SUBSIDIES TO CHINESE INDUSTRY

State Capitalism, Business Strategy, and Trade Policy

Usha C. V. Haley • George T. Haley

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Many years ago, I learned from one of our diplomats in China that one of the principal Chinese curses heaped upon an enemy is, "May you live in an interesting age." "Surely," he said, "no age ha been more fraught with insecurity than our own present time."

Sir Austen Chamberlain, brother of British prime minister Neville Chamberlai
quoted by Frederic R. Coudert in *Proceedings of the Academy of Political Scienc*
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We dedicate this book to the working men and women around the world who soldier on with integrity, dedication, and commitment in our uncertain age.

USHA C. V. HALEY

Usha Haley is Professor of International Business at Massey University, Auckland, New Zealand, and Research Associate at the Economic Policy Institute, Washington, DC. She has testified on her research on China to the congressionally mandated US-China Economic and Security Review Commission and twice before the Committee on Ways and Means, including on the Nonmarket Economy Trade Remedy Act. She has presented on her research on China before the US International Trade Commission, the US Department of Commerce, and the US Trade Representative, and her research has advised the US-China Joint Commission on Commerce and Trade, the primary trade dialogue between the two countries. Her research on Chinese subsidies has been incorporated into three pieces of antidumping regulation in the European Union.

Her research focuses on the multinational corporation and international strategic management, especially in Asian and emerging markets, including business-government relations, strategic decision-making, sanctions, and subsidies. She has more than 199 publications and presentations including 24 journal articles (in *California Management Review*, *Harvard Business Review* and *Journal of Management Studies* among others), 36 book chapters, and seven books, two of which have been on international best-seller lists. Her books include *Multinational Corporations in Political Environments* (reviewed in the *Wall Street Journal* and *Academy of Management Review); The Chinese Tao of Business* (reviewed in the *Wall Street Journal); New Asian Emperors* (reviewed in the *Economist*); *Strategic Management in the Asia Pacific*; and *Asian Post-crisis Management*. She is Coeditor in Chief of the new book series *Multinational Investment and Business* for Imperial College Press.

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In 2012, she received the Academy of Management's Practice Impact Award for scholarly impact at the Seventy-Second Annual Meetings, Boston. In 2011, she was featured as "thought leader" on emerging markets at *The Economist*'s flagship High-Growth Markets Summit, London. In 2003, she received a Lifetime Achievement Award from the Literati Club (UK) and a panel of academics, businesspersons, and policymakers for contributions to understanding business in the Asia Pacific. In 2010, she was named an American Made Hero for her work with the US Congress. Her PhD is from the Stern School of Business, New York University. She may be contacted through ChinaSubsidies.com.

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George Haley is Professor of Marketing at the University of New Haven (UNH), where he teaches in graduate and executive programs; in summer, he serves as Distinguished Guest Professor of Marketing at the School of Business, ITESM in Mexico. He is founding Director of the Center for

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He has conducted policy-analysis seminars on China / emerging markets for the National Intelligence Council / CIA, and the US International Trade Commission, and testified twice before th congressionally mandated US-China Economic and Security Review Commission. He also consults with several multinational companies and governments in Asia, Australia, Latin America, and the United States. He serves or has served as Advisor to the Strategic Planning Board of Rio Tinto, Ltd. (Australia), to the Export Promotion Board (State of Connecticut), and to the Metal Manufacturers' Education and Training Alliance, and as Mentor in the Distribution Business Management Association's Corporate Global Supply Chain Mentoring Program for senior executives of large multinational corporations.

His expertise is in industrial marketing and emerging markets, including the historical, cultural, and legal environments in which marketing strategies are formulated. He focuses on business-to-business marketing, distribution and supply-chain management, product and technology managemen strategic marketing, strategic decision-making, Chinese, Latin American, and Asian business, and managing intellectual property in emerging markets. He has over 125 articles, books, book chapters, research reports and presentations, including in journals such as *Harvard Business Review* and *Industrial Marketing Management*. His books include *The Chinese Tao of Business* (recommended b the *Wall Street Journal* as the only book on Asian business to buy) and *New Asian Empero*rs (named "an important study" by the *Economist*). His latest books include *Marketing: Planning and Strategy*, 8th ed. (Cengage).

His research has been profiled several times in the major media including the *Economist*, *Financial Times*, *Wall Street Journal*, *Forbes*, *BusinessWeek*, *Time*, *Los Angeles Times*, CNN, *The Lo Dobbs Show* (CNN), *Fortune*, *Entrepreneur*, *Christian Science Monitor*, *USA Today*, *Voice of America*, *Industry Week*, *Investor's Business Daily*, *Far Eastern Economic Review*, *Marketing News*, and *Advertising Age*. He serves or has served on the review and advisory boards of eight academic journals and has guest-edited three journal special issues on Business in Emerging Economies and on B2B Marketing. He has been appointed Coeditor in Chief for the new Imperial College Press series o *Multinational Investment and Business*.

