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Supplement to THE WORLD BANK ECONOMIC REVIEW
and THE WORLD BANK RESEARCH OBSERVER

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How Industrial Reform Worked in China: The Role of Innovation, Competition, and Property Rights

Gary H. Jefferson and Thomas G. Rawski

In China early attempts at partial reform unleashed forces that, fifteen years later, have brought China's economy to the brink of a market system. The participation of tens of thousands of enterprises and millions of administrators, managers, and workers over the duration of the reform eventually built a constituency for market-directed change that was far stronger than any official announcement could have produced. Gradual and partial reform shifted the economy toward a market system under a regime of growth, improved productivity, accelerated technical change, and rising exports. Reactions of firms and governments focused increasingly on innovation, cost reduction, and further deregulation, deepening the cumulative impact of reform, rather than on rent-seeking and subsidies. This process of reform is very different from the top-down, centrally planned approach to reform that is widely advocated by international organizations and economic researchers, but it has produced a durable reform constituency that easily rebuffed high-level efforts to roll back reform in the wake of the inflation scare and political repression of 1989.

China's partial and gradual reform has combined rapid economic progress with institutions and policies that deviate widely from standard prescriptions for reform. China's reforms present economists with a puzzle. Why has China "grown so fast when conditions thought to be necessary for growth... were absent?" (Blanchard and Fischer 1993, p. 4). How did China's unorthodox reforms spark an economic surge that has far outpaced results in other ex-socialist economies and in many developing nations?

Many economists view the reform of former socialist economies as a process of replacing old institutions with new structures in an organized top-down fashion

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directed by reformers. The self-interested response of agents within the economy is expected to stimulate profit-seeking behavior and market activity. If progress is inadequate, planners can impose further rounds of reform.

This type of centrally directed reform has undoubtedly played a role in China's economic transition. It was China's central leadership that initiated economic reforms in the late 1970s, expanding the role of prices and market allocation, rolling back long-standing barriers to international trade and investment, transferring authority from central planners to enterprise managers and local governments, creating a system of dual (plan and market) pricing for industrial goods, and so on. But unlike the postcommunist leaders in countries like Poland and the Czech Republic, China's policymakers embarked on a path of reform with no clear vision of what a restructured economy should look like and no consensus about what policy mix or institutional arrangements would best get the economy there (Hua, Luo, and Zhang 1993; Shirk 1993; Naughton 1994).

Not surprisingly, policy announcements from the center were partial and tentative. The center ratified but did not direct the momentous shift from collective to household farming. Central initiatives in industrial reform focused on the incremental relaxation of controls over state-owned enterprises. Even the revolutionary "open door" strategy, reflected in a sequence of central decisions that shattered long-standing barriers to China's participation in the world economy, concentrated on expanding trade and investment activity in a small number of provinces and special zones along China's southeast coast.

From the usual top-down perspective China's recent economic gains seem remarkably large in relation to the central government's modest reform initiatives. In exploring this anomaly, we focus on an analysis of China's reform dynamics that shows how technical innovation, economizing behavior, market-leaning institutional changes, and a multitude of cumulative and mutually reinforcing choices by administrators, managers, and workers reinforced and eventually overshadowed Beijing's partial reform efforts. The focus is on industry, which is both the largest sector of China's economy and the core of its reform problem.

Successive rounds of partial reform have cumulated into significant changes in industrial structure, conduct, and performance affecting every type of firm, including old-line state firms. In this process partial reform initiatives produce unanticipated outcomes in an interplay of action and reaction among changes in economic conditions, ad hoc policy measures by various levels of government, and uncoordinated strategizing by enterprises and individuals. This interaction occurs in an environment of intense competition involving several types of firms, each with its own distinct technical capabilities and institutional constraints. Partial reform expands entry into product markets, and the ensuing intensification of competition erodes enterprise profits and undermines the revenue base at every level of government. These financial strains generate pressures that promote innovation and cost reduction. Government efforts to ease the revenue constraint and enterprise efforts to innovate and reduce costs lead to fresh rounds of market-directed institutional change.

What Needs to Be Explained about China's Industrial Reform

China's recent industrial achievements deviate from the orthodox reform scenarios in the continued dominance of the public sector; its improved performance, despite the absence of any plans for privatization; and the continued presence of important defects in the institutional underpinnings of China's industrial economy.

Rapid growth is amply documented in World Bank reports, which reveal the broad-based nature of industrial expansion. Joint ventures, foreign-owned firms, and private industry contributed only one-sixth of incremental output gains during 1980–92 (table 1). Despite the highly publicized economic boom in China's southern coastal provinces, the region's 36 percent share in aggregate industrial output in 1992 was only modestly above its 30 percent share for 1978—and below the 36.6 percent share in 1952 (Industry 1949–84, p. 145; Survey 1993, p. 72).

The Dominance of Public Enterprise

The output share of state-owned industry (firms “owned by the whole people” and directly or indirectly controlled by agencies of the central government) plunged from three-quarters to less than half between 1980 and 1992 (table 1). This decline reflects dramatic gains by collectives, especially the rural firms known as township and village enterprises (or TVEs). The 1992 output share of public sector industry, however, which includes state firms and urban and rural collectives, exceeds 85 percent. The output share of private domestic firms remains small, at less than 10 percent.¹

The explosive growth of TVE output has aroused intense interest. TVE firms, although different in many respects from state enterprises, are public enterprises. Calling TVEs “nonstate enterprises” conveys the misleading impression that rural collectives operate independently of officialdom. Some authors have speculated that TVE firms “mimic private enterprises” or operate like “loosely-structured cooperatives” (Singh, Ratha, and Xiao 1993; Weitzman and Xu 1994). TVE operations are closely monitored and often controlled by “local government entrepreneurs” (Zweig 1991, p. 720) who “exhibit characteristics of both de facto owners and senior managers of township corporations” (Whiting 1993, p. 6).² The TVE sector is built on the foundation of earlier industrialization efforts undertaken by local governments (Perkins and others 1977). Like their predecessors, the TVE firms of the 1980s and 1990s operate “under close supervision from the township or village industrial departments” (Wong, Heady, and Woo 1993, chap. 9), which contribute start-up funds, appoint managers, and “are intimately involved in major strategic decisions” (Ody 1991, p. iv).³

Improved Performance in State Industry

No one disputes the significance of the contributions that TVEs have made to the growth of production, exports, productivity, employment, incomes, and material welfare. Their success shows the insufficiency of assuming that a full and immediate

Table 1. Overview of Industrial Performance in China, 1980–92

Ownership type	Index of real output (1980=100)			Shares in nominal output (percent)				1980–92 (percent)	
	1985	1990	1992	1980	1985	1990	1992	Annual average growth	Share of incremental output
State	148	210	257	76.0	64.9	54.6	48.4	7.8	43.6
Collective	247	554	914					18.4	
Urban				13.7	13.3	10.3	11.8		11.5
Township-village				9.9	18.8	25.3	26.2		28.8
Private ^a	21,752	126,057	241,455	0.0	1.9	5.4	6.8	64.9	7.9
Other ^b	492	3,530	8,736	0.5	1.2	4.4	7.2	37.2	8.3
Total	176	328	480	100.0	100.0	100.0	100.0	13.1	100.0
Total output (¥ billion)				515.4	971.6	2,392.5	3,706.6		

a. Privately owned firms employing fewer than eight workers.

b. Includes private firms employing eight or more workers, joint ventures, foreign-owned firms, and other ownership forms.

Source: Yearbook 1993, pp. 409–13; Rawski forthcoming.

end to official influence over enterprise management, preferably through privatization, is a necessary step in the reform of socialist systems.

But the inconsistency between recent Chinese industrial experience and free-market orthodoxy runs even deeper. China's old-line state enterprises have responded to ongoing partial reform by behaving less like passive bureaucratic followers and more like profit-seeking commercial businesses. Reform has altered the objectives, incentives, and corporate culture of state firms, bringing substantial improvements in performance. With state industry accounting for nearly half of industrial output and absorbing 35 percent of aggregate fixed investment, China's recent economic gains could hardly have occurred had state industry served only as a drag on economic progress.⁴

This article is not the place for a detailed review of evidence supporting these assertions.⁵ The discussion here is limited to the following propositions about state industry, each resting on substantial empirical foundations:

- State enterprises, formerly devoted to plan fulfillment, now take profit as their chief objective. Data on state enterprise performance generate increasingly robust statistical relationships of the kind expected from profit-seeking firms operating in a competitive market setting.
- State enterprises have achieved substantial increases in labor productivity and steady, although modest, increases in total factor productivity.⁶
- State enterprises have sharply increased the pace of research and development, new product development, and process innovation (Jefferson, Rawski, and Zheng 1992a,b).
- Exports of state enterprise manufactures, which increased at an estimated annual rate of 18 percent between 1985 and 1992, reflect the impact of greater attention to quality, variety, customer requirements, and cost control.⁷
- State enterprises constitute an important and often crucial source of technology, equipment, funds, information, expertise, and marketing opportunities essential for the successful development of TVEs.

Persistence of Institutional Weaknesses

In looking at China's recent achievements, the challenge is to explain dramatic gains in industrial performance in the absence of comprehensive efforts at the center to promote liberalization and institutional change. The key question concerns the process that has moved public sector firms reared under state planning to place unprecedented emphasis on efficiency, quality, and innovation, with no program or even credible threat of privatization, and to explain how China's industrial advances have occurred without the features that many economists regard as core elements of a market system.

Chinese industry continues to operate in an environment of incomplete specification of property rights. Rules of commerce are neither clearly defined nor consistently enforced. Competing firms in the same industry or locality face widely differing legal, fiscal, and regulatory regimes. Government intervention in business

affairs extends well beyond the boundaries observed in even heavily regulated market economies (Japan, Republic of Korea), often with the effect of softening budget constraints. These difficulties restrict innovation and productivity growth, particularly, but not exclusively, in the state sector.⁸ They have also enabled insolvent and hopelessly inefficient state enterprises to continue to operate, wasting large amounts of productive resources and requiring subsidies large enough to affect macroeconomic stability (Sachs and Woo 1993; Woo and others 1993). The cost of these institutional shortcomings, although difficult to quantify, appears large.

A Model for Analyzing Induced Industrial Reform

We propose the following model of China's industrial reform, which we see as a cumulative process that begins when partial relaxation of the institutional constraints associated with socialist planning initiates competition in the markets for industrial products. Competition reduces profits, creating financial pressures that induce technical innovations, promote economizing behavior, and stimulate fresh rounds of market-leaning institutional change. This model rests on four key institutional features of China's industrial economy: decentralized supervision, incipient competition, fiscal dependence on industrial profits, and a hierarchy of heterogeneous enterprise types.⁹

Decentralized Supervision

Central control of industrial enterprises was never as tight in China as in Eastern Europe and the Soviet Union (Granick 1990). Decentralization increased during the late 1960s and 1970s as the central government transferred supervision of many firms to provincial and municipal governments. This system of decentralized supervision encouraged provinces and localities to create and pursue their own industrial development strategies. When reform began, decentralized decisionmaking also made it possible to introduce piecemeal reforms and to conduct local policy experiments without disrupting the whole economy. Successful local reforms inspired widespread emulation.

