

EMBEDDED AUTONOMY

STATES AND INDUSTRIAL
TRANSFORMATION

Peter Evans

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For Benjamin, Alexander, and Peter Bret,
A next generation looking for its own answers,
with love and hope

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Acknowledgments

BOOKS ARE curious products. To begin with, they take too long to write, much too long if the final product is the only reward. If an author is lucky the process is sufficiently rewarding in itself to make up for the distant and eventual character of the product. I was among the lucky. By looking at information technology, I gave myself an impeccably serious excuse for exploring new milieus and acquiring arcane knowledge. I found computer companies fascinating; state bureaucracies were equally mysterious in their own way. Eventually I had to relinquish the process and make sure that there was a product, but it was still the process that made the project worthwhile.

Just as the assumption that research and writing are simply a means of producing a book misrepresents reality, the conventional equation of authorship and ownership is a convenient fiction at best. In my case, I relied throughout on the insights and generosity of people who understood both computers and states much better than I did. Ideally, they should be the “owners” of this book. Instead, like any book, this one illustrates the extent to which intellectual proprietorship is akin to theft. Most of those who contributed the ideas and insights had no control over the final shape of the manuscript. Many would disagree fundamentally with the way that I have interpreted their reality. Even acknowledging their help implicates them in an outcome for which I am the only responsible party.

Acknowledging collaborators who are part of the academic world is easier. The references and notes that pepper the text are a start, and I will try to complement them here. Nevertheless, the most careful set of acknowledgments would still fail to reflect the true etiology of the ideas that went into this book. Even if the question of origins is arbitrarily limited to the decade during which I was actually working on the book, many contributors would be missing from the best list I could construct: colleagues and students whose casual hallway conversations sparked a new way of tackling a problem, unknown questioners at seminars who raised points I had not thought of before, antagonists whose views reshaped my own without my realizing it.

Even a full list of contributors would not, of course, absolve me of responsibility. I was an idiosyncratic filter for the myriad ideas and observations that came together to form the final manuscript. I sifted different versions of the reality I was trying to capture, elevating some and relegating others. In that sense it is very much “my” book. But this is not the place to resolve the perplexing relationship between authorship and own-

ership. The best I can do here is to flesh out the footnotes and references with a brief record of some of the contributions, diffuse and specific, that stick in my mind.

Recording the contributions is complicated by the fact that this book is only the latest reincarnation of my efforts to look at states and industrial transformation. Many of the ideas it contains have been tried out before as articles and tempered by the critiques and comments that those articles generated. More specifically, chapters 2 and 3 draw on my 1989 and 1992 articles on the state (Evans 1989b, 1992b). I hope I have tightened and clarified these earlier formulations. Chapters 5 through 7 draw on a series of articles on the computer industries of Brazil, India, and Korea published from 1986 to 1992 (Evans 1986a, 1989a, 1989c, 1992a; Evans and Tigre, 1989a, 1989b). Some of the detail presented in the articles is condensed in this version and the argument is more focused, but the basic analysis is the same. The numerous editors and reviewers of those articles and the even more numerous colleagues and practitioners who read and commented on them all played a role in shaping this book.

Diffuse intellectual influences are the hardest to capture, but I can say that the Committee on States and Social Structures played an important role in the genesis of this book. Housed first in the Social Science Research Council and later in the Russell Sage Foundation, the committee incubated my ideas about how states connect to societies for several years before I thought of researching the information technology industry. While all of its members have influenced my thinking, Albert Hirschman deserves special mention. His elegant and insightful analysis of institutional factors in economic development has been a model for me since my days as an undergraduate.

A diffuse set of debts is also owed to colleagues at the various institutions that put up with my comings and goings during the time that I was working on this project. From Brown University to the Graduate School of International Relations and Pacific Studies (IRPS) at the University of California, San Diego, to the University of New Mexico to Berkeley, I never lacked intellectual stimulation or collegial support. These institutions provided concrete forms of support as well. The Center for the Comparative Study of Development at Brown provided early infrastructural assistance. Colleagues at San Diego were kind enough to include me in a Pacific Rim research grant that helped fund my fieldwork in Korea. The Latin American Institute at the University of New Mexico supported both research and writing while I was there. The International and Area Studies Program and the Center for Latin American Studies at Berkeley helped fund the final stages of the research and writing. I am also indebted to one institution where comings and goings are a strictly enforced rule rather than something to be tolerated. My ideas on variations in state

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While institutions and colleagues in the United States played an essential role, the bulk of my debts are held abroad—in Brazil, India, and Korea. Like much of my intellectual life, this book began in Brazil. In 1984 a fellowship from the Centro Brasileiro de Análise e Planejamento (CEBRAP) gave me the chance to become fascinated with the informatics industry. It also gave me the chance to meet Paulo Tigre, who became my most important collaborator. The Tinker Foundation provided the resources that enabled Paulo and me to continue our collaboration. Antonio Botelho was an important contributor to this project. A later grant from the Tinker Foundation brought us together with Claudio Frischtak, whose astute analysis of high-technology industry is drawn on repeatedly in chapters 5 through 8. Over the course of the ten years that followed my stay at CEBRAP, I got to know actors on all sides of the drama that was the Brazilian informatics industry. Everyone, from the original *barbudinhos* to owners of local firms to executives in IBM and the other major multinationals to the hard-pressed staff of SEI to local politicians, spent time they did not have to spare explaining to a naïve North American what was going on in the complex world of the Brazilian informatics industry. Some did so repeatedly. Mario Dias Ripper not only allowed me to take advantage of his original thinking on how the information technology industry was evolving, but even read and commented on the manuscript. Ivan da Costa Marques kept reappearing in different roles: first as owner of a small private firm, then as president of COBRA, then as a historian of the Brazilian informatics experience. His willingness to share his insights was a constant. Many others, including Simón Schwartzman, whose story introduces chapter 7, were equally generous.

I owe my initial interest in the Korean case to two students who worked with me at Brown University—Eun Mee Kim and Myong Soo Kim. During my stay in Korea, the Institute for Far Eastern Studies at Kyungnam University in Seoul was my home, literally as well as intellectually while I did fieldwork. The researchers and staff of the institute not only made me feel welcome and comfortable but also tolerated my inept lack of Ping Pong skills. A special debt is owed to Lee Su-hoon, who made my stay in Korea possible.

