

# Lessons of China's Transition from a Planned Economy to a Market Economy

*Justin Yifu Lin*

*Peking University*

*Hong Kong University of Science and Technology*

Leon Koźmiński Academy of Entrepreneurship and Management (WSPiZ) and TIGER

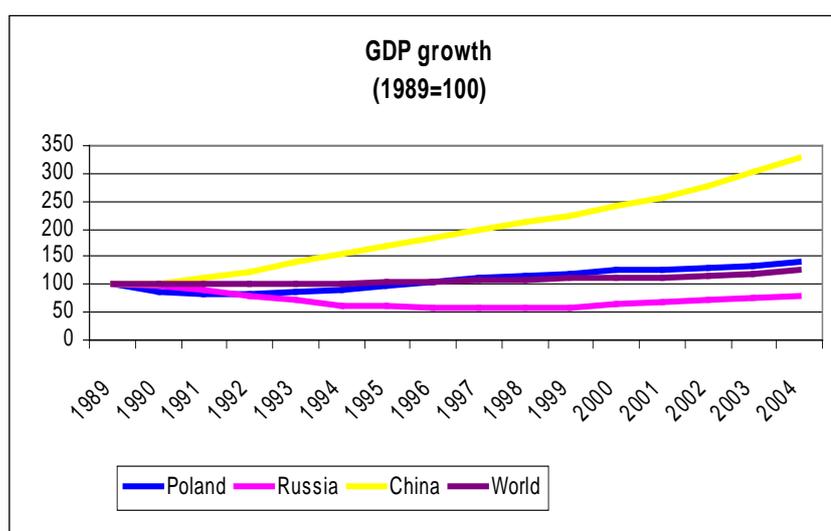
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**Grzegorz W. Kołodko:** Considering the fact that China is the most populous country in the world – having roughly 1.3 billion inhabitants, that is 20 or so percent of the global population – remarkable economic expansion of its economy and fast growth of output and standards of living of Chinese people over the last quarter of a century should be considered as one of the greatest economic achievements in the mankind's history. Such growth has also significant social consequences. Never during such short, on the historical scale, period of time so many people – no less than 300 million – have been advanced from the pool of the people considered to live before in poverty.

China's economic growth is not only fascinating in its own dimension, but on the relative scale as well. To bring this point to the fore, it is enough to compare the rate of growth of China's GDP, since the market-oriented reforms have started in 1978, with the rate of GDP growth of the world economy on the average, on the one hand, and especially with the pace of growth of GDP in other countries in transition from the former socialist centrally planned system to the open market economy. It is clearly seen especially since after 1989, that is the beginning of accelerated transformation of the East Central European economies and the republics of the former Soviet Union.

**Chart 1: The winners and the losers  
of globalization and transition**



Source: The World Bank and national statistics.

Here the important questions emerge: when actually China has started **the transition** to a market economy? Was it already in 1978, when the initial stages of just market-oriented **reforms** had been launched, or much later, when this country has joined the World Trade Organization and henceforth irreversibly decided to go all the long way to the **full-fledged market economy**? There are no doubts that a shift to true market economy was not on the agenda in China not only at the turn of the 70s and 80s, but not even yet in the 90s. It had been a long gradual process, lasting about two decades, which has brought China to the breaking point – going from the **reforms of the socialist system** only to a **transition from outgoing socialist centrally planned system to a new open market system**. It is so even if it is not yet officially admitted by the Chinese authorities. Hence, while claiming correctly some years ago that China was still just in “transition to the transition to a market”,<sup>1</sup> now it is the time to claim clearly that China **is** in transition process.

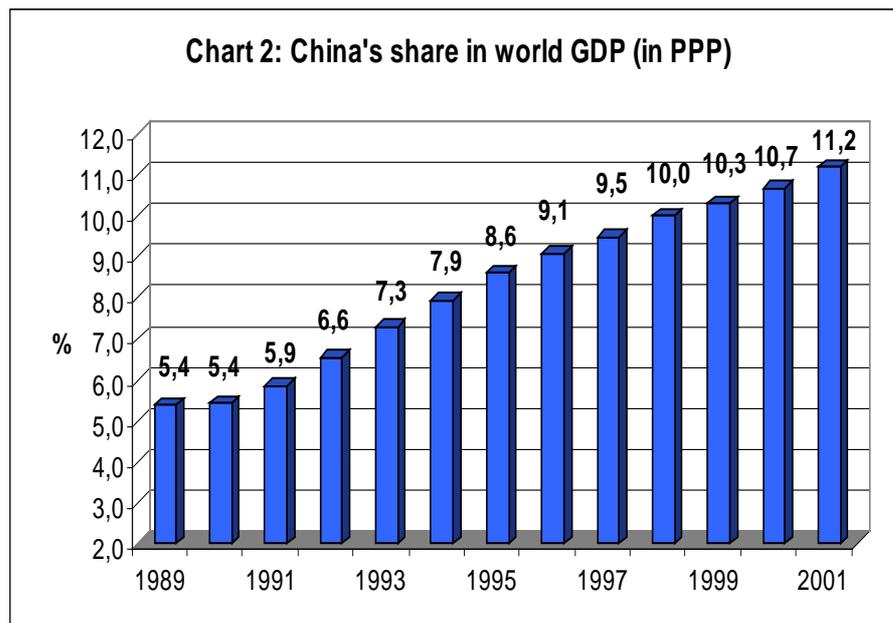
However, from today's, *ex post*, perspective, this question is less relevant than it used to be some time ago. It is not that important when the process had started, but when and how it will end? Still more important is how the process is being managed, what are the costs and the gains of the great Chinese change? By what means and to what extent this huge country is, or will be, able to catch up with the more advanced countries?

China's economic growth and opening up, followed by continuing integration into the global economy, is indispensably linked with the systemic change oriented towards the market system, on the one hand, and export-led growth, on the other. Indeed, China fast growth – which brought the expansion of GDP seven-fold over last 25 years, or about four-fold in terms of real GDP *per capita* – wouldn't be possible neither without **gradual marketization of the economy**, nor without integration with the world market during the era of ongoing globalization.<sup>2</sup> Coexistence of these two processes has brought the fruits for China in the form of its growing contribution to both, the world output and world trade. On the basis of purchasing power parity (PPP) evaluation the China's share in the global GDP had risen about two-and-a half-fold during last 15 years, from 5.4 per cent in 1989 to over 12 percent in 2004.

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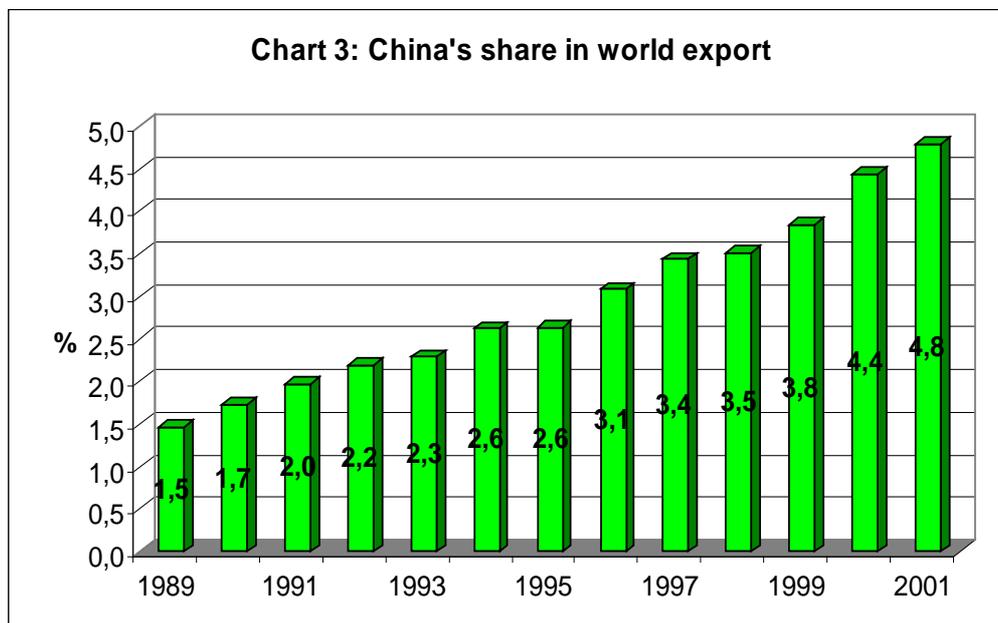
<sup>1</sup> See: Kolodko, Grzegorz W. (2000) *From Shock to Therapy. The Political Economy of Postsocialist Transformation*, Oxford University Press, Oxford-New York.

<sup>2</sup> See: Kolodko, Grzegorz W. (2002) *Globalization and Catching-up in Transition Economies*, University of Rochester Press, Rochester, NY and Woodbridge, Suffolk, UK, 2002.



Source: The World Bank.

At the same time to Chinese contribution to the world export has jumped over three-fold – from 1.5 percent in 1989 to over 5 percent contemporarily.



Source: The World Bank.

China's transition – unlike this of the former Soviet republics, including Russia and Ukraine, and also unlike the East Central European ones, including Poland – has been all the time a gradual process. Unlike Poland at the onset of transition in the early 90s, when ill-advised “shock without therapy” had been exercised, with all the avoidable loses and pains,

China, with great commitment and determination, has been working out two policies simultaneously: the policy of systemic change (that is the very transition process) **and** the policy of socio-economic development. When Poland was doing the same – that is during the implementation of “Strategy for Poland” in 1994-97 and, again later, at the time of implementation of “The Public Finance Reform Program” in 2002-04 – the result had been much better than otherwise, that is both in 1989-93 and again during the overkilling of the economy in 1998-2001.<sup>3</sup> Hence, if searching for an answer why China is so successful with its transition, one must look deeply into the coordination of these two policies: policy of systemic transition and policy of economic growth.

And this combination has happened to be managed quite successfully over the time because of the **gradual approach**. Here one more time the Chinese experience proves that this country has been able to learn from the mistaken and mismanaged at the same time Polish shock “therapy”. Especially the process of institutional building calls for quite a gradual approach<sup>4</sup> and here many countries may learn a lot from China, and not necessarily the other way around.

Today we have a great opportunity to learn much more about the ways China is transforming its economic and political system for the purpose of sustaining fast economic growth for another number of years. Within the continuing series of Distinguished Lectures (<http://www.tiger.edu.pl/english/publikacje/dist.htm>), organized by the Koźmiński School of Business (WSPiZ – [www.kozminski.edu.pl](http://www.kozminski.edu.pl)) and TIGER – Transformation, Integration and Globalization Economic Research ([www.tiger.edu.pl](http://www.tiger.edu.pl)) we are happy to host Professor Justin Yifu Lin.

Professor Lin is a Director of the China Center for Economic Research at the Peking University ([www.ccer.edu.cn](http://www.ccer.edu.cn)) and he teaches also at the Department of Economics at the School of Business and Management of the Hong Kong University of Science and Technology. He has got his MBA from the National Chengchi University in 1978 and graduated in political economy from the Peking University in 1982. In 1986 he received the Ph.D. in economics from the University of Chicago. Professor Lin is a renowned economist who has published extensively and not only on the Chinese economy. In 2004 he was awarded a Honorary Degree (*Doctor Honoris Causa*) by the University of Auvergne. In the meantime he has traveled widely and contributed to the research and teaching at various institutions worldwide, including Duke University, Australian National University, University of Michigan, University of Minnesota and UCLA.

Now, we have the opportunity to learn from Professor Lin’s knowledge and discuss the issues of our joined concern. The topic of our guest Distinguished Lecture is “**Lessons of China’s Transition from a Planned Economy to a Market Economy**”. To be sure, it is never wrong to learn the proper lessons. The more it is the case if such lessons are based on a success story – as China definitely is – and if the teacher is Professor Lin.

Welcome, Justin, and the floor is your.

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<sup>3</sup> See: Kolodko, Grzegorz W. *Structural Reform and Economic Growth in 2002-2003. The Opening and Closing Balance* ([www.tiger.edu.pl/english/aktualnosci/report\\_en.pdf](http://www.tiger.edu.pl/english/aktualnosci/report_en.pdf)). Also in Polish in: Kolodko, Grzegorz W. (2004) *O Naprawie Naszych Finansów*, TNOiK, Toruń 2004, pp. 179-190.

<sup>4</sup> See more in: Kolodko, Grzegorz W. (2004) *Institutions, Policies and Growth*, *Rivista di Politica Economica*, Maggio-Giugno 2004, pp. 3-37.

**Justin Yifu Lin:** Thank you very much. One of the most important events in the modern economic history is the socialist countries' transition from the Soviet-type planned economy to a market economy starting in the last two decades of the 20<sup>th</sup> Century. China's experience of transition has produced many interesting contrasts to the experiences of transition in Eastern Europe and Former Soviet Union (EEFSU). When the transition started in EEFSU, most economists in the West favoured a big bang approach, which included stabilization, price liberalization, and privatization. They considered these three reforms to be preconditions for a successful transition to a market economy and attempted to complete all these reforms simultaneously or in a short sequence (Blanchard et al 1991, Gomulka 1989, Kahn and Richardson 1991, Lipton and Sachs 1990). The big bang approach in essence is a version of the Washington Consensus, which is based on the basic principles of neoclassical economics for a well-functioning market economy and was recommended by the IMF/World Bank for market-oriented reforms in the developing countries (Kolodko 2001). The proponents of big bang approach expected the transition in EEFSU to have a "J-curve" effect on economic growth; that is, they expected the GDP in a country that implemented the big bang approach to decline initially and to be followed by a strong recovery in a short period of time. Most countries in EEFSU followed this approach. The big bang approach, nevertheless, has resulted in an unexpected sharp and prolonged decline in GDP with extraordinarily high inflation rates and serious deterioration of other social indicators (World Bank 1996; 2002).<sup>5</sup>

China has adopted an alternative gradual, evolutionary approach to the transition since the reform started at the end of 1978. This approach is piecemeal, partial, incremental, often experimental, and especially without large-scale privatization.<sup>6</sup> The Chinese approach is not guided by a well-founded theory or followed a pre-determined blueprint. Some economists regard this approach to be fatally flawed and self-defeating,<sup>7</sup> while the big bang approach theoretically perfect and feasible (Sachs 1993; Murphy, Shleifer, and Vishny 1992). In the late 1980s, many observers predicted the reforms in China would lead to nowhere, and its experience provided a useful, negative lesson for the EEFSU (Prybyla 1990, p. 194). However, contrasting the economic collapse and social crisis in EEFSU, China has become the fastest growing country in the world ever since the transition started. China has also successfully controlled the inflation in an acceptable level.<sup>8</sup>

The success of China's approach to transition so far has produced many challenges to conventional wisdom in economic theory (Chow 1997; Perkins 2002). This approach violates almost all the basic propositions for a successful transition from a planned economy to a market economy that are identified by many economists advising the former socialist countries in the early phase of their transition<sup>9</sup> The success has puzzled many economists

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<sup>5</sup> The cumulative output decline in countries in Central and Southeastern Europe and the Baltics reached 22.6% and in countries in the Commonwealth of Independent States reached 50.5%. In 2000, Russia's GDP was only 64 % of what it had been in 1990, while in 2000 the GDP of Poland, the best performing countries in EEFSU, increased only 44 %, compared to that in 1990 (World Bank 2002). Certainly the collapse of international trade due to the demise of CMEA has also contributed to the decline of GNP in these countries. However, the big bang approach was undoubtedly a major cause of these downfalls (Brada and King 1991; Csaki 1994).