Incipient Competition

The term "incipient competition" well describes the circumstances of domestic Chinese markets for industrial products on the eve of reform. Actual competition was sharply limited by policies that had the effect of creating strong barriers to entry. Removing these barriers, however, quickly revealed multiple competitors in nearly every product line. In China, unlike Russia and other countries of the former Soviet Union and Eastern Europe, deregulation leads to industrial competition, not to monopoly.

Competitive pressures arose from four sources. Rural industry developed widely in the decades prior to reform but was largely confined to fabricating local materi-

als into goods for local buyers (Perkins and others 1977). Entrepreneurial leaders in hundreds of counties and thousands of production brigades were poised to take advantage of deregulation by bursting into markets that they had coveted for years. China's southern regions, excluded from large-scale industrial investment during three decades of central planning, took advantage of the new open door policy to promote industrial growth with the aid of capital, skill, and commercial contacts from overseas Chinese, most of whom trace their ancestry to the southern coastal provinces. Defense conversion brought strong new entrants into a number of civilian industries; by the early 1990s at least two-thirds of output from defense industries consisted of civilian products (Blasko 1994). Finally, China's long-standing policy of building complete sets of state-owned industries in most provinces provided a ready-made source of competition.

Fiscal Dependence on Industrial Profits

Industrial profits and tax payments are a key component of fiscal revenue at every level of government. State enterprises contributed 80 percent or more of adjusted budgetary revenues in every year during 1978–87; in 1988 state industry accounted for 73 percent of profits and profit taxes from all state enterprises (Sicular 1992, table 5 and p. 3).

The fiscal reforms of the 1980s created a system in which each level of government collected taxes from enterprises under its jurisdiction, “turned over a contractually specified amount to the next higher level of government, and could keep the residual.” The result was “a shift toward local fiscal power at the expense of the center, as the center’s proportion of total government revenue fell” from 50 percent in the 1970s to less than 30 percent in the 1980s (Walder 1994, pp. 17, 19).

Chinese Industry as a Hierarchy of Heterogeneous Enterprise Types

China's industrial sector displays extreme heterogeneity. There is a hierarchy of domestic industrial enterprises ranging from foreign-linked firms to state enterprises, urban and rural (TVE) collectives, and private businesses. These groups of firms exhibit systematic differences in technological capabilities, cost structures, and institutional arrangements. There is an inverse relation between innovative capability and labor costs. Among domestic firms, state enterprises have the greatest technical strength. They also have the highest labor costs and suffer the greatest restriction from institutional constraints. TVEs are least affected by institutional limitations. The interaction of these different enterprise types creates a kind of innovation and competition ladder.

Vernon (1966) and Grossman and Helpman (1991) have developed models of international product cycles and quality ladders that focus on interactions between innovative firms in the “North” and imitators in the “South.” Northern firms rely on product innovations to support their high-cost manufacturing operations. Southern firms, with lower production costs, can capture markets from northern

rivals by replicating northern products. The North retaliates with fresh rounds of innovation. Rivalry among different types of producers leads to an ongoing evolution of product characteristics, while the locus of manufacturing activity may shift back and forth between firms located in the “industrial” North and those in the “developing” South.

This approach fits nicely with China’s recent industrial history once we extend these concepts to encompass the existence of product cycles and quality ladders *within the domestic economy of nations participating in global trade* as well as across high- and low-wage economies. Chinese industrial goods rarely match the quality and characteristics of products manufactured by global leaders. But the most accomplished Chinese firms, on their own or with the cooperation of foreign partners, can produce reasonable substitutes at a low cost. Rapidly growing exports of textiles, garments, footwear, machinery, and consumer durables illustrate China’s participation in international quality ladders.

At the top of the international quality ladder are the overseas firms that set the innovative pace in global markets. These firms define technical and quality standards that Chinese firms seek to attain. Chinese industry has its own hierarchy of firms that generates domestic versions of the rivalries, flows, and pressures associated with global product cycles. On the top rung of China’s domestic ladder of technological capabilities are foreign-invested firms; below them are state enterprises, urban collectives, TVEs, and privately owned firms. We focus on the three largest categories.

- *Foreign-invested firms.* Close foreign links give these firms better access to foreign capital and technologies than purely domestic competitors. While foreign-linked firms operate under many of the restrictions that apply to state enterprises, they enjoy favorable tax treatment and special autonomy in labor-management relations, wage setting, and foreign trade. China’s open door policy has allowed these firms to flourish, with beneficial effects on export growth, technology inflows, and the spread of opportunities for purely domestic firms to explore new approaches to production, management, and sales.
- *State-owned enterprises.* State enterprises were the traditional centerpiece of economic planning. Decades of favorable treatment have endowed them with a legacy of technical capabilities surpassing those of other domestic enterprise types. At the same time, state enterprises bear heavier burdens of social responsibilities and bureaucratic intrusion than any other type of enterprise.
- *Collective enterprises.* Urban and rural collectives are owned by local governments and sometimes by state enterprises. Their operations are generally more labor-intensive than state enterprise production; their products typically cluster at the low end of the price-quality spectrum. Some of these firms have begun to apply modern technologies and sophisticated equipment to produce goods that can compete in national and international markets as well as in local markets.

There is a well-defined hierarchy of domestic technological capabilities extending downward from joint ventures to state enterprises and collectives. Among purely

domestic firms state enterprises enjoy superior endowments of equipment, laboratory facilities, and skilled and educated workers, technicians, and managers. This resource differential favoring state firms shows up in the outcomes of quality inspections. In the fourth quarter of 1993, for example, 73.8 percent of goods from a sample of 2,221 firms passed inspection; the success rate was 90 percent for "big state enterprises" but only 62 percent for "township and private manufacturers" (Ma 1994).¹⁰ Managers of urban collectives and TVEs (as well as state enterprises) overwhelmingly identify state firms as the domestic technological leaders in their own industries (Jefferson, Rawski, and Zheng 1992b).

As in the transnational version of the product cycle, technology percolates down China's domestic quality ladder. The example of bar coding illustrates how links with international markets necessitate the mastery of suitable technologies and the achievement of specific quality standards that gradually spread into the domestic economy. Export-oriented firms have learned to use bar codes, which they see as "tickets to foreign supermarkets." Today only a few dozen domestic retail outlets use bar codes. But by the end of 1995 "China aims to have bar codes on all its exported goods and 60 percent of domestic commodities" (Sun 1994, p. 8).

One important and widely overlooked aspect of Chinese quality ladders is the dependence of many TVE producers on funds, equipment, product designs, technical information, management skills, and subcontracting opportunities obtained from state enterprises (Jefferson and Rawski 1994). In southern Jiangsu province (near Shanghai), a center of booming rural enterprise development, "more than two-thirds of township and village enterprises...have established various forms of economic and technical cooperation arrangements with industrial enterprises, research units, and higher educational institutions in larger cities" (Xu, Mao, and Yuan 1993). Officials attempting to develop industry in poor localities are encouraged to pursue "joint operations with scientific research organizations or large- and medium-scale enterprises" (Du, Huang, and Chen 1992).

The domestic quality ladder also resembles its international counterpart in that cost pressures move in the opposite direction from technological capabilities. The manager of a TVE garment firm that had begun with an infusion of cash and used equipment from a much larger state enterprise observed that "in the area of product quality, household producers can't match collectives and collectives can't match state enterprises; but as for costs, state enterprises can't match collectives and the collectives can't match individual households" (interview, June 1993). Wage costs are highest in foreign-invested firms and lowest in TVEs (table 2). The cost advantage of collectives over state firms is a staple topic of discussion in Chinese newspapers and economic journals, which emphasize the extra burden of pensions, taxes, redundant workers, fringe benefits, and welfare responsibilities assigned to state firms, especially compared with TVEs. The extra cost burdens are large and, in some cases, growing rapidly. For example, state enterprises are obliged to pay retirement benefits out of current income. National data (probably excluding the farm populace) show that the ratio of retirees to active workers increased from 1:26 in 1978 to 1:6 in 1990 (Du and Shang 1993). A 1989 sample study showed that enterprises

Table 2. *Average Wages for Different Classes of Enterprise in China's Textile Industry, 1989–91*
(yuan per person-year)

<i>Ownership type</i>	<i>1989</i>	<i>1990</i>	<i>1991</i>
Joint venture	3,663	4,232	5,674
State sector	2,069	2,252	2,377
Urban collective	1,368	1,688	1,862
Township-village	1,132 ^a	—	—

— Not available.

a. Average wage for all TVE industries.

Source: Jefferson, Rawski, and Zheng 1994.

paid about 232 yuan per worker for medical costs (Du and Shang 1993); by 1993 a survey of 100 units in Hebei province found average annual medical costs of 1,201 yuan—equivalent to 37 percent of money wages (Li and Qin 1993).¹¹

Distinct Technical and Institutional Frontiers

Firms occupying different rungs of the quality ladder face different institutional regimes, which implies that domestic competition may take the form of efforts to remake institutions as well as products. Economists think of innovations as changes in technology (a new product) or managerial systems (just-in-time inventory controls) that expand the production frontiers for individual firms or whole industries, while the firm's objectives, behavior, organization, and surrounding institutional environment remain unchanged. Since the task of economic reform consists precisely of altering these basic circumstances, the assumption of institutional stability within and outside the firm is not tenable in transition economies.

Firms in transition economies face separate technical and institutional frontiers: the technical frontier embraces the standard idea (in its neoclassical or evolutionary form) that firms can draw on alternative blueprints or techniques to transform resources (including knowledge and experience) into products. The institutional frontier delineates the set of resource configurations that is attainable under prevailing custom, law, and regulation. In the context of socialist systems and transition economies, institutional restrictions prevent the exploitation of many options that are technically feasible and block choices that would be made in the absence of institutional change.¹²

Chinese authors routinely comment on the long-standing practice of applying separate laws and regulations to firms operating under different ownership arrangements. We have already mentioned differences in taxation and labor costs. Regulatory regimes affecting labor unions, environmental hazards, workplace safety, and the like are applied more vigorously to joint ventures and state firms than to urban or rural collectives. TVEs benefit from short lines of command. Business decisions are often reached through a single telephone conversation or a meeting of two or three people. State firms, by contrast, often report to multiple supervisory agen-

cies whose overlapping jurisdictions and competing agendas complicate even routine business decisions (Byrd 1992). Shorter lines of command make it easier for TVEs to reach decisions and form business coalitions with domestic or foreign partners. TVEs and joint ventures can dismiss workers more easily than can state enterprises. Jefferson, Lu, and Zhao (1994), using a composite indicator of management authority, find a high degree of decisionmaking autonomy at the enterprise level for nearly two-thirds of 300 TVEs surveyed in 1991 but for less than half of 900 state enterprises. Bankruptcy, long a reality for TVEs, is only now emerging as a possibility for state firms.

