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# Lessons from China's Economic Reform

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# ABSTRACT

This paper identifies six key lessons from China's reform experience. These are: (a) importance of a leading sector, an important element of the "sequencing problem" (b) the efficacy of gradual and partial reform, relating to the "speed" and "comprehensiveness" of reform, (c) importance of proximate, kindred economies as reform models and sources of resource transfer, (d) importance of the distinction between centrally managed reform and bottom-up reform, (e) the tendency for flawed institutions and bad policy to obstruct reform, and (f) the need for checks and balances on economic power. The paper draws general conclusions regarding strategies of transition viewed from a comparative perspective with eastern Europe and the former Soviet republics.



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## 1. INTRODUCTION

Prior to the breathtaking acceleration of economic restructuring in eastern Europe and the Soviet Union in the late 1980s, three socialist countries -- Yugoslavia, Hungary and China -- had each accumulated a decade or more of reform experience. The purpose of this paper is to summarize key lessons of China's economic reforms -- both important successes and failures of the experiment -- that may bear upon choices facing reformers in eastern Europe, the former Soviet republics and China in the 1990s.[1]

By a number of statistical measures, China's economic reform program has achieved notable success. Key statistical indicators of this success are summarized below:[2]

**(1) Rapid Growth:** During 1965-80, China's real GDP grew by 6.4% per annum; during 1980-88, real GDP growth accelerated to 10.4%.[3] Total GNP increased 2.5 fold from 1978 to 1988.

**(2) Accelerated Employment Growth:** During 1978-88, total employment grew at an average rate of 3%, exceeding the rate of 2% achieved during 1958-1978. As labor productivity in agriculture rose rapidly, releasing workers from farm production, during 1978-88, non-agricultural employment growth accelerated to an average rate of 6.5%. More impressively, even as the baby boom generation born in the 1960s was moving into the labor force, the urban unemployment rate which stood at 5.3% in 1978 fell to 2% during 1986-88.

**(3) Rapidly Expanding External Sector:** Under the "open door" policy, foreign trade expanded five fold, from 20.6 billion current U.S. dollars in 1978 to 102.8 billion in 1988. Exports which accounted for 4.8% of Chinese GDP in 1978 expanded to 13% in 1988.[4] Equally impressive have been qualitative changes associated with the growth of trade as product quality, production technologies, managerial efficiency and marketing strategies have all been substantially upgraded.

**(4) Rising Living Standards**: During 1978-88, per capita GNP doubled in real terms. During 1978-88, the per capita real income of rural residents grew at 9.6% per year; the comparable rate for urban residents was 6.3%. During the 1980s, the average living space per urban resident doubled to 8.5 square meters, and the average rural living area per capita also doubled from 8.1 to 16.0 square meters (Perkins, 1989, p. 13).

Table 1 compares the consumption of basic needs and consumer durables for 1952, 1978 and 1988. The data show a sharp contrast between the two time periods, 1952-1978, and 1978-1988. Even

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[1] The perspectives and analysis developed in this paper are drawn from many sources. In addition to first hand observation and personal research, our views are informed by the extensive literature of other scholars who study China's economy, numerous World Bank reports on various facets of the reform program, and several sets of enterprise survey data that are being collected or analyzed with the participation of one or more of us.

[2] Unless otherwise specified, statistics reported in this section are drawn or derived from various volumes of the Statistical Yearbook of China (SSB, Chinese editions).

[3] These estimates are likely to be biased upward. Rawski (1991) and Jefferson (forthcoming) investigate sources of upward bias in official industrial output statistics ("shuifen") associated with new establishment formation, new product innovation and changes in value added ratios.

[4] Due to an underestimate of China's GNP measured in dollars, the measure used for imports and exports, these ratios are overstated. See Lardy (1991). Nonetheless, they are probably representative of the rate of increase in the openness of China's economy.

if per capita ownership of consumer durables in 1952 were zero, the gains reported during the ten years of reform are multiples of the gains recorded during the previous 26 years.

These achievements have not been obtained without substantial costs -- growing economic inequality,[5] rising economic insecurity, greater price instability, rising corruption and greater political and social instability. In weighing the role of economic reform in creating these conditions, however, it is necessary to acknowledge several factors. First, we distinguish between conditions arising from the transition and those which promise to persist -- and perhaps grow in magnitude -- under the new order. The dual pricing system, intended to be a transitional device, has invited pervasive corruption which should diminish as prices become increasingly uniform and competitively determined. On the other hand, economic insecurity, intrinsic to the market system, may become more, not less, pronounced, as labor market reform proceeds. In a risk averse society, for which we find evidence in the case of China,[6] incomes must be higher to compensate individuals for the increased disutility of risk. Some portion of the spectacular rise in incomes cited above is therefore needed just to make Chinese citizens feel no worse off as they begin to cope with the rigors of life in a market economy.

Second, some of the problems encountered during the transition may have been avoided, or substantially mitigated, through the choice of an alternative or revised reform strategy; they were not inevitable consequences of reform. Among these are accelerating inflation during 1988 and 1989 and the socially corrosive corruption made more extensive and visible as inflation increased the spread between certain plan and market prices, thus raising the potential gains from corruption.

Third, economic system reform inevitably raises major issues that challenge the core of communist ideology and the apparatus of control. Certain problems, however, such as the democracy movement and its subsequent suppression during the spring of 1989 ("liusi") and the decline of political stability, may not so much be symptoms of economic reform as they are manifestations of China's recurring problem of leadership succession within a highly personalized authoritarian regime.

## 2. CONDITIONS MOTIVATING REFORM

Recently, with few exceptions, most of the world's centrally planned economies have initiated economic system reform. Here we develop the proposition that prior to opting for reform, all of these countries shared certain similarities with respect to their development strategy and their stage of development. We develop this perspective with respect to China's experience.

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[5] The extent to which economic inequality has risen or fallen in the sense of changes in the Gini coefficient is debatable. During 1978-84, rapid growth of output and incomes within the rural sector relative to the urban sector is likely to have reduced overall inequality. Within each of these sectors, however, it is likely that the emergence of wealthy households ("wanyuanhu") has increased inequality. Also income differences between coastal regions and interior provinces have almost certainly increased.

[6] Note that in a survey of workers, only 11.7% of respondents expressed willingness to "accept the risk of being out of a job" in exchange for their incomes quadrupling (Reynolds, 1987, p. 156).

Before 1978, China followed a mobilization model of development, also referred to as a Stalinist or Maoist model, which entailed the mobilization of savings and workers to sustain high rates of growth of output and output per capita. This strategy can be usefully viewed within the context of Solow's Neoclassical Growth Model (Solow, 1956) in which two of the three instruments for driving per capita income growth are raising rates of savings and capital accumulation and limiting rates of population growth.