<sup>6</sup> To a large extent, the reform measures and sequence adopted in Vietnam and Lao are very similar to those of China. There seems to be a common East Asian model of transition.

<sup>7</sup> In the words of Vaclav Klaus, the former Finance Minister of Czechoslovakia and incumbent President of Czech, "Partial reform in a distorted economy is worse than no reform." (quoted in Wiles 1990, p. 56)

<sup>8</sup> China's annual GDP growth rate reached 9.3% in 1979-2003; whereas the inflation rate, measured by the retail price index, was 5.3% annually in the same period.

<sup>9</sup> The basic propositions, according to Nolan (1995, pp. 401-2). include: 1) 'market socialism' cannot work; 2) institutional reform cannot be successful unless there is macroeconomic stability; 3) enterprises' attempts to

(Nolan 1995). Some economists attribute the China's success to their unique initial conditions, namely, a large agricultural labor force, low subsidies to population, a rather decentralized economic system, and, large amount of rich overseas Chinese (Balcerowicz 1994; Woo 1993; Sachs and Woo 1994 and 1997; Qian and Xu 1994).<sup>10</sup> According to these economists, China's experience does not have general implications because China's initial conditions are unique. However, other economists suggest that China's success poses a challenge to the wisdom of Washington Consensus which considers stabilization, market liberalization, and privatization as necessary components to a successful transition, and the Chinese experience demonstrates the superiority of evolutionary, experimental, and bottom-up reforms over the comprehensive and top-down big bang approach (Chen et al. 1992; Harrold 1992; Jefferson and Rawski 1995; McKinnon 1994; McMillan and Naughton 1992; Murrell 1991, 1992; Perkins 1992; Rana 1995; Rawski 1995; Singh 1991).

When the transition started in EEFSU, the socialist ideology has bankrupted there. In addition to the fact that there was no theory supporting a gradual switch of system (Aslund 1990, p. 37), a new ideology of capitalist triumphalism prevailed.<sup>11</sup> Therefore, the countries in the EEFSU intended to have a rapid and comprehensive change and expected to jump to a market economy in a short period of time.<sup>12</sup> However, the studies on Poland and other countries by the World Bank (1996 and 2002) show that stabilization and liberalization can be implemented quickly, privatization may take a number of years to accomplish, the development of market supporting institutions, such as legal and financial systems, will take years, even decades.<sup>13</sup> Therefore, no matter what approach is adopted, the transition from a centrally planned system to a market system in any country, in fact, will necessary be a gradual process. During the process of a gradual transition, the effectiveness of any individual institutional arrangement cannot be ascertained *a priori* because the function of an individual institutional arrangement depends on the functions of other institutional arrangements in the institutional structure (Lin and Nugent 1995). Even the market system is accepted as the final goal of transition and what makes a market system work are known to the economists and policy makers, the goal and knowledge do not provide much guidance for a smooth transition. Therefore, it is desirable to have a better understanding about China's experiences, how China's transitions could have been accompanied by rapid and stable economic growth, whether the Chinese approach has any generalizable lessons for other

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make profits will not produce socially desirable outcomes unless prices are determined by market forces; 4) economic progress will be greatly inhibited unless the economy is fully integrated into the world economy; 5) the pace of the transition from central planning needs to be rapid; 6) and democratic political institutions are a necessary condition of success with economic reform.

<sup>10</sup> However, the initial conditions are not necessarily to the net advantage of China's transition. See the insightful discussion by Chang and Nolan (1995).

<sup>11</sup> The capitalist triumphalism, as defined by Wiles (1995, p. 48), is "Thatcherism plus optimism: i.e. monetarism plus privatization plus dogmatism, but also irresponsible (i.e., not Thatcherie) versions of easy success."

<sup>12</sup> The instruction to Jeffrey Sachs, when he was invited to advise the reform programs by Solidarity leadership in Poland in July 1989, reflected the general mood: "Give us the outline that you see fit. But make it a program of rapid and comprehensive change. And please, start the outline with the words, 'With this program, Poland will jump to the market economy.' We want to move quickly; that is the only way that this will make sense to our society, that it will make sense politically, and --as we understand form experts--the only way it will make sense economically as well." (Sachs 1993, p. 43-4).

<sup>13</sup> Even Jeffrey Sachs, the most famous proponent of big bang approach, changed his position on the speed of privatization. In the 1991 World Bank Annual Conference on Development Economics, he proposed to accelerate the privatization in Poland and argued that, otherwise, the entire process of transition would be stalled for years to come (Sachs 1991). In his later writings, he only argues that the government of a transition economy to have a commitment to privatization (Sachs and Woo 1997).

economies in transition.

The transition in essence is a process of institutional changes from those of a plan economy to those of a market economy. In the paper I will argue that the economic institutions of the plan economy are endogenously shaped by the adoption of a comparative advantage-defying heavy-industry-oriented development strategy in a capital scarce economy (hereafter CAD strategy). This strategy makes enterprises in the priority sectors of CAD strategy nonviable in an open, competitive market. Many institutional distortions in the plan economy are required for protecting and subsidizing those nonviable enterprises in the CAD strategy. The shock therapy, which attempts to eliminate the institutional distortions simultaneously, causes economic collapse due to the fact that this transition approach neglects the endogenous nature of those distortions. The gradual approach in China achieves dynamic growth because this approach continues to provide protections and subsidies to the nonviable enterprises meanwhile allowing enterprises to enter into the previously suppressed sectors, which are consistent with China's comparative advantages. The completion of China's transition to a market economy, which requires the elimination of all institutional distortions arising from the plan economy, depends on final resolution of viability issue of enterprises in the CAD strategy's priority sectors.

The paper is organized as follows: In Section II, I will discuss the logic origin of this planned economic system. In section III, I will provide a review of the process of reforms in China. Some lessons from the Chinese experience are presented in Section IV. It is followed by some concluding remarks in Section V.

## **I. DEVELOPMENT STRATEGY AND TRADITIONAL SOCIALIST ECONOMIC SYSTEM**

Due to the differences in the stage of development, agriculture was a larger sector in China than in EEFSU. Despite this difference, the nature and problems of the economic system in China and in FSUEE were very similar (McKinnon 1995). They all had a Soviet-type planning economic system before the transition.<sup>14</sup> It is recognized that the Soviet-type economy is a coherent whole with its own inherent logic, necessary components, and natural interaction of those components (Ericson 1991; Kornai 1992). Lin, Cai, and Li (2003) show that the Soviet-type planning system was endogenous to the choice of a CAD strategy in a capital-scarce economy.

I will first analyse the effect of a CAD strategy on the evolution and economic rationality of the Soviet-type planning system, using the Chinese case as an example. China's pre-reform economic system had three integrated components: (1) a distorted macro-policy environment which featured artificially depressed interest rates, over-valued exchange rates, low nominal wage rates as well as low price levels for living necessities and raw materials; (2) a planned allocation for credit, foreign exchange, and other materials; and (3) a traditional micro-management system of State-owned enterprises (hereafter SOEs) and collective agriculture. These three components were endogenous to the choice of CAD strategy in a capital-scarce agrarian economy, although the specific institutional arrangements that were actually adopted in China were also shaped by socialist ideology, the Chinese Communist Party's experience during the revolution, and the Chinese government's political capacity.<sup>15</sup> The relationship

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<sup>14</sup> Even although Hungary and Poland had been experimenting market liberalization for over a decade before the rush to liberalization after 1989, the broad outlines of their economies were still those of the Soviet model (Lavigne 1995).

<sup>15</sup> Perkins and Yusuf (1984, p. 4) noted that a unique feature of China's economic development under socialism

between the development strategy and the economic structure is summarized in figure 1.

At the founding of the People's Republic in 1949, the Chinese government inherited a war-torn agrarian economy in which 89.4 percent of the population resided in rural areas and industry consisted of only 12.6 percent of the national income. At that time, a developed heavy-industry sector was the symbol of the nation's power and economic achievement. Like government leaders in India and in many other newly independent developing countries, Chinese leaders certainly intended to accelerate the development of heavy industries. After China's involvement in the Korean War in 1950, with its resulting embargo and isolation from Western nations, catching up to the industrialized powers further became a necessity for national security. In addition, the Soviet Union's outstanding record of nation-building in the 1930s, in contrast to that of the Great Depression in Western market economies, provided the Chinese leadership with both inspiration and experience for adopting a CAD strategy for accelerating China's development. Therefore, after recovering from wartime destruction in 1953, the Chinese government set the development of heavy industries as the priority. The goal was to build, as rapidly as possible, the country's capacity to produce capital goods and military materials. This development strategy was shaped through a series of Five-Year Plans.<sup>16</sup>

Heavy industries are capital-intensive. China was a capital-scarce, low-income, agrarian economy in the 1950s. Therefore, the capital-intensive heavy industries were not China's comparative advantage at that time. The construction of a heavy-industry project in a developing country has three characteristics: 1) it requires a long gestation;<sup>17</sup> 2) most equipment for a project, at least in the initial stage, need to be imported from more advanced economies; and 3) each project requires a lump-sum investment. When the Chinese government initiated this strategy in the early 1950s, the Chinese economy also had three distinct characteristics: 1) the available capital was limited, and, consequently, the market interest rate was high;<sup>18</sup> 2) foreign exchange was scarce and expensive because exportable goods were limited and primarily consisted of low-price agricultural products; and 3) the economic surplus was small and scattered to widespread household farms due to China's nature of a densely-populated poor agrarian economy. Because the three characteristics of Chinese economy were mismatched with the three characteristics of a heavy industry project, enterprises in the priority sectors were not viable in an open, competitive market (Lin 2003) and a spontaneous development of capital-intensive industry in Chinese economy was impossible.<sup>19</sup> Therefore, a set of distorted macro-

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was the government's capacity to implement village-level programs nationwide through bureaucratic and Party channels. Therefore, the Chinese government was able to impose certain institutional arrangements, such as the collective farming system instead of the Soviet's state farms, in the economy, deemed as important by ideology or by economic rationality, which may not be feasible in other economies (Perkins 1966).

<sup>16</sup> The Five-Year Plan was disrupted from 1963-65, the period immediately after the agricultural crisis of 1959-1962. The first to the seventh Five-Year Plans covered, respectively, the periods from 1952-57, 1958-62, 1966-70, 1971-75, 1975-80, 1981-85, and 1986-90.

<sup>17</sup> The construction of a light-industry project, such as a small textile factory, takes one or two years to complete. The construction of a large heavy-industry project, in general, takes a much longer time. For example, in China the average construction time for a metallurgy plant is 7 years, for a chemical plant is 5-6 years, and for a machine-building plant is 3-4 year (Li and Zheng, 1989, p. 170).

<sup>18</sup> Three percent per month was a normal interest rate in the informal financial markets that existed before the adoption of the development strategy. It is equivalent to 36 percent per year.

<sup>19</sup> A spontaneous development of heavy industry was impossible for several reasons. First, the high interest rates would make any project that requires a long gestation unfeasible. For example, it takes on average 7 years in China to complete the construction of a metallurgy plant, as indicated in footnote 3. The market interest rate in

policies was required for the development of heavy industry. At the beginning of the first Five-Year Plan, the government instituted a policy of low interest rates and over-valued exchange rates to reduce both the costs of interest payments and of importing equipment.<sup>20</sup> Meanwhile, in order to secure enough funds for industrial expansion, a policy of low input prices, including nominal wage rates for workers<sup>21</sup> and prices for raw materials, energy and transportation, evolved alongside the adoption of this development strategy. The assumption was that the low prices would enable the enterprises to create profits large enough to repay the loans or to accumulate enough funds for reinvestment. If the enterprises were privately owned, the State could not be sure that the private entrepreneurs would reinvest the policy-created profits on the intended projects.<sup>22</sup> Therefore, private enterprises were soon nationalized<sup>23</sup> and new key enterprises were owned by the State to secure the State's control over profits for reinvesting in heavy-industry projects. Meanwhile, to make the low nominal-wage policy feasible, the government had to provide urban residents with inexpensive food and other necessities, including housing, medical care, and clothing. The low interest rates, over-valued exchange rates, low nominal wage rates, and low prices for raw materials and living necessities constituted the basic macro policy environment of the CAD strategy.<sup>24</sup>

The above macro policies induced a total imbalance in the supply and demand for credit, foreign exchange, raw materials, and other living necessities. Because non-priority sectors

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the early 1950s in China was about 30 percent per year (2.5 percent per month). Suppose the fund for the project was borrowed at market rate and repayment was made after the completion of the project. The principal and interest payment, calculated at a compound rate, for each dollar borrowed at the first year of the project would be 6.27 dollars. It is obvious that no project would be profitable enough to shoulder such a high interest burden. Second, since most equipment needed to be imported from advanced countries, the limited supply of foreign exchange again made the construction of heavy industry expensive under the market-determined exchange rate. Third, because the agricultural surplus was small and scattered, it was difficult to mobilize enough funds for any lump-sum project.

