanese production revolution highlights the relationship between national market dynamics and patterns of international interaction (Tyson and Zysman 1989). The market and policy logic rested on three aspects of the Japanese political economy. First, the Japanese market was relatively closed to the implantation of foreign firms; consequently, competition was restricted to Japanese firms. Second, there was rapidly expanding domestic demand; financial resources channeled to expanding sectors by government policy permitted firms to satisfy demand by building production capacity. Third, foreign technology was easily and readily borrowed. Under these conditions, the market logic encouraged Japanese firms to aggressively pursue market share as a means of maximizing profits—goals traditionally assumed to be contradictory. Formally, firms faced long-term declining cost curves (Murakami and Yammaura 1982). That meant that as firms increased volumes—ideally capturing more market share in the expanding market—costs would fall, allowing prices to drop to increase sales, thus starting the cycle over.

The pursuit of market share spilled over into international markets (Yamamura 1982). Companies in Japan competed for market share, which required them to build production capacity in anticipation of demand. Excess capacity was almost inevitably the result. Because much of the production capacity was then a fixed cost, the temptation was to sell at marginal production cost in foreign markets. As long as the domestic market was insulated and foreign markets were open for sale of excess capacity, Japanese firms had a constant incentive to build in anticipation of demand and offload the consequences of overly ambitious judgments onto foreign markets. In fact, when the domestic market became saturated, a group of firms would begin to export at the same time. The result, in the phrase translated from the Japanese debate, was a “downpouring of exports.” The sudden flood of exports into the major export market—the United States—caused intense political conflict with America in a series of sectors beginning with textiles and continuing through automobiles and, later, semiconductors. Political actors in the United States were forced to confront the Japanese challenge and in some cases, such as the semiconductor industry, forged innovative political deals. The periodic international disputes over Japanese dumping were thus a function of the domestic pattern of competition in which market share was key. The Japanese example leads to

8 the issue of how one nation's policy routines and market logics influence the options of another.

As national market strategies amplified by communications technology shape the terms of international economic competition, others face the challenge of adapting. Although the choice has been cast as one to be made between national convergence around a constrained set of adjustment strategies and diverse national paths that reproduce past institutional solutions, external pressures often open up the space for political and institutional innovation.⁴ These innovations naturally rest on preexisting institutional legacies but may include considerable reinterpretation and redeployment. Institutional capacity may be adapted, layered, and reconfigured to address the new international economic environment (Thelen 2003; Streeck and Thelen 2005). Old political tools find important new roles in unexpected terrain at the same time that truly new institutions may be integrated into the national system. Policy responses may unintentionally arise from the convergence of past decisions, but the character of adjustment is often strongly tied to the domestic political arena and the ability of political actors to forge a viable adaptation bargain. Where a political bargain is achieved, institutional innovations may result that effect economic development, and where it fails, national systems may be doomed to muddle along. In this volume we explore this relationship between national strategies, information technology, and international markets by examining the cases of Finland, Japan, and the emerging markets.

The Finnish story is a dramatic surprise and little understood. International markets and information technology made possible Finland's emergence as a significant economic player with a communications technology cluster and world-class communications company, Nokia. As a small country of 5 million people, it did not have the domestic economy or supply base to support a world-scale and world-class company. Its success is a national story, and not one just of market processes or corporate strategy, but of a conscious national strategy to reposition itself in the global economy by investing in information technology. At the same time, it is an international story whereby a small Nordic country emerged as a dominant player redefining the terms of global IT competition.

Finland shifted in the 1990s from being a Soviet supplier and basic forest products provider to a communications leader and a producer of sophisticated equipment. Reeling from an economic depression in the early 1990s, when real gross domestic product (GDP) fell more than 10 percent and unemployment hovered at nearly 20 percent, Finland seized an opportune moment in the global electronics industry and the process of European integration to accomplish significant structural change of its economy. Nokia and its associ-

ated cluster of firms became a major player in the world communications industry, and its wood industry modernized, becoming ever more competitive in product and equipment markets. Finland now posts annual growth rates around 5 percent, among the highest in the world.