The Dynamics of Partial Reform in China's Industry

We see the dynamics of partial reform in China's industry as a succession of responses to imbalance by both enterprises and governments. Our framework is in the tradition of Hirschman's (1958) analysis of unbalanced growth. The dynamic that transforms partial reform into improved performance is simple and direct:

- The government implements partial reform measures that reduce entry barriers and lower the cost of many types of transactions. These initiatives have different impacts on the options available to various groups of firms. Partial reform accelerates the domestic product cycle by facilitating the transmission of cost pressures and technologies up and down the hierarchy of industrial enterprises.
- The differential impact of reform efforts destabilizes the existing division of industrial resources and product markets among different types of firms. Competition in industrial product markets intensifies.
- Stronger competition diminishes the flow of quasi-rents derived from the enforcement of entry barriers and market segmentation. Reduced profitability limits the growth of wages and bonuses for some firms and throws others into a position of financial loss. The erosion of profits also limits the growth of revenues accruing to local and provincial authorities and to the central government.
- Firms react to financial pressures by choosing strategies involving one or more of the following components: restructuring operations, lobbying for further deregulation to facilitate profit-seeking initiatives, and lobbying for government subsidies or official intervention to restore the initial financial position.
- Governments also react to financial pressures that reduce their share of total output and destabilize the distribution of fiscal revenue across regions and administrative levels. Officials face conflicting enterprise lobbying efforts, some demanding further autonomy and deregulation, others seeking protection from the effects of earlier reforms.
- These induced responses of firms and governments further erode entry barriers and reduce transaction costs. Beneficial feedback effects accelerate every dimension of the reform process by intensifying competition, further dimin-

ishing quasi-rents, and motivating enterprises and governments to undertake new reform efforts. These changes set in motion further rounds of technical development, economizing efforts, and incremental reform.

- This entire process affects the attitudes of enterprise personnel and government officials to the direction and outcome of reform. Changing attitudes affect the objectives and strategies of all participants.

Although this mechanism focuses attention on endogenous or bottom-up aspects of the reform process, not every industrial policy initiative undertaken since the beginning of reform represents an endogenous response to the initial partial reform effort. Many policy changes, such as the partial commercialization of bank lending and the reduction of budgetary appropriations for industrial research and development projects, probably represent a combination of endogenous response and exogenous initiative.

Furthermore, there is no guarantee that partial reform will succeed. If governments act to stifle competition, equalize financial outcomes for winners and losers, or alter regulations to restore the prereform status quo in product markets, the endogenous process linking initial reforms with innovation, economizing, and further institutional change may stall.

We see this cumulative process of endogenous response as the key to explaining how China recorded unexpectedly strong achievements in both growth and institutional change despite modest reform initiatives on the part of its central government. Our discussion focuses on seven propositions about Chinese industrial reform corresponding to each element of the model.

*Proposition 1: Partial Reform Erodes Market Segmentation,
Thereby Lowering Barriers to Technology and Resource Flows*

China's reforms of the late 1970s restored household agriculture and reopened rural markets; expanded China's participation in global markets for commodities, capital, and technology; and began to loosen controls in the industrial sector. Each of these policy shifts eroded barriers to competition in industrial factor and product markets.

Agricultural reforms provided a big boost to China's rural industries by increasing the supply of labor and raw materials and, following the quick rise of farm incomes, boosting demand for output. As Sachs and Woo (1994) point out, China's comparatively large rural sector creates possibilities for rapid productivity growth that are not accessible to more urbanized states like the Czech Republic, Poland, and Russia.

The open door policy brought a rapid increase in imports of industrial goods, many of them competing directly with domestic products. Partial liberalization of the external sector sharply reduced the transaction costs associated with international inflows of capital, technology, market information, managerial skills, and equipment. New policies speeded the transfer of capabilities and cost pressures across China's borders and throughout the hierarchy of domestic enterprises. The pace of change was particularly rapid in regions of southern China that benefited from proximity to Hong Kong as well as from accelerated deregulation.

The initial industrial reforms were directed mainly at large-scale, urban-based state enterprises. The objective was to enliven large-scale industry by encouraging firms to shed the passive mentality of plan followers in favor of self-motivated efforts to take full advantage of available resources. Large firms were allowed to retain a portion of their profits. And because discretionary funds cannot stimulate production or innovation unless they can be used to acquire productive inputs, the reforms included measures that diverted industrial resources from planned allocation into market channels.

Although intended to stimulate state enterprises, these measures had their largest impact in the TVE sector. Urban-oriented reform enabled TVEs to obtain inputs formerly reserved for clients of the plan system and to penetrate markets outside their home areas. The relaxation of restrictions on information-sharing, consulting, and technical ties across urban-rural administrative boundaries made it easier for collectives and TVEs to adopt new technologies and to produce substitutes that could compete with state enterprise products. These changes shattered constraints that had previously restricted TVE growth. The result was an unexpected growth explosion in China's rural industries.

These partial and uneven reforms substantially eroded barriers that had long obstructed flows of resources and products across the boundaries separating different types of firms and different administrative and bureaucratic jurisdictions. As old distinctions gradually blurred, resources, products, funds, and information began to circulate in new directions. The new market channels were soon large enough to leave quantitative traces in the form of shrinking divergences in factor returns among different enterprise groups (table 3). The bright growth prospects and high rates of return enjoyed by TVEs at the start of reform attracted a large inflow of funds, which pushed down returns to TVE capital. Naughton (1992) documents a

Table 3. *Profit/Capital Ratios in Different Segments of Chinese Industry, Selected Years, 1980–92*
(percent)

Year	Before taxes			After taxes		
	State enterprises	Urban collectives	TVEs	State enterprises	Urban collectives	TVEs
1980	24.8	26.6	32.5	16.0	18.5	26.7
1982	23.4	22.0	28.0	14.4	13.8	20.2
1984	24.2	22.3	24.6	14.9	13.9	15.2
1985	23.8	24.5	23.7	13.2	15.3	14.5
1988	20.6	19.7	17.9	10.4	11.3	9.3
1990	12.4	—	13.0	3.2	—	5.9
1992	9.7	—	14.2	2.7	—	7.2

— Not available.

Note: Rate of return is the ratio of the sum of profit figures (positive or negative) for all firms to the sum of net (of depreciation) value of fixed assets plus average amount of working capital in use.

Source: State enterprises, Yearbook 1991, p. 416; Yearbook 1992, p. 437. Urban collectives, Industry 1984, p. 85; Industry 1986, p. 87; and State Statistical Bureau. TVEs, Yearbook 1991, pp. 377–79; Yearbook 1993, pp. 396–97.

related phenomenon: the convergence of rates of return to capital across different branches of industry. These changes occurred prior to the creation of organized capital markets, which remain embryonic even today.

Access to high-level technical personnel offers another example of declining market segmentation. Comparing data from China's 1985 industrial census with 1989 survey results reveals a big increase in the availability of engineers and technicians outside the state sector. Using the 1989 survey data, Jefferson, Rawski, and Zheng (1992c) find a surprisingly close correspondence between the marginal profitability of upper-level technicians within state enterprises, TVEs, and urban collective firms in three branches of industry.

Proposition 2: Reform Intensifies Competition in Markets for Industrial Products

On the eve of reform China's industry was in a position of incipient competition, with large numbers of potential entrants poised to intensify product-market competition. Partial reform rapidly turned this potential into reality. Booming imports of manufactures, swift expansion of joint ventures and other foreign-linked enterprises, and rapid erosion of the economic and administrative barriers preventing state enterprises from raiding each other's customers all contributed to the upsurge of competition. The greatest impetus to competition came from the growth of TVE production, which leaped from 10 to 25 percent of total industrial output between 1980 and 1990 (see table 1).

Competition expanded most rapidly in markets directly affected by the growth of TVE output, but competitive pressures extended to other markets as well. By the late 1980s more than half of industrial products were being sold through markets, and that share has since risen to more than 80 percent. Less than 10 percent of industrial output is decided through mandatory plans. Concentration ratios are low and declining (Jefferson and Rawski 1994). With competition from manufactured imports on the rise and barriers to domestic trade increasingly porous, it is clear that partial reform has firmly installed rivalrous product markets as a regular feature of everyday operations for most of China's industrial enterprises. Few firms remain immune from competition. The experience of the Luoyang Tractor Works, China's largest manufacturer of wheeled tractors and bulldozers, is illustrative. According to an article in *China Daily*, Luoyang "is trying to improve the quality of its products as well as its marketing and publicity techniques in a bid to offset...sluggish domestic sales.... The Luoyang tractor complex had been forced to sacrifice more than half of its profits in trying discounts, lotteries, and free delivery of goods to boost sales" (Gao 1990).

Proposition 3: Competition Erodes Profits and Curtails the Growth of Fiscal Revenues

Reform has brought a large decline in industrial profits. Rates of return for state enterprises and TVEs in 1990–92 are less than half what they were in 1980–82 (see table 3). Rates of return (including taxes) by industry confirm the impression of

declining profits (table 4). Growing opportunities for tax evasion have widened the error margins for reported profit totals. Wang (1992) cites studies suggesting that the hidden profits of state industry in 1990 may have surpassed the amounts reported to the statistical authorities. Some observers (Sicular 1992) argue that the decline in profitability is mild, confined mostly to state enterprises, and may reflect cyclical factors (the retrenchment of 1988–90). Despite these qualifications, the data strongly support the hypothesis of secular decline (see tables 3 and 4), especially since the boom years of 1992 and 1993 brought no revival in rates of return.

Rates of return shown in table 4 also reflect the powerful impact of TVE competition on industrial profitability. In the early years of reform, profits fell fastest in branches with the greatest TVE activity. During 1980–85 falling profitability was concentrated in industries using agricultural raw materials, especially beverages, tobacco, textiles, and apparel. During the second half of the 1980s the downward pressure on profitability extended to branches with little direct TVE competition, including power, chemicals, iron and steel, machinery, and electronics, but profitability eroded even more in branches with strong TVE activity. The 1991 rates of return for branches with extensive TVE participation are less than half the 1980 base; none of the branches with limited TVE participation experienced as steep a drop in

Table 4. Rates of Return to Capital in Chinese Industry, 1980–93
(percent)

Sector	1980	1985	1991	1992	1993
Industry	25.2	23.8	11.9	10.1	10.6
Light industry	49.1	31.8	15.0		
Farm materials	54.7	32.0	15.9		
Nonfarm materials	39.1	31.5	13.0		
Heavy industry	18.5	20.3	10.2		
<i>Sectors with active TVE competition</i>					
Food processing	20.4	17.5	9.7		
Beverage	48.5	28.4	18.6		
Tobacco	326.9	207.4	113.6		
Textile	69.0	26.5	6.6		
Apparel	46.0	26.0	11.7		
Leather, hides	30.3	19.4	5.6		
Handicrafts	43.0	27.4	12.0		
Plastics	31.6	21.2	9.1		
<i>Sectors with limited TVE competition</i>					
Power	20.6	16.0	13.0		
Chemicals	22.0	21.7	14.0		
Ferrous metallurgy	18.3	25.8	15.5		
Machinery	13.0	19.3	7.9		
Electronic	14.0	24.9	8.5		

Note: Rate of return equals taxes plus profits as a percentage of the net (of depreciation) value of fixed assets plus working capital.