In 2009, the American Marketing Association's flagship *Marketing News* named him one of six "Marketing Academics to Watch" based on his research, teaching, and impact. In 2010, AmericanMadeHeroes.com named him a Hero Advocate for his work on behalf of American manufacturers, and he was identified as a "Thought Leader" in Business-to-Business and Industrial Marketing and Manufacturing by *IndustryWeek*. He received UNH's University Research Scholar Award in 2011. His PhD is from the University of Texas at Austin. He may be contacted through ChinaSubsidies.com.

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OUR CONTRIBUTIONS

For the past five years or so, we have asked: Why did China frequently move in a couple of years, in capital-intensive industries with no labor-cost advantage, from bit player and net importer to the largest manufacturer and the largest exporter in the world? Why have so many industrialized countries become primarily exporters of commodities and scrap to China? And how is this affecting business strategies and national competitive advantage? This book is an effort to provide some answers to these questions. Economic theories of comparative advantage offered limited insights int these questions that involved Chinese manufacturing subsidies, but we saw that understandings of imperfect markets, state capitalism, business policy, and strategic trade policy could offer more. Our book aims to make several contributions.

First, we provide a complex theoretical explanation for industrial subsidies that in key Chinese manufacturing industries appear in dollar terms to exceed over 30 percent of industrial output. Analyses of manufacturing subsidies have mostly surfaced in economic theories; and economic theories have mostly portrayed subsidies as distortive, redistributing and reallocating resources according to nonmarket criteria and resulting in economically inefficient allocations of these resources. Unless in special circumstances (such as with infant industries), economists have generall ignored the view that subsidies may contribute significantly to aspects of a country's comparative advantage, and not just disadvantage. However, China's state capitalist regime has used subsidies as tool to promote the governments' and the Communist Party of China's (CPC's) interests. The state has willingly paid the price of economic inefficiency to accomplish the CPC's political, social, economic, and diplomatic goals. Because of China's sudden heft in international trade and manufacturing, these considerations regarding subsidies have an immediacy that abruptly transcends the purely theoretical. Theorists and analysts should therefore explore subsidies as governmental strategic tools, including the potential long-term economic effects on international trade and welfare of using subsidies in this fashion. Again, this book hopes to begin an inquiry into these issues.

Second, we develop independent measures of industrial subsidies using publicly reported data at company and industrial levels and from diverse sources. Generally, researchers have a notoriously hard time measuring subsidies, and Chinese subsidies even more so. As this book describes in severa sections, for institutional and strategic reasons, the information on manufacturing subsidies that the Chinese government provides has rampant missing and misreported data; also, few consistent definitions exist for the data. In addition, the Chinese government does not report subsidies to domestic industrial companies, many of whom are major players in their global industries. Yet researchers and analysts as well as governments around the world have depended solely on these Chinese self-reported data for analyses of effects on welfare, industries, and trade. For our analyses, we used data from industrial analysts, nongovernmental organizations, and companies to obtain end-user and reference prices. We gathered data that companies relied on to cost out their products. We analyzed policy statements and reports specifying government subsidies. For many subsidies, we use price-gap analysis to develop our estimates. Though the data are incomplete, for the first time we used multifaceted data that incorporate organizational variables and estimates, not just Chinese governmental reports to measure subsidies.

Third, this book explores the strategic aspect of subsidies for business and governments. It expands on instruments of trade policy to include networks of regulation impacting indigenous innovation, that advance the goals of state capitalism, not of market efficiencies. We separate business strategies into those affected by and shaping consumption and production subsidies. Other

theorists have explored businesses and strategic groups' responses to trade policy, including subsidies. We extend their analysis by examining generic market (competitive) and nonmarket (political) strategies that businesses may undertake.

Over the last five years, research in this book on several industries, including steel, glass, paper, auto parts, and solar, has been incorporated into regulation and business strategy both in the United States and in the European Union. The letters from members of the US Congress and the Office of th President in the appendix indicate how some of this research has been used. However, though the practical aspects of our earlier conclusions appeared obvious, we still lacked an adequate understanding of the theoretical context of Chinese industrial subsidies. We see this book as a step in that direction.

CHAPTER OUTLINES

The chapters in this book include a theoretical introduction to subsidies, an overview of the methodology we employed to measure subsidies, four empirical case studies on subsidies to Chinese steel, glass, paper, and auto parts, and finally implications of Chinese subsidies for business strategy and trade policy. The chapters may be read as stand-alone, in-depth inquiries into a topic concerning subsidies or a case that has policy and governmental attention, or in their entirety for an examination into how Chinese subsidies have operated in our global, interconnected business and political environments. A brief outline of each chapter follows.