During the first three decades of central planning, rising rates of savings and capital accumulation were achieved through two important measures: (a) maintaining terms of trade favorable to the industrial sector, and (b) limiting wage growth for industrial workers. Low prices paid to agricultural producers and a state monopoly on the trade of agricultural products sustained agricultural subsidies to the industrial sector -- both raw material inputs to production and inexpensive food to industrial workers to justify low wages. The extra industrial profits produced by industrial units were collected by the state and used to finance capital construction within the industrial sector. The peasants' disguised (unrewarded) contribution to GNP from 1955 to 1985 has been estimated at over 600 billion yuan (Institute of Development, 1987). The effect of these measures was to raise China's savings rate from less than 10 percent in the 1950s to more than 30 percent by the late 1970s.

The Chinese government's second major initiative designed to raise living standards was a reduction in rates of population growth. Total fertility rates which stood at 6.4 in 1965 (World Bank, 1990, p. 230) fell to 2.9 in 1980 (World Bank, 1982, p. 144). Annual rates of population growth declined from 2.3% during 1960-70 to 1.4% during 1970-82 (World Bank, 1984, p. 254).

The critical insight of the Solow growth model is that rising savings rates and falling population growth rates motivate higher capital-labor ratios and rising living standards. Once these rates stabilize, however, in the absence of technical change, the economy moves toward a new steady state in which living standards stagnate. By the late 1970s, China's savings and population growth rates had approached their respective upper and lower limits. Since rates of savings and population growth cannot forever be manipulated in the "right" direction, in Solow's model only the third instrument for raising living standards -- productivity growth -- is able to motivate continuous improvements in living standards.

But productivity growth performed poorly prior to the reform period. During 1957-78, both agricultural and industrial productivity stagnated.[7] In Berliner's terms, enterprises and workers in socialist economies escape the pressure of the "invisible foot," which, in market economies, is "applied vigorously to the backside of enterprises that would otherwise have been quite content to go on producing the same products in the same way..." (1978, p. 529). Moreover, when innovation did occur, it was often wasteful and ineffective. As one senior engineer at the Beijing No. 1 Machine Tool Factory recounted, prior to the reforms innovation was not uncommon, but it was generally inspired by command from above or by patriotism, not by relative prices or profits.

The pattern of growth described above is typical of centrally planned economies in Eastern Europe and the Soviet Union as well as China. In the decades following World War II, most of these countries maintained high and rising rates of domestic savings (principally government savings) which allowed for

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[7] Perkins (1988) estimates rates of combined agricultural and industrial total factor productivity (TFP) growth of 1.41% during 1957-65 and 0.62% during 1965-76. Chen Kuan et al (1988) find that TFP in state industry stagnated during 1957-78.

rapid rates of capital accumulation. At the same time, rates of population growth in these countries fell to levels below those of countries with comparable income levels.[8] By the 1980s, these countries appear to have reached their political limits with respect to the potential for elevating savings rates and depressing population growth. Against a background of slow or stagnant productivity growth, the impetus to rising per capital incomes and living standards had become exhausted. While politics -- a quest for political freedom in Eastern Europe and an effort by Deng Xiaopeng to restore the prestige of the communist party in China following the Cultural Revolution -- may have determined the timing of change, within the context of Solow's model, we can see that during the past decade, for most of the countries now having begun the transition, the only route to achieving further gains in living standards was to raise productivity and the only route to raising productivity was to introduce incentives and markets.

## 3. KEY LESSONS OF REFORM

With a perspective on the motivation for reform, we now turn our attention to the lessons of the reform experience itself. China's reform experience yields many lessons. Here we have chosen to stress the six which we consider to be most salient. These are: (a) importance of a leading sector, an important element of the "sequencing problem" (b) the efficacy of gradual and partial reform, relating to the issue of the "speed" and "comprehensiveness" of reform, (c) importance of proximate, kindred economies as reform models and sources of resource transfer, (d) importance of the distinction between centrally managed reform and bottom-up reform, (e) the tendency for flawed institutions and bad policy to obstruct reform, and (f) the need for checks and balances and the uncertain ability of a government with a monopoly of political power to establish such measures.

A. **The importance of a leading sector**: Few of the achievements or failures of China's reform program can be viewed in isolation. Dynamic change in one sector has invariably spilled over into change in other sectors. To understand the successful features of China's reforms, it is vital to understand the synergy which caused the cumulative impact of reform to be far greater than the sum of its parts.

China's economic reform started with rural agriculture. The initial success of the agricultural reforms is beyond dispute. With the restoration of family-based farming, agricultural production grew rapidly. Crop production grew at 6.8% for 1979-1984, well above the 2.5% growth rate for the 1953-1978 period. Agricultural productivity and farm incomes rose, and the quality and quantity of food available to consumers improved vastly.[9]

Rather than the success of the agricultural reforms, the focus of this section concerns the impact of China's successful agricultural transformation on other sectors, that is, the role of a leading reform sector played by agriculture. While the agricultural reforms greatly increased agricultural productivity,

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[8] Note that unlike China, the Soviet and E. European governments did not implement aggressive population control programs. Nonetheless, due to efforts to expand labor force participation, particular for women, residential space constraints, and the expansion of social security programs, including pensions, fertility rates fell in these countries.

[9] For a discussion of these gains, see Sicular (1990).

their impact on other parts of the system is the important lesson to be drawn from their success. Specifically, the agricultural reforms must be credited with the impetus they gave to rural industry.

In recent years, rural industry (also called township-village enterprises or TVEs) has become the most dynamic sector of China's economy.[10] In the 1980-1988 period, over 30% of the growth of China's total material production was contributed by rural TVEs. The share of output value of rural TVEs in GNP increased from 13% in 1980 to 21% in 1988. The growth of rural TVEs is even more significant considering that TVEs receive no budgetary investment allocation and subsidies from the state.

This remarkable growth would have been unachievable without two conditions: first, liberalization of the state material allocation system which allowed industrial goods produced by the state sector to be purchased by the emerging TVE sector and, second, the agricultural reforms. Through their impetus to agricultural labor productivity, which rose at an annual rate of 4.7% during 1978-84,[11] the agricultural reforms motivated higher incomes and savings and a pool of surplus labor, thereby generating abundant sources of capital and labor which, in turn, fueled the dynamic growth of rural enterprise.

(i) **Capital**: In 1978, the assets owned by Chinese peasants were estimated at 80 billion yuan (Institute of Development, 1987); each rural resident owned, on average, just 100 yuan (equivalent to 60 U.S. dollars) of assets. Almost all rural assets were collectively owned, i.e., owned by the people's communes.

After the reforms, 800 million Chinese peasants regained the right to accumulate private assets and the right to engage in non-agricultural activities. By 1985, rural private assets exceeded 700 billion yuan, growing in excess of 27% per year (Zhou, 1988). In that same year, gross fixed assets of the TVE sector amounted to approximately 120 billion yuan,[12] just a fraction of the enormous pool of assets that had been accumulated during the first seven years of rural reform.