Once again, executives and government officials were extraordinarily gracious and tolerant in helping an inquisitive, uninformed outsider find his way through the maze of local industrial development, but the fieldwork was possible only because of the skillful assistance of Kim (now

Park) Mi Kyoung and Lew Soek-jin. A number of Korean colleagues, including Choi Byung Sun, Choi Jang Jip, Kim Byung Kook, Kim Doo-sub, Lim Hyun-Chin, and Moon Chung-in, not only were generous hosts but helped shaped my understanding of state-society relations in Korea. I am particularly indebted to Kim Kwang Woong of Seoul National University, without whose aid the fieldwork could not have been successfully completed. After my return, excellent research by Kang Mungu, Sang Injun, and Jon Hae-ja enabled me to analyze and update the material.

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Once my work moved from the field to the word processor, an embarrassingly large number of readers critiqued and reshaped the manuscript. Dietrich Rueschemeyer's ever-sound judgment helped me avoid a number of obvious errors. The final manuscript also benefited from Theda Skocpol's perspicacious reading of an early draft. The advice of Evelyne Huber and John Stephens was crucial in reshaping successive drafts of the introduction and conclusion. Peter Katzenstein worked hard to get me to improve the arguments connecting states and computers. Barbara Stallings provided both encouragement throughout the project and a clear-headed critique of the results. Michael Burawoy went far beyond the call of collegial duty, reading successive drafts, providing extensive comments, and using all the skills he has acquired as a veteran thesis adviser to prod me into getting the job done.

Among the many other readers who provided comments and criticisms, a number stand out in my mind. Alice Amsden, Pranab Bardhan, Martin Carnoy, Chris Chase-Dunn, Wally Goldfrank, Mark Granovetter, Ron Herring, Chalmers Johnson, Atul Kohli, Joel Migdal, Michael Rogin, Robert Wade, John Waterbury, and John Zysman all added new ideas and helped make the manuscript more coherent and convincing.

Often I succeeded in resisting my friends' advice, but to the extent that they prevailed, readers of this book have every reason to be grateful.

Students as well as colleagues have played an important role in the evolution of this book. Berkeley's sociology students deserve special credit. While enduring neglect as I tried to make a series of continually postponed deadlines for preparation of the final manuscript, they remained a superb "test audience" and an endless source of new ideas. My use of Patrick Heller's Kerala case in chapter 10 is only the most obvious example. In addition, a number of them worked directly on the research and production of the final manuscript. Brian Folk did an excellent job pulling together material on information technology in Europe. Youngmin Yun made it possible for me to update my understanding of the Korean case. Shana Cohen performed innumerable tasks, including a very useful critical reading of chapters 5 through 8. Several versions of the manuscript benefited from the painstaking reading and corrections of John Talbot. Beth Bernstein worked unrelentingly to turn the final version of the manuscript into something with which a publisher could live.

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Abbreviations and Acronyms _____

ABICOMP	Association of the Brazilian Computer and Peripherals Industries (Brazil)
ACER	Taiwanese computer manufacturer
APPD	Association of Data Processing Professionals (Brazil)
ASIC	application-specific integrated circuit
AT&T	American Telephone and Telegraph (United States)
BARC	Bhabha Atomic Research Center (India)
BEL	Bharat Electronics Ltd. (India)
BNDE	National Economic Development Bank (Brazil)
BNDES	National Bank for Economic and Social Development (Brazil) (same as BNDE except for name change)
CAD	computer-aided design
CAM	computer-aided manufacture
CAPRE	Commission for the Coordination of Electronic Processing Activities (Brazil)
C-DOT	Centre for the Development of Telematics (India)
CEPD	Council on Economic Planning and Development (Taiwan)
CMC	Computer Maintenance Corporation (India)
COBRA	Computadores e Sistemas Brasileiros SA (Brazil)
CONCEX	Foreign Trade Council (Brazil)
COSL	Citicorp Overseas Software Ltd. (India)
CPqD	Telebrás' Center of Research and Development (Brazil)
CSN	Compania Siderúrgica Nacional (Brazil)
CTI	Centro Tecnológica para Informática (Brazil)
CVRD	Brazil's state-owned iron exporter
DACOM	Korean data communications company owned by KTA together with private stockholders
DASP	Department of Public Administration (Brazil)
DCM	Delhi Cloth Mills (India)
DEC	Digital Equipment Corporation, second largest U.S. computer firm
DEPIN	Departamento de Política de Informática e Automação (Brazil)
DG	Data General, U.S. computer firm
DISNET	NIC system for information on India's districts
DOE	Department of Electronics (India)
DOT	Department of Telecommunications (India)

DRAM	dynamic random access memory (semiconductor memory chip)
ECIL	Electronic Corporation of India Ltd.
EIAK	Electronics Industry Association of Korea
EPB	Economic Planning Board (Korea)
EPBAX	electronic private branch automatic exchange
ESPRIT	European Strategic Program for Research and Development in Information Technologies
ESS	electronic switching system
ETRI	Electronics and Telecommunications Research Institute (Korea)
FERA	Foreign Exchange Regulation Act (India)
FKI	Federation of Korean Industries
FKTU	Federation of Korean Trade Unions
GEIA	Grupo Executivo para Indústria Automobilística (Brazil)
GTE-111	Grupo de Trabalho Especial-111 (Brazil)
HCL	Hindustan Computers Ltd., largest local firm in India
HP	Hewlett-Packard (United States)
IAS	Indian Administrative Service
IC	integrated circuit
ICL	International Computers Limited (England)
ICS	Indian Civil Service
IDB	Industrial Development Bureau (Taiwan)
IDM	Indian computer company acquired by HCL
IISCO	Indian Iron and Steel Company
IIT	Indian Institutes of Technology
IMPRESS	Indian railway reservation system designed by CMC
INTEL	leading U.S. manufacturer of microprocessors
ISDN	integrated service digital network
ISI	import-substituting industrialization
IT	information technology
ITA	Air Force Institute of Technology (Brazil)
ITI	Indian Telephone Industries, state-owned telephone producer
KIST	Korean Institute of Science and Technology
KIT	Korea Institute of Technology
KMT	Kuomintang; Nationalist party (Taiwan)
KTA	Korean Telecommunications Authority
JDB	Japan Development Bank
JECC	Japan Electronic Computer Corporation
LDP	Liberal Democratic party (Japan)
MC&A	joint venture between SID and IBM (Brazil)