What explains Finland's surprising success in the digital era? Importantly, the economic transformation was consciously engineered as part of an explicit bargain among social partners that included raising the levels of research and development (R&D) spending in the country to historic levels. The Finns relied on, and indeed created, a form of adaptive corporatism that allowed new directions in policy and industrial organization to forge this policy action. Finnish society then relied on domestic political institutions to attempt an economic gamble on repositioning themselves in the international economy. Corporatist political institutions were used to liberalize critical sectors and can thus be seen as a support to reform and growth, not just a rigid system of labor market privileges. The nature of production in a digital era allowed Finnish firms to rely on homegrown R&D, European standards, and free trade to find real economic success internationally.

Two chapters address these issues, one examining the economic and market story and the other the political and policy dynamics. "Finland's Emergence as a Global Information and Communications Technology Player: Lessons from the Finnish Wireless Cluster," by Ari Hyytinen, Laura Paija of ETLA, the Research Institute of the Finnish Economy, Petri Rouvinen, and Pekka Ylä-Anttila, tell the economic story. Ylä-Anttila was part of the policy-making team for the original transformation and has been a member of several working groups developing new strategies for the twenty-first century. The political story is presented by Darius Ornston and Olli Rehn in "An Old Consensus in the 'New' Economy? Institutional Adaptation, Technological Innovation, and Economic Restructuring in Finland." This chapter grows from Ornston's recent work on Finland and Ireland and Rehn's earlier work on small-country adaptation. Importantly, Rehn was responsible for economic policy in the Finnish prime minister's office and then was appointed EU Commissioner for Information Society and Enterprise and then for European Enlargement. The chapters explain how corporatist political institutions were redeployed to focus policy efforts around success in technology-centered international markets.

Although the Finnish case provides an unexpected but successful national experiment in the digital era, Japan offers an important counterpoint. The first part of the Japanese story, seemingly, has been told many times and is sketched above. In a sense, the global era began with a national story, Japanese production innovation. Under the label of lean production, Japan dominated

10 many world markets in the 1980s. The critical factor for our purposes is that this set of production innovations hinged on the internal dynamic of Japanese competition and policy (Zysman and Doherty 1996).

Then the Japanese miracle foundered. Japan was the dominant force in microelectronics during the 1980s, and its failure to become an information technology leader seems somewhat surprising. What prevented Japan from leveraging its lead in the previous round to innovating in the digital era? Just as in the case of Finland, the nature of digital technology when combined with national policy choices significantly shaped economic outcomes. The Japanese implosion over the past few years turned principally on national policy choices that were driven by internal dynamics. The financial collapse, for example, that came with the breaking of the economic bubble was a product of the particular credit-based system of finance that served well for catch-up in a closed market, but worked less well for a maturing industrial sector with an excess of savings. Note by contrast that in the 1980s the French adapted a similar system; their success in transforming their capital markets and system of monetary control permitted the close financial linkages with Germany and later the European Union.

The bursting of the bubble and the domestic deflation that ensued came at a difficult moment in international market competition, the beginning of the digital era. It was the moment of transition from the electromechanical, with significant Japanese consumer goods leadership, to a digital era of American leadership. Routers replaced switches in communications networks; Apple iPods replaced Sony Walkmen. National policy further weakened Japanese international position by bolstering those interests that were most threatened by the digital transformation.

Two chapters depict the Japanese story in the digital era. Robert E. Cole, in "Telecommunications Competition in World Markets: Understanding Japan's Decline," analyzes the causes of Japan's decline in international competitiveness in the telecommunications sector since the 1990s. Cole argues that in the face of global liberalization of the sector, technological innovations of the 1990s, and the convergence of telecommunications and information technology sectors, Japan made serious policy mistakes. First, it was unable to deregulate successfully, standing by a commitment to relationship contracting. The government supported established firms and products in an environment characterized by disruptive technologies. Second, newcomers were critical in this phase of the industry's evolution. Cisco's router command interface had become a de facto industry standard by the time Japanese equipment manufacturers could shift to the production of routers. Cisco's powerful first-mover advantage forced Japanese firms to give up global markets. Third,

the Japanese took non-strategic approaches to setting standards. Japanese manufacturers had dominated global markets in wireless telecommunications in the 1980s, but Nippon Telegraph and Telephone's (NTT's) proprietary domestic personal digital cellular (PDC) standard, deployed in the 1990s, isolated the Japanese market. The PDC standard not only dissuaded foreign players from entering, but also made it difficult for Japanese equipment producers to export abroad.