(ii) **Labor**: Prior to the reforms, China's food allocation system, work point system and resident registration system limited peasants to working in agricultural activity at the places where they were born. In 1978, about 10% of the rural labor force engaged in non-agricultural activities. As agricultural labor productivity rapidly rose, enabling the country's food requirements to be satisfied by a shrinking number of workers, and as restrictions on off-farm work were relaxed, off-farm employment rose sharply. By 1988, 21% of the rural work-force was engaged in non-agricultural activities as a defacto rural labor market emerged. During the 1980s, more than 67 million rural workers were absorbed by TVE enterprises.[13] Yet, the rapid increase of employment in rural TVEs did not curtail labor productivity

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[10] Rural TVEs, called "commune and brigade enterprise" ("shedui qiye") prior to the reforms, are established at the township and village level and at below-village levels. In general, TVEs face harder budget constraints, have clearer ownership status, and are more independent compared with state-owned enterprises. For a more in-depth discussion of rural industry, see Byrd and Lin (1990).

[11] This estimate is certain to be low, since many workers who were registered as agricultural workers increasingly allocated a part of their labor to non-agricultural activities or left agriculture altogether.

[12] Estimated from data reported in MOA, 1989, p. 576.

[13] *Economic Daily* (Jingji ribao), October, 1989.

growth in that sector. Over 1980-1988, labor productivity in rural industry rose by an average of 12% per year, high by any standard.[14]

Through its dynamic growth, the TVE sector has itself become a leading sector, now generating inter-sectoral and systemic benefits. Specifically, the development of TVEs has (1) mitigated the problem of rural surplus labor and the flight of workers to cities, (2) expanded the scope of market activity, bringing competitive pressure to bear on state-owned enterprises, (3) diffused the potential under the reforms for a growing division between urban and rural areas, and (4) contributed to the economy's export performance.

This latter consequence is further demonstration of China's virtuous circle of economic reform. Initially, great distances and many sectors separate what are probably China's two most successful reforms -- its rural reforms and its open door policy. The former transformed agricultural production whereas the latter has given rise to a growing export sector which, in turn, finances the purchase of a wide range of new industrial technologies and equipment. But the success of these reform initiatives is not unrelated. The rise in agricultural labor productivity that generated the surplus labor and abundant savings critical to the expansion of TVEs also served indirectly to finance the growth of industrial exports. In 1989, rural TVE exports grew by 30%, reaching $10.5 billion,[15] approaching one-quarter of China's total export volume.

While we have stressed the positive role of a lead sector and the potential for inter-sectoral linkages in generating synergy in the reform process, the inter-sectoral impacts of individual reforms can also have negative consequences. One such case, also relating to the linkage between agriculture and TVEs, concerns the abrupt slowdown in agriculture growth in 1985.[16] Sicular (1990) argues that the slowdown follows the 1984 decisions to sanction officially the development of private rural enterprise and to allow rural credit cooperatives to lend more freely to rural industry and services.[17] Together with various other non-agricultural measures, in combination with agricultural price controls, these actions depressed the relative competitiveness of agriculture and accelerated the flow of labor and capital to non-agricultural activities. Hence, controls in one sector may require second-best measures in which controls become appropriate for sectors capturing disproportionate shares of resources. Viewed dynamically over the last decade, however, the reforms that led to rapid TVE growth have, in turn, created a positive-sum outcome, that these reforms created greater efficiency and more resources throughout the economy than would have existed in their absence. In this sense, the sequence of China's first decade of reforms was fortuitous .

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[14] This figure is somewhat overinflated due to upward bias ("shuifen") in TVE "constant price" measures of output growth (see Rawski, 1991). China's State Statistical Bureau openly acknowledges that it does not have a reliable output deflator for the TVE sector. Nonetheless, even a generous downward adjustment from 12% to 8% would still attest to extraordinary productivity growth in TVE industry.

[15] *People's Daily* (Renmin Ribao) overseas edition, June 8, 1990.

[16] The annual growth rate of crop production fell from 6.8 percent during 1978-84 to 1.0 percent during 1984-88.

[17] Other reasons suggested for the slowdown include the full implementation of the household responsibility system in 1984 and a decline in the availability of chemical fertilizers (Lin, 1989).

B. **The efficacy of gradual and partial reform**: China's urban industrial reforms did not begin formally until 1984. Various reforms that were enacted piecemeal during 1978-84 were considerably expanded in 1984, but the 1984 reform package was not characteristic of the "big bang" programs being tested or advocated for eastern Europe and the former Soviet republics. In particular, China's urban industrial reform program emphasized an expansion of enterprise autonomy and incentives and the reduction, but not elimination, of within plan allocations.[18] Among the more important of the urban industrial reforms are:

a. multi-year management responsibility contracts which set various management targets, the most important of which are those for profits, profit remittance and taxes;[19]

b. profit retention and the authority to invest and distribute bonuses out of retained profits; and

c. at the margin, considerably expanded authority to chose the level and mix of production, to sell output and acquire material inputs on the market, and to set, or at least to negotiate, prices.

These reforms have had the effect of providing a discretionary source of funds that, within regulated bounds, can be used to reward profit-seeking behavior and to finance new investment. The result has been a widespread reorientation of enterprise managers and workers toward competitive, profit-seeking behavior and a greater tendency for the more profitable enterprises to capture a larger share of investment resources.

Establishment of the dual price system was widely regarded as (i) representing a compromise that preserves planned allocation while drawing incremental output into a market system and (ii) softening the risk of economic reform by "changing a big earthquake into several small tremors."[20] The incremental aspect of the two-track system also allowed for implementing price reform and enterprise reform in tandem.

Although enterprise autonomy and initiative are substantially greater than they were at the outset of the reforms, analysts frequently emphasize the incomplete and unsatisfactory extent of China's industrial reforms. Chief among the shortcomings of the existing reform regime are: (i) the persistence of weak labor markets which complicates the problem of worker discipline and incentives, (ii) excessive intervention of local officials in the affairs of enterprises which erodes the authority and effectiveness of enterprise managers[21], (iii) the persistence of "soft" budget constraints, and (iv) the tendency of local government to inhibit competition and interregional trade for the purpose of accumulating resources and

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[18] See Tidrick and Chen (1987) for a more complete account of the status of China's industrial reforms as of the mid-1980s.

[19] See Koo (1990) regarding several earlier applications of the enterprise contract responsibility system and Jefferson and Zou (1989) for an analysis of 16 contracts.

[20] These objectives of the dual pricing system are discussed by Wu Jianling and Zhao Renwei (1987).

