

Technology and the State

France in the late 1990s undertook a revolution in innovation policy. Afraid of falling behind the liberal market systems of the United States and the United Kingdom, the cohabitation government of Prime Minister Lionel Jospin and President Jacques Chirac put in place a vast array of new policies—from tax incentives for investing in risky high-tech start-ups to new standards for electronic signatures—designed to promote new information and communications technologies in France. In their analysis, France in the 1990s had succeeded in the basic sciences, but failed to translate laboratory findings into commercially viable new technologies. Roger-Gérard Schwartzberg, French minister of research, described France’s apparent economic lag as emerging “not from a lack of gray matter, but from an incomplete exploitation and valuation of resources.”¹

The French leadership was especially concerned about a brain drain, as France’s technically trained elite increasingly moved to join vibrant small-firm sectors that already existed in Britain and the United States.² With its new policies the government sought to encourage the commercialization of new technologies, and they looked to the United States to understand how this might be done. What they found was that in the cutting-edge sectors that constituted the “new economy”—biotechnology, information and communications technology, e-commerce—the successful exploita-

tion of basic science findings appeared to depend on a context of dynamic, new, innovative firms funded through private venture capital. Preoccupied by a growing technology lag, and driven by the fear of losing highly trained technicians to foreign firms, France was determined to create a domestic analog to Silicon Valley.

The new set of technology policies France put in place turned French innovation policy on its head. Traditional government and bank-financed research and development were progressively replaced by private venture capital. France's technical elite, long accustomed to a secure career track in France's prestigious laboratories and industrial conglomerates, were encouraged to move into risky new companies. New technologies that had once been developed in France's prestigious industrial conglomerates were now being commercialized by small technology start-ups. Much of this effort was focused on start-ups working in the new information and communications sectors.

But France's homegrown analog to Silicon Valley, if it did succeed, was likely to look different from its American counterpart in at least two ways. First, France's new technology start-ups did not emerge spontaneously. Drawing on the French interventionist regulatory tradition, the government played a guiding role in establishing the basis for high-tech innovation in the private sector. Efforts included public contests and educational programs to promote entrepreneurship, industry incubators sponsored by public research labs, even an entirely new legal form for companies tailored to the needs of high-tech start-ups. The goal was to create a new institutional framework in which individual entrepreneurship could prosper. But encouraging small-firm dynamism appeared, at least at the outset, to imply more rather than less state activism.

Second, French policymakers faced strong political pressure to make the new innovation strategy compatible with French political values of equality and social solidarity. Government efforts to promote entrepreneurship were therefore carefully designed to limit their impact on French society. Stock options in France were tightly regulated to balance incentives for innovation against excessive executive compensation. The administrative burden on French companies was reduced, but not through simple deregulation. Instead, the French *service publique* began adopting Internet-based capabilities to streamline business interaction with the gov-

ernment. And new private investment instruments were carefully designed so that they would not threaten France's popular public welfare system. Even as the French government encouraged private innovation via start-ups working in new technology sectors, it retained a strong guiding role for itself in the economy.

This book investigates France's experience in adapting to the requirements of innovation in the new information and communications technology (ICT) sectors. It focuses on the six-year period from 1996 to 2002. Although short in duration, this period included dramatic efforts at regulatory reform; a boom in technology start-ups, venture capital, and initial public offerings (IPOs); the spread of the Internet, then a collapse in the Internet market, accompanied by a broader economic decline. This short stretch of time, in other words, was a crucible for French leaders and businesspeople, a period in which the new challenges of the ICT revolution were confronted, when new policies and practices were tested and stressed.

Of course, the challenges that the new information and communications technologies posed were not unique to France. All countries, in one way or another, faced the same issues. But by focusing on the experience of a single country, we can gain a deeper sense of the political and economic challenges of adjustment, and of the interests that lay behind the policies. It may be many years before we are able accurately to assess the economic consequences of the experiment that France undertook during this six-year period. But we can already capture the political and social texture of the struggle. To understand the challenge that new technologies pose to sovereignty, we need to look where silicon and the state collided.