<sup>20</sup> For example, the interest rate on bank loans was officially reduced from 30 percent per year to about five percent per year. For a one-dollar fund borrowed at the beginning of a 7 year project, the principal and interest payment at the time that the project was completed would be reduced from 6.27 dollars to 1.41 dollars.

<sup>21</sup> Despite the real GNP per capita had tripled between 1952 and 1978, the nominal wage was kept almost constant, increasing only 10.3 percent, during the same period (China State Statistical Yearbook 1987, p. 151). However, because of in-kind subsidies, the real wages to urban workers were not as low as the nominal wages suggested. Moreover, urban wage rates may decline sharply if the restriction on the rural-urban migration is removed. For a more detailed discussion of the formation of low nominal-wage policy, see Cheng (1982, chap. 8) and Wu (1965, chap. 4).

<sup>22</sup> Even with all the above price distortions that facilitate the heavy-industry development in China, the time period required by a heavy-industry project to earn back the capital investment was, on average, about 4 to 5 times longer than the period required by a light-industry project (Li 1983, p. 37). Therefore, a profit-maximizing private owner would have higher incentives to invest in a light-industry project.

<sup>23</sup> Under the New Democracy Policy, adopted by the Communist Party in the late 1940s, private enterprises were supposed to coexist with State-owned enterprises for an extended period after the revolution. However, the enterprises were soon nationalized after 1952 when the government adopted the CAD STRATEGY. The attempt to secure profits for the heavy-industry projects was the motivation for the government's change in position toward private enterprises.

<sup>24</sup> Theoretically, the government could use subsidies instead of distorting the price signals as a means to facilitate the development of capital-intensive heavy industry in a capital-scarce economy. It can be shown that the subsidy policy is more efficient economically than the policy of price distortion. However, with the subsidy policy, the heavy industry would incur a huge explicit loss and the government would have to tax other sectors heavily to subsidize the loss. Under such a situation, the government would find it difficult to defend its position of accelerating the development of heavy industry. Moreover, the government in an underdeveloped economy may not have the ability to collect huge taxes. This may explain why governments, not only in socialist economies but in capitalist economies, use price distortions instead of subsidies to facilitate the development of priority sectors.

would be competing with the priority sectors for the low-priced resources, plans and administrative controls replaced markets as the mechanism for allocating scarce credit, foreign reserves, raw materials, and living necessities, ensuring that limited resources would be used for the targeted projects. Moreover, the State monopolized banks, foreign trade, and material distribution systems.<sup>25</sup>

In this way competition was suppressed, and profits ceased to be the measure of an enterprise's efficiency.<sup>26</sup> Because of the lack of market discipline, managerial discretion was potentially a serious problem. Managers of SOEs were deprived of autonomy to mitigate this problem.<sup>27</sup> The production of SOEs was dictated by mandatory plans and furnished with most of their material inputs through an administrative allocation system. The prices of their products were determined by pricing authorities. Government agencies controlled the circulation of their products. The wages and salaries of workers and managers were determined not by their performance but by their education, age, position and other criteria according to a national wage scale. Investment and working capital were mostly financed by appropriations from the State budget or loans from the banking system according to State plans. The SOEs remitted all their profits, if any, to the State and the State budget would also cover all losses incurred by the enterprises. In short, the SOEs were like puppets. They did not have any autonomy over the employment of workers, the use of profits, the plan of production, the supplies of inputs, and the marketing of their products.

The development strategy and the resulting policy environment and allocation system also shaped the evolution of farming institutions in China. In order to secure cheap supplies of grain and other agricultural products for urban low-price rationing, a compulsory procurement policy was imposed in the rural areas in 1953. This policy obliged peasants to sell certain quantities of their produce, including grain, cotton, and edible oils to the State at government-set prices (Perkins 1966, chap. 4).

In addition to providing cheap food for industrialization, agriculture was also the main foreign-exchange earner. In the 1950s, agricultural products alone made up over 40 percent of all exports. If processed agricultural products are also counted, agriculture contributed to more than 60 percent of China's foreign exchange earnings up to the 1970s. Because foreign exchange was as important as capital for the CAD strategy, the country's capacity to import capital goods for industrialization in the early stage of development clearly depended on agriculture's performance.

Agricultural development required resources and investment as much as industrial development. The government, however, was reluctant to divert scarce resources and funds from industry to agriculture. Therefore, alongside the CAD strategy, the government adopted a new agricultural development strategy that would not compete for resources with industrial expansion. The core of this strategy involved the mass mobilization of rural labour to work

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<sup>25</sup> In the literature in China and other socialist countries, many authors presumed that the distorted policy environment and the administrative controls were shaped by socialist doctrines. The socialist ideology might play a role in the formation of these policies, however, the existence of these policies and controls also have an economic rationale. They facilitate the implementation of a CAD strategy in a capital-scarce economy. This explains why non-socialist developing economies, such as India, also had a similar policy environment and administrative controls when they adopted the same development strategy.

<sup>26</sup> An enterprise is bound to be loss-making if its outputs happen to be inputs to the other sectors, for example energy and transportation, because the prices of its outputs are suppressed. On the contrary, an enterprise is bound to be profit-making if its outputs are at the low end of the industrial chain, because the enterprise can enjoy low input prices and high output prices at the same time.

<sup>27</sup> The state enterprises were granted some autonomy after the reforms in the late 1970s. As expected, one of the results of this reform was a rapid increase in wages, bonuses and fringe benefits at the expense of the enterprise's profits.

on labour-intensive investment projects, such as irrigation, flood control, and land reclamation, and to raise unit yields in agriculture through traditional methods and inputs, such as closer planting, more careful weeding, and the use of more organic fertilizer. The government believed that collectivization of agriculture would ensure these functions. The government also viewed collectivization as a convenient vehicle for effecting the State's low-priced procurement program of grain and other agricultural products (Luo 1985). Income distribution in the collectives was based on each collective member's contribution to agricultural production. However, monitoring a member's effort is extremely difficult in agricultural production due to dimensions of time and space. The remuneration system in the collectives was basically egalitarian (Lin 1988).

The distorted macro-policy environment, planned allocation system, and micro-management institutions outlined above all made the maximum mobilization of resources for the development of heavy industry possible in a capital-scarce economy. Since most private initiative in economic activities was prohibited, the pattern of the government's investment was the best indicator of the bias in the official development strategy. Despite the fact that more than three-quarters of China's population lived from agriculture and labor-intensive light industries were consistent with China's comparative advantages, agriculture and light industries each received less than 10 percent of State investment in the period 1953-1985, while 45 percent went to heavy industry. As a result, the value of heavy industry in the combined total value of agriculture and industry grew from 15 percent in 1952 to about 40 percent in the 1970s.<sup>28</sup>

Judging from China's sector composition, the trinity of the traditional socialist economic structure--a distorted macro-policy environment, a planned allocation system, and a puppet-like micro-management institution--reached its intended goal of accelerating the development of heavy industries in China. However, China paid a high price for such an achievement. The economy is very inefficient due to two reasons: 1) low allocative efficiency because of the deviation of the industrial structure from the pattern dictated by the comparative advantages of the economy, and 2) low technical efficiency due to managers' and workers' low incentives to work. The production of the economy located in some points within the production frontier as shown in figure 2. The economy was very inefficient as a result. The most important indicator that reflected this inefficiency was the extremely low rate of total factor productivity growth in China. A World Bank study shows that, even calculated at the most favourable assumptions, the growth rate was merely 0.5% between 1952-1981, only a quarter of the average growth rate of 19 developing countries included in the study (World Bank 1985a). Moreover, the total factor productivity of China's SOEs was in a state of stagnation or even negative growth between 1957-1982 (World Bank 1985b).

## II. CHINA'S APPROACH TO TRANSITION

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<sup>28</sup> When the reforms started in 1979, the government initially planned to increase agriculture's share in the State fixed capital investment from 11% in 1978 to 18% in the following 3 to 5 years. Due to the rapid agricultural growth brought about by the rural reforms, agriculture's share in the State fixed capital investment actually declined sharply to only about 3% in the late 1980s and early 1990s. However, the share of total fixed capital investment in agriculture in the nation as a whole did not decline so much as the figures suggest, because part of the decline in the State investment was compensated by an increase in farmers' investment (Feder et al, 1982). Similarly, the share of heavy industry in the state fixed capital investment did not decline after the reforms in 1979. However, the state's share in the total investment declined from 82% in 1980 to 66% in 1990. The non-state sectors' investments are mostly on projects that are less capital intensive. Therefore, the share of heavy industry in the nation's fixed capital investment is less than the share in the State investment.

The Soviet-type planning economy was very good at mobilizing scarce resources for investment in a few clear, well-defined priority sectors (Ericson 1991).<sup>29</sup> However, in China as well as in the EEFSU, the economy all encountered the similar problems of low allocative and technical efficiency. Although the problems that China faced were similar to those in the EEFSU, China adopted an approach very different from that at EEFSU. First, China pursued *perestroika* (economic restructuring) to stimulate the dynamism of the economy but avoid *glasnost* (political openness) to avoid the collapse of the Communist party. The Chinese approach in essence is a “micro” first approach (McKinnon 1995), which is different from not only the big bang approach in the EEFSU but also the IMF/World Bank’s standard approach for restructuring, which recommended a “macro” first approach to transition.<sup>30</sup> In China, the transition started with the decollectivization of agriculture, the improvement of the governance of state-owned enterprise through the enlargement of enterprise autonomy, the promotion of non-state enterprises that face hard budget constraints, and the introduction of a dual-track system to prices and exchange rate before their liberalization. In China, the process did not involve mass privatization. SOEs maintained its dominant role in the industrial sector. Through this cautious and gradual approach, these economies have been able to replace the traditional Soviet-type system with a market system meanwhile maintaining remarkable records of growth and price stability during the transition process.

For the governments in the Eastern Europe, their goal of transition was clearly defined at the very beginning as “to replicate the economic institutions of Western Europe” (Sachs and Lipton 1990, p. 47). However, in China the goal was simply to improve the efficiency of the economic system and the reform did not have a well-designed strategy or policy measures. For example, as Perkins (1988, p. 601) observed, it was unlikely that China’s leaders at that time had worked out a blueprint when they set out to reform the economic system. Instead of being designed *a priori*, the choice of specific reform measure and the sequence of transition reflected the government’s pragmatism toward the problems or crisis that emerged in the economic system and the opportunities that can be utilized to mitigate or solve the problems. These government’s philosophy toward specific reform measures is best reflected by Deng Xiaoping’s famous saying: “No matter it is a white cat or black cat, as long as it can catch mouse, it is a good cat.” The sequencing of reform measures is best described by another Chinese saying: “To cross a river by groping the stones.” However, retrospectively, the transition process in China followed a logical process that is predictable from the internal logic of Soviet-type economy (Lin, Cai, and Li, 2003, chap. 5).

As discussed, the trinity of the traditional economic system is endogenous to the adoption of a heavy industry-oriented development strategy in a capital-scarce economy. The main fault in this economic system was low economic efficiency arising from structural imbalance and incentive problems. Before the late 1970s, the Chinese government had made several attempts to address the structural problems by decentralizing the resource allocation

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<sup>29</sup> An evidence to support the above argument is the fact that, compared to the non-socialist economies at similar levels of economic development, the socialist economies, no matter they were in the East Asia or in the Eastern Europe or USSR, all had much larger industrial, especially heavy-industry, sectors (Rana 1995, Lavigne 1995).

<sup>30</sup> The first priority in the IMF/World Bank approach is fiscal control. This requires an organized internal revenue service capable of collecting taxes from households and liberalized enterprises in both agriculture and industry. After fiscal control, the interest rates can be liberalized and the money and credit are hardened to stabilize the prices. Before the removing of trade restrictions, foreign exchange rate should be unified. The last stage of the reform is the full capital account convertibility, which should wait until domestic financial liberalization has been completed and established (Rana 1995, pp. 14-5).

mechanism.<sup>31</sup> However, the administrative nature of the allocation mechanism was not changed and the policy environment and managerial system were not altered, and thus the attempts to rectify the structural imbalance and improve economic incentives failed. The goals of the reform in late 1978 were also to rectify the structural imbalance and improve incentives. However, what set the reforms apart from previous attempts were the micro-management system reforms, that made farmers and managers and workers in SOEs partial residual claimants. This small crack in the trinity of the traditional economic system was eventually pried open, leading to the gradual dismantlement of the traditional system, and the emergency of a market system.

#### (a) **The micro-management system reforms**

The most important change in the micro-management system was the replacement of collective farming with a household-based system, now known as the household responsibility system. In the beginning, the government had not intended to change the farming institutions. The government had recognized in 1978 that solving managerial problems within the collective system was the key to improving farmers' incentives. However, in the resolution adopted by the third Plenum of the Eleventh Central Committee of CPC, which marked the start of transition in China, any type of household-based farming arrangement was explicitly prohibited. Nevertheless, a collective in a poverty-stricken area began to try out secretly a system of leasing a collective's land and dividing the obligatory procurement quotas to individual households in the collective in late 1978. That area was hit by a drought in that year. All other collectives reported sharp reduction in output. The output in that collective not only did not decline but increased 30 percent. Observing the advantage of the household-based farming system in improving agricultural production, the central authorities later conceded to the existence of this new form of farming, but required that it be restricted to poor agricultural regions, mainly to hilly or mountainous areas, and to poor collectives in which people had lost confidence in the collective system. However, this restriction was ignored in most regions. Production improved after a collective adopted the new system, regardless of its relative wealth or poverty. Full official recognition of the household responsibility system as a "socialist" farming institution and applicable to any collective in China was eventually given in late 1983. By that time, 45 percent of the collectives in China had already been dismantled and had instituted the household responsibility system. By the end of 1983, 98 percent of agricultural collectives in China had adopted this new system. When the household responsibility system first appeared, the land lease was limited to only one to three years. However, the short lease reduced farmers' incentives for land-improvement investment. The lease contract was allowed to be extended up to 15 years in 1984. In 1993, the government allowed the lease contract to be extended for another 30 years after the expiration of the first contract.