Minicom	Ministry of Telecommunications (Brazil)
MITI	Ministry of International Trade and Industry (Japan)
MOC	Ministry of Communications (Korea)
MOST	Ministry of Science and Technology (Korea)
MTI	Ministry of Trade and Industry (Korea)
NAIS	National Administrative Information System (Korea)
NAS	National Advanced Systems, manufacturer of main-frames (United States)
NCCC	National Computerization Coordination Committee (Korea)
NIC	National Informatics Centre (India)
NICs	newly industrializing countries
NICNET	NIC'satellite-based communications system (India)
NIIT	National Institute of Information Technology (India)
NRC	National Resources Commission (Taiwan)
NTT	Japan's state-owned telecommunications monopoly
OEM	original equipment manufacture; equipment made for another company to sell under its own brand name
ÖGB	Austrian Trade Union Federation
OLTP	on-line transaction processing
ONGC	Oil and Natural Gas Corporation (India)
ÖVP	People's party (Austria)
PC	personal computer
PNDII	Brazilian development plan by General Geisel
POSCO	Pohang Iron and Steel Company Ltd. (Korea)
POSDATA	subsidiary of POSCO providing value-added network services to other businesses
POSIX	standardized version of UNIX
POSTEC	Pohang Institute of Technology (Korea)
PROCOMP	Brazilian computer firm
PSI	Indian computer firm
RAX	rural automatic exchange designed by C-DOT (India)
SAILNET	communications network provided for Indian steel authority
SBC	Brazilian Computation Society
SCL	Semiconductor Complex Ltd. (India)
SCOPUS	Brazilian computer firm
SECOMU	Seminars on Computation at the University (Brazil)
SEI	Secretaria Especial de Informática (Brazil)
SID	Brazilian informatics firm
SIDERBRÁS	holding company in charge of Brazil's state-owned steel companies
SISNE	indigenous Brazilian version of MS-DOS

SOD	early Brazilian-designed operating system
SOE	state-owned enterprise
SOX	Brazilian clone of UNIX
SPARC	Sun brand name for chips and work stations (United States)
SPÖ	Socialist party (Austria)
SNI	National Intelligence Service (Brazil)
SUFRAMA	Superindencia for Amazonia (Brazil)
TCS	Tata Consultancy Systems (India)
TDX	ETRI's electronic switching system (Korea)
TICOM	Korean supermini
TITAN	Telecommunications, Instrumentation, and Telecontrol in an Automated Network; automated monitoring system for Indian oil and natural gas wells
TNC	transnational corporation
TUL	Tata Unisys Ltd. (India)
UNIX	software operating system designed and owned by AT&T
USX	U.S. Steel
VAN	value-added network
VAX	DEC minicomputer
VLSI	very large scale integrated circuits
VÖI	Federation of Austrian Industrialists
WIPRO	Indian business group; includes WIPRO Information Technology Ltd., a large local producers of computers, and WIPRO Systems Ltd., a software specialist
X-OPEN	consortium of American and European companies founded in 1986 to establish international UNIX standards
ZFM	Manaus free zone (Brazil)

EMBEDDED AUTONOMY

States and Industrial Transformation

A PERENNIALY popular Brazilian joke about two lions evokes one way of seeing the state. Escapes from the zoo, the two lions take different paths. One goes to a wooded park and is apprehended as soon as he gets hungry and eats a passerby. The second remains at large for months. Finally captured, he returns to the zoo sleek and fat. His companion inquires with great interest, "Where did you find such a great hiding place?" "In one of the ministries" is the successful escapee's answer. "Every three days I ate a bureaucrat and no one noticed." "So how did you get caught?" "I ate the man who served coffee for the morning break," comes the sad reply.

The moral is clear: bureaucrats do nothing and are never missed; even other bureaucrats care more about their morning coffee than about anything their colleagues do. The joke is popular because it affirms the conviction that Third World states deliver little of value. It is also popular because it converts bureaucrats from predators to prey. Identifying with the lion, listeners reverse their usual self-perception as victims of the state.

For those with less sense of humor, the quotidian power of the state over their individual lives can take on disturbing proportions. As Anita Desai (1991, 3–4) puts it, "In the present time, in which the laws and whims of politicians and bureaucrats are as pervasive and powerful as those of the gods, not only must a minister be propitiated before he will issue a license, allot a house, or award a pension, but so must every clerk through whose hands the relevant file passes." This is not a lament about dictatorship or authoritarian repression, it is a complaint about how the Third World state conducts "business as usual" in relation to ordinary citizens.

Identification with the escaped lion is natural, but until less hierarchical ways of avoiding a Hobbesian world are discovered, the state lies at the center of solutions to the problem of order. Without the state, markets, the other master institution of modern society, cannot function. We do not spend our valuable time standing in lines in front of the counters of bureaucrats because we are masochists. We stand there because we need what the state provides. We need predictable rules, and these in turn must have a concrete organizational structure behind them. We need some organizational reflection, however imperfect, of general as opposed

to individual interests. We need something beyond *caveat emptor* to sustain the process of exchange. We need “collective goods” like sewage systems, roads, and schools.

Attempts to dismantle the state or make it wither away risk perverse consequences. Communist revolutionaries who fought to install a system that would lead to the state’s “withering away” ended up constructing state apparatuses more powerfully repressive than those of the age of absolutism. Fervent calls for the dismantling of the state by late-twentieth-century capitalist free-marketeers served to derail the state’s ability to act as an instrument of distributive justice, but not to reduce its overall importance.

From the poorest countries of the Third World to the most advanced exemplars of welfare capitalism, one of the few universals in the history of the twentieth century is the increasingly pervasive influence of the state as an institution and social actor.¹ None of which is to say that the existing states give us what we need. Too often we stand in line in vain. The contradiction between the ineradicable necessity of the state in contemporary social life and the grating imperfection with which states perform is a fundamental source of frustration. Dreams of cannibalizing bureaucrats are one response. Analyzing what makes some states more effective than others offers less immediate satisfaction but should be more useful in the long run.

Since analyzing states entails almost as much hubris as pretending to run them, it is important to place some boundaries on the endeavor. My boundaries are narrow and clear. I have focused on only one of the state’s tasks—promoting industrial growth. The empirical discussion is even more specific—the growth of local information technology (IT) industries. In addition, I am primarily concerned with a particular set of states—newly industrializing countries (NICs). Within this set, the empirical narrative draws primarily on the experiences of Brazil, India, and Korea during the 1970s and 1980s. Despite the boundaries, the hubris remains. The underlying aim is to understand state structures and roles, relations between state and society, and how states contribute to development.

In this chapter I will try to do four things. I will begin with a brief excursus on how responsibility for economic transformation has become increasingly central to the state’s role. Then I will set economic transformation at a national level in the context of a global division of labor. The third section sets out a telegraphic sketch of the argument to be developed over the course of the chapters that follow. Finally, I will try to explain the conceptual approach and strategies of investigation that lie behind the analysis.