Kenji Kushida, in a complementary chapter, "Japan's Telecommunications Regime Shift: Understanding Japan's Potential Resurgence," sets out to explain likely conditions under which rapid domestic developments from the late 1990s might reverse this decline. He asks what might lead to a sudden increase in the presence of Japanese firms in global IT markets. He considers how the Japanese "regime" in telecommunications is changing in a way that might make a competitive rebound possible. The concept of regime includes the primary industry and government actors involved, how these actors interact with one another, and sources of standard setting. In this new regime, the Ministry of Post and Telecommunications (MPT) is no longer the sole promulgator of telecommunications industrial policies; NTT has lost its technological dominance and the power to set standards, thanks to the advent of the Internet; and electronics firms can no longer count on NTT's procurement budgets for networking equipment or start-ups.

Kushida argues that the decline in international competitiveness in the 1990s was a result of discontinuous technology entering a malconfigured telecommunications regime. The regime shift currently underway is the resulting adjustment process—a politically mediated process in which state and industry actors iteratively create new constraints and opportunities. In terms of a possible Japanese resurgence, domestic developments associated with this regime shift are causing Japanese manufacturers to refocus on taking back international market share.

Which unexpected national stories might appear on the global stage to define the trajectory of international IT markets? Japan's arrival was startling and affected the terms and rules of global competition; its loss of leadership was unexpected. Finland's rise was certainly unforeseen, but it followed trajectories established in Europe and elsewhere. What surprises lie ahead?

Naazneen Barma addresses this question in "The Emerging Economies in the Digital Era: Marketplaces, Market Players, and Market Makers." Much empirical and policy attention has been devoted to IT access and usage dimensions of the global digital divide. This chapter directs analytic focus to the other side of the coin, that of global digital innovation. It thereby challenges the conventional wisdom that developing countries are merely marketplaces

- 12 for digital products innovated in the industrialized world. Empirical examination of recent developments in IT production and use in several newly industrializing economies—in particular, China, India, and the East Asian newly industrialized countries (NICs)—reveals the different roles that emerging economies can and do play in global IT innovation. Probing the concept of innovation demonstrates that it often comes through invention, yet it can also emerge from learning by doing and from learning by using. Understanding the trajectories of these different ecologies of innovation and the stakeholders associated with them are central to an analysis of the role emerging economies play in global digital competition. In particular, it appears that successful innovations in emerging economies are often user focused. Furthermore, the state plays a more visible role in digital innovation in emerging economies, be it through heavier regulation, private-public cooperation, or outright government IT policies. These more incremental ecologies of innovation may not pose a direct challenge to dominant digital producers; they do, however, have the potential to alter the structure of future global digital markets.

PART II: THE EXPERIMENTS

The technologies that underpin the digital revolution provide new ways of organizing, storing, analyzing, and transferring information. The catch is that what needs to be done is not always evident. What matters for productivity and growth is the capacity to imagine how the underlying digital technology can be used, to envision the tools, to design their sophisticated application. The imagination and the applications evolve as an array of experiments—experiments not only in technology or tools, but in the organizations that employ the tools and the business models for establishing new ways of creating value. Some of those experiments will succeed; some will fail. All provide rich material from which to learn about innovation in a digital era.

We consider three such categories of experiments in this book. The first exemplifies the failure of imagination; old models were applied to new situations. Enron is treated as a failure to understand the collaborative possibilities of the new networks. The second category of experiments considers the reorganization of production in the digital era: offshoring/outsourcing, on the one hand, and development of open-source software, on the other. These represent experiments that rely on the opportunities inherent in digital technology. The third category includes experiments with the management of knowledge—experiments that question the fundamental nature of knowledge. Without explicitly addressing the issue, the chapters all suggest that national contexts are producing unique streams of experiments that may generate distinctive strategies for firms with different national origins.