Chapter 1 asks how subsidies aided China in becoming so competitive in capital-intensive products for which it enjoyed no comparative advantage a decade prior. Economic rationales span th use of subsidies for industrial development (including effective corporate strategy), technology development, and the pursuit of strategic trade goals. These theories mostly portray subsidies as distortive because they redistribute and reallocate resources according to nonmarket criteria, resultin in economically inefficient allocation of resources. Unless in special circumstances (e.g., infant industries), economists have generally not considered that subsidies may contribute significantly to aspects of a country's comparative advantage. Yet without attention to national political contexts, th economic metaphors of free trade, comparative advantage, and efficient allocation of resources appear insufficient to capture the vast changes that have ensued from subsidies and will continue to affect global markets. In several capital-intensive industries with small labor costs and in less than five years, China rose from bit player and net importer to among the largest producers and exporters in the world. Rather than aberrations, in China, subsidies form central parts of "conceptions of control," important ways in which Chinese businesses and governments produce, stabilize, and creat common understandings of markets. Subsidies reflect interactions and struggles between critical Chinese actors, including central and provincial governments. Flows of capital serve as important mechanisms for Chinese state control of markets, but few industry studies exist of how these vast flows operate. The opacity and complexity of Chinese government borrowing also hinders accurate assessments. Concepts of state capitalism enunciated as market-transition theory, the multiorganizational Chinese state, and state as paramount shareholder can help to form a prism for more complex and relevant understandings of Chinese subsidies.

Chapter 2 defines subsidies, highlights previous empirical research that identified subsidies in China, surveys the rationales for the variables we used, and covers problems with measurement and data. Here we outline the methodology for the ensuing four sequential industry studies conducted between 2007 and 2011 to identify the growth of subsidies to Chinese manufacturing over time: steel (2000-2007), glass (2004-2008), paper (2002-2009), and auto parts (2001-2011). In all these industries, China had moved from a net importer to one of the largest exporters in the world. In all

these capital-intensive industries, labor was between 2 and 7 percent of total costs. In these fragmented industries, the vast majority of firms enjoyed no economies of scale or scope. Although the time periods and some of the industry-specific variables vary because of the availability of data, all studies build on common assumptions and use some common variables. Connections are specifie between Chinese policy, trade regulation in the GATT and the WTO, and subsidies. The chapter also surveys research and provides data on major forms of subsidies to Chinese industry including (*a*) fre or low-cost loans, (*b*) subsidies to energy (coal, electricity, natural gas, heavy oil), and (*c*) subsidies to key inputs, land, and technology. For our analysis, we included data from companies, nongovernmental organizations, government agencies around the world, think tanks, and industrial analysts to obtain end-user and reference prices. We also analyzed policy statements and reports specifying government subsidies. Though the data are incomplete, for the first time we used multifaceted data that incorporate organizational variables and estimates, not just Chinese governmental reports, to measure subsidies. We discuss data problems we encountered and the price gap approach we used to measure some of the subsidies. Finally, the chapter presents the 15 equation that we used to calculate subsidies to Chinese industry.

Chapter 3 tracks subsidies to China's steel industry from 2000 to 2007 and the industry's sudden transformation from net importer to the largest producer and exporter in the world. In 2007, China was the largest producer and consumer of steel in the world, with 40 percent of the global market. In 2005, China went from a net steel importer to a steel exporter. In 2006, China became the largest ste exporter in the world, up from fifth largest in 2005. In 2007, energy subsidies to Chinese steel were estimated at approximately $15.7 billion, showing a 3,800 percent increase since 2000. The central government's policies of consolidating the steel industry had failed and the Chinese steel industry ha become more fragmented. With no discernible cost advantage, Chinese steel still sold for 25 percent less than US and European steel. From 2000 to midyear 2007, total energy subsidies to Chinese steel reached $27.11 billion, including subsidies to thermal coal of $11.16 billion, to coking coal of $15.2 billion, to electricity of $916.39 million, and to natural gas of $54.12 million.

Chapter 4 documents the Chinese glass industry's explosive growth and exports and the government subsidies that bolstered it from 2004 to 2008. In 2009, with over 31 percent of global glass production, China was the largest producer of glass and glass products, had the greatest numbe of glass-producing enterprises, and had the largest number of float-glass production lines in the world. China was also the largest consumer of glass. However, because of existing and planned production capacity, glass exports from China were expected to outpace greatly projected increases i domestic demand. Since 2003, glass production in China has more than doubled. Concurrently, production capacity in China has also doubled since 2003 and increased more than threefold since 2000. China's glass industry enjoyed no economies of scale or scope. The industry also displayed geographic fragmentation, with manufacturers in 29 of the 32 provinces. Because of poor data, analysis took place at the level of the flat-glass sector that received approximately $4.8 billion in subsidies from 2004 to 2008. Extrapolating to the glass industry as a whole, we determined that China's glass and glass-products industry received at least $30.3 billion in subsidies from 2004 to 2008. The subsidies spanned heavy oil, coal, electricity, and soda ash and grew steadily in this perio reaching about 35 percent of gross industrial output value of glass in 2008.

