

CHINA'S ECONOMIC GROWTH AND LABOR EMPLOYMENT
– STRUCTURAL CHANGE, INSTITUTIONAL EVOLUTION AND POLICY ISSUES

Report submitted to the International Labor Organization, for the Research Program

**“What are the Macro Drivers of Growth, Employment and Income in
the Chinese Economy – A Case Study in Policy Coherence and Sequencing”**

by

Dic Lo,

Renmin University of China and SOAS, University of London

diclo@soas.ac.uk

June 2007

I wish to thank Li Guicai for the preparation of a series of notes of background study for this report. Research assistance by Chen Xiaoping, Wang Na and Xu Jing are gratefully acknowledged.

SUMMARY

1. The achievement of the twin targets of sustained rapid economic growth and compensation-enhancing employment expansion has been the prime target of China's state leadership, particularly since the turn of the century. Achieving these twin targets is essential to the leadership's objective of "constructing a harmonious society".
2. In the first half of the reform era, China was able to achieve both rapid economic growth and rapid employment expansion, based on a labor-intensive growth path. The drawback is that the growth of labor compensation tended to lag seriously behind that of economic growth. This contributed to worsening income distribution and macroeconomic demand deficiency, which, in turn, led to the breakdown of the prevailing growth path.
3. Since the early-1990s, the Chinese economy has switched to a capital-deepening growth path. This has appeared to be capable of sustaining rapid growth and increases in labor compensation. The draw back is that its capability of job creation has been weak. Now, the sustainability of the growth path depends on whether productivity gains from capital-deepening industrialization can be channeled to the development of the labor-absorbing capacity of the services sector.
4. By design or by default, it appears that government policies in recent years have all been consistent with, even conducive to, labor compensation expansion and capital-deepening growth. These policies include using fiscal stimuli to boost investment, promoting the market power of workers, increasing the protection of labor rights, emphasizing income

redistribution to avoid worsening social polarization, and expanding social welfare provision. There thus arises the question as to whether this policy line is justifiable, or whether the government should rather shift to the alternative, more market-oriented policy line of promoting a return to the previous, labor-intensive economic growth path.

5. The desirability and feasibility of these two, alternative policy lines are assessed in terms of their potentials for achieving the indicated twin targets, and in relation to the broader economic conditions of institutional evolution, structural change and macroeconomic demand. The conclusion that follows the assessment: there are both advantages and disadvantages for the two policy lines, but, in view of the reality, the capital-deepening growth path appears to be more feasible than the labor-intensive one.
6. To achieve the twin targets of rapid economic growth and compensation-enhancing employment expansion, a nuanced and internally-coherent approach is always needed in the design of government policies concerning labor employment as well as those concerning broader social and economic development.

1. Introduction

China has experienced a process of rapid expansion in labor force and employment over the reform era, which started in the late 1970s. Between 1978 and 2005, the total of the labor force increased from 407 million persons to 779 million, while the number of employed workers increased from 402 million to 758 million. Put another way, during this 27-years period, the Chinese labor force almost doubled, increasing from a index-base of 100 in 1978 to 191 in 2005. And the number of employed workers increased by 89% during the same period.¹

This process of expansion in labor force and employment is of worldwide significance. In the first place, as of 2005 year-end, China's labor force accounted for almost 26% of the world total. And the share of employed workers was slightly bigger, of almost 27%.² According to the International Monetary Fund, weighing countries' labor force by their export-to-GDP ratio, the effective global labor supply quadrupled between 1980 and 2005, with East Asia contributing about half of the increase.³ And it is well-known that, over this period, there has been an accelerating trend of massive relocation of industry and jobs from the rest of East Asia to China. Using the same indicator of employment adjusted by the export-to-GDP ratio, as of 2005 year-end, China's share of the world total of workers producing for the global market reached 25%. No wonder, the condition of labor employment,

¹ All Chinese data from National Bureau of Statistics of China, *China Statistical Yearbook*, various years, unless otherwise indicated; www.stats.gov.cn.

² All world data from World Bank, *World Development Indicators*, various years, unless otherwise indicated; www.worldbank.org.

³ International Monetary Fund, *World Economic Outlook*, April 2007, ch.5; www.imf.org.

compensation and work standards in China has increasingly become a matter of worldwide concern in recent years.