Source: Data for 1992 and 1993, Communiqué 1994. Other data, Industry 1992, pp. 168–78.

profitability. Singh, Ratha, and Xiao (1993), using provincial data for 1984–89, also show that faster growth of nonstate industry (collective, foreign-invested, and private firms) is associated with lower profit rates for state industry.

Profit erosion also affected government revenue, which has declined sharply as a share of total output from about 30 percent in the early 1980s (as reform began) to 20 percent at the end of the decade and to 14 percent in 1992 (Wong, Heady, and Woo 1993). Slow growth of revenues from industry, the chief source of government income, was the principal cause.

Proposition 4: Enterprises React to Market Pressure by Searching for Financial Gain

Enterprises facing competition and declining profit margins have several options for strengthening their financial position. They can improve their performance within existing institutional limits, pressure the government to extend greater autonomy and incentives to the firm, or pursue rent-seeking alternatives (subsidies, soft loans to offset losses, lobbying for restrictions to stifle competition). We examine the firm's opportunities in each of these directions.

Improve performance within existing institutional limits. Chinese state enterprises, particularly firms facing fierce competition and declining profits, have demonstrated a substantial capacity to economize and innovate. As state-owned enterprises came under increasing competitive pressures during the 1980s, total factor productivity improved steadily (Wu 1993). Singh, Ratha, and Xiao (1994) establish an explicit link between competitive pressure and productivity growth by showing that total factor productivity in state industry rose most rapidly in provinces with the largest shares of nonstate production in total industrial output.

We tested this association between competition and state enterprise efficiency using the following regression equation with 1990 enterprise data:

$$(1) \ln(Q/L) = -1.25 + 0.63 \ln(K/L) + 0.09 \text{ COMP} + 0.65 \text{ PCOMP} - 0.11 \ln(NK/K)$$

(3.04) (13.94)
(2.55)
(4.72)
(2.54)

$$R^2 = 0.32, \text{ obs.} = 496,$$

where Q/L is labor productivity, K/L is the capital-labor ratio, and NK/K is the share of nonindustrial capital held by the enterprise.¹³ COMP and PCOMP are measures of competition—COMP is an estimate of the elasticity of demand for the firm's major product and PCOMP reflects the firm's assessment of the overall competitive pressure it faces.¹⁴ Using either panels of provincial data or cross-sectional enterprise data, we consistently find that competitive pressures motivate firms to improve overall efficiency.

The partial reforms of the 1980s also brought a distinct acceleration of innovative activity in state enterprises. One survey of eighty state enterprises found that the

value of new products as a share of gross output rose from 13.5 percent in 1980 to 18.7 percent in 1985 and to 24.2 percent in 1989 (Jefferson, Rawski and Zheng 1992b). Similarly, in a 1992 survey of 10 percent of China's large and medium-size industrial enterprises, 91.6 percent of the 954 respondents described efforts at product and process innovation. More than half reported major modification to their main products, 80.7 percent had new products in the marketplace, 60.8 percent were engaged in major process innovation, and 65.5 percent were implementing new production technologies (Ma and Zhao 1993).

A second set of panel data covering 249 enterprises in the textile, electronics, and equipment industries provides information on output of new products (but not on the intensity of competition) that allows us to examine the impact of changes in profitability during 1984–86 on new product innovation during 1986–88. We assume a two-year lag between changes in profitability and shifts in the output share of new products. Product innovation is constrained by two factors: diminishing returns to product innovation, captured by NPS86, the initial 1986 share of new products in total output; and financial capacity, represented by PRO86, the 1986 ratio of profit (including tax) to sales. Our estimation yields the following result:

$$(2) \quad \text{NPS8886} = 0.005 - 0.320 \text{ PRO8684} - 0.443 \text{ NPS86} + 0.371 \text{ PRO86} \\ (0.617) \quad (1.970) \quad (7.908) \quad (5.921)$$

$$R^2 = 0.250, \text{ obs.} = 210.$$

Here NPS8886 is the change in the share of new products in output value during 1986–88 and PRO8684 is the change in the profit-sales ratio during 1984–86.¹⁵ These estimation results confirm that declining profitability creates an incentive to innovate, conditional upon the enterprise's financial capability and the diminishing returns to innovation.

Seek greater autonomy and strengthened incentives. Along with efforts to improve performance within existing institutional limits, financially pressed enterprises seek greater autonomy and a larger share of residual earnings. Through the mid-1980s circumstances and opportunities were widely regarded as more favorable for collective or private firms. Toward the late 1980s published materials and interviews with factory managers began to reveal a gradual shift toward the view that the autonomy associated with collective ownership had come to outweigh the privileges available within the state sector, leaving state enterprises at a competitive disadvantage. State firms complain of administrative interference and cost-inflating obligations that TVE firms and joint ventures often escape. Managers in the state sector have gradually emerged as active agents for reform.

Seek rents in the form of direct subsidies and soft loans. A final avenue of response for financially distressed enterprises is to seek rents in the form of direct subsidies, soft loans, and a competition-stifling resumption of regulation. We assume that

whenever such assistance is available, enterprises will pursue it as long as the expected payoff exceeds the cost of lobbying. From this perspective the attitude of governments controls the distribution of enterprise resources between economizing and innovation on the one hand and rent-seeking on the other. The following section considers whether reform has reduced the availability of various types of direct and hidden subsidies for enterprises experiencing financial distress.

Proposition 5: On Balance, Government Policy Increases Industry Autonomy and Market Exposure and Hardens Budget Constraints

The central facts of life for Chinese public finance in the 1980s include a slowdown in revenue growth, a significant hardening of budget constraints for subnational governments (Walder 1994), and repeated episodes of macroeconomic instability attributable to fiscal deficits and excessive monetary expansion.

Subnational governments are generally more able but less willing to subsidize weak firms and industries than their counterparts at the center. The reason is simple: fierce competition among development-conscious subnational jurisdictions. Diverting resources from development spending to subsidies threatens to undercut the ability of provinces, cities, counties, townships, and villages to attract domestic and foreign investment. With local revenues increasingly tied to the growth of profits from local industry, slow growth of investment endangers the revenue prospects of the same bureaus and officials faced with requests for subsidies and protection.

Under these circumstances, how do officials respond to the pleas of firms whose financial interests are damaged by competition? They have two main options: to grant direct or indirect subsidies or to push enterprises toward the market. While subsidies continue, evidence shows that government policy has gradually tilted toward sending enterprises to market.

Subsidies for TVEs are rare. Loss-making firms are closed and their workers are dismissed. At the start of reform, state enterprises typically expected full compensation for losses. By 1986 the ratio of subsidies to losses for state industry had dropped to 0.8 (table 5). Another sharp dropoff in compensation occurred with the retrenchment of 1988 and 1989. Despite some confusion about the exact timing and scope, it is clear that a decade of partial reform has established a declining scale of partial compensation as the general rule for loss-making state industrial firms.

Direct subsidy is not the only avenue of government support for weak enterprises. Public officials can use tax concessions, regulatory protection, and soft bank credits to sustain loss-making firms. Tax concessions are limited by the same constraint as subsidy payments: the high opportunity cost of committing scarce fiscal resources. Regulatory protection runs counter to the general trend of China's domestic and international economic policy. Governments rely on both these tools in specific instances, but large increases in tax concessions or protective trade restrictions are widely viewed as undesirable and unfeasible. In the words of Vice Minister of the State Economic and Trade Commission Chen Qingtai: "In the past enterprises turned to the government when they ran into difficulty because the gov-

ernment could lower taxes and allowed them to retain more profits. This road has now been basically closed" (1994, p. 48).

This leaves the banking system as the primary vehicle for large-scale indirect support of weak firms. China's banks certainly experience strong official pressure to advance funds to weak borrowers. "Policy loans" that are viewed as unrepayable from the start are extended to both large and small industries at the behest of powerful official interests. Finance officials indicate that such loans account for about 30 percent of new lending, with most of the soft credits destined for investment projects (1992 interview).

Policy lending is an important component of Chinese industrial policy, but it is subject to restrictions. Increases in bank lending have the same inflationary potential as government deficits. Furthermore, the banks, which have developed systems of credit ratings as part of their own profit-seeking agenda (Whiting 1993), have already cut the "policy" component of current lending to less than 10 percent (1993 interview). Banks can be expected to defend their business autonomy with increasing tenacity.

Partly for this reason, China's government has begun to implement financial reforms that will create three layers of financial institutions: a central bank, policy banks to support official priorities, and profit-oriented commercial banks. These reforms will shift the locus of conflict without resolving the problems facing loss-makers. The vice governor of the central bank, reaffirming his determination to "exercise stringent control over the money supply," insists that the new policy-lending banks "must be careful not to run in the red." Yao Zhenyan, president of one of the new policy institutions, makes the same point, emphasizing "the importance of investment efficiency" and insisting that "we must ensure the return of principal, although we are not aiming at profits" (Policy Bank 1994). With highly placed bank officials attacking soft credits even at institutions designed to serve this very need, and with ordinary banks eager to "further commercialize their business" (Wu 1994),

Table 5. Losses and Subsidies for Chinese State Enterprises, 1986-91
(billions of yuan)

Year	All public enterprises			State-owned industries		
	Loss	Subsidy	Ratio ^a	Loss	Subsidy ^b	Ratio ^a
1986	41.71	32.5	0.78	4.71		0.81
1987	48.17	37.5	0.78	5.07		0.72
1988	52.06	44.6	0.86	7.13		0.73
1989	74.96	59.9	0.80	12.80	9.50	0.74 [.53]
1990	93.26	57.9	0.62	27.88	11.80	0.42 [.34]
1991	93.11	50.6	0.54	30.02	14.50	0.48 [.40]

a. Subsidy/loss.

b. Information provided by the World Bank.

Source: All public enterprises: losses, Hwa 1992; subsidies, World Bank 1992, p. 242. State industries: Wong, Heady, and Woo 1993; World Bank estimates.

executives and workers of loss-making firms can expect only limited relief from their financial predicament unless they improve their performance in the marketplace.

The growing reluctance of government to support weak enterprises is reflected in microeconomic data. Survey data analyzed by Morris and Liu (1993) show that, despite an increase in the absolute level of subsidies, there was considerable hardening of budget constraints for state firms during the late 1980s. Other data support the hypothesis that enterprises facing strong competition move (or are pushed) toward the market in the expectation that greater independence will help them resolve their financial problems.