The first category of experiments deals with business strategy. Andrew Schwartz tells the story in “Missed Opportunity: Enron’s Disastrous Refusal to Build a Collaborative Market.” The classic Enron story focuses on the easy answer, fraud; Enron as a Ponzi scheme designed to enrich scoundrels. But Schwartz argues that beneath the off-balance-sheet transactions and partnerships that have drawn such intense scrutiny, Enron’s efforts to reduce complex products into tradable commodities represented one of the most promising ideas of the past twenty-five years. Enron’s failure, the argument goes, was due in part to a business strategy that missed the collaborative opportunities represented by the new network marketplaces. Enron saw competitors as ruthless and uncompromising, a mentality that rejected the very real possibility that rivals could, working together, create new markets with tremendous profit opportunities. Enron’s brilliant vision of the New Economy, contends Schwartz, did not go far enough; it required a new business model that emphasized cooperation among competitors.

Work reorganization constitutes a second set of experiments. The introduction and application of networks that permitted easier communication and exchange of data, even in the years before the Internet, followed a clear pattern. François Bar and Michael Borrus pointed out that first existing processes were automated; then applications in new networks were launched; and finally work processes were reorganized (Bar and Borrus 1997). Hence we need to consider both the reorganization of existing work processes and the creation of fundamentally new processes of production.

In “The Relocation of Service Provision to Developing Nations: The Case of India,” Rafiq Dossani and Martin Kenney examine the reorganization of service work. It is really a story about the conditions that contribute to offshoring work in a service era. Apart from the capacity to store and transmit information, a variety of factors facilitate outsourcing from a company and offshoring the work away from a core location. Increasingly, production—whether production of objects, software, or service—is converted into standard constituent elements. Those constituent elements can then be addressed as modules with standard interfaces. One consequence is that work can be segmented organizationally and geographically.

Dossani and Kenney’s chapter highlights the notion that the reorganization afoot is only partly about cost; more fundamentally, it is about imagining and implementing new approaches to the organization of production. The story parallels the earlier reorganization of manufacturing but raises potentially a more fundamental challenge. A few years ago, it seemed that the United States was supposedly moving from an industrial economy to a postindustrial or service economy. A decline in manufacturing employment was offset, so the argument went, by the growth in the service sector. Many argued that we

14 were living through a digital revolution, and thus, as a national economy, we could safely exit manufacturing through a secure economic afterlife developing software and providing services—a whole array of activities that do not involve making physical goods.

Now, as American corporations move some white-collar and technology jobs to regions with lower-cost yet highly educated workforces, there is a fear that the scale of the offshoring will be great enough to affect the fate and future of higher-wage skilled workers in the United States. The real debate needs to be about jobs tomorrow and the capacity to adjust and innovate in global markets. It hinges on whether the further diffusion of IT abroad will continue to enhance economic productivity at home and whether that increased productivity at home will in turn generate new high-wage jobs at home. Whether or not job creation offsets job losses, as the optimists would propose, the adjustment will be substantial.

In “From Linux to Lipitor: Pharma and the Coming Reconfiguration of Intellectual Property,” Steven Weber considers the possibilities of radically new production systems. The outsourcing/offshoring debate, whether about services or manufacturing, inherently considers the reorganization and relocation, and then adjustment, of existing production structures. Open source as a principle of organization hinges on distinct approaches to mobilization and coordination of work, not a vague voluntarism but replicable rules of participation and gain. But the principles and rules on which it rests are new. For example, it rests on foundations that turn notions of property from ones of control over the use of an object into control over the processes of distribution. The collaborative work arrangements it points to are about production of software and made possible by digital networks. One critical question is whether the open-source strategy of production that emerged in software in fact is applicable in other domains, such as the pharmaceuticals sector. If it is, what implications would it have for the future productivity of the industry?