Unlike the spontaneous nature of farming institution reform, the reform in the management system of the SOEs was initiated by the government. These reforms have undergone four stages. The first stage (1979-1983) emphasized several important experimental initiatives that were intended to enlarge enterprise autonomy and to expand the role of financial incentives within the traditional economic system. These measures included the introduction of profit retention and performance-related bonuses and permitted the SOEs to produce outside the mandatory State plan. The enterprises involved in exports also were

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<sup>31</sup> The first attempt was made in 1958-1960, the second in 1961-1965, and the third in 1966-1976 (Wu and Zhang 1993, pp. 65-7).

allowed to retain part of their foreign exchange earnings for use at their own discretion. In the second stage (1984-1986) the emphasis shifted to a formalization of the financial obligations of the SOEs to the government and exposed enterprises to market influences. From 1983, profit remittances to the government were replaced by a profit tax. In 1984, the government allowed SOEs to sell output in excess of quotas at negotiated prices and to plan their output accordingly, thus establishing the dual-track price system. During the third stage (1987-1992), the contract responsibility system, which attempted to clarify the authority and responsibilities of enterprise managers, was formalized and widely adopted. The last stage (1993-present) attempted to introduce the modern corporate system to the SOEs. In each stage of the reform, the government's intervention was reduced further and the SOEs gained more autonomy.

The reform of the micro-management system has achieved its intended goal of improving technical efficiency. Empirical estimates show that almost half of the 42.2 percent growth of output in the cropping sector in the years 1978-84 was driven by productivity change brought about by the reforms. Furthermore, almost all of the above productivity growth was attributable to the changes resulting from the introduction of the household responsibility system (Fan 1991; Huang and Rozelle 1994; Lin 1992; McMillan, et al. 1989; Wen 1993).<sup>32</sup> Production function estimates by several studies find that for industry the increase in enterprise autonomy increased productivity in the SOEs (Chen et al. 1988; Gordon and Li 1989; Dollar 1990; Jefferson et al. 1992; Groves et al. 1994; Li 1997).<sup>33</sup> Therefore, the reforms in micro-management system in both agriculture and industry have created a flow of new resources, an important feature of China's reforms.

The increase in enterprise autonomy under a distorted macro-policy environment, however, also invited managers' and workers' discretionary behavior. Despite an improvement in productivity, the profitability of the SOEs declined and the government's subsidies increased due to both a faster increase in wages, fringe benefits, and other unauthorized expenditures (Fan and Schaffer 1991) and the competition from the autonomous township-and-village enterprises (TVEs) (Jefferson and Rawski 1995).<sup>34</sup> However, once the enterprises had tasted the fruits of autonomy, it would have been politically too costly to revoke it. The decline in the profits of SOEs and the competition from TVEs forced the government to adopt other measures that further increased the autonomy of SOEs in the hope that the new measures would make the enterprises financially independent.

### **(b) Resource allocation mechanism reform**

The increase in enterprise autonomy put pressure on the planned distribution system. Because the SOEs were allowed to produce outside the mandatory plans, the enterprises needed to obtain additional inputs and to sell the extra outputs outside the planned distribution system. Under pressure from the enterprises, material supplies were progressively de-linked from the plan, and retail commerce was gradually deregulated. At the beginning, certain key inputs remained controlled. However, the controlled items were increasingly reduced. Centralized credit rationing was also delegated to local banks at the

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<sup>32</sup> Similar gain in agricultural productivity was also observed in Vietnam's agricultural decollectivization (Pingali and Xuan 1992).

<sup>33</sup> Similar productivity gain is also reported for Vietnam's State-owned enterprises. See the empirical studies cited in Sun (1997, pp. 3-4).

<sup>34</sup> I will discuss the emergence of TVEs and its impacts on the reform of SOEs in the following subsection.

end of 1984.

An unexpected effect of the relaxation of the resources allocation mechanism was the rapid growth of the non-State enterprises, especially the TVEs.<sup>35</sup> Rural industry already existed under the traditional system as a result of the government's decision to mechanize agriculture and to develop rural processing industries to finance the mechanization in 1971. In 1978 the output of TVEs consisted of 7.2 percent of the total value of industrial output in China. Before the reforms, the growth of TVEs was severely constrained by access to credits, raw materials and markets. The reforms created two favorable conditions for the rapid expansion of TVEs. 1) A new stream of surpluses brought out by the household responsibility reform provided a resource base for new investment activities. 2) The relaxation of rigidity in the traditional planned allocation mechanism provided access to key raw materials and markets. In the period 1981-1991, the number of TVEs, employment, and the total output value grew at an average annual rate of 26.6%, 11.2%, and 29.6%, respectively. TVEs' annual growth rate in total output value was three times that of the State firms in the same period. In 1993, TVEs' output accounted for 38.1 percent of the total industrial output in China. The share of industrial output from nonstate enterprises increased from 22 percent in 1978 to 56.9 percent in 1993 (State Statistical Bureau 1995, p. 73). The emergence of TVEs has been claimed by some researchers as the greatest achievement of China's reform (Sun 1997).

The rapid entry of TVEs and other type of nonstate enterprises produced two unexpected effects on the reforms. First, nonstate enterprises were the product of markets. Being outsiders to the traditional economic system, nonstate enterprises had to obtain energy and raw materials from competitive markets, and their products could be sold only to markets. They faced hard budget constraints and they would not survive if their management was poor. Their employees did not have an "iron rice bowl" and could be fired. As a result, the nonstate enterprises were more productive than the SOEs (Weitzman and Xu 1995, Sun 1997). The dynamism of nonstate enterprises exerted a pressure on the SOEs and triggered the State's policy of transplanting the micro-management system of the nonstate enterprises to the SOEs and of delegating more autonomy to the SOEs. Reform measures for improving the micro-management system of SOEs-- such as replacement of profit remittance by a profit tax, the establishment of the contract responsibility system, and the introduction of the modern corporate system to SOEs-- were responses to competitive pressure from TVEs and other non-state enterprises (Jefferson and Rawski 1995). The increase in competition among the enterprises and between the state and non-state enterprises also increases the productivity of the SOEs (Li 1997). Secondly, the development of nonstate enterprises significantly rectified the misallocation of resources. In most cases, nonstate enterprises had to pay market prices for their inputs, and their products were sold at market prices. The price signals induced nonstate enterprises to adopt more labor-intensive technology and to concentrate on more labor-intensive small industries than on SOEs.<sup>36</sup> Therefore, the technological structure

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<sup>35</sup> The non-state enterprises include the TVEs, the private enterprises, and joint-venture enterprises, overseas Chinese enterprises, and foreign enterprises. Among them, the TVEs are the most important in terms of output share and number of enterprises. It is noteworthy that TVEs, although different in many aspects from SOEs, are public enterprises that are funded, owned, and supervised by the township or village governments. A firm-level study found that there is no essential difference in the allocation of control rights between the SOEs and TVEs (Jefferson, Zhao, and Lu 1995).

<sup>36</sup> For example, in 1986 an average industrial enterprise in China had 179.9 workers, and the fixed investment per worker was 7510 yuan (China Industrial Economy Statistical Material 1987, p. 3); whereas an average TVE in the same year had 28.9 workers, and the fixed investment per worker was 1709 yuan (Statistical Yearbook of China 1987, p. 205).

of nonstate enterprises was more consistent with the comparative advantages of China's endowments. The entry of TVEs mitigated the structural imbalance caused by the heavy industry-oriented development strategy.

### (c) Macro-policy environmental reform

Among the trinity of the traditional economic system, the distorted macro-policy environment was linked most closely to the development strategy, and its effects on allocative and technical efficiency were indirect. The reforms of the macro-policies were thus the most sluggish. I will argue later that most economic problems that appeared during the reforms--for example, the cyclic pattern of growth and the rampant rent seeking--can be attributed to the inconsistency between the distorted policy environment and the liberalized allocation and enterprise system. Therefore, the Chinese government constantly faced a dilemma: to make the macro-policy environment consistent with the liberalized micro-management institution and resource allocation mechanism or to re-centralize the micro-management institution and resource allocation mechanism for maintaining the internal consistency of the traditional economic system. The deprivation of enterprise autonomy would definitely incur the resistance of managers and employees of SOEs. A return to the traditional economic system would also mean return to economic stagnation. Therefore, no matter how reluctant the government was, the only sustainable choice was to reform the macro-policy environment and make macro-policies consistent with the liberalized allocation and micro-management system.

Changes in the macro-policy environment started in the commodity price system. After the introduction of profit retention, the enterprises were allowed to produce outside the mandatory plan. The enterprises first used an informal barter system to obtain the outside-plan inputs and to sell the outside-plan products at premium prices. In 1984, the government introduced the dual-track price system, which allowed the SOEs to sell their output in excess of quotas at market prices and to plan their output accordingly. The aim of the dual-track price system was to reduce the marginal price distortion in the SOEs' production decisions while leaving the State a measure of control over material allocation. As the share of a commodity that was allocated under the plan price gradually reduced due to the growth of non-state sectors and the outside-the-plan production activity of the SOEs, the government would then give up the plan price, allowing the price to converge to the market prices.<sup>37</sup> By 1988 only 30 percent of retail sales were made at plan prices, and the SOEs obtained 60 percent of their inputs and sold 60 percent of their outputs at market prices (Zou 1992). By 1996, with the exception for a few raw materials and coal, fuel, and transportation, the prices for most commodities and services have been liberalized.

The second major change in the macro environment occurred in the foreign exchange rate policy. In the years 1979-80, the official exchange rate was roughly 1.5 yuan per US dollar. The rate could not cover the costs of exports, as the average cost of earning one US dollar was around 2.5 yuan. A dual rate system was adopted at the beginning of 1981. Commodity trade was settled at the internal rate of 2.8 yuan per dollar; the official rate of 1.53 yuan per dollar continued to apply to non-commodity transactions. After 1985, the yuan was gradually devalued. Moreover, the proportion of retained foreign exchange, which was introduced in

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<sup>37</sup> By the time the price of a commodity was liberalized, the proportion of the commodity that was allocated by the plan, compared to the proportion that was allocated by the market, was very small already. Therefore, the shock was much smaller than the gap between the market price and plan price would indicate. The process of exchange rate liberalization, which will be discussed later, is the best example.

1979, was gradually raised, and enterprises were allowed to swap their foreign exchange entitlement with other enterprises through the Bank of China at rates higher than the official exchange rate. Restrictions on trading foreign exchanges were further relaxed with the establishment of a "foreign exchange adjustment center" in Shenzhen in 1985, in which enterprises could trade foreign exchanges at negotiated rates. By the late 1980s, such centers were established in most provinces in China and more than 80 percent of the foreign-exchange earnings was swapped in such centers (Sung 1994). The climax of foreign exchange rate policy reform was the establishment of a managed floating system and unification of the dual rate system on January 1, 1994, by that time 80 percent of foreign exchanges has already been allocated through the swap markets.<sup>38</sup>

Interest-rate policy is the least affected area of the traditional macro-policy environment. Under the heavy industry-oriented development strategy, the interest rate was kept artificially low to facilitate the expansion of capital-intensive industries. After the reforms started in 1979, the government was forced to raise both the loan rates and the savings rates several times.<sup>39</sup> However, the rates were maintained at levels far below the market-clearing rates throughout the reform process. In late 1993, the government announced a plan to establish three development banks with the function of financing long-term projects, import/export, and agricultural infrastructure at subsidized rates and to turn the existing banks into commercial banks. The three development banks were established in 1994. The commercialization of the existing banks is expected to take at least another three to five years. Moreover, it is unclear whether after the reform the interest rate will be regulated or will be determined by markets. The mentality of the heavy industry-oriented development strategy is deeply rooted in the mind of China's political leaders. To accelerate the development of capital-intensive industry in a capital-scarce economy, a distorted macro-policy environment-- at the very least in the form of a low interest-rate policy-- is essential. It is likely that administrative interventions in the financial market will linger for an extended period.<sup>40</sup>

A unique feature of the transition in the East Asian economies is the continuous growth during the transition process. The above discussion gives us an explanation for the success. As shown in Figure 3, when the transition started, the attempt of the government in China was to move the production of their economies from point B to point A in figure 3a. The measures were to improve incentives in the SOEs and collective farms by giving agents in SOEs and collective farms some autonomy and allowing a closer link between personal rewards and individual. The empirical studies cited in the above discussion show, in spite of the lack privatization, the attempt was successful and a new stream of resources was created by the micro-management system reform. The partial autonomy also implies that

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<sup>38</sup> Vietnam and Lao also adopted the dual-track system to reform the prices and exchange rates at the early stage of the transition. Almost total deregulation of prices and exchange rates occurred in Vietnam in 1989 and in Lao in 1988. This total deregulation is sometime used as an evidence that Vietnam adopted a big bang approach to transition (Sachs and Woo 1997, Popov 1997). However, according to the definition, a big bang approach includes three essential elements: comprehensive price and trade liberalization, stabilization, and commitment to mass privatization of the SOEs (Sachs and Woo 1997, p. 5). However, Vietnam not only did not totally remove its trade restrictions, but also did not have any commitment for privatization of SOEs. Therefore, Vietnam's total price liberalization in 1989 was a partial instead of a big bang approach reform.

<sup>39</sup> To stop bank runs, the savings rates were indexed to inflation rates in October 1988. But the policy was revoked in 1991. In May 1993, the interest rate for a one-year time deposit was 9.18 percent, and for a one-to-three-year basic investment loan it was 10.80 percent (*China Statistics Yearbook, 1993*, pp. 670-71). However, the market rate for a commercial loan was between 15 and 25 percent.

<sup>40</sup> In Vietnam, the interest rates are increased occasionally but not liberalized. In the case of Lao, the interest rates have been liberalized since 1989 although the Central bank still sets the floor and ceiling ratio.

entrepreneurs in the state sector and in rural area gain partial control over the allocation of the newly created stream of resources. The suppressed sectors in the traditional economy are the sectors that are consistent with the comparative advantages of the economy and are more profitable due to the existence of unsatisfied demands. The unexpected results of the micro-management reform are that, driven by profit motivation, the autonomous entrepreneurs allocated the new stream of resources under their control to the more profitable suppressed sectors. Since the planned allocation mechanism and distorted macro-policy environment were preserved, the State still had control over the old stream of resources and guaranteed that these resources would be allocated to the priority sectors. That is, the economy follows a dynamic path from point A to a point close to G, instead of to H, in figure 3a. Therefore, throughout the reform process, the economy enjoys continuous growth as shown in figure 3b. Moreover, as the economy grew, the proportion of resources that was allocated according to the planned prices became increasingly small. Therefore, by the time the price for a commodity was liberalized, the shock was much smaller than the gap between the market price and plan price would have suggested.