Technology and the State

Observers have suggested that today's new information and communications technologies constitute an industrial revolution. On a par with the mechanization of the eighteenth century or the vertical integration pioneered in the nineteenth century, this third industrial revolution threatens to change the very economic and social order of society.³ Like these earlier

revolutions, the new ICT may fundamentally reshape industry and the workplace.⁴ Researchers at the Berkeley Roundtable on the International Economy describe the new ICT as “producing one of those very rare eras in which advanced technology and changing organizations do not revolutionize just one leading economic sector but transform the entire economy and ultimately the rest of society as well.”⁵ But in one important respect this latest revolution appeared to be different from its predecessors. Despite the political challenges that earlier industrial revolutions posed, they left the state stronger and the nation more consolidated. The third industrial revolution, by contrast, appeared to threaten core functions of the state.

The French state historically played a central role in developing and commercializing new technologies. These new technologies in turn promoted, rather than subverted, the purposes of the state. France’s earliest communications technology, the visual telegraph invented by the Chappe brothers, employed a chain of tall towers sporting mechanical semaphore arms. The system was used to transmit messages from Paris to the limits of French territory. Soon new steel train lines extended along the paths of the semaphore, built in a radial pattern extending from Paris, accompanied by the new electrical telegraph. Such projects have been deeply tied to the creation of a distinctive French identity. These early technologies drew the country together as a commercial unit, while also meeting basic military needs to transport troops and materiel to the borders. “There could be no unity,” concludes Eugen Weber in *Peasants into Frenchmen*, “before there was national circulation.”⁶ They helped to create what Benedict Anderson has called an “imagined community,” an image of France as a nation of which all were a part.⁷

Not only did new technologies reinforce the French state; the state was also the primary sponsor and user of new technologies. Especially in the post–World War II period, emerging technologies were systematically pursued and applied to reinforce national sovereignty. The new technologies increased the power and autonomy of the French state in two ways. As complex and technologically challenging projects, they required a deep government role in the promotion of new research. This has been especially true in the post–World War II era. The elite National Center for Scientific Research (Centre national de la recherche scientifique, CNRS),

founded in 1939 on the eve of World War II, created a network of research labs intended explicitly to support basic research in the national interest. Through CNRS the postwar French state was able to direct the development of new technologies.

Moreover, the technologies often had explicitly national goals. Military research allowed France to manufacture advanced weapons. Space launch technology gave France worldwide surveillance capacity. France also pursued an aggressive nuclear power program in order to reduce its energy dependency on the Middle East. When France withdrew from NATO in 1966, for example, the United States refused to sell advanced computers to assist with France's nuclear research. In response, Charles de Gaulle created a new national laboratory in advanced computing, the Institut national de la recherche en informatique et en automatique (INRIA), located in the abandoned NATO headquarters in Rocquencourt.⁸ Research at INRIA in turn laid the groundwork for France's homegrown computer manufacturer, Bull. Thus both in their development and in their use, the new technologies of the second half of the twentieth century served to concentrate and reinforce the French state's control over key technologies. In doing so they helped to forge a modern French identity grounded in national autonomy, cohesiveness, and a respect for state initiative.

And what was good for the state appeared to be good for industry. Since the 1950s, French industrial innovation projects have been ambitious and largely successful.⁹ That success had its roots in large state-run companies, so-called national champions, which received high levels of government financial and research support. The Ariane space launch vehicles, Airbus and the *Concorde*, France's nuclear program, Minitel, Renault automobiles—nearly all of France's industrial achievements of the postwar period had their origins in collaborative projects between France's large firms and the state. The relationship between large and small firms was correspondingly troubled.¹⁰ If anything, French planners typically tried to eliminate small companies, in the understanding that they lacked the market power and economies of scale necessary for promoting economic efficiency.¹¹