[21] See Walder (1989).

revenues (Chen Kang, 1990). Moreover, as Perkins observes (1989, p. 30), "The whole approach was ad hoc and highly experimental with many forward movements and reversals in one area or another." Evidence of these and other problems lead analysts to ask whether the enterprise reform program has really created the conditions required to improve enterprise performance fundamentally, or if they have simply empowered local governments with the authority previously held at the center and complicated the task of management so much that gains will be negligible.

Because, from an institutional perspective, persuasive arguments can be made on either side concerning the effectiveness of China's urban industrial reform program, here we focus on the impact of the reforms in promoting productivity growth and economic efficiency, key objectives of the urban industrial reforms. Specifically, we present evidence concerning: (i) industrial productivity growth, including evidence concerning the impact of specific reforms on factor productivity growth, and (ii) changes in productive efficiency resulting from a tendency for returns to factor inputs to become more equal, as we would expect if profit seeking behavior were becoming more pronounced and factor and product markets were becoming more complete and competitive.

(i) **Productivity growth**: Evidence that the industrial reforms have raised factor efficiency is reported by Jefferson, Rawski and Zheng (JRZ, forthcoming),[22] who find that during 1980-88, total factor productivity (TFP) in state industry rose at an average annual rate of 2.4%. The comparable rate for the collective sector (including TVEs) was 4.6%.[23] This finding of robust TFP growth compares favorably with an earlier finding reported by these authors and their colleagues (Chen et al, 1988) that during 1957-78, productivity growth in state industry was virtually stagnant.

While several research programs are underway to identify the contribution of individual reforms to this vastly improved productivity performance, some preliminary evidence is available.[24] Using a small sample of twenty state and collective-owned industrial enterprises, Jefferson and Xu (1991a) find that increased enterprise autonomy, profit retention and market exposure have each motivated higher rates of factor productivity growth. Specifically, their findings show that: (a) by empowering factory managers to rationalize the allocation of workers within the enterprise, the optimal labor combination program ("laodong youhua zuhe") has accelerated labor productivity growth in factories adopting the program relative to those that have not; (b) among enterprises relying most heavily on self-financed investment, capital productivity has risen most rapidly;[25] and (c) enterprises purchasing the largest share of material inputs on the market reveal comparatively high rates of material input productivity growth.

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[22] Unlike previous studies of Chinese industrial productivity growth, this study (i) includes intermediate inputs and (ii) develops price deflators for investment goods and intermediate inputs, so that these, as well as output and labor, can be treated as constant price valuations or physical quantities.

[23] Coverage of the collective sector excludes village level ("cunbande") TVEs.

[24] Relevant studies include those sponsored by the Socialist Economies Unit of the World Bank, the National Science Foundation and Henry Luce Foundation (at Brandeis University and the University of Pittsburgh), the Ford Foundation (at Oxford University, the University of Michigan and the University of California at San Diego), and the London School of Economics.

[25] This finding may alternatively be interpreted as showing that the higher the rate of growth of capital productivity, the greater the share of self-financed investment. In either case, the finding points to a benefit of higher profit retention rates.

(ii) **Convergence of factor returns**: In an economy consisting of profit-maximizing enterprises operating within competitive product and factor markets, we expect uniform prices of comparable goods and factor inputs and a tendency for the equalization of returns to capital, labor and intermediate inputs among sectors and enterprises. Recently, evidence compiled by Jefferson and Xu (1991b) show a tendency within Chinese industry for factor returns to have converged during the 1980s. The coefficients of variation,[26] shown in Table 2, measure the dispersion of returns to labor, capital and materials across 226 large and medium-size state industrial enterprises and within specific industrial branches.[27] Declining values, such as those shown in the table, reveal a pattern in which factor returns are becoming more equal over time. Since the convergence of factor returns implies the growth of allocative efficiency, some part of the growth in industrial total factor productivity, reported above, appears to reflect improving resource allocation at the core of China's industrial sector. Consistent with these findings, Naughton (1992) reports that from 1980 to 1989, across 38 industrial branches of state industry, the coefficient of variation of profit rates[28] fell from 0.78 to 0.44.

During the 1980s, China's strategy for a dual track economy with the state sector's share gradually declining in favor of alternative ownership forms, including private and cooperatively-owned enterprise, has yielded striking success.[29] Arguing for rapid marketization and privatization, some analysts and participants in the economic transformation of Eastern Europe and the Soviet Union contend that "a chasm cannot be leaped in two jumps." China's industrial reforms offer a vivid example of halfway reform -- the first of the two or more jumps required to attain levels of industrial efficiency envisaged by China's reformers. Nonetheless, while partial and gradual reform has succeeded within state industry, it is unlikely that these gains would have materialized if the state had not sanctioned rapid reform in the rural sector and relaxed the state's monopoly on industrial production that existed at the outset of the reforms. The rapid entry and growth of non-state enterprises, particularly TVEs, has created a competitive industrial environment which has eroded profits in the state sector and required state factory managers to upgrade their operations.[30]

C. **The important role of a kindred model**: Since the introduction of the "open door" policy in 1979, China has moved with remarkable speed from near complete autarky during the 1960s and early 1970s to a position in 1988 in which the China's reported trade ratio exceeded those of India, the U.S. and

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[26] Computed as the ratio of the standard deviation to the mean.

[27] Jefferson and Xu (1991b) use average revenue products (ARP) as a proxy for marginal measures. In order to relax the underlying assumption of identical production technologies (output elasticities) across industrial branches, the authors investigate the tendency of factor returns to converge within individual branches and find further confirmation of significant patterns of convergence. Table 2 also reports data by plan status to control for different pricing conventions.

[28] Measured as the ratio of the sum of profits and taxes to capital.

[29] In 1978, the state sector represented 90 percent of the gross value of China's industrial output; currently, this share barely exceeds 60 percent.

[30] This argument is developed in McMillan and Naughton (1991).

Japan, the three largest market-oriented countries.[31] In addition to direct trade promotion, the opening of China has been greatly facilitated by the expansion of foreign direct investment and the designation of Special Economic Zones.[32]

One conspicuous and significant feature concerning the internationalization of the Chinese economy, particularly the outward-oriented provinces of the southeast, is the dominant role of Hong Kong and growing influence of Taiwan. As trading partner, financier, and intermediary and facilitator,[33] Hong Kong has had a profound and pervasive effect on the development path of a country with 200 times the population of this small but dynamic entrepot.

(i) **Trading partner**: Because Chinese trade statistics do not distinguish between direct and indirect (entrepot) trade, following Sung (1988) who has investigated the Hong Kong-China link, we use Hong Kong statistical sources.[34] These statistics show that in 1988, exports to Hong Kong represented 40.8% of China's total exports. For only a quarter of this share, Hong Kong was the final destination, while three-quarters were re-exported, a substantial share having been processed in Hong Kong before being shipped out.[35] On the import side, 30.8% of total Chinese imports came from Hong Kong, of which more than two-thirds were processed in China and re-exported through Hong Kong.