The third set of experiments concerns knowledge, the very fundamentals of an information or digital society. Information in digital form can be formalized, stored, searched, transmitted, and used to control the operations of physical processes. The complex relationships whereby engines operate or planes fly can be stated as algorithms represented in digital form. But how do we know, in an avalanche of facts and stated relationships, which ones we care about? How do we manage the knowledge we have? That ultimately forces two questions: What is the nature of knowledge? And how will knowledge contribute to the creation of value in companies and the economy?

Knowledge, particularly theoretical knowledge, has been recognized as an essential element of the contemporary economy. Critically, though, it is the

expression of information, data, and knowledge in digital form that is truly distinctive, permitting the application of digital tools. Digital technology represents a set of tools for thought, tools that manipulate, organize, transmit, and store information in digital form. In so doing they extend the range of what can be represented in formal data. We both gather an awesome amount of data and formalize the know-how of communities of practice. In one sense the flood of data made possible by these tools can drown the recipient, but oddly, the same tools for thought make easier the creation of meaningful information and the generation of knowledge from that flood of data.

Niels Christian Nielsen and Maj Cecilie Nielsen, in “Spoken-about Knowledge: Why It Takes Much More than Knowledge Management to Manage Knowledge,” confront the question of what knowledge is in order to address the question of how it should be managed in companies. They note that both the conventional categories of knowledge that we use, stored as formally stated sets of facts and relationships and as know-how embodied in communities of practice, are philosophically incomplete or misleading conceptions of what knowledge is. Only a recognition that knowledge is embedded in often fundamentally metaphoric frameworks will allow us to confront the fact that knowledge takes on value in the constant interplay of formal and embodied knowledge. This conversation recreates and recasts the frameworks and metaphors.

The growing importance of knowledge and its management are reflected externally in strategic R&D relationships and internally in quite innovative approaches to company organization. Given the diffuse and specialized character of much of the knowledge required for any product and market, the way companies relate to each other is critical. Christopher Palmberg and Olli Martikainen, in “Pooling Knowledge: Trends and Characteristics of R&D Alliances in the ICT Sector,” demonstrate the diverse means by which this external knowledge management may occur. Especially vital to information technology sectors, these relationships vary cross-nationally and within sectors. These experiments, then, reflect in part the environmental setting within which firms are embedded.

Internally, the company organizations required for efficient manufacturing may not be the same as those required for effective exploitation of knowledge. It appears a distinctive form of organization is emerging in the digital era, the learning organization. It may be distinct from the traditional categories of craft, Taylorist, or lean production. The work of Lorenz and Valeyre, as explicated by Tobias Schulze-Cleven, suggests that a distinctive organizational form is emerging in northern Europe, principally in the Nordic countries. Social welfare policies that may have been complications in an era of mass production

- 16 provide the social basis for the learning organization needed in the knowledge economy. As Zysman argues in the next chapter, and the cases here support, the route to adaptive flexibility can come through a strategy of both reinforcing social protections and eliminating them. The question is not necessarily the level of protection, but rather the form those protections take.

PART III: MARKET TRANSITIONS

Corporate strategies are chosen given a web of policies that set market signals and define market opportunities.⁵ Moving from one set of market signals to another is not simply a matter of whether a new equilibrium can be defined and can produce better outcomes, but whether one can navigate successfully the transition to the desired end point. In short, corporate experiments implementing new digital technologies are entangled in political debates about the reorganization of markets and marketplace rules. Some of these debates are about applications of specific rules: what may be done with bits of personal information that can be gathered, stored, referenced. Other debates are about the networks themselves and about the rules for use and competition that structure those networks. These debates delimit the politically viable menu of possible market transitions. Some market endpoints become impossible because the transition to that endpoint does not exist. An analysis concerned with the political economy of the digital era, then, must not only examine the characteristics of static marketplaces but also the transitions that form the bases of such markets.