States and Economic Transformation

States remain, as Weber defined them, “compulsory associations claiming control over territories and the people within them,”² but Weber’s definition does not reduce the complexities of analyzing what states do. The first step in making analysis manageable is separating out the different roles that states perform. Making war and ensuring internal order are the classic tasks. **In the contemporary world, fostering economic transformation and guaranteeing minimal levels of welfare are not far behind.**

“Realists” tell us that, as sovereign entities in an anarchic world, states must concern themselves above all with the conditions of military survival.³ Gilpin (1987, 85) puts it succinctly: “The modern nation-state is first and foremost a war-making machine that is the product of the exigencies of group survival in the condition of international anarchy.” Historical analysis makes it clear that the task of war making, more than any other, drove the construction of the modern state.⁴ War making is also the task that allows the state most easily to portray itself as the universal agent of societal interests.

War making is one justification for the state’s monopoly on violence; avoiding Hobbesian chaos internally is the other. Here again the state projects itself as an agent of the universal interests of society. What happens when a state disintegrates demonstrates that the claim is at least partially valid, as the citizens of contemporary Somalia can bitterly attest. Yet the claim also masks other aspects of the state’s role.

When it defends sovereignty and internal order, the state is also, as Charles Tilly (1985) puts it, running a “protection racket” on its own behalf. Classic Marxist analysis reminds us that states are instruments for dominating the societies they serve. State actions reflect and enforce disparities of social power on behalf of the privileged. When the state exercises its monopoly on violence internally, its identification with the interests of the nation is no longer automatic. All states would like to portray themselves as carrying out a project that benefits society as a whole,⁵ but sustaining this image requires continuous effort.⁶

Making war and enforcing internal order are classic roles, shared by ancient and modern states. In modern times, a third role has increasingly stolen the limelight. **As political survival and internal peace are more often defined in economic terms, states have become responsible for economic transformation. There was always a connection between economic success and the ability to make war; economic failure meant eventual geopolitical decline.** Now the state’s economic role goes beyond being a means to military ends. It is a source of legitimacy in itself as well as a

means to accomplishing the classic goals of military survival and internal order.

Being involved in economic transformation has two different facets. First of all, it means becoming implicated in the process of capital accumulation. Wealth creation is no longer considered just a function of nature and markets; effective statecraft is involved as well. Eliciting entrepreneurship and facilitating the creation of new productive capacities require a more complicated involvement in the affairs of the citizenry than simply eliciting loyalty and enforcing good behavior. The capacity required for what I will call the state's "transformative role" is correspondingly greater.

Once the state is implicated in the process of capital accumulation, responsibility for economic hardship is less easily shifted to nature or markets. If the inegalitarian outcomes of market relations cannot be dismissed as "natural," the state becomes responsible for deprivation as well as oppression. Its involvement in conflicts over distribution and welfare is more explicit.⁷

Welfare and growth easily become entangled. Fostering growth is often portrayed as a substitute for addressing distributional issues. Equating the overall accumulation of productive capacity with the national interest makes it easier to claim the role of universal agent. Better a smaller share of an expanding pie than a larger piece of a shrinking one, the argument goes. In reality, of course, pieces often shrink faster than pies grow, and losers ask whose interests transformation serves. Nonetheless, growth remains a prerequisite to delivering welfare in the long term. Finding new ways to generate growth is a preoccupation even for welfare states.

As they become increasingly involved in economic transformation, states increasingly look at the international system not just as a system of sovereign political entities but also as a division of labor.⁸ The connection between internal accomplishment and external context becomes intimate and direct. The very possibilities and criteria of economic transformation depend on the international division of labor. Transformation is inescapably defined in global terms.

The Global Context

Modern nations must fit their economic aspirations and activities into a global division of labor. Some produce cotton, others weave cloth, others market high fashion. Some mine iron ore, others make automobiles, others sell insurance. As "world-system" theorists have hammered home,

each nation's place in production for global markets has powerful implications for its politics and the welfare of its citizens.⁹

Like any kind of differentiation, the international division of labor can be seen as a basis of enhanced welfare or as a hierarchy. The arguments for enhanced welfare are enshrined in the theory of comparative advantage: all countries will be better off if each concentrates on what it does best.¹⁰ Compatibility with resource and factor endowments defines the activity most rewarding for each country. Trying to produce goods that other countries can deliver more efficiently will only lower everybody's welfare.

Poorer countries have always been suspicious of this argument. From Alexander Hamilton¹¹ to Friedrich List¹² to Raul Prebisch,¹³ there has been the suspicion that position in the international division of labor was a cause of development, not just a result.¹⁴

No one denies that an interdependent global economy is an improvement over a system of autarky, even for those that occupy less desirable niches. Nor does anyone deny that countries should do what they do best, just as the theory of comparative advantage argues. Yet contemporary theorizing offers support for persistent convictions that trying to get into more desirable niches is an important part of the struggle to develop.

Recent developments in trade theory suggest that profit rates can differ systematically and persistently across sectors. As Paul Krugman (1987, 230) puts it, "with imperfect competition sustained by economies of scale and entry barriers, some industries may be able to generate persistent excess returns." Differential profit rates are, however, only part of what is at stake.

As Albert Hirschman (1977) has argued persuasively, filling a particular niche in the international division of labor has dynamic implications as well as static ones. Some sectors create a "multidimensional conspiracy" in favor of development, inducing entrepreneurial energies, creating positive spillovers in the rest of the economy, and molding political interest groups into a developmental coalition (Hirschman 1977, 96). Niches in the international division of labor are desirable not just because they may entail higher profits and more rapid accumulation of capital, but also because they facilitate the achievement of the social and welfare goals associated with "development" in the broadest sense of the term.

Ability to generate a "multidimensional conspiracy" in favor of development is not inherent in a product itself. It depends on how the product fits into a global array of sectoral possibilities. As such theorists of the "product cycle" as Vernon and Wells have shown, products also have developmental trajectories.¹⁵ The country that catches them on their upswing will reap different rewards from one that inherits them on their

downswing. Textiles offered eighteenth-century England a “multidimensional conspiracy,” but they are unlikely to do the same for late-twentieth-century India. Autos and steel supported a “multidimensional conspiracy” in the United States during the first half of this century, but not in Brazil during the second half. One era’s multidimensional conspiracy may become another’s “lagging sector.”