However, there were some costs to the above-described approach to transition. Take the case of China as an example, because the reforms in macro-policies, especially those regarding the interest rate, lagged behind the reforms in the allocation mechanism and micro-management institutions, there were several economic consequences. The first one was the recurrence of a growth cycle. The interest rate was maintained at an artificially low level. The enterprises had incentives to obtain more credits than the supply permitted. Before the reforms, the excess demands for credit were suppressed by restrictive central rationing. The delegation of credit approval authority to local banks in the autumn of 1984 resulted in a rapid expansion of credits and an investment thrust. As a result, the money supply increased 49.7 percent in 1984 compared to its level in 1983. It caused the inflation rate to jump from less than 3 percent in the previous years to 8.8 percent in 1985. In 1988 the government's attempt to liberalize price controls caused a high inflation expectation. The interest rate for savings was not adjusted. Therefore, panic buying and a mini-bank run occurred. Loans, however, were maintained at the previously set level. As a consequence, the money supply increased by 47 percent in 1988. The inflation rate in 1988 reached 18 percent. During the periods of high inflation, the economy overheated. A bottleneck in transportation, energy, and the supply of construction materials appeared. Because the government was reluctant to increase the interest rate as a way to check the investment thrust, it had to resort to centralized rationing of credits and direct control of investment projects-- a return to the planned system. The rationing and controls gave the State sectors a priority position. The pressure of inflation was reduced, but slower growth followed.

As mentioned earlier, although the reforms in the micro-management system improved the productivity of the State sector, deficits increased due to the discretionary behavior of the managers and workers in the SOEs. Therefore, fiscal income increasingly depended on the non-state sectors. During the period of tightening State control, the growth rates of the non-state sectors declined because the non-state sectors' access to credits and raw materials were restricted. Such a slowdown in the growth rate became fiscally unbearable. Therefore, the State was forced to liberalize the administrative controls in order to make room for the growth of the non-state sectors. A period of faster growth followed. Nevertheless, conflicts between the distorted macro-policy environment and the liberalized allocation and micro-management system arose again.

A second consequence of the inconsistency between the distorted policy environment and the liberalized allocation mechanism and micro-management institutions was a rampant rent-

seeking phenomenon. After the reforms market prices existed, legally or illegally, along with planned prices for almost every kind of input and commodity that the State controlled. The difference between the market price and the planned price was an economic rent. It is estimated that the economic rent from the controlled commodity price, the interest rate, and the exchange rate was at least 200 billion yuan, about 21.5 percent of the national income in 1988. In 1992, the economic rent from bank loans alone reached 220 billion yuan (Hu 1994).<sup>41</sup> The non-State enterprises as well as the autonomous SOEs certainly had incentives to engage in rent-seeking activities through bribes and other measures to obtain the under-priced resources from the State allocation agencies. It is reported that under competitive pressure, the SOEs in the heavy industries, which were given priorities in obtaining the State-controlled resources, also needed to give certain side payments to the banks and other allocation agencies in order to secure the earmarked loan and materials or to obtain them promptly.

Because of the rent-seeking activities of other types of enterprises, SOEs were often unable to obtain the credits and materials indicated in the plans. The rent-seeking activities also caused widespread public resentment and became a source of social instability. To guarantee the survival of the SOEs and to check social resentment, the government attempted to re-institute tight controls on the allocation mechanism in the austerity programs of 1986 and 1988. However, the controls were relaxed later to allow the growth of the non-state sectors. Except for the interest rate, administrative controls on the prices of most materials and commodities have been removed.

### III. LESSONS FROM CHINA'S TRANSITION

Even we give allowances to the possibility that, due to statistical problems, the growth rates in China are over reported and the economic collapses in EEFSU are over exaggerated, the contrast in the economic performances during the transition processes in these two groups of countries are still very dramatic. The successful experiences of China, to some extent also of Vietnam and Lao, up to date have presented several challenges to the conventional wisdom about economic transition from a Soviet-type system to a market system.

One of the earliest consensuses among economists advising the transition in EEFSU was the need for quick privatization. The arguments are as follows: Private ownership is the foundation for a well-function market system, real market competition requires a real private sector (Sachs and Lipton 1990), most problems encountering SOEs in a transitional economy can be ameliorated by rapid privatization (Sachs 1992), and privatization must take place before SOEs have been restructured (Blanchard et al. 1991).<sup>42</sup> Despite the ambiguity of property right arrangements of SOEs and TVEs, the productivity of the SOEs in China and Vietnam improved significantly during the transition process and the TVEs in China became the most dynamic sector. The evidence suggests that the soft budget constraints of SOEs in

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<sup>41</sup> The total credit of the State banks was 2,161.6 billion yuan (US\$ 248.5 billion at the swap market exchange rate). The difference between the official interest rate and the market rate was about 10 percent. The rents from bank loans alone were as high as 216 billion yuan.

<sup>42</sup> Certainly there were some economists, arguing for an evolutionary, gradual approach to privatization. Kornai (1990) is an example. He argues that private property rights cannot be made to work by fiat in the transitional economies where entire generations were made to forget the civic principles and values associated with private ownership and private rights and that a mere imitation of the most refined legal and business forms of the leading capitalist countries. However, Kornai also believes that private ownership is the foundation for a well-functioning market system and privatization is the only way to eliminate the symptom of SOE's soft-budget constraints

the Soviet-type economy is more likely arising from the policy burdens that the government imposed on the SOE,<sup>43</sup> rather than from the paternalistic nature of the state ownership in a socialist economy, as argued by Kornai (1992). The experience also suggests that performance of different business entities depends mostly not on formal ownership arrangement, as the earlier privatization consensus believes, but rather on the incentive structure and the degree of market competition.<sup>44</sup>

Another early consensus for transition is the need for a total big-bang price decontrol. An influential paper by Murphy, Schleifer, and Vishny (1992) attributed the fall in output in Soviet Union in 1990-91 to partial price liberalization. They argue that a dual-track pricing system would encourage arbitrage, corruption, rent seeking, and diversion of scarce inputs from high-value to low-value use. However, the dual-track price system is one of the most significant features of China's approach to transition. While some of the problems, described by Murphy, Schleifer, and Vishny, have surfaced after the introduction of the dual-track system in China, the majority of SOEs behaved in a way intended by the introduction of the dual track system. That is, they were responsive to the market signals, enjoyed the rising payoff generated by the market activity, and they are evolving away from the planned track (Naughton 1995). The economy as a whole and the state sector as well continued to grow after the introduction of the dual-track system. By contrast, the economy collapsed and had a hyperinflation after removing all price controls in EEFSU. McKinnon (1995) showed that unless the SOEs had a hard budget constraint, otherwise a big bang price decontrol would cause the producer price level to increase indefinitely, both in absolute terms and relative to retail price, due to the SOEs' unconstrained biddings for scarce resources. No meaningful equilibrium in producer prices would exist under such a condition. Therefore, as long as the budget constraints of the SOEs remain soft, direct controls of price and resource allocation in this sector are desirable. On the one hand, the controlled leg of the dual-track system maintains the stability in the economy and allows the SOEs to operate continuously, and on the other hand, the liberalized leg of the dual track system provides the resources, incentives and signals to the non-state as well as the SOEs to allocate resources to the dynamic areas of the economy.

As in China, the countries in EEFSU were all over-industrialized with oversized SOEs; their service sectors and light industries were underdeveloped; and employees' incentives were low (Newbery 1993; Brada and King 1991; Sachs and Woo 1994). Their economic problems--namely the structure imbalance and the low incentives-- are also similar to those in the transitional economies in East Asia because they all adopted a similar economic development strategy and because they all have a similar macro-policy environment, planned allocation mechanism, and puppet-like SOEs. From a theoretical point of view, the attempt of the big bang approach can be illustrated by figure 4. For an economy with a given stock of resources, the efficient point of production is point E; however, under the heavy industry-oriented development strategy, the actual production point is B, as illustrated in figure 4 a.. The big bang approach attempts to reform the economic system so that the existing stock of

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<sup>43</sup> The policy burdens on the SOEs include over-capital intensity in a capital-scarcity economy due to the government's strategic goal and the burden of old-age pension and labor redundancy. Because of these burdens, the government can not demand the SOEs to be accountable for their losses and need to subsidize the SOEs when losses occur. Furthermore, because it is hard to distinguish between policy-induced losses and operational losses, the SOEs can press the government to cover all its losses. Moral hazard becomes a serious problem in the SOEs (Lin, Cai and Li, 1998, 2001; and Lin and Tan 1999). The performance of SOEs were thus poor.

<sup>44</sup> The empirical evidence from EEFSU also shows that there does not exist a "ownership frontier", that is, efficient firms can be founded both in SOEs and private enterprises (Brada et al. 1994, 1997; Mencinger 1996; Pinto 1993, Frydman et al 1996, Sereghyova 1993, Jones 1997).

resources can be utilized more efficiently. Diagrammatically, the approach attempts to move production from point B to point E. The stabilization, price liberalization, and privatization are necessary conditions for achieving this goal. This is because, to induce economic agents to move from B to E voluntarily, the agents should have a stable expectation about the economy, correct relative-price signals, and the incentives to respond to these price signals. The prescription of stabilization, price liberalization, and privatization is internally consistent. The scheme is equivalent to a replacement in a short sequence of the whole traditional Soviet-type planned system with a market system.

If the resources are highly mobile and can be moved freely from one sector to another sector, privatization can be accomplished in a stroke, and other market supporting institution can be established over night, the big bang reform would enable the economy to jump from point B directly to point E, as the dotted line in figure 4a shows. However, some fixed equipment in heavy industries cannot be used for production in light industries; for other equipment, modifications are required for new uses (Brada and King 1991). Workers in heavy industry also need retraining before they can be assigned to new jobs. Moreover, for many loss-making large SOEs, they cannot be privatized without restructuring first. Therefore, even Poland, the country most committed to the big-bang approach, the privatization proceeded only slowly. If the SOEs were privatized without restructuring, such as in Russia, for fear of large unemployment, they could not be shut down and the state would be obliged to continue all kinds of explicit or implicit subsidies.<sup>45</sup> On the one hand, the privatization would not be able to bring the hard budget constraints as the program originally; on the other hand, many of the emerging private firms are turning to the state for all kinds of rents. Subsidies, tariff protection, legal monopolies, and redistributive regulations are still prevailing even where direct state ownership has become rare (Brada 1996, Frydman et al 1996, Lavigne 1995, Stark 1996, Sun 1997). After the privatization, the former SOEs were owned by a network of cross-ownership, involving banks, investment funds, other enterprises, state asset management agencies, and local governments. The resulting ownership structure is far from the clear, well-defined, private property rights. In addition, the establishment of new market institutions takes time and resources (Murrell and Wang 1993; Lin 1989b). Therefore, even though the big bang approach is adopted, the market will not function as desired in a short period of time. During the initial stage of reforms, an increase in light industry and service sector would not be able to compensate for the decline in heavy industry. Instead of moving directly from point B to point E in figure 4a, the economy moves first from B to F before reaching E. The resulting GDP path of growth is a "J-curve," as shown in figure 4b. How large the decline in GDP would be and how long it would take before recovery would depend on how severe the initial distortion is and how quickly the necessary institutions can be established. The experiences in EEFSU show that the decline can be more than 50 percent of the GDP and that it may take several years before a turning point is reached. The World Bank study suggests that the country, which is firm in implementing the big bang approach would suffer less and the turning point would come faster (World Bank 1996). However, even for Poland, the best case in the World Bank study, the decline in GDP was still very substantial, 19 percent in first two year, and the GDP did not recover to the level of 1989 until 1995.<sup>46</sup> Moreover, the stabilization program did not

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<sup>45</sup> In Russia, the explicit subsidies from fiscal appropriation reduced after the mass privatization but the implicit subsidies from soft bank loans, tax arrears, ad hoc tax exemptions, and so on continued. Even in Poland, tax arrears remained a problem (World Bank 1996, p. 45).

<sup>46</sup> It is noteworthy that when Poland engaged in the stabilization program, it had access to a full range of external support, made available by the IMF, the World Bank, and other international organizations

work immediately as in the case of Latin America, where most proponents of the big bang approach drew their experiences. High inflation or even hyperinflation continued for several years after the beginning of the stabilization program. Under such a dreadful situation, any government is certain to encounter a legitimacy crisis (Dewatripont and Roland 1992). The leadership may not be able to hold a consensus on the course of further reforms, and political instability is likely to follow. The quick shifts of government in the Eastern European countries after the beginning of transition proved this point. Instead of a "J-curve," the result of a big bang approach to reform may be a big "L-curve."

If the transition can be big-banged, the issue of how to sequence reform was largely irrelevant. However, the experiences suggest that no matter what approach is adopted the actual transition from a Soviet-type economy to a market economy can only be a gradual process. Therefore, the micro first sequencing of transition in China should be viewed more positively. However, before we draw any lessons from China's experiences, we needed to answer a number of often-raised questions about the applicability of China's to the EEFSU.