Chapter 5 covers China's rapid rise in the global paper industry, fueled by over $33.1 billion in government subsidies from 2002 to 2009. Since 2000, China tripled its paper production. In 2008, China overtook the United States to become the world's largest producer of paper and paper products China's paper industry has limited economies of scale or scope and is geographically fragmented, operating in 30 provinces. China also has among the smallest forest bases in the world per capita. Consequently, it is the largest importer in the world of major industrial inputs, including pulp and

recycled paper. Labor makes up about 4 percent of the costs in this industry; in contrast, imported recycled paper and pulp comprise over 35 percent of the costs. Yet Chinese paper sells at a substanti discount compared to US or European paper. Governmental policies have systematically aimed to reduce China's dependence on imported raw materials and to subsidize the paper industry's restructuring. Subsidies measured from 2002 to 2009 include those for electricity ($778 million), coa ($3 billion), subsidy income reported by companies ($442 million), and loan-interest subsidies ($2 billion); from 2004 to 2009 they include those for pulp ($25 billion); and from 2004 to 2008, they include subsidies for recycled paper ($1.7 billion). Missing data prevented calculation of pulp or recycled-paper subsidies in 2002, 2003, and 2009.

Chapter 6 highlights how from 2001 to 2011, the Chinese auto-parts industry received $27.5 billion in subsidies, helping to make it one of the largest producers and exporters in the world. As a "pillar industry," auto parts have received strong support from the Chinese government. The industry has grown more than 150 percent since 2004 but remains highly fragmented with more than 10,000 registered and 15,000 unregistered manufacturers. US global auto strategy has centered on manufacturing in China and exporting back home. Consequently, China's exports of auto parts to the United States are three times those of its next highest trading destination, Japan. Specific subsidies included $2.3 billion reported by 73 companies (2001-2009); $1 billion for coal (2001–2010); $0.6 billion for electricity (2002–2010); $0.3 billion for natural gas (2004-2010); $1.6 billion for glass (2004-2010); $3.2 billion for cold-rolled steel (2003-2010); and $18.4 billion for technology development and industrial restructuring (2001-2011). For the next decade, the government has committed an additional $10.9 billion in subsidies for restructuring and technology development.

Chapter 7 analyzes how subsidies to Chinese industry have affected and are affected by business strategy and trade policy. Our findings contradict the widespread belief that China's enormous success as an exporting nation derives primarily from low labor costs and deliberate currency undervaluation. The subsidy practices we covered have impact beyond the four industries on which we focused. We explore the implications of these subsidies for firms, for the global economy, and fo future research. Business strategies include lobbying for subsidies, advocating for protection from subsidized foreign competitors, and adroit managing of supply chains to guard against the whiplash effects generated by uncoordinated subsidies. Free trade may lead to suboptimal outcomes, and protectionism can increase national income by raising firms' profitability in imperfect markets. Wit an open US market and closed China market, Chinese firms could achieve more efficient scale via sales volume domestically and abroad, while squeezing US competitors into a portion of their domestic market. Once foreign firms fall behind, recovering profitability becomes unlikely, and so strategic trade policy should rationally become managers' top priority. Business strategies alter in response to production or consumption subsidies and include market or competitive as well as nonmarket or political strategies. Understanding trade-policy instruments can explain some patterns of specialization ensuing from trade with China, and we cover three government policies broadly focusing on domestic consumption (antidumping and countervailing duties) or domestic production (indigenous innovation). Subsidies to Chinese manufacturing have many implications for firms, including manufacturing location and technology development. For the global economy, regular boom-and-bust cycles may now become the new normal, and these call for informed negotiation via trade blocs and bilaterally. Chinese government subsidies will continue, contributing substantially to their firms' competitiveness in global markets.

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We also thank the many academics, managers, government officials, governmental representatives, trade representatives, trade lawyers, industry analysts, students, coauthors, and reporters in the United States, China, Australia, the EU, New Zealand, Mexico, India, Taiwan, and Hong Kong who tirelessly listened to our ideas and generously gave of their time and insights. These include participants of the US International Trade Commission's Industry Seminar Series in Washington, DC, for initial feedback on the variables used in this book and their measurement. Special thanks also to senior policymakers and analysts in the United States International Trade Commission (USITC), United States International Trade Administration (ITA), United States Department of Commerce, and the United States Trade Representative (USTR), Washington, DC, for regular and helpful feedback through the various industrial studies. Specific industrial studies in this book also benefited from insights, data, or both from John Bonnell (JD Power Asia Pacific), Scott Boos (Alliance for American Manufacturing), Tim Brightbill (Wiley Rein), Robert Carr (USITC), Vince DeSapio (USITC), Elizabeth Drake (Stewart & Stewart), Per Ekander (Arctic Paper), Jake Handelsman (International Forest & Paper Association), Dawn Heuschel (USITC), Ambassador Alan Holmer (Department of Treasury Special Envoy to China and the Strategic Economic Dialogue), Gerald Houck (USITC), Jennifer Kelly (United Auto Workers, Michigan), Thomas Klier (Federal Reserve Bank of Chicago), Stephen Koplan (Wessel Group), Jamie Milnes (MEPS International, UK), Keith Romig (United Steelworkers), Tim Stratford (China Affairs, USTR), the Trade Working Group of the US Congress, and, Timothy Weckesser (SinoConsulting).