Conventionally, in the West such transitions often began with a process of deregulation, a term that was rather loosely applied to a grab bag of very different objectives and stories. The term implied a call for a reduction in the extent of government intervention and rule making in marketplaces, and for the substitution of competition for government's direct regulatory or administrative hand on what were perceived as natural monopolies. In the United States the classic story of deregulation was the breakup of the regulated monopoly AT&T. Indeed, as Steve Vogel has argued, deregulation really meant reregulation, a change in the character and purposes of rules — changes that often reinforced the authority of bureaucrats — rather than a reduction in total government intervention (S. Vogel 1996). In Western Europe and elsewhere, public administrations performing supposedly public services have been converted into private firms operating in newly formed marketplaces. This was a process of de-administration, privatization, and market creation.

A diverse set of political and economic factors drives the formation and re-formation of markets. There are at least two sets of debates: a political one

concerned with who wins and who loses from the process of reregulation, and a technical economic one focused on defining market rules that will optimize welfare. The classical argument about regulation begins with a concern for how government rules overcome market failure. The notion of market failure is one in which agents pursuing private interest in a market will not produce an optimal outcome. A natural example is R&D, where public investment can offset a private tendency to underinvest. In response, of course, others argued that state regulation of the economy was not a market corrective but rather reflected government failures and the use of government rules by specific interests to capture private rents. And more recently, it has been argued that self-managed marketplaces and private competition serve the public interest better than regulation.

Can these stories and arguments be unified in a political economy of market transition? To do so, we should ask why some of these market transitions succeed, while others that seem quite similar on the surface fail. A marketplace can be understood as a constrained or partial equilibrium, a market outcome resting on the specific set of rules and institutional arrangements that at a given moment define constraints and induce a logic of market competition. Each marketplace, then, is constructed by a contingent set of rules, rules that are usually embedded in a set of institutionalized organizations such as firms, banks, and governments (North 1990). Marketplace transition or creation — be it deregulation, reregulation, de-administration and privatization, or creation — involves a shift from one constrained equilibrium to another. The creation and transformation of markets will always be a story about establishing rules and the marketplace structure. These rule sets and institutional arrangements rest on explicit, and sometimes implicit, political bargains.⁶

The transitions are not automatic. What is interesting is the route: how we go from one point to the other. Let us define a successful transition as arriving at a new stable constrained partial equilibrium (CPE), a market clearing within constraints, without dramatic and continuing political disruption. The French financial reforms in the 1980s reached a stable end point; we no longer hear about the reforms or their consequences. The Japanese reforms in the same period have not reached a stable endpoint; they have created economic difficulty and continuing political struggle. There can be several CPEs, of course, each with different implications for distribution and innovation. But to represent an endpoint all CPEs must have prices that allow the demand for goods to clear.

How do we understand the politics that allow that transition, that shift in the rules and institutions of the marketplace, to happen? Such a political process can be addressed from two vantages, rents that motivate politics and

18 sensitive prices that dislocate politics. The first view focuses on the rents that motivate market actors to seek changes in the rules. The rules of a marketplace can be redefined to create new opportunities for existing players or possibilities for new entrants. Stability requires that the rents, or possible rents, be largely extracted or no longer politically available. This is a sequence, with moments of stability and periods of aggressive dislocation. It is not just that rent seekers create new rules, but rather that each rule change creates new rent seekers, new market players who are likely political activists in the rule game. As long as the rents are there or significant new rents and new political contestants are created, then the bargains will not be stable, and the rules will fluctuate and evolve. As the rules evolve, market dynamics, prices, and supply will also fluctuate. Arriving at a market clearing equilibrium is not obvious.

A second vantage would examine the power of politically sensitive prices. If energy prices jump too high or too abruptly, many consumers and producers are profoundly dislocated, without the capacity or time to adapt. If rents move upward abruptly, then many residents are forced to move or alter expenditure patterns significantly. Such price dislocations define affected groups that may mobilize politically. They will likely mobilize to mute or reshape markets.⁷ If the market process of moving from one equilibrium to another involves movements in those prices that dislocate society, then significant disruptive politics are the result. We often think about how massive layoffs or firm closures generate demands for government intervention. Energy costs, whether electricity or oil, can only move so far so fast without disrupting the community. Changing the regulation in the California energy markets produced both shortages and price increases. Whether those swings in supply were expressions of a shortage of generating capacity or market manipulations that were not possible in the regulated utility market, the result was an intense political struggle.