The first question is that why the gradual reform that adopted in Poland, Hungary, and former USSR before their adoption of big bang approach did not work. Those countries had also tried to reform their traditional system by giving SOEs more autonomy. However, their partial reform did not result in similar virtuous effects as in China. A number of explanations are in order. 1) Unlike in China where the SOEs, after fulfilling their plan obligations, were allowed to sell their extra outputs at market prices, the enterprises in the EEFSU were not allowed to set their prices (Sachs 1993, p.28). The price rigidity meant that excess demand and chronic shortage remained and the state producer would not have the incentives to allocate their products to more efficient users who would be able to pay higher prices for their products. 2) Entry by nonstate enterprises were subject to severe restriction (Kornai 1986). Production remained monopolized and international trade remained centrally regulated (Sachs and Lipton 1990). Therefore, unlike SOEs in China after the transition, the existing SOEs in EEFSU never faced real competition pressure from domestic or international sources and lacked the incentives to improve productivity. 3) In the traditional Soviet-type system, to prevent the managerial discretion under the distorted macro-policy environment, SOEs were not allowed to set their workers' wage level. In the Chinese case, after the micro-management reform, the wage was still controlled by the state. A worker's wage would increase only if the enterprise's profits exceeded a preset level. However, in Poland, Hungary and the former USSR, their partial reform gave the enterprises the autonomy to setting their own workers' wages. The weakening of state's control on wages gave the managers and workers opportunity to increase their incomes at the expense of the state by absorbing whatever income flow and whatever assets they could obtain from SOEs. The state's revenues were thus in great difficulty.<sup>47</sup> 4) The wage inflation caused the shortage to become even more acute. The government in Poland as well as in the former USSR tried to play a populist game, they increased the imports of consumer goods and made the countries fall into severe foreign indebtedness (Aslund 1991). Probably due to the above differences, instead of bringing a continuous growth and gradual transition to a market economy as in China, the partial reform led Poland and the former USSR to the brink of

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(Jayawardena 1990). Similar supports had been expected (Sachs 1991) but were not available to other countries implementing a similar program later. Moreover, Poland is like the Guangdong province of China. Due to its geographic proximity to western Europe, Poland received a large inflow of foreign direct investment in the transitional process.

<sup>47</sup> To some extent, China also encountered this problem. In spite of the increase in productivity, the profitability of the SOEs declined. As a result the government's fiscal revenues from the SOEs were reduced substantially (McKinnon 1995).

bankruptcy internally as well as externally and to the verge of hyperinflation.

The second question is whether the people in the EEFSU will respond to the opportunity arising from the dual-track reform. In China, the engine of growth comes from the emerging nonstate sectors, which derived their labor force in a large part from the unsubsidized agricultural sector. Agricultural labor force in EEFSU was very small. In addition, it is argued that all workers, including agricultural workers on the state farms and the collective farms, received heavy subsidies from the state. The argument then goes that only by ending the subsidization of the state sector was it possible to free labor from the state sector for the new non-state sectors in the economy. Therefore, the two-track gradual reform, which continues to give supports to the state sector, could not work in that context (Sachs and Woo 1994). However, even there are some opportunity costs for leaving the state sector, the incentives to leave the state sector also depends on the expected gain from working in the non-state sector. In China, the margin of free market prices to the planned prices is 20 to 40 percent in 1980-91 (Gelb and Jefferson, and Singh 1993). The price margins could be 3 to 4 times or more in EEFSU (Aslund 1989).<sup>48</sup> Therefore, even the opportunity costs for a worker to shift to the nonstate sector were higher in EEFSU than in the transitional economies in China, the expected gains were also much larger there. Kornai (1986) observes that in Hungary many of the people working in the private sector were in the highest income group. Aslund (1989, pp. 168-9) also cited many reports that in Russia some people working in the nonstate sector producing simple products for the markets and became millionaires.<sup>49</sup> Therefore, as commented by Kornai (1990, p. 36), the relaxation of certain restrictions was enough to let private activity mushroom again. Turning a blind eye toward people who disregarded the letter of the law was sufficient for all those activities normally regarded as part of the second economy to catch on. People in the EEFSU before the transition were as responsive to profitable market opportunities as people in the transitional economy in China.

The transition from a Soviet-type plan economy to a market economy has proved difficult for several reasons. These include a lack of serviceable institutional framework, the severe distortions in the price and production structures, and the relative dearth of historical precedents from which the transition economies could derive lessons. The big bang approach cannot deliver its promise of jump to a market economy because the stabilization cannot be achieved immediately and the privatization is to last a long time. As such, the crucial issue of the transition is to have a strategy of sequencing reforms that identifies the most pressing shortcomings and concentrates resources on the relaxation of binding constraints and that aspires to improve economic performance, leading to higher material welfare and better life chances (Rawski 1995). The IMF/World Bank's macro-first approach may be appropriate for the non-Soviet-type economy, where market institutions are more or less intake and the structure imbalance is less severe than the Soviet-type economy. To use the famous analogy in a somewhat different version, "When the chasm is narrow, it's all right to jump over it". The stabilization program can achieve its goal immediately and the economy can soon operate in a normal market environment. However, in the Soviet-type economy, the chasm is too wide and too deep. A jump without careful preparation will definitely result in an astonishing fall into the ditch. Under such a situation, it is desirable to fill and to narrow the

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<sup>48</sup> One example is the exchange rate. In China the margin of market rate to the official exchange rate before the exchange rate unification in 1994 was at most 50 percent throughout the whole transition period. In the former Soviet Union, the official exchange rate was US\$ 1.5 to one rouble in 1991. A tourist could easily get US\$ 1 for 12 rouble on the street of Moscow.

<sup>49</sup> Aslund (1989, p. 169) cited one example, the average income per member was 12,500 rubles a month in a cooperative, which was 60 times of the average Soviet wage and 10 times of the top official salaries.

chasm first before making the jump. China's experiences suggest that it is possible to take advantages of the severe incentive suppression and serious structural imbalance in the Soviet-type economy to have a strategy of sequencing reforms that improves incentives and reduces distortions in a gradual manner and obtains economic growth simultaneously in the transitional process. From what I see, the useful lessons from the "micro first" approach to transition in China can be summarized as follows:

First, the government can take measures to improve the micro incentives by granting partial managerial autonomy and profit-sharing to the micro units so as to increase incentives and to allow the economy to move closer to the production frontier. The government should encourage the local and private initiatives in institutional innovations in this stage.

Second, the government can introduce a dual-track price and allocation system allowing the resources to be allocated increasingly by the micro units to the previously suppressed, more productive sectors, while maintaining the normal production of the SOEs.<sup>50</sup>

Third, the government can liberalize the price when the commodity is largely allocated by the market track.

Fourth, the government gradually introduces and strengthens the necessary market institutions during the above process.

#### **IV. CONCLUDING REMARKS**

In this paper, I attempt to draw some lessons from the experiences of China's transition from a centrally planned socialist economy to a market economy. Even though the reform in China was not guided by a well-defined blueprint, the transition have followed a path that can be explained by the theory of induced institutional innovation (Hayami and Ruttan 1985, Lin 1989, North 1990). The traditional Soviet-type economic system was an internally consistent structure of institutional arrangements, consisting of the distorted macro-policy environment, planned resource allocation mechanism, and puppet-like micro management units. The traditional system made the mobilization of resources for building up the strategy-determined capital-intensive heavy industries possible in a capital-scarcity economy. However, its economic efficiency was low. The transition in East Asia started with granting partial autonomy to micro units, which cracked the integrity of the traditional system. Once the integrity of the traditional economic system was cracked, the institutional changes evolved in a way that was self-propelling toward the replacement of the traditional system with a more efficient market system. In the process, the efficiency of the SOEs was improved through greater autonomy and by meeting competition from the nonstate sectors. However, the dynamism of the economy came mainly from the swift entry of new, small, nonstate enterprises. The old planned allocation mechanism and distorted macro-policy environment gradually became unsustainable and were discarded. During the reform process, the State, the enterprises and the people have had sufficient time to make adjustments to the new market system. The reforms benefit the majority of people as the economy has maintained strong growth throughout the whole process.

By contrast, the big bang approach adopted in EEFSU also attempts to replace the inefficient economic system with a more efficient market system. The privately owned small

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<sup>50</sup>Prices here includes foreign exchange rates, wages rates, interest rates, and the prices of all products and services.

firms emerged immediately after the lifting of the ban on private enterprises, which became the driving force of economic growth in EEFSU (World Bank 2002). However, the privatization of medium- and large-scale SOEs was prolonged and proceeded slowly. This resulting enterprise mix is in fact similar to what emerged in the transitional economy in East Asia. However, China's approach did not disrupt the production in the State sectors. Therefore, the gradual approach in China achieved the same positive effects of the big bang approach but avoided its costs. If transitional costs and the path-dependence of institutional changes are taken into account, China's gradual approach can be argued to be both theoretically and empirically preferable to the "big bang" approach (Wei 1993).

The adoption of an approach to transition in a country reflected the socio-political condition in that country at the time of transition. When the transition began, the communist parties in East Asia were firm in control and their purpose was to improve the system rather than replacing the system, while in EEFSU, the communist parties as well as socialist ideology had already collapse. However, the adoptions of a specific approach may also reflect cultural differences. For the transition from a wartime economy after the World War II, the Germany adopted a big bang approach and Japan adopted a gradual approach (Teranishi 1994). In the 1950s, over 90 percent of manufacturing outputs in Taiwan was produced by the state sector. Instead of privatizing the SOEs, Taiwan allowed the private enterprises to grow and to become gradually a dominate sector (Lau 1993). The Asian culture stresses pragmatism, values measures that will bring Pareto improvement in an incremental manner, and tends to twist the ideology to fit the reality instead of the other way around.<sup>51</sup> Western society seems to be more ideology oriented than the Asian society. Drawing on the history of the last three centuries of England and other Western economies, Schultz (1977), finds that the alteration and establishment of various distinct political-economic institutional arrangements in the Western society were induced or shaped by the dominant social thoughts in those times. In addition to the collapse of communist parties, the adoption of a big bang approach in EEFSU reflected the influence of prevailing "capitalist triumphalism" in the society (Wiles 1995). A dominant social thought may not be the "correct" one in the sense that the solution embodied in the thought will lead to a higher income growth rate and more desirable income distribution. Fundamentally, social thought is limited by the bounded rationality of the human mind. When the transition in the EEFSU started, Western policy advisers thought the process was a well-trodden path (Sachs 1993, p. 2) and it was possible to jump to a market economy. The experience in EEFSU now shows that, even though a big bang approach is adopted, the transition from a centrally planned economy to a market economy will still be a slow, gradual process (World Bank 1996, Lavigne 1995, chapter 10). If the gradual nature of a transition process had been known to the majority of people at the beginning of reform, the approach adopted in EEFSU might have been different.

The lessons of the China's transition, that were summarized in Section 3, may be useful for designing reform policies in other economies where the Soviet-type heavy-industry-oriented strategy or other similar development strategies have been adopted under capital-scarce conditions.<sup>52</sup> The lessons may also be useful for EEFSU, because their transition to a

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<sup>51</sup> For example, the Chinese government often labels any thing that works for China as socialist. From this point of view, there is no confusion for a Chinese decision maker about what is a socialist market and what is the meaning of socialism with a Chinese character.

<sup>52</sup> In essence, the heavy industry-oriented development strategy is a forging-ahead strategy in which the government distorts the macro-policy environment in order to facilitate the development of some industries which exceed the stage of development dictated by the comparative advantages of the economy's endowment structure. The import-substitution strategy widely adopted in Latin America is another example of the forging-

market economy has not completed yet. However, it is important to recognize the difference in the stages of development, endowment structures, political systems, and cultural heritage in each country. To be effective, the actual reform measures should take the economy's initial conditions into consideration and exploit all favorable factors within and without the economy.<sup>53</sup> Therefore, the specific design and sequence of reforms in an economy should be "induced" rather than "imposed". A simple transplantation of successful measures in an economy will not guarantee its success in other economies.

Even though the overall performance of China's approach to transition is very remarkable, the transition in China is not complete yet. Because the reform in the macro policy environment, especially the reform in the interest rate policy, lags behind the reforms in micro management institution and resource allocation mechanism, institutional arrangements in the economic system become internally inconsistent. As a result of the institutional incompatibility, rent seeking, investment rush, and inflation are internalized in the transition process. To mitigate these problems, the government often resorts to traditional administrative measures and causes the economy's dynamic growth come to halt and the regression of institutions. From the above analysis one can see that it is imperative for China to complete the reform in macro policy environment so as to remove the institutional incompatibility and so that the economy can set forth a sustained, smooth growth path. In addition, as the Chinese economy becomes a more matured market economy and more integrated with the world economy, it is essential for the continuous growth of the economy to establish a transparent legal system that protects property rights so as to encourage innovations, technological changes, and domestic as well as foreign investments in these economies.

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ahead development strategy.

<sup>53</sup> For example, the presence of overseas Chinese, the existence of a large stock of industrial resources in the rural sector prior to the start of reform, and the continuation of substantial marketing activity throughout the agricultural sector during the entire socialist period are among the important initial conditions that have contributed unequivocally to the success of China's reforms.

**Grzegorz W. Kołodko:** Thank you indeed, Professor Lin, for your excellent, clear and inspiring presentation. The lecture delivered today will soon be available for further readings and considerations on our website (<http://www.tiger.edu.pl/english/publikacje/dist.htm>) and later published in the series of distinguished lectures. Now I would like to encourage all of you, especially our students and our guests, to raise issues, to make comments, and to ask questions.

**Paweł Sobczak, Little Tigers Science Club:** Professor, following Churchill's words that 'democracy is the best system that we know so far', I would like to ask you whether you believe there will be Western-style democracy in China one day, or maybe some new kind of democracy?

**Justin Yifu Lin:** Well, I think it's a very important question. I'm sure eventually China will have a democratic system, as eventually we all will have this kind of system. In terms of economic development and transition, however, I think to maintain the state control is very important. The ability for the government, first, to mobilize the resources for the protection and, at the same time, to contain the necessity to subsidize is very important. So, in this process, I would say that the Chinese government did the right things. That is: to achieve economic growth, first. We can also see, not only in China, but in the East Asian countries like Japan, Korea, Taiwan, Singapore, in their early stage of development they were all under a certain kind of authoritarian regime. They did not introduce democratic system until they reached the certain stages of their development. In Japan, in fact, we can say that they only introduced the system in the 1980s. In Singapore, they have not introduced the system yet. In Taiwan, they introduced the system in the 1990s, in Korea - also in the 1990s. The second observation is that even after introducing democracy to Korea and Taiwan, their economies started to stagnate. Koreans introduced democracy in 1991, while their income per capita was about 9,000 USD. Now it's still 9,000. Taiwan introduced direct presidential elections in 1995-1996. In 1992, Taiwan per capita income already reached 14,000 USD. Now, ten years after, their per capita income is 13,000 USD. So their economies are stagnant. Naturally, it seems that, certainly, not all authoritarian regimes are going to do well. We had a lot of dictatorship, authoritarian regime in Latin America, in Africa – they did not do well. Nevertheless, we did not observe any developing countries, which have had democracy and dynamic economic growth at same time. I would, therefore, say, maybe it's more important to get rich first. And when you are rich enough, then elections may become important because at that time growth may not mean so much anymore.