Our industry study on steel subsidies draws on our earlier unpublished Alliance for American Manufacturing report; and our industry studies on glass, paper, and auto-parts subsidies draw on our earlier Economic Policy Institute briefing papers to inform the trade debate. These industry studies have benefited from reviews from academics and also from policymakers, US senators and representatives, trade lawyers, labor-union leaders, managers, and industry and country analysts.

Finally, we owe special thanks to our editor, Terry Vaughn at Oxford University Press, who believed in this project, provided suggestions, and in good humor gave us extra time when problems acquiring Chinese data invariably affected our schedules. We also thank Catherine Rae and Cathryn Vaulman at Oxford University Press for her help with our manuscript.

To all the above mentioned who helped shape our writing, we owe our gratitude.

CHAPTER 1
The Hidden Advantage of Chinese Subsidies

China provided "easy access to capital," Michael McCarthy, director at Evergreen Solar, told us on wintry February morning as the company started moving all production of solar panels from Massachusetts to a joint venture (JV) in Wuhan, China. "We need capital to expand and grow. That i fundamental." Earlier, in January 2011, Evergreen Solar had closed its main US factory and laid off 800 workers. In the previous three years, with the Massachusetts government's loans and tax credits and its proprietary technology, Evergreen had become the United States' third-largest solar-panel manufacturer. The company cited plunging solar-panel prices worldwide, coupled with much higher Chinese government subsidies (financial transfers from the government that provided benefits) as reasons for its move.[1]

The Chinese had become the largest manufacturers and price setters in the nascent solar photovoltaic industry, accounting for over half the world's production in 2010. World prices had fallen by two-thirds in the last three years. Evergreen's CEO, El-Hillow, told the *New York Times* tha the Chinese governments' and state-owned banks' considerable subsidies had helped Chinese manufacturers to keep costs very low (Bradsher 2011a). In 2010, the top five solar companies in China had received over $31.3 billion in loans from the state-owned China Development Bank alone (Mercom).[2] El-Hillow said that the Chinese were now offering him similar massive subsidies that would keep Evergreen competitive; these subsidies, rather than low Chinese labor costs, influenced his move, he elaborated, as labor formed just a tiny part of his manufacturing costs. China's real advantage, he said, lay in the ability of solar-panel companies to partner with local governments and to obtain loans at very low interest rates from state-owned banks. Evergreen, with its partners, the Wuhan municipal and Hubei provincial governments, borrowed two-thirds of its Wuhan factory's costs (as compared to less than 5 percent of its US factory's costs from the Massachusetts government) from two Chinese state-owned banks at very low interest rates with no principal or interest payments due until the end of the loan in 2015. "Therein lies the hidden advantage of being i China," El-Hillow said (Bradsher 2011a).

This book provides a theoretical basis and an empirical analysis for understanding the hidden advantage of Chinese production subsidies with practical implications for world industry. Rather tha aberrations, in China subsidies form central parts of what Fligstein (2001) called "conceptions of control," important ways in which Chinese businesses and governments produce, stabilize, and creat common understanding of their markets. Flows of subsidies reflect interactions and struggles betwee critical Chinese actors such as central and provincial governments and state-owned enterprises (SOEs) with different resources, interests, and visions of markets. As we describe in later chapters, Evergreen's story has resurfaced across other industries, including steel, glass, paper, and auto parts. In all these capital-intensive industries where labor costs play minor roles, and in the space of approximately five years, China rose from a net importer to among the largest producers and exporters in the world. How did subsidies aid China in becoming so apparently competitive in capita intensive products for which it enjoyed no comparative advantage[3] a decade prior? What are the implications for firms and other countries in the face of this hidden advantage? Table 1.1 indicates the growth of three measurable subsidies to Chinese private firms and SOEs in the form of research-and-development (R&D) funds, subsidies to loss-making SOEs, and additional appropriations for SOEs' circulating capital, as reported by China's National Bureau of Statistics (NBS). From 1985 to 2005, these reported subsidies totaled $310.18 billion.