But the features of the French political economy that so closely aligned the interests of the technology sector and the state also posed challenges for promoting innovation in the new information and communications

sectors. France's tradition of state-initiated innovation tended to concentrate France's technical "knowledge-bearing" elite within the state-run sectors. Those with the greatest capacity for technological innovation were still mainly working for the government.¹² On top of this, the postwar tradition of state-led industrial planning and the apparent success of earlier government-funded innovation projects had led French citizens to associate innovation with government initiative.¹³ But this legacy confronted the French state with a conundrum. On the one hand, government-led initiatives were poorly suited to the rapid pace of technological and market development in the new information and communications technologies. France's Plan Calcul to promote the electronics sector in the 1960s and 1970s had already shown that state-sponsored innovation did not necessarily compete well in the global marketplace for information technologies.¹⁴ On the other hand, if new private initiatives failed, it was likely that these failures would nonetheless be blamed on the government. Moreover, the dominant role of the central government in postwar France had weakened local authorities that might otherwise have taken the lead in promoting decentralized private-sector innovation projects.¹⁵ France's postwar economic trajectory had concentrated expertise, political responsibility, and institutional capacity at the state level. This posed real problems for cultivating technology-intensive innovation in small firms.

The Challenge of New Information Technologies

Moving to a decentralized model of innovation in order to make France competitive in the new information technologies required potentially risky changes in policy. Would private investors make appropriate decisions about the allocation of venture capital? Would entrepreneurs acting separately pursue projects that generated a successful technological trajectory for France? Could the government legitimately step back from technology decisions that were arguably critical for France's economic future?

French politicians expressed real concerns about whether their country could adopt the institutions necessary to promote high-tech start-ups without at the same time importing the entire package of American-style capitalism. "How can we catch up with the United States," asked Christian Sautter, Jospin's former economics minister, "without losing our souls,

that is, without sacrificing the solidarity that lies at the heart of the European model?”¹⁶ The centerpiece of the ICT revolution, the Internet, was grounded in a collection of new technologies and services—microelectronics, software, telecommunications; Internet service providers, e-tailers, and web designers—that appeared to prosper only in a liberal economy. Yet France had, until recently, possessed few of the necessary liberal economic institutions.

Venture capital funds, a central source of start-up capital, were invented in the United States in 1954. They did not appear in significant numbers in France until forty years later. Stock-option plans had become a core component of compensation for technology entrepreneurs in the United States, luring highly skilled scientists, engineers, and businesspeople into risky ventures with the promise of future fortune. But French tax law had recently been rewritten to make stock options prohibitively expensive. Finally, a successful high-tech start-up sector implied the rapid formation and dissolution of companies. The U.S. common law legal system and its tradition of *laissez-faire* regulation imposed low costs on company creation and failure. France’s civil code legal system and strong regulatory tradition, in contrast, placed brakes on company creation and failure.

The risks implicit in a small-firm technology sector also challenged basic tenets of France’s social contract: risk-sharing, job security, and wage equality. Entrepreneurs and investors in the new economy would face high levels of financial risk. On the one hand, this high level of risk would drive a rapid cycle of company formation and failure that challenged France’s traditional emphasis on job security and the socialization of risk. On the other hand, the high-powered incentives necessary to draw scientists and investors into risky ventures would create a new class of affluent French, a prospect that implied widening inequalities. France’s efforts to promote a French Silicon Valley therefore generated a heated political debate focused on its compatibility with France’s implicit—and occasionally very explicit—social contract.

Policymakers and public intellectuals feared that the liberal policies required for success in the new economy might be the thin edge of an unstoppable deregulatory wedge. Alain Minc argued in his best-selling *www.capitalisme.fr* that a market economy would necessarily lead to a market society: “The principles of the market . . . competition [and] the

continuous evaluation of performance, penetrate into broader and broader spheres of society. It becomes, over the course of time, a market society.”¹⁷ Critics like Minc argued that the logic of market liberalism could not be embraced halfway, that it would eventually come to dominate all of French life. Anglo-American commercial culture was held up as a cautionary example of what French society could become if it embraced the ideology of the “new economy” and its technologies: a society in which markets alone dictated the terms of work, of leisure, and of national culture.