**Zdzisław Góralczyk, Former Poland's Ambassador to the PR of China:** I would like to congratulate you on your lecture today and ask some questions. China is now trying to get a status of market economy. Could you, please, explain shortly what you think is a difference between what you call socialist market economy right now in China and a market economy in traditional capitalist or even new capitalist states.

The second question is concerned with the continued growth of Chinese economy, which we have witnessed for over 25 years. I have observed China in many different periods, the 1950s, the Great Leap Forward, the Cultural Revolution, and now the policy of reform and opening up – the Long March continues. However, some foreign experts, in view of the recent difficulties of Chinese economy, shortage of energy, some shortage of resources, say that you may create problems for the international market, as the prices of needed commodities are rising. They also speculate that the lack of democracy might eventually cause an economic crisis or big slowdown of your development. What do you think of such speculations?

**Justin Yifu Lin:** About the market system with Chinese characteristics. First, no two countries have had exactly the same system, even the developed countries. We know the market system in England operate differently from the market system in France or in Germany. And we also know that the Japanese system is quite different from the European system and so on. So we will not have any system that is exactly the same. Consequently, you are going to have a system with national characteristics anyway. Second, about the socialist system with Chinese characteristics. I think that is a very important theoretical equation of Deng Xiao Ping. Whether a system or a basic institutional arrangement is socialist or not depends on three characteristics. The first characteristic is that whether this kind of institution contributes to the continuous improvement of productivities. Second, whether a system is socialist or not depends on whether this institution or system contributes to the strengthening of national power. The third one is that whether a system contributes to the continuous improvement of people's well-being or not. So as long as it contributes to the productivity, national strength, and the people's well-being, it's socialist, according to the Chinese definition. So I don't think it's a very good approach. Very often, in other countries they want to have certain kind of socialist system according to textbook prescription, according to ideologies. But in China we just do it another way. Socialism has become just some kind of a description of a good system. We don't care if other people call it market system or capitalist system; we call it socialist system as long as it contributes to these three aspects of human life or economic achievement.

And answering your second question – yes, now there is a lot of attention paid to the need for China to import resources, energy, gas and so on. The price is increasing, and people are saying that it may cause the Chinese system to collapse. Since the reforms started in 1979, every year people have pointed to some constraints and said that China would collapse due to those constraints. In the past 25 years, almost every year, you have a new reasoning. But China continues to grow. So, on the basis of past experience, we can find the pessimism currently may not be found. I don't think it is found, for several reasons. If because of China's import, the energy price increases, than we are going to adapt. First, people will start to conserve the energy; they will use the energy more efficiently. Second, we are going to introduce some new kind of technological innovation, to find substitute for gas, for oil, for other kinds of national resources, and with this, too, improve the efficiency and also technological innovation; I'm sure, there will be enough resources for the growth of China, and for the growth of other countries.

**Waldemar Hoff, WSPiZ:** Professor Lin, I would like to let you know that next semester we open a course in Chinese language, and that we are going to have two Chinese professors delivering courses on business in China. And then I have an observation to share that the Chinese model of transition does not seem that remote from the Polish experience, unlike in Czech Republic and former Eastern Germany, because what we might consider a “big bang” in the 90s was actually a culminating point following a dual system that we have always had in Poland, like for example in the agriculture sector - we had private ownership for all these forty years before the “big bang”, and then we had private ownership of services, private ownership of small crafts. And finally the question: As a business lawyer I cannot help but ask – what was the role of law, of legal reforms, were there any major legal reforms behind these economic reforms, or, in other words, do you attribute your success to these legal reforms, or, you are successful, because you were working, sort of, apart from the law?

**Justin Yifu Lin:** I thank you for the question and the observation. In fact, from my own observation, the Polish approach to reform was in a way very closely related to the nature of

the reform in China. If I understand correctly, although you tried to introduce “shock therapies”, what I understand, in Poland you did not immediately privatize large SOEs. You only introduced price liberalization and so on. So, in spirit, your reform approach is close to the reform approach in China. We introduced the reform of SOEs gradually, strengthening the fiscal discipline also gradually, and during this process the government would still maintain a certain kind of protection and support in order to prevent the immediate collapse of the SOEs. I agree. The Polish experience is more like the Chinese experience. Second, the legal reform in China was introduced also gradually, when there was a need for it. For example, at the beginning of transition, China would not allow private ownership. But because of the emergence of the private sector, there was a need for ownership protection. The government, however, did not introduce the protection of private property until last year. And you can see that the Chinese system is not to enforce that kind of legal system before this kind of legal protection or regulation was demanded by the market. Only when you have a market, a demand for this kind of legal system, and then the government introduces this kind of legal system. So that is also so kind of a gradual approach.

**Kamil Łowicz, Little Tigers Science Club:** My question is what the Chinese government is doing now in order to reform SOEs. What kind of action is it taking?

**Justin Yifu Lin:** That’s a good question. As I said, the SOE sector reform is crucial for the completion of transition to market economy and there are, in fact, two troubles with the SOEs. One is social burdens. They need to take care of a lot of redundant workers. The other social burden is that they need to take care of a lot of retirement pensions for all of their retired workers. You know, in the past, pensions or support for the redundant workers were coming from the state budget as a fiscal appropriation. Now an individual firm needs to pay this kind of costs. That is one problem. And the other problem that I mentioned, I call it the ‘strategic burden’ – they are in the sectors, which are not viable. How to deal with these two issues? For the social burden, the government introduced, first, the social security system, to take care of the retirement pension from the SOEs. And second, the government introduced some kind of a retraining system to allow the SOEs to lay off the redundant workers. And in this kind of lay off program, on one hand, the government must continue to provide minimal support to this kind of layoff workers. At the same time, the government retrains them, helps them find new jobs so that this kind of social burden can be eliminated. That’s one thing. And regarding the strategic burden, these sectors, these enterprises, they are in the capital-intensive sectors, but China is a kind of scarce economy. The government introduced four policies depending on the nature of the output. If the output is necessary, essential for the national security, under that kind of situation the government will continue to provide them with some kind of fiscal appropriation like in any other country. Like in the US or in Russia, if this kind of output is considered as essential for the national defense, or the national security, certainly, the government needs to continue their support. Second, if their output is not sensitive for the national security now and the output has a large domestic market, for example, automobiles or telecommunications, they can use the market to get access to foreign capital in two ways: either list them in the international capital market so they can have access directly to the different capital, or to form some kind of joint ventures with foreign companies. All of auto-producers in China now basically become joint ventures with foreign auto-makers, like telecommunication and so on; now they are listed in the international equity markets, capital markets, so they can address their capital shortage issues. The third one – if their output does not have a large domestic market, certainly, they cannot get access to international capital, and for that kind of situation the government encourages them to shift their production to a new market niche, which is more labor-intensive and which also has a large domestic market. We

do have many successful examples for that. For example, the most competitive color TV set producer in China used to be a military equipment firm, they produced radars; now they produce color TV sets. Obviously, if they could produce radar, producing color TV sets is like a toy for them. And also we have a very successful motorcycle producer. They used to produce tanks. Now they produce motorcycles, and they are very profitable. That's the third category. But to shift their production lines, they require some kind of engineering capacity or managerial capacity. If they do not have any engineering capacity and managerial capacity, the only way is to allow them to go bankrupt. But I would say firms in the first category and the last category are very small. The majority of the firms are in the second or the third category. So with these two approaches to the reform we eliminate the policy burdens. Without the policy burdens, the manager should be responsible for the profitability of the firm, and the government is not obliged to subsidize them or protect them anymore. I think only under that kind of situation the reform in the SOE sector can be successful, and that is the direction that China is going for and it is also the policy that China is implementing now. Certainly, doing that requires time, requires ingenuity in dealing with all kinds of issues related to what I just described.

**Kamila Lipska, Little Tigers Science Club:** I study banking, and would like to know when the banking system in China will be liberalized?

**Justin Yifu Lin:** That is also a very important issue. China became a member of the WTO in the year of 2001 and promised to allow foreign banks to enter in the year of 2006. Foreign banks can now come to China, set up their branches, so the banking sector liberalization, in a way, is introduced. However, as I mentioned, the government still relies on the banking sector to subsidize the SOEs. So the government also needs to eliminate this policy burden of the banking sector before total liberalization can be introduced. And so successful reforming of the banking sector depends on successful reforming of the State Owned Enterprises and, certainly, as I say, although now we are going more in the right direction, we may not be able to complete the SOE reform immediately. That means we cannot really liberalize the banking sector immediately. How to solve this kind of issue? On the one hand, we promised to allow foreign banks to enter; on the other hand, the local bank reform relies on the successful reform of SOEs, but SOE reform takes time. In fact, the liberalization in the banking sector is partial. The government allows the foreign banks to enter, however, they need to get approval from the Chinese government. They cannot set up their branches in China freely. Second, their activities, their transactions also need to be approved. If they want to start a new type of business, they need to get an approval. This will give the Chinese government time to measure what kind of competition the banking sector in China can endure and, consequently, to mitigate the potential shocks to the banking sector. However, I do agree that the eventual liberalization of the banking sector is necessary for the healthy operation of Chinese economy, but it will be as I described – a lot of distortion in the whole system. Liberalizing one institution you may cause a shock to the whole system and cause some kind of crisis.

**Andrzej Bolesta, TIGER:** Professor Lin, I have some comments and questions to share. China is currently a country of rapidly increasing standard of living disparities; especially, between poor central and western provinces and much more developed eastern provinces. What is being done to reverse the trend? What is the policy of catching up of poor regions? My second question is about rural areas reforms. There are still about 850 million people living in the rural areas - most of them are employed in the agriculture sector. However, not more than 350 million can be employed in this sector if we would like to enable development and modernization of the agriculture, which would guarantee food security for the populous

country. Now the question is: how can we shift about 500 million people out of the agricultural sector to other sectors of the economy? We have to realize that it is not 300 thousand people, not 5 million, it is 500 million people who we are talking about, who in a foreseeable relatively close future have to be moved into other sectors of the economy.

**Justin Yifu Lin:** Yes, these are very true, important issues for China, as far as the regional disparities are concerned, and also how to improve the income of the farmers. In a way, these two issues are related. If we can successfully address the issue of SOEs, then the government will not be obliged to subsidize SOEs, and the government can liberalize the prices of agricultural products, the prices of natural resources. When the coastal areas become more industrialized, they will import more agricultural products from the central part of China, then the price of agricultural products will increase. Growth in coastal areas will benefit the people in the central part of China. Similarly, when the coastal areas grow, they import more natural resources from the western part of China. Then the prices of natural resources will increase. People in western part of China will benefit from the coastal growth. The regional income disparities will not continue to grow, as we observe now. Second, without this kind of market mechanism you cannot get rid of all kinds of regional disparities. And to further reduce the regional disparity, migration of people, mostly farmers, is still necessary from the central and western parts of China to the industrialized areas of the coast. We need to find jobs for them, and the most important way to create enough jobs is to develop labor intensive sectors, which are China's compared advantages. And if you can develop labor intensive sectors, certainly, they will create enough jobs to absorb all migrating labor force. China needs to rely on its comparative advantages, and the Chinese comparative advantage is in the labor-intensive sectors. So, I will say, developing labor intensive sectors, on one hand, can further reduce the regional income disparities and, at the same time, maintain Chinese competitiveness in the global market. And so we can kill two birds with one stone. But to develop labor intensive sector also require the change in the development thinking. Because in the past, the Chinese tried to develop capital intensive sectors considering that a symbol of modernization. Certainly, heavy industries were not considered so important but this kind of development concept is still there. Now the heavy capital intensive sectors were repressed by IT sectors, biotechnology sectors; and still there is some thinking that to make China a modern country we need to develop the IT sectors, we need to develop the biotechnology sectors in order to compete directly with the advanced countries. But if the Chinese government had tried to pursue this kind of erroneous strategies, it would be against China's comparative advantages. And under that kind of situation, the regional income disparity issue you just described cannot be eliminated.

**Piotr Błoński, Little Tigers Science Club:** What kind of impact will the appreciation of the yuan have on the competitiveness of Chinese economy?

**Justin Yifu Lin:** Recently, that has been a hot topic in the newspapers. Some people argue that the Chinese yuan was undervalued, and that caused the competitiveness of Chinese export; and because of the undervalued Chinese yuan, many jobs in other countries were stolen by the Chinese economy. Many countries viewed this as some kind of reason for the poor performance of their economies. However, I think that this kind of analysis is not real. This analysis cannot sustain with careful economic reasoning. In fact, for example, in the US, they always say that the Chinese yuan was undervalued, so they import so many products from China. However, if we look carefully at the import-export from China to the US, all of them are labor-intensive products like toys, textiles and so on. And the US do not have the comparative advantage in this kind of products at all. So, if China appreciates the Chinese

yuan, in fact, it's going to hurt the US. Because if China appreciates the Chinese yuan, the export of Chinese products to the US will become more expensive. Under that kind of situation, the US will either have to import from other developing countries or continue importing from China, but whatever they do, their import will become more expensive. It does not contribute to the increase of the US job opportunities. At the same time, it will increase the living costs of their workers, of their people, and so they are hurt if China really appreciates the Chinese yuan. However, before the elections, you know, they wanted to have some kind of a scapegoat for their own troubles, for their own economic failure; and because of the competitiveness of Chinese products it's the easiest place to find a scapegoat. And so this kind of accusations, this kind of argument, I would say, was mainly politically motivated. But now Bush has been reelected, so now, I'm sure, this kind of pressures will be reduced; because if they analyze the situation carefully, they will know: to appreciate Chinese yuan actually is not at their benefit.