From the perspective of domestic development, the significance of the expansion in labor force and employment could also be seen in connection to the concurrent development of the sustained rapid growth of the Chinese economy over the reform era. The massive expansion in employment, together with the fast increase in the productivity of workers, has been the immediate impetus behind the phenomenal output growth. As can be seen from the figures in Table 1, between 1978 and 2006, China's real GDP increased by more than 12 times. With employment increased by 90% during this period, real GDP per worker increased by more than 11 times. This is truly phenomenal, for a labor force that is more than a quarter of the world total. Meanwhile, the fact that the sustained rapid economic growth has involved the effective employment of the expanding labor force further implies that the main part of the Chinese population has benefited from the economic growth. It has thus been a prime target of China's state leadership that economic growth and employment expansion must both proceed smoothly, and in tandem. This has been especially true since the turn of the century, when the state leadership turned to emphasize the necessity of correcting the excess in social polarization caused by market reforms, with the objective of "constructing a harmonious society".

[Table 1]

Yet, the actual path of growth of the Chinese economy in recent years did not seem to fare well with this state objective. It is true that, over a main part (especially the first half) of the reform era, China's economic growth was largely a labor-intensive one. Growth was

largely propelled by the absorption of new entrants to employment. More precisely, it was a process of the massive transfer of labor from the rural-agricultural sector to industry and services, the latter two sectors (particularly industry) being characterized by much higher levels of productivity as well as much faster productivity improvement. Starting from the early 1990s, however, the economic growth path has tended to switch to a capital-deepening one. The substitution of capital for labor, particularly in industry, has become increasingly evident. As a result, the ability of economic growth to create jobs and absorb new labor to employment has tended to diminish. As can be seen from Table 1, the acceleration of output and productivity growth in recent years has not been accompanied by a comparable expansion in employment. Expansion in employment has tended to lag behind that of the labor force, quite in contrast to the situation prior to the mid-1990s.

The change in the character of the economic growth path should be seen in the broader context of China's economic transformation. Succinctly, the labor-intensive growth path that prevailed in the first half of the reform era was associated with a rapid expansion in consumption demand, which was in turn underpinned by an egalitarian pattern of income distribution.. Yet, with the progress of market reforms and thereby the growing unevenness of income distribution, consumption expansion has substantially slowed down and the economy has switched from supply-constrained to demand-constrained. From the mid-1990s onward, insufficient aggregate demand has prevailed in the economy. And investment has replaced consumption as the main driving force behind the expansion in aggregate demand. Consequently, China has tended to follow an economic growth path that is characterized by a process of “producing investment goods for producing investment goods”, meaning that it has

become increasingly capital-intensive – not only because of normally expanding investment, but also because of the tendency to substitute capital for labor in the production process. This capital-deepening growth path has proved to be capable of generating rapid productivity improvement, but only at the cost of leaving less and less of the expanding labor force to be absorbed into employment.

It is within this broader context depicted above that relevant government policies aimed at achieving the twin targets of both economic growth and job creation could be properly assessed. The prevailing path of economic growth might well be efficient, in the sense that it is characterized by fast productivity improvement due to technological progress and dynamic increasing returns. It might even be necessary because of demand constraints, and for the sake of upgrading Chinese industry and enhancing its competitiveness in the world market.⁴ But, without generating sufficient jobs to alleviate the pressure for employment, the growth path might not be socially sustainable. In this light, government policies in the areas of macro demand management, income redistribution, welfare provision, labor market regulation, as well as those concerning international transactions, all need to be designed in a coherent manner taking into consideration of the broader context. The achievement of the twin targets, of sustained rapid economic growth and income-enhancing employment expansion, is by no means a straightforward matter. There is no guarantee that maintaining the on-going growth path, or returning to the previous growth path, would automatically achieve the twin targets.

⁴ Dic Lo and Guicai Li (2006) “China’s economic growth, 1978-2005: structural change and institutional attributes”, Department of Economics working paper no.150, School of Oriental and African Studies, University of London, www.soas.ac.uk/departments/departinfo.cfm?navid=437.

The objective of this report is to undertake a study of the dynamics of China's economic growth and labor employment. Our approach centers around the concept of a growth path that involves structural change and institutional evolution, thereby exhibiting its characteristics in terms of the efficiency and sustainability of growth, labor employment and compensation, and the composition of aggregate demand. It is with this approach that we set out an integrative analytical framework incorporating both demand-side and supply-side factors in the growth process. And it is within this framework, and in light of the achievement of the twin targets, that relevant government policies are assessed.