(ii) **Financier**: The dominance of Hong Kong in China's external relations is also reflected as a source of direct foreign investment. Of the $3.2 billion in foreign direct investment in 1988, $2.1 billion, two-thirds of the total, originated from Hong Kong and Macao. The fact that Guangdong province accounts for 43% of China's total foreign direct investment further underscores the importance of proximity to Hong Kong, not only for Hong Kong investors, but also for other foreign investors for whom access to Hong Kong's services, skills, market and infrastructure, unobstructed by language or cultural barriers, are critical assets. The rapid growth of trade between China and Hong Kong partly reflects patterns of investment, particularly Hong Kong investment in low-wage processing and assembling operations in China. Hong Kong firms supply such operations with the required raw materials and components, part of which are made in Hong Kong.

(iii) **Intermediary and facilitator**: A further measure of the important role of the kindred economy is the spectacularly large number of foreign visits of kindred Chinese living in Hong Kong, Macao and Taiwan (i.e. those referred to by Beijing as "tongbao", literally "same womb"). In 1988, of 31.7 million visits, 29.8 million -- fully 90% -- were Chinese from Hong Kong, Macao and Taiwan, the balance consisting of foreigners and overseas Chinese. The predominance of visits originating with "tongbao" reflects the frequency with which Chinese investors, managers, traders, technicians, and other economic agents, including discriminating consumers, cross into China. The vision of nearly 100,000

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[31] This comparison of trade ratios should be treated with some skepticism, since imports and exports are measured in U.S. dollars, while China's GNP is under-stated due to omitted items and underreporting, as well as the usual problem of using different relative prices to value traded and non-traded goods. See Lardy, Appendix 2 (1991).

[32] For an excellent discussion of China's open door policy, the magnitudes of trade and investment flows and their impact on China's export and growth performance, see Perkins (1989).

[33] Sung (1988) identifies these four categories.

[34] Time lags and differences between f.o.b. and c.i.f. are ignored.

[35] Re-exported trade does not include trans-shipments, since these pass through the port without clearing customs.

trips per day underscores the tremendous volume of resources, skills and attitudes being transplanted from Hong Kong into China.

These statistics do not fully capture the important impact of Hong Kong on China. The tens of thousand of transactions per day between Hong Kong and nearby areas in China, particularly Guangdong province, serve to challenge the institutions and attitudes of central planning. In particular, the presence of Hong Kong trade, capital, and middlemen:

1. challenges trade and investment monopolies and substantially reduces transaction costs associated with both trade and investment;

2. abets China's thriving black market in foreign trade, forcing planners to maintain a more realistic exchange rate for the Chinese yuan; and

3. provides a laboratory, so that reform initiatives with respect to pricing, investment incentives, and trade measures are able to generate rapid feedback to allow planners to gauge the effectiveness of reform policy.

As Sung (1988) emphasizes, in the long run, the biggest role Hong Kong can play in the Chinese economy is that of a model demonstrating the efficacy of the market. In the following section, we discuss the critical distinction between centrally managed and bottom-up reform. During the past decade of reform, it is unlikely that any one area or collection of persons has provided more inspiration and guidance in ways of spontaneous reform than Hong Kong.

In recent years, with the relaxation of restraints on travel and investment in China, Taiwan has emerged as a second source of kindred resources and knowhow. Since its foreign exchange reserves are second in the world only to those of Japan, the potential for Taiwan to reinforce and expand the impact that kindred Chinese have made to China's first decade of reform is considerable.

In the case of east and west Germany, the dog (west) is clearly wagging the tail (east). For the case of China, however, it is arguable that, in a more subtle and protracted way, Hong Kong, Macao and Taiwan, specifically the accumulated capital, technologies and skills of their combined population of less than 30 million persons, may, more than any other single factor, be responsible for the ongoing economic transformation of the lives of over one billion people. If so, this will be the case of the tail wagging the dog -- initially through the transformation of Guangdong province and then fanning out to Fujian and Hainan provinces and beyond.

D. **The critical distinction between centrally managed reform and bottom up (or spontaneous) reform**: "Reform" has a proactive connotation. Indeed, China's economic reform program was deliberately initiated; these initiatives constitute an impressive list of reform measures. Notable among these initiatives are the establishment of "Special Economic Zones" (SEZs), provisions for the retention of profits and the distribution of bonuses, and the enterprise contract responsibility system. The direct impact of these initiatives from the center has been substantial. However, three points require emphasis.

First, it is critical to realize that many of these reforms are enabling reforms; that is, they authorize local initiatives but do not guarantee achievement of their intended effect. In order for reform initiatives from the central government to be effective, micro-level actors -- households, enterprises, and localities -- must respond favorably to these initiatives.

Second, many reforms have followed defacto change; the government consented or sanctioned important reforms only after they had become widespread. The most dramatic example is China's rural reforms. Contrary to popular belief, these reforms were not planned by the central government. In fact, leasing land for household farming ("fentian dangan") and setting quotas on a household basis ("baochan daohu"), the two most important ingredients of the Household Production Responsibility System, were in 1979 explicitly banned by China's leadership.[36] Initially opposing land tenure and the household contract system, the central government gradually recognized that these innovations from below were widely supported and constituted a viable mode of agricultural production. Although these measures were initially authorized for remote regions in 1980, it was not until 1985 that the government sanctioned the key administrative measures that comprised China's successful agricultural reforms. Yet, by the end of 1984, over 93% of China's cultivated land had been contracted to households (Sicular, 1990), and nearly 100% of China's rural villages were fixing quotas on a household basis (Institute of Development, 1987). More recent examples of bottom-up initiatives that only later became accepted by authorities at the Center include stock exchanges in Shanghai and Shenzhen and Shanghai's Pudong development zone.

Third, many reforms remain unsanctioned. Unsanctioned reform has been widespread during the past decade, but as the government became increasingly reticent to back the reforms during the 1988-90 austerity program and particularly during the period following the crackdown in Tiananmen Square, the phenomenon of unsanctioned reform has become more important. While some of these unsanctioned reforms, such as the growth of private banking, are well publicized, most are surreptitious. Among these are the establishment of subsidiaries in rural areas of Guangdong province for the purpose of processing or distributing goods which would otherwise be subject to state allocations and price regulation.[37] More generally, many enterprises consciously develop counter policies ("duice") which are formulated to counter or thwart government policy ("zhengce") or regulations which inhibit local initiative or profit.