The following regression, based on 1990 data for state enterprises surveyed in late 1991 and early 1992, evaluates the impact of market conditions on the government's grant of decisionmaking autonomy (DMA) to enterprises:

$$(3) \text{ DMA} = 1.73 + 0.12 \text{ COMP} + 0.10 \text{ PCOMP} - 0.27 \text{ PROFIT} + 0.02 \text{ IND}$$

(19.40) (5.02) (3.69) (2.17) (0.46)

$$R^2 = 0.10, \text{ obs.} = 572.$$

In this regression DMA is a composite measure of enterprise control over production and marketing decisions.¹⁶ COMP and PCOMP are the same measures used in equation 1. PROFIT is the ratio of profit (or loss) to the gross value of output in 1990. To control for differences in autonomy that are specific to the light-heavy industry mix, the equation includes IND, a dummy variable in which 0 represents heavy industry and 1 represents light industry. The regression results show that competition (measured by the firm's estimate of the elasticity of demand for its products and the degree of competitive pressure from rivals) is associated with a relatively high degree of managerial autonomy, which we interpret as synonymous with greater exposure to market forces. Low or negative profits also contribute to a greater transfer of production control and marketing rights to enterprise management.

Recent developments in the woolen textile industry illustrate the government's propensity to assist troubled firms with offers of deregulation rather than direct or indirect subsidies. During 1990–91 the requirement that woolen textile exporters sell through foreign trade corporations insulated them from international market changes and led to large inventories and losses. In response to pressures from producers the government allowed woolen textile companies to export directly to overseas customers. Chinese firms soon began to produce semifinished inventories that could be more quickly transformed into final goods that conformed to the specifications and just-in-time production requirements of overseas customers.

Although government intervention continues to cushion some firms, especially state enterprises, against the consequences of weak performance, limited resources, fear of inflation, and changing attitudes have increased the likelihood that firms and their workers will bear the financial consequences of market outcomes. There is a growing gap between financial outcomes for successful and unsuccessful firms. Loss-making industrial enterprises, formerly eligible for full compensation as part of

official administrative routine, face growing difficulties under China's steadily deepening reforms. In the rural sector, losses bring a quick exit for enterprises and dismissal for workers. Subsidies continue, but even for urban state enterprises, subsidies have dropped from full coverage of losses to well below half. Workers associated with loss-making enterprises face a growing probability of sanctions such as slow wage growth, deterioration of bonuses, erosion of health benefits and other nonwage income, layoffs with only partial wage payment, delayed wage payments, compulsory transfers and, most recently, dismissal.

Proposition 6: Feedback Mechanisms Amplify and Extend the Reform Process

The consequences of reform are not limited to a linear progression in which new policies intensify competition, reduce profits and fiscal revenues, and create pressures for better industrial performance. At every stage we observe feedback mechanisms that reinforce the momentum of beneficial change. The success of some enterprises in reducing costs or developing new products reverberates up and down the domestic quality ladder, escalating the pressure on rival enterprises to follow suit. Every reform that relaxes institutional constraints on market entry, enterprise autonomy, or technological change shortens the distance separating adjacent rungs along the ladders of technology and cost, increases the probability of competition-enhancing innovation, and raises the risks facing enterprises that are slow to reform. Reductions in fiscal resources caused by falling profits or tax evasion (itself an outcome of reform-induced expansion of enterprise autonomy and financial mechanisms) increase pressures on enterprises by reducing the chances of successful rent-seeking, further widening the gap between "winners" and "losers."

Groves and others (1994) provide a quantitative illustration of feedback mechanisms that shows how state enterprises use grants of autonomy to strengthen work incentives and raise productivity. Their analysis of sample data indicates that enterprise autonomy is associated with large shares of discretionary payments in worker compensation and with high shares of untenured contract workers in the labor force. Their statistical analysis confirms the expected positive link between these incentive changes and productivity growth. Thus incremental grants of enterprise autonomy appear to feed back into faster productivity growth, which in turn intensifies competition, and so on.

Proposition 7: China's Decision to Create a Market-Based Economic System Is an Endogenous Outcome of the Partial Reform Process

China's initial reform efforts sought to improve economic performance; there was no clear picture of what the economy should look like after reform. Partial reform initiated a learning process that expanded the horizons of all participants. Competition among firms organized under heterogeneous institutional arrangements opened the door to a dynamic and interactive reform process in which specific policy initiatives have different effects on the opportunity sets of firms facing

different institutional and technological constraints. Enterprises adopted competitive strategies designed to capitalize on the advantages conferred by their institutional as well as technical endowments. Competition forced participants to compare the merits of alternative institutional arrangements in exactly the same way that managers analyze the profit consequences of different product designs, machines, or compensation arrangements. Heterogeneity encouraged a culture of envy in which firms and managers demand access to more attractive institutional possibilities to place them on an equal footing with rivals operating under different institutional arrangements (Liu 1993).

The experience of partial reform created promarket sentiment among former advocates of central planning. Shirk (1993, p. 288; also see Rawski 1994b) shows how managers of large-scale industry changed their views:

[These leaders] were at first leery of market reforms that threatened to shake them out of their comfortable dependence on the state. But the wrenching experience of the 1980–81 readjustment... gave them a new appreciation of the opportunities offered by the market, and their envy of the benefits of reform enjoyed by smaller enterprises and nonstate enterprises motivated them to demand that these benefits be extended to their own enterprises.... Large state factory managers changed from lazy conservatives coddled by the state to active reformers challenging the state.

Government officials and political leaders experienced a similar change of position.

The rise of promarket sentiments among the political and administrative elite represents the biggest feedback of all in China's partial reform process. In the early 1990s these changes coalesced into a stunning reversal of deep-seated attitudes. Ideas that only ten years earlier stood far beyond the limits of permissible discussion now took center stage as the government announced huge staff cuts, ambitious young bureaucrats began leaving the government to pursue private business careers (K. Chen 1994), and China's Communist party formally announced a national goal of creating a decentralized market economy (Decision 1993).

This remarkable change in values, combined with intense fiscal pressures, has sparked a series of policy innovations aimed at relieving governments of the burden of supporting loss-making enterprises. Although official documents rarely use terms like "ownership reform" or "privatization" to describe these changes, recent initiatives amount to a policy of endogenous or induced privatization. Various ministries, provinces, and localities have begun to lease state-owned industrial firms to private agents (including foreign companies). Some loss-making firms have been forced to merge with stronger enterprises, with substantial loss of jobs;¹⁷ others are simply auctioned off to the highest bidder. The government has also begun to encourage organizational innovations designed to restructure state enterprises as limited-liability entities owned by government, corporate, and private shareholders.

Conclusion

The contrast between the top-down, centrally planned reforms proposed by international organizations (and endorsed by many economists) and the gradual, cumulative reform process described in this article reminds us of earlier controversies between advocates of “balanced” growth (Rosenstein-Rodan 1943; Nurkse 1953) and proponents of “unbalanced” development (Hirschman 1958).

The balanced growth approach portrays economic growth as an event—a big push or great leap—rather than as a process; it downplays the developmental potential of inherited economic structures and ignores international and domestic linkages. These oversights amplified the surprise attending the subsequent export success of economies such as Japan, the Republic of Korea, and Taiwan [Taiwan (China) is the designation used by the World Bank], wrongly identified as “basket cases” on the basis of low initial capability and unfamiliar institutional arrangements.

Although several years of practical experience have muted the all-or-nothing aspect of initial perspectives on socialist reform, there is still a tendency for discussions of reform issues to repeat the mistakes of the balanced growth approach by underestimating the complexity of imposing market systems from above.

James Buchanan insists that “a market is not competitive by assumption or by construction,” but “*becomes* competitive, and competitive rules *come to be* established as institutions emerge” to shape behavior (1979, p. 29, our emphasis). Buchanan thinks that economics should focus on this “process of becoming.” This orientation seems highly appropriate for the study of socialist reform. China’s gradual and partial path of industrial reform was not determined by a few top officials. Industrial reform evolved from sequences of decisions made by tens of thousands of enterprises and millions of administrators, managers, and workers. The large number of participants and the extended duration of the reform process, which gave people ample time to evaluate alternatives and reconsider their initial views, eventually built a constituency for market-directed change that was far stronger than any official announcement could have achieved. This process is very different from Western parliamentary democracy, but it has produced a durable reform constituency that easily rebuffed high-level efforts to roll back reform in the wake of the inflation scare and political repression of 1989.

Before reform, government officials set the agenda for China’s industrial firms. Now everyone has an agenda. Enterprises, managers, and workers design strategies for success. The state finds itself reacting to the outcome of decentralized efforts to implement a multitude of uncoordinated agendas. Enterprises and individuals no longer await the government’s announcements, but struggle to shape government involvement in ways that suit their own plans. In short, China’s industrial economy, despite its subsidies, soft loans, tenured state enterprise workers, and numerous other divergences from the textbook ideal, looks increasingly like a market system.

Notes

1. The share of domestic private enterprise is the sum of shares for individual enterprises employing fewer than eight people (*geti gongye*) and larger private firms. Figures for the latter category are obtained as residuals by subtracting the contribution of joint ventures, overseas Chinese firms, and foreign-owned plants from the output share of "other" (*qita*, or other than state or collective) types of ownership (Industry 1992, p. 7). These figures take no account of private firms masquerading as collectives (Walder 1994); including their output would probably raise the 1992 share of private enterprise to more than 10 percent.

2. Similarly, Chang and Wang (1994, p. 2) emphasize that a TVE is "controlled by the township government...not by its nominal owners, that is, the local citizens."

3. A 1990 survey of 285 TVEs found that only 16 percent had the authority to appoint their own leaders. In 60 percent of cases the supervisory authority (that is, the local government) appointed enterprise leaders without consultation (Jefferson, Lu, and Zhao 1994). An earlier survey found that more than 80 percent of TVE managers attributed their appointments to the local government (Song 1990). Walder (1994, pp. 15, 34) observes that "the control of top [local] officials over public firms is greatest" in "the smaller rural jurisdictions" where "the party secretaries or other top officials...play an active role in the management of their valued industrial assets."

4. Data on fixed investment are for 1992 (Yearbook 1993, pp. 145, 150). It is not easy to specify the share of state firms in industrial fixed investment. The 1992 figure for industrial investment of state enterprises occupies an impossibly large 97.5 percent share of the combined total of industrial investment outlays under the three subheads of basic construction, technical renovation, and "other" (a small category that we assign exclusively to industry even though part should be credited to transport and geology).

5. For extended discussion, including numerous references, see Harrold (1992), Rawski (1994b), and Jefferson and Rawski (1994).

6. Wu (1993) summarizes the literature on productive efficiency. Woo and others (1993) employ sample data to show a declining trend for total factor productivity in several branches of industry, but only by assuming a common trend for product and input prices during a period of rising relative prices for industrial materials. Preliminary calculations by Jefferson, Rawski, and Zheng (1994) suggest that the contribution of total factor productivity to output growth may have risen from 25 to 30 percent during 1980–88 to 50 percent during 1988–92.