Sources of French Policy Activism

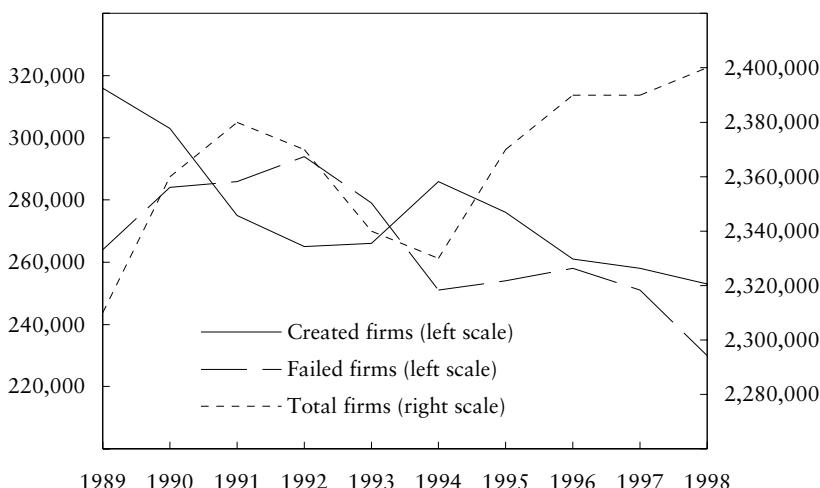
The new emphasis on promoting high-tech start-ups in France had its roots in three sets of domestic concerns: France’s poor performance in new economy sectors, high unemployment, and a political desire by the incoming administration to appear engaged in the economy. In the first instance, French leadership was responding to concerns over an apparent innovation lag in France. The incoming Jospin government saw clear signs that French industrial innovation had declined in the 1990s. The French share of patents issued in the United States had fallen from 3.03 percent of all patents in the period 1991–94 to 2.72 percent in the period 1995–98. France also had relatively fewer researchers than other countries, accounting for just 5.9 percent of the work force, compared with 7.4 percent in the United States and 8.3 percent in Japan.¹⁸ The government was particularly concerned about innovation in the high-technology sectors, especially ICT and biotechnology. France contributed only 2.5 percent of the total cost of research to the human genome project, for example, whereas 33 percent came from Britain and 55 percent from the United States.¹⁹ And it trailed its major European rivals in levels of computer and Internet use both in business and in the general population. Because ICT and biotechnology sectors both appeared to rely on small, dynamic companies to create and commercialize new products, the French government saw small-firm innovation as a core component of its national innovation strategy.

Perhaps more important than the innovation lag, however, was the prospect of new job creation that the small-firm sector offered. The Jospin government came to power with a mandate to lower France’s stubbornly high rate of unemployment. Newly created firms in the technology sectors

were seen as a particularly important source of new jobs. Indeed one in five private sector employees in France worked in a company that was less than five years old.²⁰ A study conducted in 1995 showed that technology companies formed by researchers created three times as many new jobs as did other kinds of new companies.²¹ Another study on the economic impact of innovation found that the new technology sectors had contributed 35 percent of the growth of the U.S. economy between 1995 and 1998, while the new economy sectors in France accounted for only 20 percent of overall economic growth.²² The promotion of a new high-technology sector dominated by successful small firms offered not only the prospect of rapid new job creation, but also a set of new jobs in high-wage, high-skill areas of the economy.

Interest in promoting innovation and job creation through technology start-ups was especially strong because it came in the wake of a decade-long decline in company creation in France (see figure 1-1). New firm creation had fallen almost continuously over the previous decade, from 320,000 new firms created in 1989 to 255,000 new firms created in 1999. Germany, in comparison, saw the creation of 390,000 new companies in 1999. Indeed France had the lowest rate of new company formation, per capita, in Europe.²³ The outlook for new firms in France was not entirely negative. After 1996, a relative drop in company failures offset the decline in company creations, so the total number of firms in France grew after 1996. A comparison with Britain showed that new French firms at the time were far more likely to succeed than were their British counterparts. In France, 57 percent of new firms lasted at least five years; only 37 percent did so in Britain.²⁴ The problem was that the Silicon Valley model relied both on rapid new firm creation *and* on the possibility of rapid firm failure, and France's economy seemed to enjoy neither of these.