Spontaneous reform has, at a minimum, been a necessary complement to managed reform, and sometimes it has been a necessary prerequisite to managed reform. Among the conditions that have caused spontaneous reform to be so important and effective are:

1. The tradition of a relatively weak central government, aided by China's geographic size and diversity;

2. Pent up dissatisfaction and widespread desire for reform and greater local and individual initiative;

3. A population which has not lost the recipe for commerce and entrepreneurship, in part because "classical socialism" had been in force for just two decades (approx. 1957-77); and

4. The open door policy and the proximity of kindred models and resources.

The capacity for spontaneous economic reform is an important resource which the government should not stifle. It generates signals where the greatest returns are to be gained from incremental reform.

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[36] See "Resolutions of the Communist Party of China Central Committee on Certain Issues Concerning the Agricultural Development," **Almanac of China's Economy 1981**, pp. 11-100.

[37] See Jefferson and Zou (1989).

The challenge to the Chinese government is two-fold: first, to establish the macroeconomic controls and appropriate regulatory environment within which spontaneous, unbalanced reform can evolve, and, second, to establish a system which can monitor feedback from the reform process and formulate relevant policy initiates to resolve bottlenecks and distortions as they appear within China's piecemeal reform program. More emphasis should be placed on creating institutions with these capabilities and maintaining flexibility in the formulation of policy, particularly the use of indirect instruments, rather with relying upon traditional capabilities and methods of state planning. The final two lessons address this latter point.

E. **Flawed institutions and bad policy impede reform**: Economic reform is impeded not just by the lack of a feasible and coherent strategy, the lack of political will or the fear of economic dislocation. At certain junctures of China's reform process, flawed institutions (or policy instruments) and bad policy have also make key reforms difficult to initiate or to sustain. During the past decade, significant examples of obstacles to reform include: (i) flawed instruments of indirect macroeconomic management which have necessitated reliance on direct, administered measures, and (ii) various policies that retard employment generation and thus increase the prospect of vast unemployment associated with expanded labor mobility and labor markets.

(i) **Macroeconomic management**: Among the key instruments of macroeconomic stability in a market economy are an independent central bank, flexible interest rates and an efficient revenue system. The absence or compromise of these instruments requires the use of direct controls. In the case of China, the implementation of a macroeconomic stabilization program during 1988-90 required the excessive use of direct administrative means, such as price controls, credit and materials allocations, and forced open market operations (e.g. substituting bonds for worker's cash wages). The effect was to contravene prior reforms and create a more serious hiatus in the reform program than required had the instruments of indirect macroeconomic stabilization been in place.

Specifically, the following shortcomings in China's system of macroeconomic management have necessitated direct administrative intervention:

(a) lack of independence: The independence of China's central banking system is weakened in several ways. First, under the existing structure, the financial system, government plans, and the state budget are still interdependent. Most loans by the specialized banks, the People's Construction Bank and the Industrial and Commercial Bank in the industrial sphere, are covered by the mandatory plan. This means, in effect, that the State Planning Commission and local planning commissions assign to banks the responsibility of financing investment projects that have been approved by the planning system. The Planning Commission approves projects, the Ministry of Finance pays the bills, and the banks lend money accordingly. When the government does not have enough money in the bank, printing money has been the usual solution for overdraft. In this sense, the money supply is endogenous; there is no consciously independent monetary policy.

Independence of China's banking establishment is also compromised by its system of governance. Because banks operate under the close supervision of local governments, which wield influence over the careers of bank directors and their families, banks are careful to listen to local government priorities; acting in the "interest of the region" is more important than profits or policies of the banking system. Local governments do not like to see local banks remit excess reserves to the next level in the hierarchy, or to see banks lend excess reserves to banks in other localities --- even to branches of the same bank. The rule of the game has been to keep deposits within the local boundary, and to annex resources through attempts to force the hand of the central bank. The effect is to swell the volume of local reserves and credit so as to require the use of direct credit controls.

(b) Inflexible interest rates: A prominent feature of China's financial system is the considerable appetite of enterprises for investment resources. This condition is motivated by low, often negative, real rates of interest. During the 1980s, nominal interest charges were gradually adjusted upward, but not as rapidly as the rise of inflation. The effect was declining real costs of capital that spurred more investment demand and greater macroeconomic instability at precisely the time when interest rates should have been used to moderate the demand for credit.[38] Arresting this growing imbalance of supply and demand for investment funds required more credit rationing and greater intervention in the banking system.

(c) Inelastic revenue system: China differs from most other countries in that the central government collects very few of its own taxes. Apart from customs duties and selected excises, the Center relies on local government for the collection of revenues, most of which originate with state industry. Some portion of revenues collected locally are remitted to the Center as specified by a system of financial responsibility contracts. Under this scheme, local governments remit revenue to the Center in accord with a fixed target. In some cases, a fraction of revenues in excess of the target are also remitted.

The problem with this revenue scheme is that it has been found to be highly inefficient, that is, inelastic with respect to the growth of nominal income. In particular, as inflation accelerates as it did during 1987-88,, the tax base of the Center, fixed in nominal terms, declines in real terms. Furthermore, once they have satisfied their contracted revenue targets with the Center, localities tend to hide revenues of which a portion is supposed to be remitted to Beijing.[39] During the latter half of the 1980s, the inflationary growth of central government expenditures led to a growing gap between expenditures and revenues which, in turn, required deficit financing and the printing of money.

China's breakdown in macroeconomic stability during the late 1980s arose from many sources, but clearly the problem was made worse by an insufficiently independent banking system, inflexible interest rates and an efficient revenue system. The acceleration of inflation during the last half of the 1980s and the use of clumsy administrative means to combat it took a considerable toll on the reform program, beyond the use of various counter-reform measures. Inflation undermined the enthusiasm of the public for the reform process, particularly price reform, and damaged the confidence and credibility of reformers in their ability to superintend an orderly transition to a market economy. Although inflation has been curtailed, its underlying structural causes remain fundamentally unaltered.

(ii) **Anti-employment policies**: A second major area in which flawed institutions or bad policies -- in this case the latter -- have inhibited critical reform initiatives is in the area of labor market reform. Urban labor market reform is needed both to enforce greater discipline and efficiency within China's industrial enterprises and to create the flexibility required to support structural adjustment entailing the reallocation of workers across sectors, industrial branches and individual enterprises.

China has adopted a wide range of policies and pricing conventions that have the unintended consequence of discriminating against labor-intensive activities. By suppressing employment-creating economic activity and increasing the likelihood of a large increase in urban unemployment should enterprises be given more freedom to layoff redundant workers, these policies make it all the more

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[38] Jefferson and Rawski (1990) report evidence that for enterprises selling into the market, during 1985-88, the user cost of capital (real rate of interest plus depreciate rate) was virtually zero.