From this perspective, “development” is no longer just a local trajectory of transformation. It is also defined by the relation between local productive capacity and a changing global array of sectors. The countries that fill the most rewarding and dynamic sectoral niches are “developed.” Being relegated to niches that are less rewarding or filling less desirable links in a “commodity chain” reduces the prospect of progressive change.¹⁶ Insofar as the international division of labor is a hierarchy, worrying about development means worrying about your place in the hierarchy.

Accepting national development as enmeshed in a global economy in which some positions are more dynamic and rewarding than others forces us to ask another question: Are positions in the international division of labor structurally determined or is there room for agency? Put more simply, can countries deliberately change the position they fill in the international division of labor?

Traditional renditions of the theory of comparative advantage are adamantly on the side of structure. Countries that attempt activities other than those most compatible with their productive endowments simply saddle themselves with wasteful output and lose potential gains from trade. If you are sitting on copper deposits, you are stupid not to sell copper. If your climate allows you to grow superior coffee, you should take advantage of it. Whether these are privileged or disadvantaged sectors in the global economy is neither here nor there. Countries must do what they do best. To do otherwise is self-destructive. The international division of labor presents itself as a structural imperative.

Traditional renditions make most sense in a world where international trade consists of unprocessed raw materials. In a world where manufactures dominate global trade and even services are increasingly considered “tradables,” choices about what to make and sell cannot be deduced from a simple reading of natural endowments. Constructing comparative advantage is no less plausible than taking it as given. In William Cline’s formulation, “increasingly, trade in manufactures appears to reflect an exchange of goods in which one nation could be just as likely as another . . . to develop comparative advantage.”¹⁷ In a globalized economy where most value is added at several removes from natural resources, the global division of labor presents itself as an opportunity for agency, not just an exogenous constraint.

The idea of constructing comparative advantage is, in some ways, a natural extension of traditional theory. The original Ricardian version emphasized given natural endowments. Heckscher and Ohlin's refinements emphasized relative domestic scarcities of labor and capital that were themselves products of development rather than inherent features of a given national territory. The idea of constructing comparative advantage brings in social and institutional factors that are even more clearly consequences of the developmental process. Cline does not really mean that "one nation could be just as likely as another" to develop comparative advantage in a particular good. He means that a simple assessment of natural resource endowments or the relative scarcity of different factors of production cannot tell us who will have a competitive advantage in chemicals or computers or designer jeans. Social and political institutions must be analyzed as well.

Michael Porter's work makes the point more explicitly. Why should Switzerland specialize in textile equipment while Italy gains comparative advantage in machinery for injection molding? Why should Denmark be a leader in pharmaceutical exports while Sweden has a comparative advantage in heavy trucks (Porter 1990, 1, 149, 162, 314)? With hindsight, these specializations might be traced back to historical differences in endowments, but emergence of advantage depends on a complex evolution of competitive and cooperative ties among local firms, on government policies, and on a host of other social and political institutions.

Sociologists and historians have long postulated such connections between social and institutional endowments and subsequent positions in the international division of labor. Robert Brenner's (1976) classic analysis of the divergent roles taken by Eastern and Western Europe in the early modern period is a case in point. For Brenner, Eastern Europe's specialization in the production of commodity grains depended on the inability of the Eastern European peasantry to defend itself against the imposition of repressive labor control, while the more politically powerful peasantry of Western Europe forced agriculture into products that lent themselves to productivity-enhancing technological change. Maurice Zeitlin (1984) focuses more on the state and politics to explain Chile's relegation to the role of a producer of raw materials over the course of the first third of the twentieth century, but the argument is similar.¹⁸ Dieter Senghaas's (1985) analysis of the evolution of Denmark's position in the international division of labor over the course of the nineteenth and twentieth centuries stresses how social and political factors facilitate state strategies, which in turn allow reconstruction of the country's niche in the global system.

In a world of constructed comparative advantage, social and political institutions—the state among them—shape international specialization.¹⁹

State involvement must be taken as one of the sociopolitical determinants of what niche a country ends up occupying in the international division of labor.

States with transformative aspirations are, almost by definition, looking for ways to participate in “leading” sectors and shed “lagging” ones. Gilpin (1987, 99) argues that “every state, rightly or wrongly, wants to be as close as possible to the innovative end of ‘the product cycle’ where, it is believed, the highest ‘value-added’ is located.” These states are not just hoping to generate domestic sectors with higher profit rates. They are also hoping to generate the occupational and social structures associated with “high-technology industry.” They are hoping to generate a multidimensional conspiracy in favor of development.

Even if states are committed to changing their positions in the international division of labor as Gilpin suggests, desire and capability have to be sharply separated. Constructing new kinds of comparative advantage may be possible, but it is not likely to be easy. If not immutable, the structure of the global hierarchy is certainly obdurate.²⁰ Explicit attempts to move within it are likely to be ineffective or even counterproductive. Aspiration without the requisite state capacity can lead to bungling that undercuts even the existing bases of comparative advantage. Efforts to reshape participation in the global economy are interesting, not just because they might succeed, but also because they reveal the limits of what states can do.

If institutional endowments and the exercise of agency can reshape the kinds of products a country produces, and if producing different kinds of products has broad implications for development, arguments about how and whether states might facilitate the local emergence of new sectors become centrally important to understanding states, national development, and ultimately the international division of labor itself. Laying out one such argument is the purpose of this book.

The Argument

Sterile debates about “how much” states intervene have to be replaced with arguments about different kinds of involvement and their effects. Contrasts between “dirigiste” and “liberal” or “interventionist” and “noninterventionist” states focus attention on degrees of departure from ideal-typical competitive markets. They confuse the basic issue. In the contemporary world, withdrawal and involvement are not the alternatives. State involvement is a given. The appropriate question is not “how much” but “what kind.”

Ideas about variations in state involvement have to be built on the

historical examination of particular states. I chose the set of states for which the challenge of industrial transformation is most salient. This study focuses on “newly industrializing countries” (NICs), defined, not narrowly as the four East Asia tigers,²¹ but broadly to include those developing countries large enough or advanced enough to support a full range of industrial production. NICs are particularly good cases because they are less thoroughly constrained than peripheral raw materials exporters and more desperate to achieve transformation than advanced industrial countries.

Within this group I focused on Brazil, India, and Korea. At first glance this is an unlikely threesome. At the beginning of the 1970s, Brazil was the archetype of “dependent development,” a country whose rapid industrialization was propelled by a combination of investment by transnational corporations and the demand for consumer durables that depended on rising inequality. India was a “multinational subcontinent” of three-quarters of a billion people, the vast majority of whom still depended on peasant agriculture, renowned for its penchant for autarky. In Korea, peasants were no longer the majority, and export orientation was considered the only sound basis for industrial growth. Yet all three are countries where state involvement in industrial transformation is undeniable. For understanding why it is more important to ask “what kind” of state involvement rather than “how much,” they are an excellent triplet.