The route from one CPE to another is evidently an interplay between markets and politics. Imagine two sets of prices: those prices that must move significantly for market adjustment, and those prices that are politically very sensitive. If there is extensive overlap and significant movement between radical price moves and prices that are politically sensitive, then there is a real risk of political controversy over the new rules. If there is no overlap between market-significant and politically sensitive prices, then the losers can be ignored or perhaps compensated, depending on the style of the political system. As overlap grows, the political problem of managing the discomfited increases. Again, however, this is not likely to be a single step, but a series of moves and adjustments.

One lesson from these two vantages is that the market transition is not over until the politics settle down; otherwise the rules are likely to change again to mollify the dislocated and to capture rents. Or, put differently, each marketplace rule structure is a political bargain or imposed outcome that by either intention or result settles questions of who gets what. And conversely, each new CPE constitutes a new set of political bargains; hence the politics of a marketplace transition is an outcome, not just a cause.

There are significant implications for policy makers debating rule changes in markets and for academic analysts. Policy makers who simply compare static outcomes without considering the route by which markets must move from one equilibrium to the next can be profoundly misleading. It is critical to analyze the transition as well as the possible outcomes; the transition to some outcomes may simply not exist, and the price of others may simply be too high.⁸ For academic analysts, this vantage emphasizes that distributional consequences are central to understanding developmental trajectories, and it points to the political strategies one must assess in understanding outcomes.

We consider here the market transitions associated with the emerging cellular networks, with the stories told twice, once from an American perspective and then from the European vantage. In “The Peculiar Evolution of 3G Wireless Networks: Institutional Logic, Politics, and Property Rights,” Peter Cowhey, Jonathan Aronson, and John Richards argue that wireless telecommunication developments demonstrate the difficulties associated with such moves. Predictable roadblocks will slow the transition from one set of powerful embedded interests to new property rights and marketplace rules. The new property rights will benefit a reformulated set of stakeholders and political entrepreneurs and create their own market distortions. As this unfolds, the evolution of institutional mechanisms for organizing markets may lag behind the changes in property rights, producing marketplace discontinuities. The basic political economy of the 3G wireless marketplace described here differs in fundamental ways from the stories on 3G in the business press. The set of contributions from the Research Institute of the Finnish Economy opens a similar set of issues. As information technology continually disrupts sector equilibrium, market rules — often in the form of standards — influence corporate responses. Both in the diffusion of second-generation wireless, described by Heli Koski in “Factors for Success in Mobile Telephony: Why Diffusion in the United States and Europe Differs,” and in the innovation strategies held by firms focusing on third-generation technology, depicted by Aija Leiponen in “National Styles in the Setting of Global Standards: The Relationship between Firms’ Standardization Strategies and National Origin,”

- 20 government intervention has shaped patterns of consumer uptake and industry cooperation. Market transitions, then, are integrally linked to the institutional settings in which they are embedded.

PART IV: SOCIAL TRANSFORMATIONS

The unfolding digital revolution and the creation of a digital infrastructure are not just about national economic strategy, corporate experimentation, or market transitions. Even as information technology creates new market possibilities, it has the potential to redistribute power, force the reexamination of basic political bargains, and threaten influential political interests. The very opportunities inherent in the digital era raise concerns that could threaten to disrupt the economic potential of the digital era. Governments, businesses, and citizens are left to struggle with devising policy responses that resolve these disputes, and the resultant actions inevitably shape the character of the national information society. A critical feature of the digital era, then, is managing the sociopolitical repercussions of technological change.

Decisions about the rules of information—be they intellectual property, privacy, or market transactions—are at once decisions about broader social values, whether they are intended to be or not. Politics and communities are at their very root based on flows of information. And shifts in those information flows affect the character of human interactions and, in turn, political organizations. If information that was once available only in local groups is suddenly available through a network in the isolation of the home, interaction patterns change. Seemingly clear and agreed-upon technical purposes, such as how to provide a system of addresses for e-mail or to provide credit or payment, almost inevitably involve more fundamental issues such as privacy or freedom of speech.