Beyond these economic reasons for pursuing a small-firm technology strategy, there was also a political logic. The Jospin administration came into office on the premise that policy activism could address France's economic woes. In 1995, François Mitterrand had announced, "We have tried everything. Nothing works against unemployment." Jospin's campaign strategy had been to repudiate Mitterrand's fatalism. Once in office, his administration was dedicated to the idea that the government *could* do something.²⁵ This was the political logic behind the new government's

Figure 1-1. *Company Creation and Failure in France, 1989–98*

Source: Christian Cordellier, “Créations et cessations d’entreprises: sous la stabilité, le renouvellement,” *INSEE Première*, no. 740 (October 2000), p. 1.

emphasis on small-firm innovation.²⁶ A focus on new technologies would highlight differences not only with the Mitterrand legacy but also with the previous administration of Alain Juppé, which was perceived not to have emphasized technology. When the Jospin group took over in 1997, almost no one in the French ministries used e-mail, and the Internet was essentially unknown. La Villette, France’s advanced technology showplace northeast of Paris, had explicitly banned the Internet from its displays. Thus for the Socialists coming into power, a new technology emphasis allowed them to seem both activist and modern. And, critically, the new technology policies promised to be inexpensive. In an explicit understanding between Prime Minister Lionel Jospin and Economics Minister Dominique Strauss-Kahn, Jospin agreed to put his political weight behind the new information and communications technologies, but to give them minimal financial support.²⁷

Policy Entrepreneurship

Rather than pursuing a path of deregulation modeled on the U.S. experience, the Socialist government that came into power in 1997 pursued an

activist policy to promote the information and communications technologies. The Jospin team worked methodically to redraw economic incentives and barriers so as to promote entrepreneurship, but in a way that would be compatible with the social and economic obligations of the French state. These reforms, which in most instances amounted to reregulation rather than deregulation of the economy, allowed France to find its own way in the globalized economy.²⁸ The U.S. experience, as one French venture capitalist expressed it, was more of a benchmark than a model.²⁹

In reforming the regulatory framework for entrepreneurship, the French government paid close attention to the interest and advice of economic actors. Speaking of the need for new rules in a globalized economy, Dominique Strauss-Kahn, finance minister under Jospin, said: “These new rules will not only be statist: they will also involve the social partners.”³⁰ One forum for this involvement was the new Council of Economic Analysis (Conseil d’analyse économique, CAE). Created July 24, 1997, the CAE included thirty-two professional economists and was headed by the prime minister. Unlike the U.S. Council of Economic Advisers, the CAE was nonpartisan. Its representatives came from different parties and positions, some even from outside France. In this sense it looked more like its German neighbor, the council of “five wise men,” who were politically neutral and diverse in perspective. Because the CAE deliberated in private, it avoided much of the political conflict that the five wise men often generated. Prime Minister Jospin called the new group a *boîte à idées*, or think tank, to the government.³¹ It undertook studies of issues such as unemployment, government contracting, and the “new economy.” Jospin’s successor, Jean-Pierre Raffarin, was less attentive to the CAE, and reportedly considered merging it with France’s traditional economic planning agency, the Commissariat général du plan. Ultimately it was left in place, but with less influence.³²

The French Senate sought its own source of input through a new program of Senatorial Meetings with Industry (Rencontres sénatoriales de l’entreprise). Its goal was “to better understand the evolution of the economy, to listen to corporate actors, and to see the concrete impact of legislation.”³³ From October to December 2000, for example, forty-one senators visited companies for one to three days. The companies covered the spectrum from start-ups to multinationals, and nine of these were in

the Internet economy.³⁴ Legislation written in the Sénat, including corporate governance reform and the reregulation of stock options, was informed by these visits.³⁵