Variations in state involvement must also be situated in specific arenas. I chose to look at the evolution of the information technology (IT) sector in each of these countries during the 1970s and 1980s.²² The IT sector (also known as “informatics” or the computer industry) is of obvious interest because it is the sector most likely to spark a twenty-first-century conspiracy in favor of development. It is a particularly good case because it provides an exceptionally strong test of the proposition that state involvement can affect a country’s place in the international division of labor.

The information technology sector is fascinating in itself, but the purpose of a sectoral lens is to allow the concrete investigation of general concepts. The aim of this project is not to theorize the IT sector but rather to sharpen general ideas about state structures, state-society relations, and how they shape possibilities for industrial transformation.

My starting premise is that variations in involvement depend on variations in the states themselves. States are not generic. They vary dramatically in their internal structures and relations to society. Different kinds of state structures create different capacities for action. Structures define the range of roles that the state is capable of playing. Outcomes depend both on whether the roles fit the context and on how well they are executed.

How should we characterize variations in state structure and state-society relations? My strategy was to start by constructing two historically grounded ideal types: predatory and developmental states. The basic characteristics of these two types are laid out in chapter 3. Predatory states extract at the expense of society, undercutting development even in the narrow sense of capital accumulation. Developmental states not only have presided over industrial transformation but can be plausibly argued to have played a role in making it happen.

Associating different kinds of states with different outcomes is a start, but if the two ideal types consisted only in attaching appropriate labels to divergent outcomes, they would not get us very far. The trick is to establish a connection between developmental impact and the structural characteristics of states—their internal organization and relation to society. Fortunately, there are clear structural differences between predatory and developmental states.

Predatory states lack the ability to prevent individual incumbents from pursuing their own goals. Personal ties are the only source of cohesion, and individual maximization takes precedence over pursuit of collective goals. Ties to society are ties to individual incumbents, not connections between constituencies and the state as an organization. Predatory states are, in short, characterized by a dearth of bureaucracy as Weber defined it.

The internal organization of developmental states comes much closer to approximating a Weberian bureaucracy. Highly selective meritocratic recruitment and long-term career rewards create commitment and a sense of corporate coherence. Corporate coherence gives these apparatuses a certain kind of “autonomy.” They are not, however, insulated from society as Weber suggested they should be. To the contrary, they are embedded in a concrete set of social ties that binds the state to society and provides institutionalized channels for the continual negotiation and renegotiation of goals and policies. Either side of the combination by itself would not work. A state that was only autonomous would lack both sources of intelligence and the ability to rely on decentralized private implementation. Dense connecting networks without a robust internal structure would leave the state incapable of resolving “collective action” problems, of transcending the individual interests of its private counterparts. Only when embeddedness and autonomy are joined together can a state be called developmental.

This apparently contradictory combination of corporate coherence and connectedness, which I call “embedded autonomy,” provides the underlying structural basis for successful state involvement in industrial transformation. Unfortunately, few states can boast structures that approximate the ideal type. Korea can legitimately be considered a version of embedded autonomy, but, as chapter 3 shows, Brazil and India are

definitely intermediate cases, exhibiting partial and imperfect approximations of embedded autonomy. Their structures do not categorically preclude effective involvement, but they do not predict it either.

Structures confer potential for involvement, but potential has to be translated into action for states to have an effect. I talk about patterns of state involvement in terms of “roles.” To convey what Brazil, Korea, and India were doing in the information technology industry, I needed some new terminology. Traditional ways of labeling the state roles make it too easy to slip back into the comfortable feeling that the parameters of state involvement are known and we need only worry about “how much.” New words are flags, recurring reminders that the question should be “what kind.” I ended up with four rubrics, which are explained in more detail in chapter 4. The first two, “custodian” and “demiurge,” represent variations on the conventional roles of regulator and producer. The second pair, which I call “midwifery” and “husbandry,” focus more on the relation between state agencies and private entrepreneurial groups.

The role of custodian highlights one aspect of the conventional role of regulator. All states formulate and enforce rules, but the thrust of rule-making varies. Some rules are primarily promotional, aimed at providing stimulus and incentives. Other regulatory schemas take the opposite tack, aiming to prevent or restrict the initiatives of private actors. The rubric “custodial” identifies regulatory efforts that privilege policing over promotion.

Just as being a custodian is one way of playing out the more generic role of regulator, the demiurge²³ is a specific way of playing the more generic role of producer. All states play the role of producer, taking direct responsibility for delivering certain types of goods. At the very least, states assume this role in relation to infrastructural goods assumed to have a collective or public character, like roads, bridges, and communications nets. The role of demiurge is based on a stronger assumption about the limitations of private capital. It presumes that private capital is incapable of successfully sustaining the developmentally necessary gamut of commodity production. Consequently, the state becomes a “demiurge,” establishing enterprises that compete in markets for normal “private” goods.

Taking on the role of midwife is also a response to doubts about the vitality of private capital, but it is a response of a different sort. The capacities of the local entrepreneurial class are taken as malleable, not as given. Instead of substituting itself for private producers, the state tries to assist in the emergence of new entrepreneurial groups or to induce existing groups to venture into more challenging kinds of production. A variety of techniques and policies may be utilized. Erecting a “greenhouse” of tariffs to protect infant sectors from external competition is one. Provid-

ing subsidies and incentives is another. Helping local entrepreneurs bargain with transnational capital or even just signaling that a particular sector is considered important are other possibilities. Regardless of the specific technique, promotion rather than policing is the dominant mode of relating to private capital.

Even if private entrepreneurial groups are induced to tackle promising sectors, global changes will continually challenge local firms. Husbandry consists of cajoling and assisting private entrepreneurial groups in hopes of meeting these challenges. Like midwifery, it can take a variety of forms, from simple signaling to something as complex as setting up state organizations to take over risky complementary tasks, such as research and development. The techniques of husbandry overlap with those of midwifery.

Most states combine several roles in the same sector. Sectoral outcomes depend on how roles are combined. My expectations for the informatics sector are obvious from the descriptions of the roles themselves. Neither trying to replace private capital nor fixating on preventing it from doing undesirable things should work as well as trying to create synergistic promotional relations with entrepreneurs or potential entrepreneurs. Combining midwifery and husbandry should work better than combinations that rely more heavily on custodian or demiurge.