The effect of information rules does not play out in a single inevitable logic. The architecture of an information society (or the political and technological rules that govern the use of digital tools) may vary considerably. Just as decisions about how to construct a freeway or public transportation system influence the character of a city's labor or housing market, variations in information rules may produce radically different digital societies (Lessig 1999). Whether or not an individual has the ability to log on to a computer anonymously has significant implications for use patterns. Societies and governments, then, confront a series of intense debates over how to structure political and economic rights in a digital environment.

This section begins by disposing of the old debate that the digitally networked world would be a Wild West, immune to government control. Taylor C.

Boas, in “Weaving the Authoritarian Web: The Control of Internet Use in Non-democratic Regimes,” uses the case of free speech in authoritarian regimes to demonstrate the level of control possible in a digital architecture. Rather than purely limiting technology diffusion, authoritarian regimes have constructed mechanisms to embed surveillance into their national version of the digital era. Far from being forced from power by innovation, these regimes have been able to mobilize Internet technology to expand their political reach.

Three issues — intellectual property, free speech, and privacy — show the interconnection between business strategy and broader public values and how the resolution of these issues influences the texture of our political and social communities. Brodi Kemp, in “Copyright’s Digital Reformation,” shows how incumbent interests were able to use legislation to reassert their interest in the digital world. Far from ushering in a peer-to-peer, user-based intellectual property system, privileging an individual’s right to share purchased goods, the entertainment industry successfully lobbied to bolster their rights of control over digital media. With the recent prosecution of individuals by the music industry for sharing files, it seems clear that the balance of power over intellectual property has (at least for the near term) shifted even further to content providers and away from consumers — a rather ironic result from a technology that was heralded as bolstering individual power over corporate interests. Contributing to a broader debate, Kemp highlights how international agreements have been deployed in the digital era to bolster domestic economic interests.

We try to sum up the issues and cases by asking, do the political rules of state and polity shift in significant ways with the digital revolution? To drive the discussion in heuristic exaggeration, Newman and Zysman ask, in “Transforming Politics in the Digital Era,” whether the digital era marks a second great transformation (K. Polanyi 1944). The Industrial Revolution was not a technological story, but the outcome of a basic transformation in the organization of economy and society. The authors examine how digital technologies shift the fundamental logic of politics in this new era and attempt to describe the variety of information societies that are emerging.

Information technology has unleashed a set of national, corporate, and societal experiments. The effects of these experiments range from the terms of global competition to the character of everyday political life. And the success and failure of these efforts have been in large part influenced by domestic and international politics and their interaction. As the digital era enters its second decade, it is vital to assess its progress as well as its future — to learn from these initial moves. We believe that the contributions in this volume make a significant contribution to this effort.

NOTES

1. For the political version of this argument see Margolis and Resnick 2000.
2. Brad de Long and Konstantin Magin, "The Last Bubble Was Brief, but It Was Still Irrational," *Financial Times*, April 19, 2005, 19.
3. Alexis de Tocqueville makes the classic argument. See Bendix 1964.
4. For a summary of the convergence and diversity debate, see Berger and Dore 1996.
5. Andrew Schwartz and John Zysman were developing this argument together at the time Dr. Schwartz's illness became more serious. Zysman wants to acknowledge the depth of Andrew Schwartz's insight, his consistent and persistent analytic drive, and his support. In addition to the argument presented in his contribution to this volume, Schwartz's view on market transition can be found in his book *The Politics of Greed: Privatization, Neo-liberalism, and Plutocratic Capitalism in Central and Eastern Europe* (Lanham: Rowman & Littlefield, forthcoming).
6. For the importance of political bargains to the rules of the market see Fligstein 1996.
7. This follows the logic of the double movement elaborated by Polanyi 1944.
8. Howard Shelanski's comments on Cowhey, Aronson, and Richards's paper at the conference "The Digital Era: National Responses, Market Transitions, and Global Technology," Berkeley, CA, October 22, 2004, makes this point.