**Grzegorz W. Kołodko:** Thank you very much. I think that we will be coming to the conclusions, because our students have other classes, but I would like to get your answer for two last general questions. One is about politics of the process and another is about its economics. As for the politics: by all means, democracy is a value per se, a value itself, but what we are discussing here, in a certain context, is the relation, the feedback between democracy and economic development or between the lack of full-fledged democracy of the parliamentary western style and economic development. And that is true that China has accomplished a great deal of economic progress under a non-democratic political regime, but it is very unlike a non-democratic regime, and we do not have many cases from the world where there is such a remarkable progress. Most of the time there is an economic failure, sometimes even a disaster, as in the case of many Latin American countries in the eighties, or all of the time in sub-Saharan countries. So how would you answer the question, 'What makes China so special? How come you have such an enlightened leadership without democracy?' It wasn't the case of Brazil for many, many years, it wasn't the case of Congo, why it was the case of China, how did things happen the way they do? And as for the economics, would you take a risk to claim that the mechanism works in such a way that we may expect a continuation of this robust growth for another 20 years or so? If there is just the rate of growth of 7 per cent, 7.2 per cent on average, for the next 20 years, it would quadruple China's GDP. Then China will really become the second world economy, not on the purchase power parity basis, but on the exchange rate basis, whatever the exchange rate will be. So is it sustainable, considering the dynamics of the economic and political process, which is at the pipeline in China, to keep going at such a remarkable pace for another generation?

**Justin Yifu Lin:** Certainly, there is no easy answer to your questions. The first one about democracy and growth, and also about authoritarian regimes as poor performers. Most of the authoritarian countries' economic performance was very poor. But, at the same time, we also observe most of the developing countries - even if they have democratic systems, their economic growth is also very poor. We only observed a few countries in East Asia that perform very well, and we know that when they performed very well they were under more authoritarian regime. So how to maintain authoritarian regime and, at the same time, to have good economic performance? I think that is the subject that I devoted the past 20 years to understand, and I'm sure you also devoted a lot of time to understand that. From what I see, to have good economic performance, the most important thing is to follow the country's comparative advantages in the development process, and in Japan, in Taiwan, Korea, Singapore, you can see - their economic development follows a certain kind of stages. They all started with labor-intensive sectors, and they were very competitive in their domestic

markets, in international market, because these kinds of labor-intensive sectors were consistent with their comparative advantages. And because they were consistent with their comparative advantages, they can have larger market sales, domestically and internationally, and they can enjoy high profits from production and so on. Consequently, they accumulate capital. When they accumulate capital, their internal structure changes, their comparative advantage changes, and then they gradually upgrade their industries and their technologies. That is the pattern that we observed in Japan and in the four 'small dragons'. On the other hand, most of the developing countries, no matter whether they are under a democratic regime, as in India, or not, in their early stages of development, they wanted to develop the modern sectors, heavy industries sectors, capital-intensive sectors, when they are very capital-scarce, being low income economies. In this kind of a situation, they require all kinds of distortion and government intervention that we just discussed in my presentation. And with that kind of necessity to intervene, to distort their economic system, no matter if it's in a democratic system, or in an authoritarian, or in a socialist system, their economic performance is going to be very poor. So my own understanding, my own thesis is that following the comparative advantage is a guideline for economic development, which is a crucial thing. And in an authoritarian regime, if they follow this kind of comparative advantages in their development plans than their economic stabilities and their dynamism can be maintained, which is more important than the political system. And, in terms of transition, because most of the developing countries started with distortion, started in wrong strategies, they need to engage in transition. And to engage in transition, I think, an authoritarian regime will be useful if they know the direction of the transition and if they know how to engage the transition into the gradual approach as I just described. In that kind of transition, only with some kind of authoritarian government you can maintain the stability and, at the same time, allow the market entry to have its dynamism. I think, that is actually not an easy question, and, in terms of implementation, it's also going to be very hard even if the government has the characteristics of authoritarian regime. It's not guaranteed that they will be successful, but it may be a precondition for the success of transition.

The second question - the sustainability of growth. Yes. I do have competence on that. I think that if we want to analyze the potential for sustainable growth, the most important things are continuous technological changes. According to Ernest Madison, he found that before the industrial revolution in the XVIII century, the average annual growth of GDP in any country was less than 0.05% for about 2000 years. And after the industrial revolution, the GDP growth on the average was about 2%. That is an increase of about 40 times. This kind of 40 times increase in GDP growth, certainly, happened because of the rapid, continuous technological changes during the industrial revolution. And for a developing country, if they follow the right approaches, if they rely on technology imports to utilize the technological gap with the advanced countries, it's a main driving force for their technological change. Then they can archive technological innovation at a very low cost, because the cost of imitation is smaller than that of doing R&D. If you compare the current stage of economic development in China, from any socio-economic indicators, including life expectancy, infant mortality rate and agriculture as percentage of the GDP, education and labor and so on, you'll find current stage of development in China is very similar to the stage of development of Japan in the 1960s. The current stage of development in China is very similar to the stage of development of Japan in the 1960s, and also very similar to the stage of development of Korea in the 1970s. And we know that for Japan in 1960-1988 it took 28 years to achieve the same per capita income as in the US. Korea also, from early 1970s to nowadays maintains 30 years of economic growth. And with that I will say: potentially, it's possible for China to maintain another 20 or 30 years of economic growth. I think the technological potential should be

there, but certainly tapping into that kind of technological potential requires many things. One thing is for China to complete the transition from the planned economy to market economy, and China should follow the comparative advantage in its stage of development. If China can do that, I'm quite confident that it will be able to maintain the dynamic growth for another 20 or 30 years.

**Grzegorz W. Kołodko:** Thank you very much, professor Lin, for your excellent presentation, for answering our questions, for being here with us. We're hopeful and also positive that there is real growth and real prospect for the future, so this is not only transition from the planned economy to the market economy, but also transition to the better future, and I wish you all the best. Thank you very much again for attending today's event, and maybe, since most likely this is our last meeting in this great company here this year, let me take the liberty to wish you, Mr. Lin and to Mrs. Kin as well a very Merry Christmas and a Happy New Year.

**Justin Yifu Lin:** Happy New Year.

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## The Formation of the Traditional Economic Structure in China

### Exogenous Development Strategy

#### a. Heavy-Industry

Oriented Development Strategy

#### b. Capital-Scarce

Low Technical Efficiency  
Agrarian  
Economy

### Endogenous Economic Structure

#### 1 Distorted Macro-Policy Environment

Structural Imbalance System

- i. Low Interest-Rate Policy
- ii. Overvalued Exchange-Rate Policy
- iii. Low Input-Price Policy

iv Wage-Rate Policy

v. Low Living-Necessity Price Policy  
Puppet-like State Enterprises  
Collective Farms

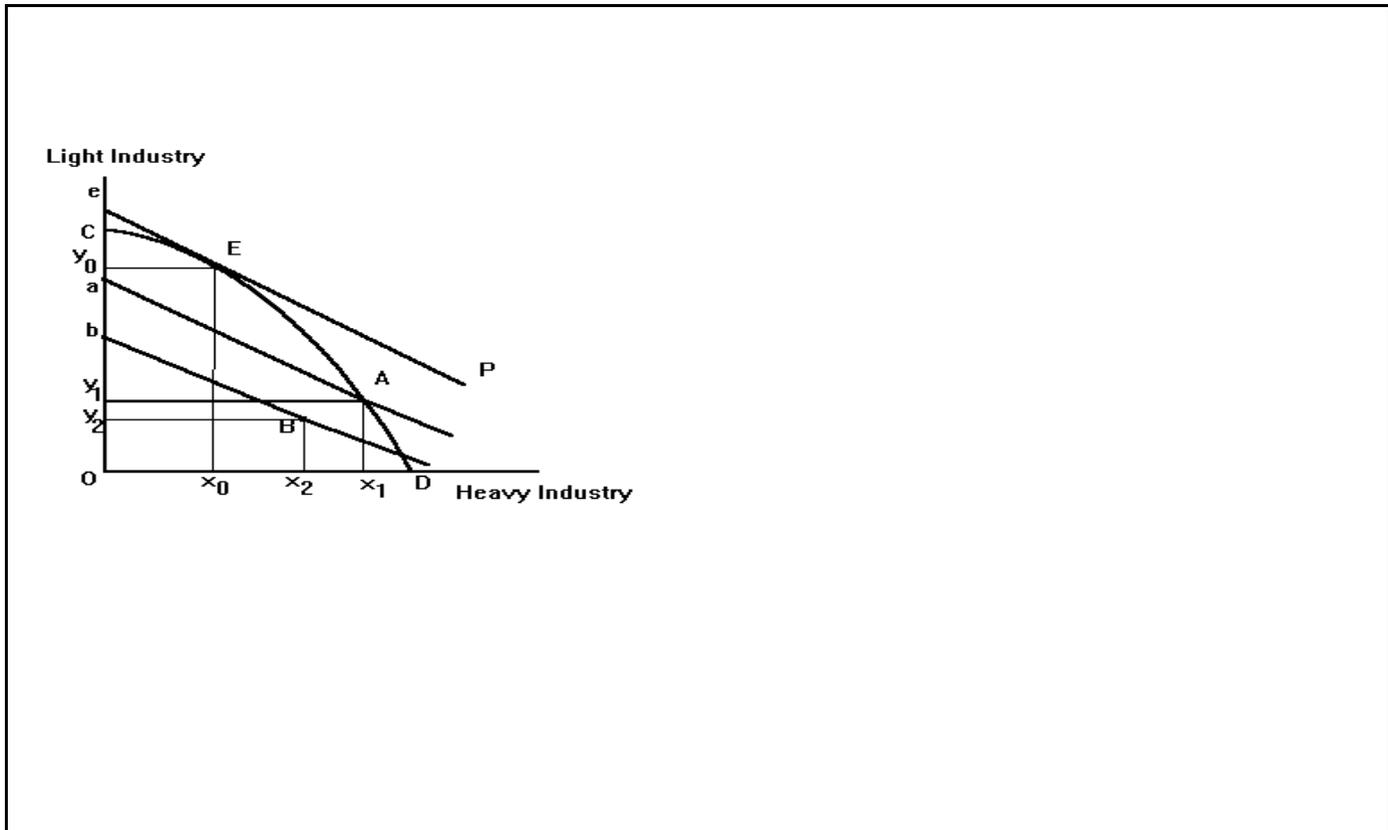
### Economic Performance and Economic Endowments

2. Planned Allocation

#### 3. Micro-Management System

Low Incentives

Figure



Figure

3:

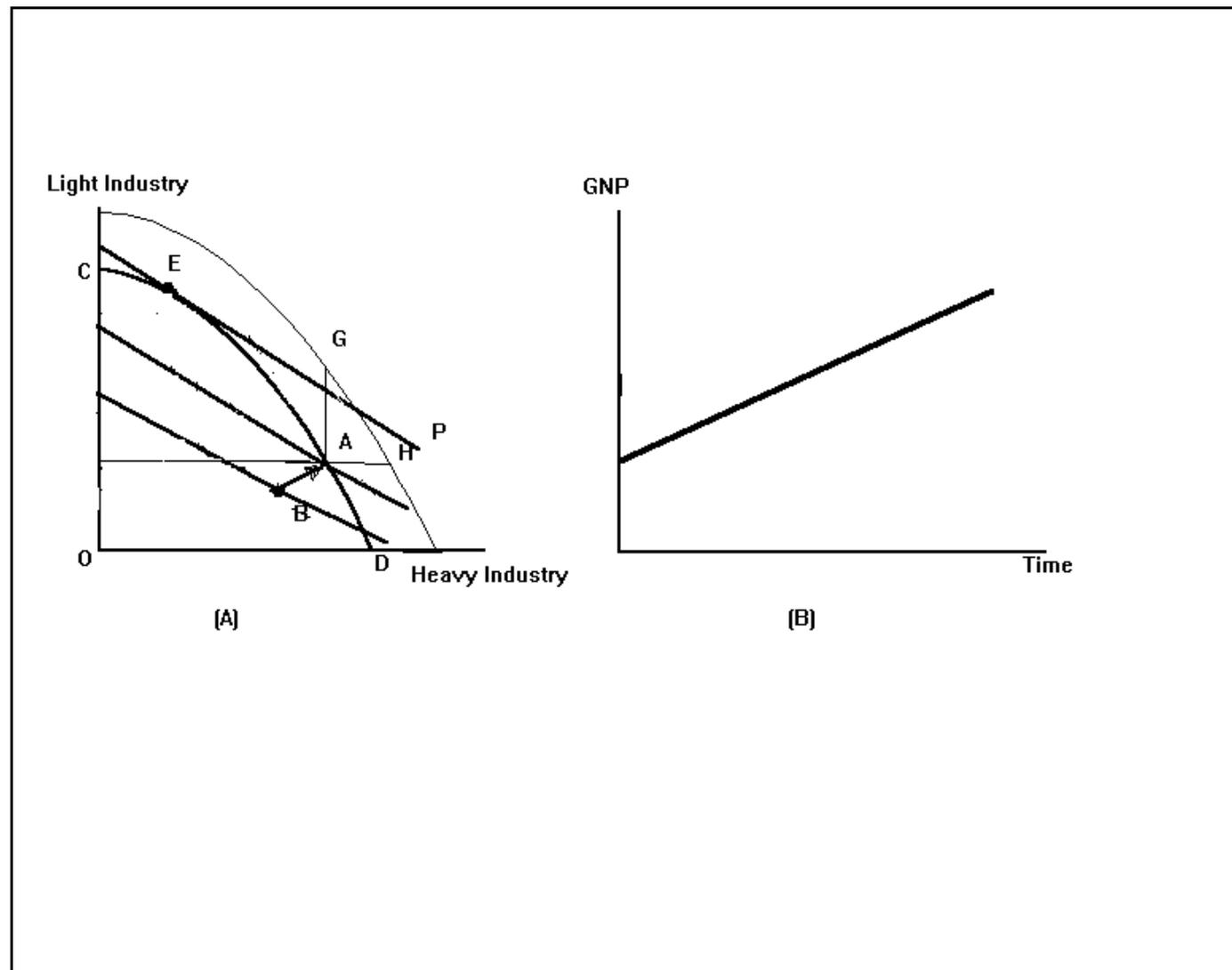


Figure 4