The evolution of information technology sectors in Brazil, India, and Korea provides a nice illustrative confirmation of this basic contention. The blend of roles varied across countries. The variations grew, at least in part, out of differences in state structure and state-society relations. Different role combinations were associated with differential effectiveness in the expected way.

As chapters 5 and 6 show, the principal difference between Korea and the other two countries was that Korea was able to build on a base of firms with a broad range of related industrial prowess, fostered by prior midwifery. This allowed the state to shift easily to the combination of prodding and supporting that I have called husbandry. Brazil and India made less thorough-going use of midwifery, got bogged down in restrictive rule-making, and invested heavily in direct production of information technology goods by state-owned enterprises. Their efforts to play custodian and demiurge were politically costly and absorbed scarce state capacity, leaving them in a poor position to embark on a program of husbandry that would help sustain the local industries they had helped create.

The similarities among the three countries were as suggestive as the differences. In each, the vision of a local information technology sector began with individuals convinced of the value of local informatics pro-

duction who managed to find positions of leverage within the state apparatus. Their ideas were eventually turned into policies and institutions designed to bring forth local production. Initial state policies in all three countries began with “greenhouses,” which provided space for local entrepreneurs to experiment protected from transnational competition. The greenhouses were a fundamental part of playing the role of midwife. Midwifery bore fruits in all three. The local industrial panorama in the mid-to late 1980s represented an impressive transformation of the scenery that had been in place two decades earlier, as chapter 7 shows.

By the end of the 1980s, Korea’s industry was the largest and most robust, but local producers could claim significant successes in all three countries. Brazil had put together a new set of diversified informatics corporations that were significant actors on the local industrial scene. They presided over what had become a multibillion-dollar local industry. Local entrepreneurs commanded experienced organizations that employed thousands of technically trained professionals. Local *técnicos*²⁴ had demonstrated their technological bravura and even managed to turn their talents into internationally competitive products in the financial automation sector. India could boast early design successes by local hardware firms and the prospect of growing participation in international markets for certain kinds of software engineering. In Korea, production of information technology products had become a cornerstone of the country’s overall industrial strategy. The *chaebol*²⁵ were going head to head with the world’s leading firms in memory chips and had succeeded, at least for a time, in becoming a force in the world personal computer (PC) market.

All three industries had serious weaknesses, but they did demonstrate that developing countries could be producers as well as consumers of information technology goods. Overall, it was an impressive set of accomplishments for three countries that conventional analysis at the end of the 1960s would have categorically excluded from a chance at real participation in the globe’s leading sector.

If I had stopped following my three information technology sectors in 1986 or 1987, this would have been the story—complicated in its details, but still relatively straightforward in its overall lessons. Some states and some roles were definitely more effective than others, but states could make a difference, even in what was universally judged an extremely difficult sector to crack.

Trends in the latter part of the 1980s gave the story a different twist, which is related in chapter 8. If nationalist industrialization had been the leitmotif in the 1970s, a new internationalization was clearly taking hold at the end of the 1980s. The hallmark of this new internationalization was a new relation between transnational and local capital, epitomized

by IBM's new joint venture in India.²⁶ This was accompanied by a new emphasis on connectedness to the global economy, in terms of both increased openness to imports and increased concern with exports.

The easy interpretation would have been that this was a case of "the empire strikes back,"²⁷ of maverick nationalist aspirations being brought back under the discipline of the global economy. In fact, the new internationalization was not simply the negation of earlier nationalist policies. In some ways it was a vindication. IBM provides the emblematic case. Its expansion in the 1990s was increasingly based on alliances with locally owned firms. This was in part because the nature of the industry had changed globally, but it was also because local greenhouses had produced Brazilian, Indian, and Korean firms whose organizational strength, human capital, and experience made them legitimate partners. The new internationalization was in part the product of successful midwifery.

What was most interesting about this change, from the point of view of my argument, was its contradictory implications for relations between the state and the industrial constituency it had helped create. Local entrepreneurial groups had been at first tempted entrants, then grateful clients, and eventually actors strong enough to attract transnational allies. It was the state's opposition to foreign entry that gave local capital its trump card in negotiating the initial alliances, but once alliances had been negotiated, relations between firms and states changed again. The state's leverage was undercut. Firms had, in effect, traded the rents associated with state protection of the local market for those associated with their transnational corporate allies' proprietary technology and global market power. The new alliance of local entrepreneurs and transnational corporations make it harder to sustain the old alliance between local capital and the state.

If shrinking political support for state action corresponded neatly to the increasing developmental irrelevance of state action, the equation would be balanced, but that is not what analysis of the new internationalization suggested. New alliances were prone to devolve back into de facto subsidiaries. New exports, like software from India or PC clones from Korea, opened avenues for mobility in the global division of labor, but they also had the potential to turn into low-return dead ends. Continued husbandry was crucial, but in a sector populated with firms more beholden to transnational alliances than to state support, the political viability of past patterns of state involvement was in doubt.

I began my investigation of informatics industries trying to understand how state initiative could reshape local industrial efforts. I ended up intrigued by the way in which the very success of state efforts could undercut the political possibilities for sustaining state involvement. The neo-utilitarian perspective prevalent in the 1980s predicted that state in-

volvement would produce an economically stagnant, politically stable symbiosis between officials with the capacity to create rents and private actors anxious to take advantage of them. I had found the opposite. State involvement was associated with economic dynamism, and the result was political contestation, not symbiosis.

The argument at the sectoral level, which is summarized in chapter 9, ends up combining a vision of how state initiatives might produce industrial transformation with ideas about how state-induced industrial transformation redefines the political possibilities for future state action. This sectoral argument in turn raises obvious questions for my societal-level analysis of state structures and state-society relations. If successfully fostering new entrepreneurial groups in a particular sector generates a new political relation between the state and the constituency it has helped create, should not the same logic hold more generally?

Reexamination of the evolution of state-society relations in chapter 10 suggests that the same basic dynamic does apply more generally. There is evidence to suggest that the transformative project advanced under the aegis of embedded autonomy in Korea may have undercut its own political foundations. If this is true, future state involvement will require some sort of reconstruction of state-society relations.

In the original formulation, embedded autonomy implied dense links not with society in general but specifically with industrial capital. From the point of view of other social groups, it was an exclusionary arrangement. Could embeddedness be built around ties to multiple social groups? Comparative evidence suggests that sometimes it can be. One way of reconstructing state-society relations would be to include links with other social groups, like labor. Chapter 10 explores this possibility by looking at some quite different cases, namely, agrarian communism in Kerala and European social democracy in Austria. These cases suggest that a broadly defined embeddedness may offer a more robust basis for transformation in the long run. This suggestive evidence argues for further exploration of potential variations in embedded autonomy.