China's modern global rise began more than three decades ago in 1976, when Deng Xiaoping took over as China's paramount leader after Mao Zedong. Deng's vision for China's restructuring included "socialism with Chinese characteristics," where the state continued to retain ultimate control of China's economic and political environments as it opened up to the world (Communist Party of China 2007). Analysts and researchers have credited Deng's policies as transforming Mao's restrictive and failed state-control model into one that could operate effectively in a global, capitalist economy (Spence 1997). In December 2001, in line with Deng's reforms, and after 15 years of diplomatic negotiations, China became a member of the World Trade Organization (WTO) (*BBC News* 2001). In a front-page editorial, China's state-owned newspaper, *People's Daily*, labeled WTO membership as "historic moment in China's reform and opening-up and the process of modernization" with prophetic hopes that China's manufacturing and exports would become even more competitive globally. In 2009, China surpassed Germany to become the world's largest exporter (Haley 2010). In 2010, China became the second-largest producer in the world, overtaking Japan. In 2010, Chinese foreign-exchange reserves also topped $2.85 trillion, the largest in the world (Bradsher 2011b). In December 2010, only the United States and Japan exceeded China's patent filings; with 16.7 percent annual growth from 2006, in 2011 China surpassed the United States to become the top patent filer in the world (Yee 2011; Zhou and Stembridge 2010).

Table 1.1. REPORTED SUBSIDIES TO CHINESE MANUFACTURING ENTERPRISES, 1985–2005 (BILLIONS OF DOLLAR

	Innovation and technology subsidies	Subsidies to loss-making SOEs	Subsidies for SOEs' circulating capital	Total
1985	3.52	17.27	0.49	21.28
1986	3.76	9.41	0.29	13.46
1987	3.36	10.11	0.32	13.79
1988	4.06	12.00	0.26	16.32
1989	3.89	15.91	0.32	20.12
1990	3.22	12.10	0.23	15.55
1991	3.40	9.59	0.25	13.24
1992	4.06	8.07	0.19	12.32
1993	7.31	7.14	0.32	14.77
1994	4.82	4.25	0.20	9.27
1995	5.92	3.93	0.42	10.27
1996	6.29	4.06	0.52	10.87
1997	7.76	4.45	0.63	12.84
1998	7.75	4.03	0.51	12.29
1999	9.25	3.50	0.68	13.43
2000	10.45	3.37	0.86	14.68
2001	11.98	3.63	0.27	15.88
2002	11.70	3.14	0.23	15.07
2003	13.21	2.74	0.14	16.09
2004	15.03	2.63	0.15	17.81
2005	18.25	2.36	0.22	20.83
Total	158.99	143.69	7.50	310.18

Source: Compiled from China Statistical Yearbook; Girma et al. 2009.

In 2011, Chinese labor wages, though rising, still constituted about one-fifteenth of labor wages in the United States and other industrialized countries.[4] Yet China's economic growth has speedily

transcended its historical base of labor-intensive industries to capital-intensive industries. Rodrik (2006) showed that China's exports have significantly more sophistication and contain more high-tech goods than pure comparative-advantage arguments predict. He argued that China's industrial policies of "promotion and protection" shaped its industrial structure and exports. Much of China's economic prowess has manifested in the space of a decade, with many Chinese products selling for about 30–50 percent less than comparable products from industrialized nations. Economic theories o cost advantages from efficiencies and technological breakthroughs fail to explain fully these cost advantages: As the industry studies in this book indicate, Chinese industries remain highly fragmented, with most companies having no economies of scale or scope and using antiquated technologies. The next section highlights some of the unique characteristics of Chinese state capitalism. The ensuing sections provide brief reviews of economic and sociopolitical reasons for subsidies to enable moving beyond pure comparative advantage as an explanation for China's economic rise and global economic effects.

STATE CAPITALISM WITH CHINESE CHARACTERISTICS

State capitalism refers to situations where states play significant and visible roles in markets. Polany (1944; Polanyi, Arensberg, and Pearson 1957) identified states and markets as the two central, interconnected pillars of modern capitalism. Subsequent research elaborated on the state's roles in modern industrialized societies (e.g., Wallerstein 1979; Hobson 1997; Weiss 1998; Evans, Rueschemeyer, and Skocpol 2002). Focusing on Japanese institutional arrangements, Johnson (1995) confirmed the capitalist developmental state's significance in industrialization through emphasizing growth, productivity, and competitiveness and using an elite bureaucracy. Other research in Korea (e.g., Amsden 1992), Taiwan, and Singapore (e.g., Deyo 1987; Wade 1990; Wong 2004) amplified states' roles in industrial development.

Chinese state capitalism has commonalities with other Asian variants that have strong governments to direct investment and to suppress labor (Fligstein and Zhang 2011). Indeed, the Chinese government deliberately learned from Japanese, Korean, and Singaporean developmental experiences. In the late 1990s, Beijing tried to reorganize SOEs into big business groups similar to those in Japan and Korea (White et al. 2008). The State-Owned Assets Supervision and Administration Commission (SASAC) of the State Council learned about asset management from Singapore's Ministry of Finance and Temasek. But in Japan, Korea, and Singapore, elite families have always controlled private, large firms (see Haley, Haley, and Tan 2009); in China, the state, rather than elite families, controls firms in the core Chinese economy.