New organizations also emerged to represent the positions of the growing entrepreneurial class. The lobbying group *Croissance Plus*, created in 1997 by Pierre Harin, pushed for government support for activities in the new technology sectors. *Croissance Plus* included 150 individual members from new technology firms.³⁶ Cofounder Benoît Habert, for example, was president of the venture capital fund of *Dassault Développement*. Among other activities, the group invited political figures to discuss their views on the new economy. Interestingly, the sources of technology lobbying were not only domestic. The group *Objectif 2010*, organized by Philippe Pouletty, an immunologist and French entrepreneur who had moved his company *SangStat* to Silicon Valley, was influential with the Jospin government in the late 1990s. He lobbied against France's wealth tax and helped to design the new company statute to benefit entrepreneurial start-ups. The name of the organization was a reference to its goal: to make France hospitable to entrepreneurs by the year 2010.³⁷ Another influential group, *France Libre d'Entreprendre*, was based in Kent, England. Run by Olivier Cadic, an outspoken expatriate critic of the French regulatory and fiscal environment, the group spurred debate in France by helping French companies that wanted to leave France to set up in England.³⁸ Both of these groups, representing French entrepreneurs in the Anglo-Saxon world, had a powerful voice in shaping the reforms that France put in place.

Perhaps most critical was the way in which Economics Minister Dominique Strauss-Kahn reached out to the business community. A technophile by nature, Strauss-Kahn traveled repeatedly to Silicon Valley. He met with the leaders of American high technology when they came to France, including Steve Jobs (Apple), Bill Gates (Microsoft), John Chambers (Cisco), Michael Dell (Dell), Michael Lynton (AOL), and Eckhard Pfeiffer (Compaq). His special adviser on the new information and communications technologies, Stéphane Boujnah, had been a mergers and acquisitions lawyer at the law firm Freshfields. Boujnah and Strauss-Kahn were able between them to create a strong link between business and government.³⁹ Indeed without Strauss-Kahn it seems likely that much of the French agenda to promote technology start-ups during this period would not have been launched.

One direction from which France drew little inspiration was the European Union (EU). Although (or perhaps because) the new government technology policies coincided with the push for monetary integration within the EU, France for the most part did not turn to Brussels for solutions to its lag in the new information and communications technologies. There were some exceptions. The European Investment Bank did allocate some resources to new venture capital funds in France. And an effort to benchmark growth of the Internet across Europe was launched following the EU's Lisbon Summit in March 2000. More frequently, though, the EU stood in the way of French efforts. The European Commission, for example, repeatedly criticized tax incentives for investing in French technology firms on the grounds that they were anticompetitive. And EU efforts to create a common framework for Internet commerce largely failed to displace distinctive domestic regulations. Indeed when Jean-Noël Tronc, adviser to Lionel Jospin on the information society, outlined France's strategy for promoting and managing the new information technologies, the European Union was almost entirely absent from his proposed set of policy solutions.⁴⁰

Organization of the Book

Chapters 2 and 3 of this book consider the new institutional context that was created to support highly risky new economy ventures. They argue that the Jospin administration worked to create the functional equivalent of American labor market and financial institutions, but without taking on the entire U.S. economic model. In no case, for example, did France simply pursue a strategy of deregulation. Instead, each policy was negotiated to be politically acceptable to a combination of industry and social interest groups. Complex and often arcane, the regulatory solutions showed signs of having been drafted by committee. Yet they succeeded in creating an institutional context that promoted risky high-technology start-ups without undermining the institutional foundations of French capitalism.