The essential outline of the argument can be recapitulated in three points. First, developmental outcomes depend on both the general character of state structures and the roles that states pursue. Second, state involvement can be associated with transformation even in a sector like information technology where conventional wisdom would suggest little chance of success. Finally, an analysis of states and industrial transformation cannot stop with the emergence of a new industrial landscape. Successful transformation changes the nature of the state's private counterparts, making effective future state involvement dependent on the reconstruction of state-society ties.

Of course, there is no reason to believe any of this argument right now.

Its eventual plausibility depends on how well it fits the details of the cases. The way the cases are depicted depends in turn on the way in which the research was conceived and conducted. An explicit discussion of how I went about my investigation is in order.

Research Strategy

This study uses what I call a “comparative institutional approach”: institutional because it looks for explanations that go beyond the utilitarian calculations of individuals to the enduring pattern of relationships within which such calculations are immersed; comparative because it focuses on concrete variations across historical cases rather than on generic explanations.²⁸

Taking a comparative institutional approach to the state entails rejecting reductionism. The state cannot be reduced to an aggregation of the interests of individual office holders, the vector sum of political forces, or the condensed expression of some logic of economic necessity. States are the historical products of their societies, but that does not make them pawns in the social games of other actors. They must be dealt with as institutions and social actors in their own right, influencing the course of economic and social change even as they are shaped by it.²⁹ In chapter 2 I try to set out the distinctive features of the comparative institutional approach by contrasting it to what I call the “neo-utilitarian” approach, which dominated new work on the state in the late 1970s and the 1980s but now seems on the wane.

In the comparative institutional approach, the state is seen as a historically rooted institution, not simply a collection of strategic individuals. The interaction of state and society is constrained by institutionalized sets of relations. Economic outcomes are the products of social and political institutions, not just responses to prevailing market conditions. Understanding diverse outcomes is the aim, not forcing cases into a generic mold or onto a one-dimensional scale.

Having become fashionable again, “institutionalism” has also become a term with many meanings,³⁰ but in the analysis of the state’s role in the economic development the “comparative institutional approach” can be defined concretely. It is grounded in a long tradition of work that runs from Weber through economic historians like Polanyi (1944), Gerschenkron, (1962), and Hirschman (1958, 1973, 1977, 1981) to contemporary work by political economists like Johnson (1982), Bardhan (1984), Bates (1989), Amsden (1989), and Wade (1990)³¹ and sociologists like Cardoso and Faletto (1979), Hamilton (1982), Zeitlin (1984), Gold (1986), Stephens and Stephens (1986), and Seidman (1994).³²

A comparative institutional approach implies a strategy of gathering evidence. Obviously, one central aim is to collect evidence that will locate specific state policies and societal responses in the larger institutional context that produces them, showing how that context helps define interests, aspirations, and strategies. At the same time, demonstrating variation across cases requires delving into specifics. Whether the focus is on society or within the state, the central methodological precept of a comparative institutional approach is to ground assertions of institutional effects in the analysis of the actions of specific groups and organizations. Above all, a comparative institutional approach must avoid treating the state as a reified monolith.

This chapter is full of statements like “the state can” or “the state wants.” Other chapters share the same language. Such formulations have to be taken as metaphorical shorthand. The purpose of doing research is to figure out what lies behind them. In practice “the state wants” because some group of individuals within the state apparatus has a project. This does not mean the project is merely a reflection of their personal biographies or individual maximizing strategies. It does mean that their project may well be opposed by others elsewhere in the state and that the definition of what the state “wants” is the result of internal political conflict and flux. An investigation of state policy involves probing specific sources and supports, not attributing results to some sort of unitary volition.

Taking the state seriously as an institution without reifying it requires putting together a variety of evidence. I began my research with “secondary evidence,” scholarly accounts of state and society in Brazil, India, Korea, and other countries that offered comparative perspectives on these three. Analyses by researchers working for organizations like the World Bank were also valuable sources. The secondary literature was supplemented by a variety of government documents and statistical evidence. Most important, however, were what are known among specialists in sociological methodology as “key informant interviews.”

On the ground, “state structures” and “state-society relations” become relations among state agencies and organizations, relations between these agencies and individual firms, historical patterns of ties among individuals—all things that can only be appreciated by talking to individual state managers and private executives.

Interviews with dozens of current and former government officials were the primary source of my understanding of what was going on inside these states and the starting point for the description of state roles that is offered in chapters 5 and 6. Obviously, participants offer accounts that are biased and self-interested, but the biases and self-interest are important evidence in themselves. In addition, higher-level officials offer more than accounts of the events in which they have participated. They

offer theories as well. Juxtaposing the theories that emanate from one position in the bureaucracy with those proffered in another is one of the best ways to get a sense of how roles emerge and decline.

Avoiding reification is also important when looking at society. States are connected to “economic elites” or “the capitalist class” via ties to particular firms and individuals. The success or failure of transformative projects depends on how they jibe with the strategies of particular firms. An investigation of the consequences of state policy, especially one that focuses on a particular sector, must look at individual firms and how their strategies resonate with state actions.

Understanding the information technology sector meant beginning with the daunting literature on the global evolution of the sector as a whole. There is also, surprising as it may seem, a large scholarly literature that focuses specifically on the evolution of informatics policies in Brazil, India, and Korea. In addition, each country’s regulatory agencies and industry associations collect and publish data on the sector’s evolution. The specialized business press reports day-to-day changes in the fortunes of individual firms and products. The annual reports and occasional publications of individual firms provide further detail.

In understanding society, as in understanding the state, the most useful sources of information were discussions with individuals. Executives’ descriptions of the competitive problems facing their firms and the way in which state policy affected their strategies were the crucial complement to the perspectives of state managers in constructing chapters 5 and 6 and the matrix for my interpretations in chapters 7 and 8. Like government officials, executives offer theories and interpretations of how state and industry work. While no less biased and self-interested, their theories provide valuable perspectives on the sector’s evolution.

The overall result is a mosaic of concrete evidence melded by an argument that is abstract and general. If the combination convinces, it is not because each piece of evidence or each link in the argument is irrefutable. It is because the overall gestalt makes sense. I hope that the argument is persuasive, but, in the end, I am as interested in provoking as I am in convincing. If the chapters that follow incite readers to stop arguing about “more” versus “less” state intervention and to begin debating the relative efficacy of different structures and roles, I will have accomplished my purpose. If my work provokes others to embark on concrete investigations of the process through which states and societies shape each other, that would be even better.