Lin (2011) identified state capitalism as varying across two dimensions: the extent of the state's ownership of production; and the extent of the state's coordination with other enterprises. Among nation-states, China uniquely synchronizes party, government, military, and economy. The Chinese state freely creates and maintains enterprises, holds a majority of the shareholdings, controls critical personnel decisions, and supplies capital (Haley, Haley, and Tan 2004). SOEs compete with other enterprises in the market, and its elites enjoy capitalist rewards. However, the elites ultimately answ to the state rather than to boards of directors, shareholders, or other stakeholders. The market asymmetrically favors SOEs for capital and other resources. Some SOEs become national champions as the state restricts their competitors and encourages their mergers and acquisitions. Along with control of rewards and incentives for personnel and organizations, Lin (2011) identified control of capital as one of the distinguishing facets of Chinese state capitalism.

The Chinese central and provincial governments direct all the major financial institutions (Lin 2011). The State Council's vice premier manages all major banks. Seventeen institutions control fou

fifths of the banking system's assets; the government appoints and controls their managers' mobility Consequently, financial institutions fully cooperate with state's directives in disbursing capital. Despite provincial tussles, the Chinese state, financial institutions, and SOEs appear seamless in trad and foreign investment. For example, in trade agreements, the Chinese government almost always commits to infrastructural construction and natural-resource explorations, which it allocates as no-bi contracts to SOEs. The SOEs also receive financing from the Chinese state-owned banks. Table 1.2 indicates the extent of governmental ownership of bank assets in China.

Flows of capital serve as an important mechanism for Chinese state control of markets, but few industry studies exist of how these flows operate. Additionally, the opacity and complexity of Chines government borrowing hinders accurate assessments of the state's liabilities and capital flows. In 2010, the Chinese central government had official treasury debt of less than 20 percent of GDP. However, using official government sources, Batson and Zhang (2011) estimated public debt load as 82 percent of GDP in 2010. They attributed this debt to the myriad fiefdoms within China's large public sector that freely borrowed money to finance provincial, including industrial, ambitions (also see Shih 2008). As table 1.3 shows, local governments' debt rose from 0 percent of GDP in 1998 to 2 percent in 2010. Most of this lending originated from public-sector entities such as the China Development Bank, Ministry of Railways (MOR), and local-government investment corporations (LICs). Credit rating agency Fitch Ratings (2010) reported that Chinese banks were increasingly engaging in complex deals that hid the size and nature of their lending, obscuring hundreds of billion of dollars in loans. The report also said that Chinese regulators understated loan growth in the first half of 2010 by 28 percent, or about $190 billion—real loans were closer to RMB 5.9 trillion than the reported RMB 4.6 trillion. Many banks continued secretly to shift loans off the books, creating a "pervasive understatement of credit growth and credit exposure." In 2009, lending by state-run banks comprised one of China's most aggressive forms of stimulus (Barboza 2010).

Table 1.2. GOVERNMENTS' SHARE OF BANK ASSETS IN CHINA, 2009

Full state control (63.4%)	Partial state control (22.1%)	Least state control (14.5%)
Large commercial banks (51.3%)	Joint-stock commercial banks (14.9%)	Rural credit cooperatives (10.9%)
Policy banks (8.7%)	City commercial banks (7.2%)	Nonbank financial institutions (1.9%)
Postal service banks (3.4%)		Foreign banks (1.7%)

Source: Compiled from Dean, Browne, and Oster 2010.

Table 1.3. OFFICIAL CHINESE PUBLIC DEBT AS A PERCENTAGE OF GDP, 1998–2010

Year	Official domestic debt	Foreign debt	Central bank bills	Policy bank bonds	Ministry of Railways	Local govt. debts	Bank restruc-turing costs	Contin gent NPL liabili-ties	Total
1998	9%	4%	0%	6%	2%	0%	3%	52%	76%
1999	12%	4%	0%	7%	2%	5%	7%	49%	86%
2000	13%	4%	0%	7%	2%	5%	15%	30%	76%
2001	14%	4%	0%	8%	2%	4%	15%	26%	73%
2002	16%	3%	1%	8%	2%	6%	14%	23%	74%
2003	17%	3%	2%	9%	1%	7%	12%	18%	70%
2004	16%	2%	7%	9%	1%	7%	13%	12%	67%
2005	17%	1%	12%	10%	1%	12%	17%	8%	77%
2006	16%	1%	15%	11%	2%	15%	14%	6%	80%
2007	19%	1%	14%	11%	2%	16%	11%	5%	80%
2008	17%	1%	15%	12%	2%	16%	12%	2%	77%
2009	18%	1%	12%	13%	3%	23%	11%	2%	84%
2010	17%	1%	10%	13%	4%	27%	9%	1%	82%

Source: Batson and Zhang 2011.