7. The estimated annual growth rate of state enterprises' manufactured exports was much lower (7.8 percent) for 1988–92 than for 1984–88 (34.4 percent). However, the figure for 1988–92 probably understates actual growth, which may have surpassed 10 percent (Rawski 1994a). Survey data indicate 20 percent annual export growth for a sample of 244 large state enterprises during 1986–89 (Rawski forthcoming). Lardy (1993) points out that state enterprise exports have benefited from direct subsidies (in the 1980s) and special export credits (in the 1990s).

8. China's state firms have a long history of excessive vertical integration. The proliferation of customer-conscious behavior should encourage the spread of efficiency-enhancing specialization. But a major study by Chinese economists finds that high transaction costs arising from inadequate contract enforcement and the consequent prevalence of commercial cheating leads to "an obvious tendency toward nonspecialization outside the state sector" (Jiang and others 1993, p. 35). Whiting's (1993) study of TVE behavior comments on "the unwillingness of the courts to enforce loan contracts" and quotes one frustrated enterprise manager as complaining that "contracts here don't mean anything" because there is no practical means of forcing customers to settle overdue accounts.

9. At the conference the discussants noted that factors outside China's industrial sector, including successful agricultural reform, macroeconomic stability, and complementarities with the adjacent economies of Hong Kong and Taiwan [Taiwan (China) is the designation used by the World Bank] have facilitated the reform of domestic industry. We agree (see Gelb, Jefferson, and Singh 1993), but focus here on initial conditions that are specific to domestic industry.

10. For similar reports, see Chou (1992, p. 5) and *China Daily* (August 28, 1993, p. 1 and August 31, 1993, p. 4). Note that the qualification rate for medium-size and small factories in the survey cited in the text was "only 72.9 percent." This and other evidence points to a scale-related hierarchy of technological capabilities within state industry.

11. Data from Du and Shang (1993) include the employer's share of medical expenses incurred by workers and dependents. The Hebei survey covered the first half of 1993 and found average medical expenses of ¥ 600.69 per worker. In 1991 wages for state sector employees in Hebei amounted to 93.4 percent of the national average (Labor 1992, p. 211). We apply this figure to average 1992 state sector wages of ¥ 2,878 (Survey 1993, p. 44) and assume wage growth of 20 percent for 1992–93.

12. Beijing's Capital Steel Works has developed into a multinational conglomerate on the basis of profits accumulated under a long-term agreement that offered exceptional managerial autonomy in exchange for a promise to deliver a steadily rising flow of funds to the national treasury. The firm's own researchers

attribute more than half of Capital's large profit increments to the simple fact of autonomy: shifts in the output mix with no major changes in main equipment or in annual supplies of raw materials (Shougang 1986). Lacking Capital's political clout, rival firms found themselves stymied by institutional restrictions that prevented them from raising profits by optimizing their output mix.

13. This variable serves as a proxy for the proportion of nonproduction capital and labor in the enterprise that is devoted to the provision of housing and social services. The formulation implies that capital and labor are used in fixed proportions in the provision of housing and social services.

14. COMP and PCOMP are discrete variables, spanning a range of 1 to 3, from inelastic demand or little competition to highly elastic demand or high competition.

15. In this regression NPS is the ratio of new product output to gross output value and PRO is the ratio of profit and taxes to annual sales. $NPS8886 = NPS88/NPS86$; also $PRO8684 = PRO86/PRO84$.

16. DMA ranges from 1 (enterprise has no decisionmaking authority), to 2 (limited authority or authority shared between enterprise and supervisory agency), to 3 (enterprise has full control).

17. The summary of an interview with Li Shuguang, deputy director of the Beijing Siyuan Merger and Bankruptcy Consultancy, noted that "the biggest problem with mergers is the job losses involved in merged firms." Li stated that many of the enterprises acquiring loss-making firms "are only interested in obtaining the equipment and extra space in a merger," which creates a "problem of redundancies" (Huang 1994).

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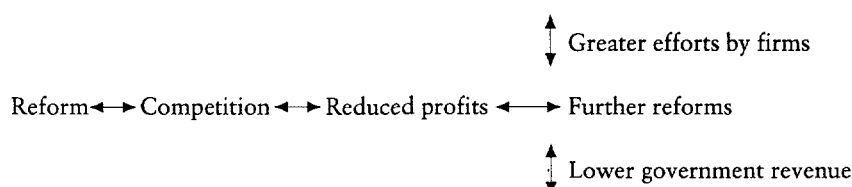
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COMMENT ON "HOW INDUSTRIAL REFORM WORKED IN CHINA:
THE ROLE OF INNOVATION, COMPETITION, AND PROPERTY
RIGHTS," BY JEFFERSON AND RAWSKI

Athar Hussain and Nicholas H. Stern

There are seven propositions in the article by Jefferson and Rawski that embody the authors' description of the process of industrial sector reform in China. Schematically, their contents may be presented as follows:



The central driving force is intense competition between state-owned and town and village enterprises (TVEs) which, by eroding the profits of state enterprises, spurs them to innovate or, in the authors' words, to climb the product ladder. Further, since profits constitute a key element of the tax base, reducing profits lowers tax revenue, thereby hardening the government budget constraint. The government responds by reducing subsidies to enterprises, forcing them to maintain the momentum of innovation. Then by drawing lessons from the success of previous reforms, the government embarks on the next round of reform. The article is silent about the fate of enterprises that are unable, or unwilling, to climb. We argue that such enterprises are too numerous to be left out of the discussion.

We agree with much of the argument of the article, but we have doubts about a number of key parts of the story and the treatment of data. First, we question the strength of empirical evidence provided in support of the analysis, particularly concerning profit and innovative activity. We also question some of the underlying descriptions of TVEs and state enterprises and the interactions between them and between firms and government. Finally, we consider the underlying causes of the rapid growth in China, pointing particularly to decentralization and incentives.

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Empirical Evidence

We have reservations about taking the falling profit rate as an unambiguous index of competition. Measured profit rates have indeed fallen for all categories of enterprises, but the counterpart has been a sharp rise in the share of value added going to labor. Such a shift seems to be central to the experience of other countries in transition as well. Compared with market economies, the share of wages in value added tended to be low in command economies (Atkinson and Micklewright 1992). The decentralization of wage determination and a relaxation in the rigor of state control seem to have increased the share of labor. Thus, at least part of the fall in profitability is due to rent-sharing rather than competition.

There is also a problem concerning how far the observed trend in profits reflects the actual trend. Compared with firms in a market economy, Chinese enterprises have both greater possibilities and greater incentives to underreport their profits. Independent accounting and auditing are still at a primitive stage, and the underreporting of profits does not carry the same costs for Chinese enterprises as it does for firms in a market economy. For example, Chinese enterprises need not be greatly concerned with the implications of reported profits for stock market valuation or credit rating. Further, a part of the observed decline in profits may be due simply to the hiving off of more profitable activities (and their associated resources) into subsidiary companies, which are private in practice but public in name. This process seems to be widespread and is described by the Chinese as "digging the socialist wall."

The share of new products in total sales, which the authors use as the indicator of product innovation, raises two problems. First, a fall in total sales of old products will be reflected as a rise in product innovation even if such innovation is absent. One would also expect this fall in sales to be accompanied by a fall in profits. Thus the regression results showing a fall in profits apparently driving a rise in innovation may simply indicate a fall in total sales emanating from a fall in sales of old products, which is raising the share of new products and depressing the profit rate. Second, the indicator is susceptible to serious measurement error in the Chinese context. Investment for the production of new goods is treated preferentially in the allocation of investment funds. This preference gives enterprises a strong incentive to repackage, or misrepresent, an old product as new.

Alternative Perspectives on the Process

The story in the article rests on competition between state enterprises and TVEs and innovation on the one hand and the ability or willingness of the government to subsidize loss-making enterprises on the other. While accepting much of what the authors have to say, we question key aspects of their analysis of both parts of the story. The pervasive government intervention in TVEs, which the authors mention, has implications for the interpretation of TVE entry and exit. The local governments that establish TVEs are fired by the goals of developing their area and of extending nonagricultural employment. The authors cite the higher frequency of closure for

TVEs than for state enterprises as evidence of competition and tighter budget constraints. This link between closure and competition may well be part of the story, but the closures may also indicate that many TVEs are established without due regard for financial viability. Moreover, although the TVEs that are closed are loss-makers, many loss-making TVEs continue to operate.

When assessing the role of competition in product markets we should remember that there may well be as many examples of TVEs operating in semiprotected local markets as there are of dynamic TVEs competing with state enterprises. Aside from trade barriers created by a strained transport system, examples of local protection abound; from time to time the central government has to remind local governments that levying duties and putting up barriers to the entry of goods produced in other areas is illegal. Studies of TVEs suggest that they are highly heterogeneous and that their performance and behavior vary across regions (for example, Byrd and Lin 1990). The competitive role Jefferson and Rawski assign to TVEs does hold for a portion of such firms, but not all.

State enterprises are similarly heterogeneous. Some of them may innovate and cut costs, but there is no evidence that this is true for all or even most of them. The virtuous circle of competition and innovation sketched in the article is at odds with the mounting concern in China about the insolvency of a large percentage of state enterprises (and also TVEs). A recent System Reform Commission study of state enterprises in Liaoning (a leading industrial center) found that only 12 percent of 1,200 large and medium-size state enterprises in the province are on sound footing. Another 18 percent are operating well with respect to short-term criteria but still may not be able to survive without government assistance. The remaining 70 percent have major problems, and many of them are financially insolvent (Guo 1994). The Chinese economy has a huge number of nonviable enterprises; it has yet to devise an effective way of dealing with the problem.

The regional diversity of China, which is crucial to understanding industrial reforms, does not play a central part in the argument of the article. State enterprises and TVEs are unevenly distributed, and their performance varies widely across regions. The share of state enterprises showing losses is much higher in old, established industrial centers than in provinces with new enterprises (State Statistical Bureau 1993). Dynamic TVEs are often found in areas where state enterprises are thinly concentrated. Competition among enterprises, central to Jefferson's and Rawski's analysis, is often across government boundaries. Local governments have ways of stifling competition or cushioning its impact when their industrial base is threatened. They also differ widely in their attitudes toward industrial reforms. The description of the attitude of subnational governments provided by Jefferson and Rawski is not representative of the whole country.

Thus the characterizations of competition from TVEs as universally intense and of the response of state enterprises as strongly innovative cannot be accepted without substantial qualification. The potential of further piecemeal reform for state enterprises and TVEs alike is now being questioned, and many in China are calling for drastic measures.

We also question the impression given in the article that subsidies to loss-making firms are being rigorously controlled. Only direct subsidies are reported in table 5, and they constitute only the tip of the iceberg. Much larger are the indirect subsidies operating through loss-making state trading agencies. These are essentially price subsidies. A substantial share goes to essential industrial inputs, such as steel and imported capital goods. In 1991, for example, direct subsidies to loss-making industrial enterprises accounted for 28 percent of the total budgetary outlay on subsidies, while budgetary subsidies to trading agencies accounted for 78 percent (Ministry of Finance 1992, p. 938). The authors mention soft loans from the banking system but diminish their importance by categorizing them as "policy loans" destined for investment projects. An investment loan to a nonviable enterprise is still a subsidy. In addition, the web of interenterprise debt (the so-called triangular debt) ultimately has to be underwritten by the government. Finally, a wide range of implicit subsidies are provided through the tax system. Enterprises may be allowed to offset loan principal repayments from their profits tax or even from indirect taxes, as in the electricity industry.