[39] There are innumerable ways in which local governments can divert revenues or arrange payments from enterprises in lieu of taxes. See, for example, Jefferson and Zou (1989) in which they report the case of an enterprise making a deal with a locality, which had already met its minimal revenue obligation, to accelerate its loan repayment in lieu of taxes.

difficult to implement meaningful urban labor market reforms. In particular, Jefferson and Rawski (1992) cite the following five areas of anti-employment policy: (i) anti-agricultural bias motivating labor to leave labor-intensive farming, (ii) anti-service sector bias which retards the development of this labor-intensive sector, (iii) bias against labor-intensive forms of enterprise ownership, particularly small-scale private enterprise, (iv) export policies and practices which mitigate against the development of labor-intensive sectors that accord with China's international comparative advantage, and (iv) distorted factor prices that motivate enterprises to substitute capital, energy and materials for labor.

The persistence of this formidable set of anti-employment policies creates a legitimate fear among China's reformers and political leadership that further relaxation of controls on labor allocation and mobility will lead to unacceptable levels of unemployment in urban areas. The government has taken initial steps toward effective labor market reform. Among these are curtailment of the labor allocation system, the optimal labor combination program to rationalize the allocation of workers within enterprises, and the creation of pension and unemployment programs which pool the expense of retirement and unemployment benefits among enterprises. The creation of a fluid and competitive labor market, however, will require a more aggressive set of reforms, reforms that will become tenable only as the constraints on market-based employment generation described above are eliminated.

E. **The importance of checks and balances and the difficulty of achieving these under a communist regime**: The intent of China's enterprise reform program was to establish enterprises on an administrative and financially independent footing. Yet, the devolution of administrative control to local government, already begun in the early 1970s, has intensified local administrative interference in enterprise management, price manipulation and corruption. The question is whether a communist government, accustomed to political monopoly and unfettered control over economic resources, can create a legal and regulatory framework within which enterprises can further broaden their autonomy.

(i) **Administrative interference**: Almost every Chinese enterprise reports to numerous supervisory agencies, often at different levels of government. These agencies exercise authority over production, sales, material supply, investment, working capital, labor allocations, and party organizations. Resistant to efforts to curtail the system of perpetual negotiations about taxes, subsidies, allocations and favors, local officials have been extremely inventive in capturing power and expanding control over enterprises through a variety of informal mechanisms, as well as through their control over geographically immobile factors and resources.

This complex, meddlesome administrative environment seriously undermines the autonomy and operations of factory directors. (World Bank, 1988; Walder, 1989). Not atypical of the directors, one, already a seasoned engineer and manager at the time he assumed the directorship of a state enterprise, reported that it took four years and most of his time and energy just to establish effective working relations with various supervisory agencies; others complained bitterly that they wanted their "popo"[40], or supervisory agencies "off their backs."

(ii) **Price manipulation**: Originally, when the two-track system was established, it was anticipated that enterprises would "grow out of the plan." This has occurred somewhat, but not so rapidly or uniformly as expected. First, some government organizations continually increase enterprise quotas and planning targets. For example, in many of Shanghai's industrial sectors, especially in metallurgy, textiles and some machine building enterprises, production was almost 100 percent planned in 1988. Output produced above the state quota is also often subject to compulsory local plans (Dong, 1988).

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[40] Literally translated as "mother-in-law."

Even though the scope of markets continues to expand, so that capital goods subjected to the state mandatory plan have been reduced from more than 80 percent of total volume of circulation to only 20-30 percent, multiple prices have not shown a tendency to merge. Sometimes, the difference between list prices and market prices may not be so big on paper, but numerous trading units tack on additional margins and demand "handling fees" in cash. Prices of raw materials may rise several times during the distribution process.

(iii) **Corruption**: Multiple prices, while an improvement over fixed state prices, provide extensive opportunities for corruption. Officials with the power to approve distribution targets under state plans often fall to the temptation of bribes. For enterprises, whether material inputs can be obtained at list prices or must be acquired at market prices can make the difference between profit- or loss-making operations. The authority of local officials to set and enforce government allocations thus serves as a direct link between power and money. Government organizations have been using their authority to force enterprises to sell their above-quota products to government-run companies at low prices. Some local governments have gone so far as to close down markets and deliberately create multiple prices for certain products. Thus, profits from high market prices have fallen into the hands of "guanshang", the profiteering officials.

Administrative interference, price manipulation and corruption, as well as attempts to monopolize production and trade at the local level, underscore the need for checks and balances in an effective market economy. Among these checks and balances are competitive markets, an autonomous banking system, a comprehensive system of enterprise, commercial and criminal law, an independent legal system to enforce and interpret the law, and an independent watchdog press to call "foul" on abusive officials and economic crimes.

In addition, a key to limiting the ad hoc interventions of Chinese bureaucracy in enterprise operations is private ownership and a code of property rights. The Chinese government has effectively stalled on the issue of privatizing state and collective enterprise. We have emphasized the effectiveness of gradual and partial reform within state industry. However, in large part this success reflects the enormous inefficiency within the industrial sector at the beginning of the reform program, which allowed various halfway measures, including the enterprise contract responsibility system and dual pricing, to motivate significant improvements in productivity. Under these halfway measures, however, serious distortions persist. Eventually, probably sooner rather than later, extensive privatization and more complete marketization will be required for China to join the club of newly industrialized economies, those developing economies that have acquired the capacity to spawn new products and technologies and to export these at competitive prices.

This list of needed institutional innovations raises a key question which, for now, remains unresolved. That is the extent to which political reform is a prerequisite for a full transition to an effective market-oriented economy. Since multi-party systems have eliminated the communist party's monopoly on power in eastern Europe and the former Soviet republics, it may be that this issue will have to be resolved with reference to the experience of a single country -- China. During the first decade, China's communist party demonstrated sufficient flexibility to achieve reforms in its economic system that could not have been contemplated in 1978. Whether a new generation of leadership can manage the transition toward more complete markets and private ownership should become evident during the next decade.

## 4. CONCLUSIONS

During the 1950s, development economists debated the relative merits of "balanced" and "unbalanced" development strategies in which advocates of the former argued that the interconnectedness of development required a "big push" on all fronts.[41] Citing limited resources, both financial and administrative, advocates of unbalanced development emphasized that as bottlenecks become manifest, resources can and will be allocated to alleviate them. The schizophrenia among specialists in transition economics regarding the "big bang" or sweeping reform versus those advocating a piecemeal, evolutionary approach mirrors this earlier debate.[42]

To a significant degree, China's reform demonstrates that gradual and partial reform can be successful. The viability of a reform strategy depends in part on the extent to which there are substitutes and complements in the reform process.[43] China's reform experience shows that privatizing state enterprises has not been essential for the near to medium-term success of its industrial reform program. Expanding managerial autonomy and incentives and ending the state's monopoly over industry have, to a substantial degree, substituted for the privatization of state enterprises. On the other hand, China's experience also suggests that there are complements, or fixed proportions, in the production of successful reform outcomes. A set of indirect instruments of macroeconomic policy, more complete than those currently in place in China, are necessary to sustain enterprise autonomy during periods of retrenchment. The alternative to indirect instruments is to infringe on enterprise autonomy through the direct control of inputs, outputs and credit to enterprises.