Chapter 2, "The State and the Entrepreneur," focuses on regulations designed to promote small-firm dynamism, including stock options, company law, and the regulatory context of small business. In each area of

policy, France put in place complex and novel policy solutions. The treatment of stock options designed to compensate technical entrepreneurs was separated from the treatment of stock options designed to align management incentives with shareholder interests. A new company law format was designed specifically to grant single-owner start-ups greater managerial flexibility. And regulatory reforms designed to ease the administrative burden for small firms focused less on simplifying the regulation and more on streamlining the ways in which companies interact with the government, including via the Internet. These policies struck a careful political balance between the goal of stimulating entrepreneurship and the countervailing goal of maintaining social solidarity.

Chapter 3, “Private Equity in the Shadow of the State,” examines the ways in which France promoted private investment in risky technology start-ups. The kind of private venture capital funding that was so successful in promoting high-tech innovation in the United States posed challenges to traditional forms of corporate governance and social security in France. In the United States, venture capital (VC) functioned in close conjunction with active stock markets, since it is through initial public offerings—or acquisition by a large company, typically paid for in company stock—that venture capitalists were able to profit from their risky investments. This Silicon Valley model created two areas of political friction for France. First, the growth of stock markets and equity-financed innovation challenged the traditional bank- and government-financed innovation that characterized much of France’s postwar growth. Second, new investment instruments that were created to encourage institutional investment in venture capital funds and in France’s new high-tech stock market, the Nouveau Marché, also threatened to become private competitors to France’s public pay-as-you-go pension system. Opponents feared that any move toward private pension funds risked undermining the public welfare state while also generating greater income inequality.

Chapters 4 and 5 focus on France’s experience with the Internet. France’s slow adoption of the new data network technology has commonly been understood as a case study in how government intervention and overregulation can slow the commercialization of new technologies. Chapter 4, “Minitel and the Internet,” argues that this view is wrong, and that a combination of market forces and a *lack* of concerted government inter-

vention lay at the core of France's slow Internet growth. France was the only country in the world for which the Internet competed directly with an existing national digital network, the Minitel system. Although Minitel did not offer the services of the Internet, it raised the performance threshold for consumers considering connecting to the Internet. In addition, France's state-owned telephone company, France Télécom, was using its dominant position in the telecommunications business to limit access to the Internet. Indeed it did so despite strong political pressure to lower Internet access rates to a level comparable to those in other European countries.

Chapter 5, "An Internet with Borders," considers the impact of French government regulation of the Internet itself. Despite a small number of highly publicized cases that have highlighted obstructive policies—including the French lawsuit against Yahoo! for selling Nazi memorabilia on its auction site—this chapter argues that France has shown considerable restraint in regulating the Internet. Regulations that *have* been put in place have typically had the goal of securing commercial transactions, thereby encouraging rather than discouraging Internet use. The greatest challenges have emerged in the context of existing French regulations that predate the Internet, concerning anti-Semitism and use of the French language. And even in these instances France has worked to accommodate these concerns with the reality of a global Internet.

Taken together, these chapters reveal that France responded to the significant policy challenges of the new technologies with a state activism that induced, rather than impeded, progress. Instead of stepping back from the economic sphere, the French state redeployed its administrative capacities in new areas. Rather than limiting its influence, the French state continued to play a central role in shaping France's economy.

The solutions that French policymakers chose were not always elegant, and it is too early to know whether they have worked. France's economic slowdown in 2002 hurt the popularity of Jospin's economic reforms. But there are reasons to view the reforms with optimism. First, the more liberal U.S. economy has overseen an extraordinary market-led misallocation of technology resources during this period, and it is against this baseline that the French experience should be evaluated. Second, the French approach offered a response that was at least politically viable. A more lib-

eral set of policy proposals might have faced insurmountable domestic obstacles, leading to retrenchment and inaction rather than reform. Third, the French solution, whatever its flaws, appears to have offered a workable accommodation of French political and social values to the requirements of competitiveness in the new technology sectors. Through careful institutional design, France created the institutional context for a burgeoning start-up sector without destroying those institutions that had long underpinned the French economy. Time will tell whether these accommodations were simply the first stage in a gradual shift toward broader economic liberalization. But the French experience should offer hope for countries that need to make technological dynamism compatible with existing social commitments of the state.