Circumstantial evidence does suggest that both the government (at all levels) and the banking system are taking a harder line on subsidies and loans to loss-making enterprises. Nevertheless, the budget constraints in China are still very soft by the standards of a market economy. Given the government's reluctance to permit bankruptcies, it does not have the option of calling a stop to subsidies to loss-making enterprises even when they are regarded as nonviable.

The fall in fiscal revenue as a share of GNP is real and is cause for serious concern (Hussain and Stern 1992). However, we have to be careful in drawing the conclusion that the budget constraints are sufficiently hard to sustain the process of competition and innovation outlined in the article. The financial capacity of the government to prop up loss-making enterprises, though it appears to have diminished in recent years, is far greater than indicated by its budgetary revenue. The boundaries of the government in a transition economy are far from clear, and the financial constraint it faces cannot be simply deduced from its budget. Nonbudgetary revenue in China has risen from 31 percent of budgetary revenue to 94.5 percent (Ministry of Finance 1992, p. 924). This change is associated with, among other things, commercial pricing policies in public utilities and more entrepreneurial behavior in public institutions.

Factors Other Than Competition in China's Reforms

As economists, we are taught to extol the virtues of competition. But it seems to us that the authors exaggerate the role of competition in explaining recent phenomena in China, to the neglect of incentives and decentralization of decisionmaking in stimulating effort and enterprise. Surely what the Chinese have illustrated is something obvious but fundamental: rewarding effort can elicit a substantial response even in the absence of radical institutional change. Decentralized government also has played a crucial role in the dynamics of China's reforms (Qian and Xu 1993). It has allowed local experimentation, letting some regions race ahead. The prolifera-

tion and explosive growth of TVEs owes a great deal to local initiative permitted by decentralization. But decentralization has also delayed reform of the tax system and impeded development of financial regulation and the conduct of macroeconomic policy. These are areas in which centralized decisionmaking has great advantages and can even be essential.

The authors also underplay some other factors that are as important as competition. For example, they attribute to the open door policy a rapid increase in imports of industrial goods, many of which they claim competed directly with domestic goods. In fact, much of China's imports have consisted of capital goods that Chinese industry is unable to produce, such as civilian aircraft, computers, and assembly lines. Imports that "directly compete" with domestically produced goods constitute only a small part of the total. A major contribution of the open door policy has been to upgrade the technology available to Chinese industry. Also, the fact that Chinese economic reforms brought an immediate tangible benefit to a large majority of the population has played a central role in supporting the momentum of piecemeal reforms. Without the popular support that came with these benefits, the process would not easily have been sustained. Notwithstanding the political control of the Communist Party, the Chinese leadership is sensitive to the attitudes of the population.

China and Other Transition Economies

The Chinese example refutes some of the more simplistic versions of the now familiar argument that the best transition is always the fastest. There are, however, important ways in which China's experience and circumstances differ from those in other transition economies. We highlight five.

1. China has been politically and economically stable. Notwithstanding changes in leadership since 1978, the basic approach to reforms has been remarkably consistent.
2. China's prereform economy differed from the command economies of the Soviet Union and Eastern Europe in some major respects. The economy was already highly decentralized in the sense that local governments had a great deal of discretion. This decentralization has made it possible to introduce piecemeal reforms and allow experimentation without disrupting the whole economy. Moreover, since much of industrial output was distributed outside the centralized supply system, the barriers to setting up new enterprises were comparatively low. Inputs for new activities could be obtained relatively easily.
3. An overwhelming percentage of the labor force was, and still is, located in rural areas and organized largely at the household level. Market-oriented reforms are easier to introduce in such an environment than in an economy dominated by large-scale industry and economic organizations. This rural-community-household structure means that market incentives can be introduced without building entirely new institutions. Much activity can be generated merely by lifting the restraints on economic activities. The flexibility of the rural labor market has been crucial in facilitating the growth of TVEs.

4. China began its reform process with none of the major macroeconomic handicaps that afflicted many other postcommunist transition economies. The inflation rate was low, and government finances were in balance. China had no international debt. Notwithstanding the acceleration in inflation since the mid-1980s, the savings propensity of Chinese households continues to be very high, making it much easier to sustain a high growth rate without runaway inflation.
5. Hong Kong has played a crucial role in the rapid expansion of exports and the large inflow of foreign direct investment. It has been the largest source of foreign capital, a major conduit for Chinese exports, and an invaluable source of commercial know-how for exporting to industrial market economies.

In sum, these differences tell us that while China's example debunks some simple slogans masquerading as rigorous analysis, it does not necessarily provide a model for all transition economies.

Finally, we would like to thank the authors for a stimulating article. It provides a challenging perspective on the Chinese experience and raises fruitful issues for discussion and research. The article is surely correct to focus on the relation between TVEs and state enterprises and to emphasize that piecemeal reform can generate a momentum of its own. There is no doubt, to paraphrase Mao, that "letting a hundred enterprises and activities bloom and contend" before destroying the old has served China well.

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COMMENT ON "HOW INDUSTRIAL REFORM WORKED IN CHINA:
THE ROLE OF INNOVATION, COMPETITION, AND PROPERTY
RIGHTS," BY JEFFERSON AND RAWSKI

Shahid Javed Burki

My view of industrial reform in China is considerably different from the one offered by Gary Jefferson and Thomas Rawski. Before presenting my view of the factors that contributed to the massive increase in industrial output and the dramatic restructuring of the industrial sector in China, I want to provide some basic information about the performance of this sector.

Transformation of China's Industry

The Jefferson and Rawski article offers a great deal of raw statistics to underscore the changes that have taken place in China's industry since the dawn of the reform era. Since the authors chose not to highlight some of the significant changes that have occurred, let me list just a few:

- Between 1980 and 1992 the real output of industry in China increased nearly fivefold—an annual growth rate of 13.1 percent.
- There was a striking change in the pattern of ownership of industrial assets during this period. In terms of output the share of the state-owned enterprises declined from 76 percent to 48 percent, while that of the collectives increased from 24 percent to 30 percent. There was no privately owned industry in 1980; in 1992 private enterprises accounted for 7 percent of industrial output.
- The losses of state-owned industrial enterprises increased sixfold in nominal terms from ¥ 5 billion in 1986 to ¥ 30 billion in 1991. The share of the state-owned industrial sector in total losses by state enterprises increased remarkably, from one-ninth to one-third over this period. However, the coverage of these losses by government subsidies declined from 81 percent to 48 percent. The distribution of subsidies to state-owned enterprises shows clearly that the government was not reluctant to expose industrial enterprises to competition. It was more willing to protect nonindustrial state enterprises instead.
- The return on capital invested in industry fell by more than half between 1980 and 1993—from 25.2 percent to 11.9 percent.

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Jefferson and Rawski also provide information on wages for different classes of enterprises, changes in the profit-capital ratio, and levels of concentration in different industrial groups.

This is a partial and somewhat idiosyncratic coverage of the data available on the Chinese industrial sector. To get a better picture of the characteristics of the industrial sector and its contribution to the development of the economy, it would have been helpful, for instance, to provide information on the geographic distribution of industrial output and on how it changed following the initiation of reforms. The authors also could have provided information on the geographical distribution of foreign direct investment, the contribution made by different industrial sectors to China's remarkable export performance, or the increase in employment in different industrial categories. Had the authors cast their statistical net over a wider area, they might have reached a different conclusion about the factors that contributed to industrial performance in China.

The Jefferson-Rawski View of Industrial Transformation

It is not always easy to understand the logic that supports the main conclusions Jefferson and Rawski reach on the transformation of the Chinese industrial sector. I have also detected a number of contradictions between the seven propositions presented in the second half of the article and the principal argument laid out in the first half. However, I will not go into these problems. Instead I will focus on the larger picture of China's industrialization.

According to Jefferson and Rawski industrial reform in China was a consequence mostly of endogenous factors: the state gave the industrial sector a big push and then, essentially, sat back and watched internal factors take over and guide the sector's evolution. We are told that enterprises and individuals by and large act on their own, proceeding on the basis of the impulses generated from within the industrial sector. The picture that is offered is that of a benign, laid-back state passively watching—although not in a disinterested way—the evolution of the industrial sector. The disequilibrium that resulted from the actions initially taken by the state has kept the sector out of balance. Impulses move down the vertical ladder—from the state-owned industries at the top of the industrial apex to village enterprises at the bottom—and across the horizontal structure as managers of enterprises at different layers of the system vigorously compete with one another.

For some reason the authors label this process of change "gradualist," contrasting it with the top-down, exogenous, centrally planned reforms they believe were advocated by several international organizations for reforming the industrial sector of the former Soviet Union.

Evolution of Chinese Industry: Another View

I have a number of quarrels with both the hypothesis offered and the "gradualism" label applied to it. Since this is not the place to present my picture of China's indus-

trial reform in detail, I concentrate on one important aspect that is central to the argument advanced by Jefferson and Rawski: the role of the state. I have a fundamental difference with the authors. In my view the state's role was much more continuous and interventionist than the authors suggest. Consider the following six sets of policies adopted and vigorously pursued by the state that encouraged not only a sharp increase in industrial output but also the restructuring of the industrial sector.

The first important decision, taken in the early 1980s, was to permit rural communities to keep the bulk of their incomes as savings and invest them in nonagricultural activities. Thus was born a new class of entrepreneur operating in the countryside. This decision was the logical outcome of the enormous increase in rural incomes that, in turn, was a consequence of the disbanding of communes and the virtual privatization of agricultural assets. The state, by permitting the establishment of industries it could not control, was creating a new force whose full impact it did not then fully appreciate. The result was an enormous expansion in the number of town and village enterprises (TVEs) and a corresponding increase in their output. By the early 1990s the TVEs not only employed the same number of workers as the state-owned sector but also had a considerably higher rate of job creation. The expansion of the TVE sector, therefore, offered some welcome space within which the government could experiment with the restructuring of state-owned industrial enterprises.

Second, having made the decision that led not only to the remarkable growth of the industrial sector but also to its dramatic restructuring, the government, by changing relative prices, altered the environment in which state-owned enterprises had functioned since their founding. The changes in relative prices came gradually, and after a great deal of deliberation and experimentation. By the early 1990s most of the decisions taken at the margin by industrial managers—in both the state and the nonstate sectors—were based on market signals.

Third, Chinese policymakers granted considerable economic autonomy to provincial and municipal governments. The coastal provinces and several large coastal cities were given an extraordinary amount of authority to conduct their economic affairs. But for that, the coastal provinces would not have grown at the rate they did, Chinese exports would not have increased at the rate they did, and joint ventures would not have become one of the most dynamic elements in the Chinese industrial sector.