This report is composed of five sections, of which this introductory section is the first. Section Two charts out the main trends of evolution of labor employment in China. Section Three analyzes the dynamics of China's economic growth and labor employment. Section Four assesses relevant government policies in the light of the depiction and analysis of the preceding two sections. Section offers some concluding remarks. The Appendix provides some simple regression analyses of some of the key issues of the topic.

2. The Trends of Evolution of Labor Employment in China

No doubt, economic growth and the expansion of labor employment have mutually reinforced each other, forming a virtuous circle in China's economic transformation, over the reform era. Viewing from the employment side, it can be inferred that the continuous massive transfer of labor from agriculture to industry and service is particularly indicative of the benefit of rapid economic growth, in terms of its ability to absorb unemployed or underemployed labor into the productive process. This is by no means natural, or easy. On the world scale and during the same period of time, the same trend of labor transfer has been far less visible in countries of comparable economic structure and growth record – in India, for example.

Figure 1 shows the evolution of the composition of China's labor employment by the three main economic sectors. It can be seen that, between 1978 and 2006, agriculture's share of total employment decreased by almost 30 percentage points, from 71% to 43%. In the mean time, the employment share of the secondary sector (i.e., industry plus construction) increased from 17% to 25%, and that of the tertiary sector (i.e., services) increased from 12% to 32%. And this very substantial change in the sector composition of labor employment occurred in the context of a massive increase of the total, from 402 million workers in 1978 to 764 million in 2006. In this connection, it is also of note that the Chinese statistical system counts all persons of the working age in rural areas as being employed. This is the case even if, in reality, there does exist a substantial proportion of unemployed or underemployed labor in rural areas. Given the large (though diminishing) proportion of rural labor in the total, existing data could thus substantially overstate the rate of employment of the total labor force.

Conversely, the transfer of labor from agriculture to industry and services implies increasing the employment rate.

[Figure 1]

This statistical anomaly notwithstanding, it can be inferred from existing data that the increase in employment is by no means a natural process automatically following the growth of the labor force. Two observations are of note from the trends of evolution of the growth of the labor force and employment charted out in Figure 2. First, for both of the two indicators, there was a very substantial decrease from the period 1979-1989 to that of 1991-2005. Second, whilst employment growth tended to outstrip labor growth in the first period, the opposite was the case in the second period. The first observation implies that it is true that employment growth depends on labor growth, i.e., a supply-side determination. The second point, however, implies that demand factors are also of importance in determining employment growth. Note also that the slow down of employment growth, and the lowering of the employment-to-labor ratio, from 1979-1989 to 1991-2005 occurred alongside a substantial increase in the average rate of economic growth from the first period to the second period. There must be a change in the character of the economic growth path which explains the slow down in employment growth.

[Figure 2]

To further pin down the role of demand and supply determinants of employment, it will be useful to contrast employment data with data of working-age population, participation rate and therefore the supply of labor. The flow data of these variables are given in Table 2, for various sub-periods of the reform era. As can be seen, in 1981-1985, the average annual

increase in the number of employment exceeded that of the labor force, implying that the flow of labor demand exceeded that of supply. In the next period of 1986-1989, the two sides were basically in balance. Thereafter, labor supply tended to exceed labor demand. In particular, in the 1996-2000 period (the period of deflation) when insufficient aggregate demand in the Chinese economy was the most serious, the average increase in labor supply exceeded that of demand by 6.52 million persons per year.

[Table 2]

As mentioned above, China's existing labor data of the rural-agricultural sector does not distinguish between employment and unemployment/underemployment. It will be useful to examine the data of urban labor alone, in order to derive more accurate information about the role of demand and supply determinants of employment. Table 3 seeks to provide a full picture of employment in China's urban areas. The massive increase in the number of economically-active population, from 100 million persons in 1978 to 294 million in 2005, is indicative of labor transfer to industry and services as well as the process of urbanization. The trend of falling labor participation rate, in the mean time, indicates the increase in the length of school education. Most worth-noting, there has been a trend of rising unemployment rate since the early-1990s. During the period 1991-2005, each year there was on average a net increase in labor supply by a magnitude of 10.29 million workers. But, the average annual increase in employment was only 7.05 million.