In 2011, China's first national audit of regional finances confirmed that local governments owed RMB 10,700 billion ($1,650 billion) or about 27 percent of China's GDP, again easily outstripping the central government's official debt figures. The audit confirmed a rise of 62 percent in local governments' debt after the 2008 financial crisis. In 2011, other estimates put the government's contingent liabilities at over 150 percent of GDP when they included SOEs' debt implicitly backed b the state (Rabinovitch and Anderlini 2011). In contrast, the United States had a debt-to-GDP ratio of 93 percent, and Japan's ratio hovered at over 225 percent. The audit revealed that Chinese provincial governments had created over 6,576 arm's-length financing vehicles to circumvent central banking rules for easier access to RMB 4,971 billion in loans. But previous estimates had put the total debt load at closer to RMB 14,000 billion. The discrepancy arose because the audit only included loans to financing vehicles with explicit guarantees from local governments, rather than state land or other collateral that the governments mostly used instead.

Provincial governments' policies drive much of China's capital flows into fixed-asset investments, or investments in plant, equipment, infrastructure, and real estate. For example, in the fourth quarter of 2008, the Chinese central government allocated about two-thirds of its economic-stimulus package, or approximately RMB 2.7 trillion, for provincial governments' expenditures. However, the provincial governments' stimulus spending ballooned to nearly RMB 10 trillion, about four times the central government's contribution. The local governments borrowed cheaply or at no cost from state-owned banks to bridge the gap and invested this capital in industrial and infrastructural projects built by locally supported SOEs with materials purchased from other SOEs (Meyer 2011). China's fixed-asset investments jumped 33 percent in the first five months of 2009, th most in five years (*Bloomberg*, June 22, 2009). Table 1.4 shows the continued rise of fixed-asset investments in China from the 1990s. Figure 1.1 shows that fixed-asset investments grew from about 24 percent of GDP in 1990 to 66 percent of GDP in 2009. The next section provides economic rationales for subsidies.

Table 1.4. FIXED-ASSET INVESTMENTS IN CHINA, 1990–2010

Period	Fixed-asset investment (RMBbn)	Fixed-asset investment nominal growth (%)	Fixed-asset investment real growth (%)
1990	451.7	2.4	-5.2
1991	559.5	23.9	13.2
1992	808.0	44.4	25.2
1993	1,307.2	61.8	27.8
1994	1,704.2	30.4	18.1
1995	2,001.9	17.5	11.0
1996	2,291.4	14.8	10.4
1997	2,494.1	8.8	7.0
1998	2,840.6	13.9	14.1
1999	2,985.5	5.1	5.5
2000	3,291.8	10.3	9.1
2001	3,721.4	13.0	12.5
2002	4,350.0	16.9	16.7
2003	5,556.7	27.7	25.0
2004	7,047.7	25.8	19.1
2005	8,860.4	25.7	23.7
2006	10,987.0	24.0	22.2
2007	13,732.4	24.8	20.1
2008	17,229.1	25.5	15.2
2009	22,484.6	30.1	33.3
2010E	27,656.0	21.0	16.9

Source: Dragonomics.

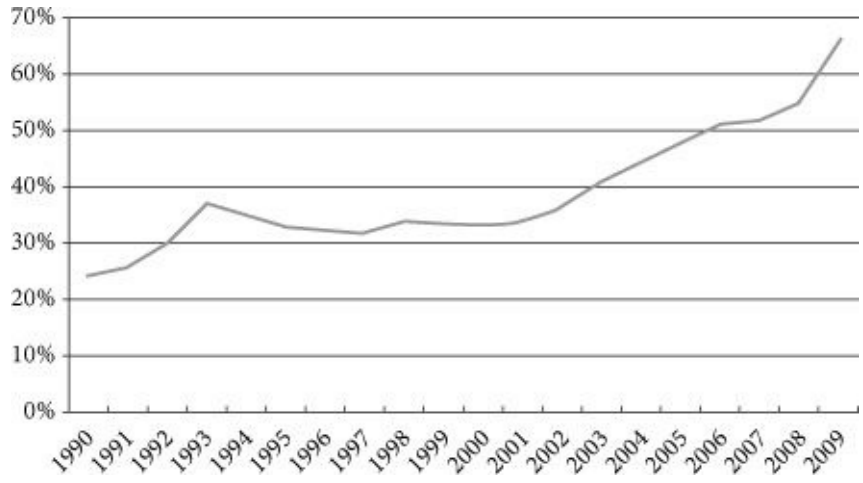

Figure 1.1
China's Fixed-Asset Investment as a Percentage of GDP, 1990–2009
Source: Dragonomics.

ECONOMIC RATIONALES FOR SUBSIDIES

Economic rationales do not deal specifically with China but span the use of subsidies for industrial development (including effective corporate strategy), for technology development, and for the pursu of strategic trade goals. A selective review of some theories as they explain the use of subsidies follows. Economists distinguish between general social expenditures (such as those on infrastructure and specific subsidies to industries. General expenditures do not, in theory, affect resource allocation