Fourth, by about the middle of the 1980s the state began to experiment with the restructuring of the industrial enterprises it owned. This experimentation continues today. No satisfactory formula has been found for improving the efficiency of state-owned enterprises, but the state is willing to take time to find the right set of solutions.

Fifth, the slow and deliberate pace of reform of state-owned enterprises is motivated by the leadership's strong desire to maintain social stability. The leadership is unwilling to risk social instability in order to improve enterprise efficiency. It is proceeding on three tracks simultaneously: creating new institutions that will ultimately assume responsibility from state enterprises for providing housing and social security, allowing the nonstate sector to expand rapidly to permit the transfer of work-

ers from the state to the nonstate sector, and continuing in the interim with various experiments to restructure the enterprises.

Sixth, lacking instruments of macroeconomic control for dealing with the frequent boom and bust cycles, the state has applied all manner of administrative and political devices to restore equilibrium in the financial, labor, and product markets and to curb investments in overheated sectors that were attracting speculative capital. The state has also been prepared to use the large external balances it has at its disposal to cool the economy with more imports.

Conclusion

I could go on listing government policies in order to underscore my point: the state in China has been active and interventionist in its approach toward economic reforms, particularly in the industrial sector. It has also been gradualist, but not in the sense implied by Jefferson and Rawski. It moved slowly and continuously after a great deal of experimentation. Its primary concern remains the rapid development of industry that will allow it to restructure state-owned enterprises and accommodate the large number of workers—perhaps as many as 20 to 30 million—that would inevitably be displaced. This, I believe, is a more accurate picture of the transformation of the industrial sector than the one offered by the authors.

FLOOR DISCUSSION OF “HOW INDUSTRIAL REFORM WORKED IN CHINA: THE ROLE OF INNOVATION, COMPETITION, AND PROPERTY RIGHTS,” BY JEFFERSON AND RAWSKI

Rawski saw no great disagreement between his and Jefferson's analysis and the discussants' comments; rather, it seemed to him, they were interpreting the same thing in different ways. This was both encouraging, responded Shahid Burki (discussant), and a typical Chinese response to external criticism: to make it endogenous.

A participant asked what role ideas—and ideologies—played in industrial reform in China. Ideas that existed long before 1978, replied Rawski, were important in China's reform; indeed, as far back as 1956 proposals for the second five-year plan involved small-scale industry, decentralized local control, and other elements that surfaced in the reform effort twenty years later. One of the refreshing things about China, added Nicholas Stern (discussant), is that it is one of the most unideological countries imaginable. Pragmatism is much more of a driving force.

Rawski said that he could not agree more with Stern, for example, about the incentive to conceal profits in Chinese industry; he was amazed whenever someone said two-thirds or more of state enterprises lost money, because those loss figures were fiscal data. So he agreed that there was a data problem, but how, then, did Stern explain convergence phenomena?

Stern rephrased the question before responding: why, if the older numbers were made up, would they all converge? He would emphasize another aspect of the data in trying to understand why profits had fallen. In his view, profits had dropped because the labor force had negotiated a larger share of them in response to the firms' greater discretion in the disposal of value added. Then the question is, how far can profits decline? In Stern's view the only constraint on how far you can reduce reported profits is what you can negotiate with local tax authorities. He prefers that interpretation rather than one involving a highly mobile and competitive capital market, which he thinks does not yet exist in China. He would not insist on any interpretation, but he would rather focus on constraints on labor's share than on profits in a mobile capital market. To turn the question of what happened to profits around and ask what happened to labor's share is simply a different way of looking at the same phenomenon. If the profit rate goes down, labor's share goes

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up. But to focus on labor's share does raise different questions, such as how labor's share is determined and what discretion there is. These issues are part of any story about competition and may in fact be more important.

Responding to the repeated mention of labor's increasing share of income in state enterprises, Jefferson observed that labor's share of income had risen from close to 7 percent in 1980 to just under 8 percent in 1990, which as a share of gross output is not that large an increase. A substantial share of compensation for state enterprise workers came from in-kind payments (in the form of housing, health care, schooling, and other social services), but these were unlikely to have represented more than 5 or 6 percent of gross output. Labor's output elasticity in state industry is at least 15 percent, he continued, which suggests that its contribution to industrial output is about 15 percent of total inputs. We would not reject the hypothesis that labor's share of income is consistent with its technical contribution to production, said Jefferson.

We're not referring only to the profit data in the article, rejoined Rawski. Many results based on econometric analyses of sample data from Chinese enterprises—some by Jefferson and Rawski, some by others—are converging on relationships that one would expect to see in a competitive market. If the data are hokey, Rawski asked, where do these results come from?

If the role of the state was so important, Rawski asked Burki, then who pushed the suicide lever that drove the ratio of government revenue to GNP from 35 percent to 14 percent in thirteen to fifteen years? Of course, Rawski acknowledged, the government was active and there were exogenous factors at work; Hong Kong and the open door policy were also important. He and Jefferson were not claiming that everything was endogenous. But despite the strictures of the discussants, Rawski believed an important endogenous process was going on, that competition was important, and that the government was reacting as often as it was leading.

To understand how the Chinese industrial sector has functioned, responded Burki, you have to take a more balanced view. You cannot just factor out the role of the state. And explaining the rapid decline of the state's share in revenues does not demonstrate the correctness of one hypothesis or another. These are outcomes of how the state was proceeding: it would go forward a couple of steps and then retreat one step. The state was at that very moment trying to respond to the problem Rawski had suggested, which is that both enterprises and provinces have benefited greatly from the autonomy the state had allowed them. That is at the crux of the Chinese experience with reform.

Rawski asked Burki if he knew of any document published in China in the early or mid-1980s suggesting that policymakers knew that reform would bring about a big decline in government revenues and yet decided to go forward with it anyway. There would be no such document because this was an unexpected outcome for policymakers, which is why he and Jefferson leaned toward the interpretation that the government, although active and purposeful, was not in charge and was reacting as much as it was acting. Burki was sure Rawski was not surprised that studies of this kind did not exist. Part of the beauty of the Chinese experience, Burki said, was that

China was not only so unideological but also so unplanned. The Chinese take positions without reflecting too much on the long-term consequences, which is why there is constant experimentation, study, adjustment, and so forth. There is very little *ex ante* work and a great deal of *ex post* work.

Jefferson said that there may be room for argument on both sides in the debate about a balanced or unbalanced approach to growth. On one side of the debate Rosenstein-Rodan and Nurkse advocated a balanced growth approach to development, and on the other side Hirschman advocated an unbalanced growth approach. Jefferson suspected that in hindsight each might appreciate the other's point of view. Hirschman, besides emphasizing links within the economic—especially the industrial—system, might also acknowledge the importance of coordinated investments by the state. And those on the other side of the debate might appreciate the spontaneous links that exist within the industrial system. Asked to comment, Burki said that China is so complex and unique that it would not further understanding to force China's experience into any particular bottle. He would prefer to reflect on what had happened and try to explain it without bringing in various theories on other situations.

A participant from the University of Massachusetts asked for observations about the training or retraining of China's managerial cadre. Was that approach to training transferable to Eastern Europe? Rawski said that he did not know enough about the training of managers in the 1990s to answer the question usefully. The participant observed that, if managers in China are responding to competitive pressure, surely not all managers are responding equally rapidly or well. Has any work been done to identify the factors that explain differences in managers' ability to respond? Rawski responded that not much is known about managerial labor markets in China and the factors that determine managerial performance.

A participant from the University of Pennsylvania asked for comments on the tremendous investment, technical assistance, and know-how the overseas Chinese had brought to China. Jefferson agreed that their contribution had been very important. The Chinese statistical yearbook, he said, shows an average of 100,000 border crossings a day between China and Guangdong Province, and he suspected that most people crossing the border were carrying export orders, technologies, managerial resources, and other factors important to industrial development. This was consistent, he said, with their emphasis on the spontaneous bottom-up nature of reform, even when initiated by the center.

Observing that China's population is far more rural than that of Eastern Europe, a participant from the London School of Economics asked how important that is in terms of providing a spare labor force for industrial activity that was unavailable in Eastern Europe (Eastern Europe's main labor force being trapped in state enterprises). How do they face that problem? Rawski replied that the nonagricultural labor force's low share in China's economy gives China added flexibility, but that a real problem remains: steel enterprises, for example, that need only 50,000 workers employ 150,000. People are being guaranteed pensions when pension funds have not accumulated, people are living in houses that cannot be profitably maintained,

and these problems will not go away. Despite a big agricultural sector, China's huge state industrial sector employs 40 million workers, and the problems of reform are immense, painful, and intractable.

Jefferson added that extending the notion of Grossman and Helpman's quality ladder into China's domestic industry was not a mere abstraction; it was based on observation. He and Rawski had recently visited a township and village enterprise (TVE), a garment factory outside Beijing, in which the factory manager told them that she was competing both with state enterprises, which produced higher-quality garments (but at a higher cost), and with households, which produced lower-quality products (but at a lower cost). This suggested to Jefferson and Rawski that product quality and innovations were moving down the ladder and that competition was moving up. Certainly the factory director was aware of the situation.

Burki said that he would place the ladder between Guangdong and the rest of the country, because innovation was coming from Guangdong and was not restricted to state enterprises. On the contrary, provincial and joint enterprises (in which the state enterprises were not active) had become leaders in innovation and technology.

One participant asked how, in hypothesis testing, the effects of overall changes on a sector or industry were isolated from the effects of TVEs on state enterprises. Jefferson suggested looking at the paper by Inderjit Singh, Dilip Ratha, and Geng Xiao (cited in the Jefferson-Rawski article), who, using provincial panel data, found that the larger was the nonstate share of industrial output, the lower was the profitability—or, the more the nonstate sector grew, the faster profitability fell. They also found that the more the nonstate sector grew, the faster total factor productivity rose.

In fact, said Jefferson, state-owned enterprises are responding to competition. Certainly, many of them are not responding to competition—and they are being left behind. Derek Morris, using another data set, suggests a close relationship between investment and gross profitability, and it does seem that the enterprises that are performing well are those that can capture investment resources and expand production. Those that do not capture resources and cannot expand capacity are not performing well and are falling behind.

A participant from the Congressional Search Division of the Library of Congress observed that with China midstream in the reform process, there was clearly a problem with the distribution of wealth—a cleavage between urban and rural centers and between coastal areas and the hinterlands. So where does the system go? Some economic problems, especially between peasants and factory workers, could become political problems, especially in areas where politics are hanging by a thread.

Income distribution is an important issue in any large country, responded Rawski. At the beginning of the People's Republic, in the early 1950s, there were huge gaps in income distribution between urban and rural citizens and within the rural sector. Chinese policies cut off the tails of the income distribution, but large inequalities remained when reform began. Reform has lessened some inequalities and magnified others. Will distribution be an issue in the future? Of course. But is Chinese politics hanging by a thread? Rawski didn't think so, although he hesitated to comment on such matters.