Still, the extent to which piecemeal, evolutionary reform can succeed may well depend upon particular characteristics of the reforming economy. The proportionately smaller rural economies in eastern Europe and their greater capital intensity and inflexibility, may limit the potential for a single leading sector to drive reform in other sectors. In these countries, it is less likely that a phenomenon comparable to China's rural industry could emerge with competitive spillover impacts on the state sector. Since competition is more likely to come directly from established, world-class firms in western Europe, there is a stronger argument for rapid, comprehensive reform with privatization as its centerpiece. In this case, management reform may not be an effective substitute for privatization.

In varying degrees, the countries of eastern Europe, through their proximity to western Europe and expatriate communities, have access to significant resources that can transcend distance, language and cultural barriers. This is less true for the former Soviet republics. While the Baltic republics maintain stronger links with the West than the Russian heartland, distance, language and culture, as well as nearly 75 years of communist rule, have attenuated the access of the former Soviet republics to resources, skills and attitudes of the market economies.

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[41] See the debate among Nurkse (1953), Rosenstein-Rodan (1961), and Hirschman (1958).

[42] See the discussion by Singh (1991) of this phenomenon.

[43] Jefferson and Rawski (1991) show how the government's formulation of reform strategy is analogous to the firm's investment decision. Their model develops the distinction between complements and substitutes in the "technique" of reform.

The relative merit of rapid versus gradual reform also depends upon the degree of certainty regarding the desired set of post-reform arrangements and the effectiveness of various reform instruments. While the eastern Europeans are moving with alacrity to replicate the western European model, the Chinese are groping toward a solution with "Chinese characteristics" which will include some as-yet-unclear mix of East Asian and western-style capitalist arrangements. Attitudes of governments and residents toward risk also condition the pace of reform. By growing out of the plan rather than scrapping it, the Chinese government has chosen to limit the downside risk of a substantial increase in urban unemployment and political instability in contrast with the east Europeans who seem intent on eliminating the old order at virtually any cost.

With the possible exception of the annexation of east Germany by west Germany, it is now clear that no transition unfolds in a precise, predictable way. Through the protracted interplay of politics and economic reform, China's transition experience promises to be as messy and unpredictable as any. Four of the conditions identified above -- China's leading dynamic rural sector, the ability of piecemeal reform to generate real gains, the inspiration of kindred models, and the bottom-up dynamic of Chinese reform -- together guarantee that China's reforms will continue to move forward. The last two conditions -- the tendency for bad policy and flawed institutions to obstruct reform and the absence of checks on political power -- will cause the path of reform to be halting and unpredictable.

# Table 1

Improvement in Living Standards

| | 1952 | 1978 | 1988 | 1978 as % of 1952 | 1988 as % of 1978 |
|---|---|---|---|---|---|
| Food(kg./person-year) | | | | | |
| Grain | 197.7 | 195.5 | 249.1 | 98.9 | 127.4 |
| Edible Vegetable oil | 2.1 | 1.6 | 5.9 | 76.2 | 371.3 |
| Pork | 5.9 | 7.7 | 14.9 | 130.5 | 193.6 |
| Beef and Mutton | 0.9 | 0.8 | 1.6 | 88.9 | 198.8 |
| Poultry | 0.4 | 0.4 | 1.8 | 100.0 | 437.5 |
| Fresh Eggs | 1.0 | 2.0 | 5.8 | 200.0 | 290.5 |
| Aquatic Products | 2.7 | 3.5 | 5.7 | 129.6 | 163.7 |
| Clothing(m./person-year) | | | | | |
| Cloth | 5.7 | 8.0 | 12.2 | 140.4 | 152.1 |
| Woollen Fabric | 0.01 | 0.08 | 0.29 | 800.0 | 362.5 |
| Silk and Satins | 0.05 | 0.28 | 0.90 | 560.0 | 321.4 |
| Living Floor Space(m /person) | | | | | |
| Urban | N/A | 4.2 | 8.8 | N/A | 209.5 |
| Rural | N/A | 8.1 | 16.6 | N/A | 204.9 |
| Possession of Principal Durable Consumer Goods(units/100 people) | | | | | |
| Sewing Machine | N/A | 3.5 | 11.8 | N/A | 337.1 |
| Wrist Watch | N/A | 8.5 | 47.0 | N/A | 552.9 |
| Bicycle | N/A | 7.7 | 30.4 | N/A | 394.8 |
| Radio | N/A | 7.8 | 23.9 | N/A | 306.4 |
| TV Set | N/A | 0.3 | 13.2 | N/A | 4400.0 |
| Tape Recorder | N/A | 0.2 | 8.3 | N/A | 4150.0 |
| Washing Machine | N/A | 0.0 | 6.8 | N/A | N/A |
| Refrigerator | N/A | 0.0 | 1.8 | N/A | N/A |
| Electric Fan | N/A | 1.0 | 13.4 | N/A | 1340.0 |
| Camera | N/A | 0.5 | 1.7 | N/A | 340.0 |

Source: China Statistical Yearbook 1989, pp. 719, 723-724

## Table 2

Convergence of Factor Returns
(coefficient of variation)

| sector | labor[a] | capital[b] | intermediate[c] | NTFP[d] |
|---|---|---|---|---|
| total (226) | | | | |
| 1980 | 0.86 | 1.04 | 0.29 | 0.32 |
| 1985 | 0.80 | 0.82 | 0.26 | 0.26 |
| 1989 | 0.73 | 0.64 | 0.21 | 0.21 |
| sales 100% within plan (74) | | | | |
| 1980 | 0.88 | 1.00 | 0.31 | 0.36 |
| 1985 | 0.83 | 0.90 | 0.31 | 0.33 |
| 1989 | 0.75 | 0.70 | 0.29 | 0.27 |
| sales partially within plan (105) | | | | |
| 1980 | 0.80 | 1.04 | 0.21 | 0.27 |
| 1985 | 0.74 | 0.69 | 0.20 | 0.19 |
| 1989 | 0.66 | 0.57 | 0.22 | 0.15 |
| no within plan sales (44) | | | | |
| 1980 | 0.83 | 0.80 | 0.27 | 0.22 |
| 1985 | 0.51 | 0.61 | 0.21 | 0.14 |
| 1989 | 0.45 | 0.49 | 0.22 | 0.12 |

[a] measured as Q/W, gross industrial output per total wage (wage plus bonus).
[b] measured as (Q/K) where K = net value of fixed assets.
[c] measured as (Q/M).
[d] NTFP is nominal total factor productivity, a geometrically weighted combination of nominal measures of Q/W, Q/K, and Q/M.

Source: Jefferson and Xu (1991).

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