[Table 3]

It is often pointed out that an important reason for the rising urban unemployment rate since the early 1990s is the market reforms of China's economic system, particularly in the

form of the privatization of public firms.⁵ Between 1995 and 2005, employment with the state sector decreased by 47.73 million workers and that with the collectively-owned sector decreased by 23.37 million workers. The combined share of the two sectors in the total of urban employment, accordingly, decreased from 76% to 27% within this ten-year period (Table 4). In principle, this is essentially a restructuring process not necessarily resulting in a net increase in unemployment – for, workers laid off by the public sector could have been taken on by private firms. Yet, the reality was that, because of the increased profit-orientation of employers (both the private firms and the marketized public firms), the incentive to raise work intensity has risen while that of keeping surplus labor has basically decreased to zero. It is reasonable to believe that market reforms of ownership, and of the employment relations, are indeed an important reason for the rising urban unemployment rate.

[Table 4]

Ultimately, it is the fundamental change in the character of the economic growth path that has accounted for the performance in employment. The simple numbers are: the average annual rate of real economic growth accelerated from 9.50% during 1978-1989 to 10.15% during 1990-2006, whilst that of employment growth decreased from 2.96% to 1.04% and that of labor force growth decreased from 2.90% to 1.18% (in the period 1990-2005). Put another way, the average annual elasticity of employment with respect to real economic growth decreased, very substantially, from 0.31 in the first period to 0.10 in the second period. There should be no mistake to infer from these numbers that the capability of Chinese economic growth in job creation has significantly diminished.

⁵ Barry Naughton (2007) *The Chinese Economy: Transitions and Growth*, MIT Press, ch.8.

To see more clearly the evolution of the relationship between economic growth and employment growth, Table 5 gives the relevant data of the economy and of the three main economic sectors in different sub-periods. For the economy as a whole, the average annual growth elasticity of employment decreased from 0.34 in 1979-1989 to 0.09 in 1991-1996, then 0.34 in 1997-2002, and finally to 0.09 in 2003-2005. Even more worth-noting is the observation that the employment elasticity of agriculture and that of non-agriculture have moved in opposite directions. For agriculture, the value of the elasticity was 0.21, -0.38, 0.34 and -0.54, respectively, for the four sub-periods. The general trend, erratic though, is the outward transfer of labor from agriculture. For the secondary sector, the value of the elasticity was 0.57, 0.16, -0.05 and 0.40, respectively, for the four sub-periods. This is a case of continuously diminishing capability in labor absorption up until recently, although whether the rebound of the elasticity after 2003 is temporary or long-term remains to be seen. Finally, for the tertiary sector, the value of the elasticity has been strongly positive throughout, although even here there has been somewhat a decrease in the elasticity in recent years. This sector has become the main source of job creation since the mid-1990s.

[Table 5]

On the whole, the preceding exposition highlights two points. First, employment growth in China has been determined by both demand-side and supply-side factors. Second, the slowdown in employment growth reflects the slowdown in the transfer of labor from agriculture to industry and services. To analyze these two points requires clarifying the character of China's changing economic growth path.

3. The Dynamics of Economic Growth and Employment

Prima facie, there should be no mistake that the immediate dynamics behind China's sustained rapid economic growth over the reform era is a process of rapid industrialization. In international comparison, China's progress in industrialization during this period has far outstripped the rest of the developing world. Its real growth rate of industrial value-added reached 11.1% per annum in the 1980s, and increased further to the rate of 13.7% per annum in the 1990s. These rates are much higher than the average of all low-income economies (including China itself) meanwhile, 5.5% and 2.7%, respectively for the two periods, as well as that of all middle-income economies, 3.6% and 3.9%, respectively. They are also substantially higher than the average of the East Asian high-growing economies (again, including China), the star performers of the developing world, where the average annual growth rates during these two periods are both 9.3%.

Figure 3 charts out the levels of relative labor productivity of industry vis-à-vis the rest of the Chinese economy. It can be seen that the curve representing relative labor productivity calculated at constant prices has persistently and substantially exceeded that representing relative labor productivity calculated at current prices. This implies a transfer of the gains in productivity improvement from the industrial sector to the rest of the economy, via the effect of changes in relative prices. And the progressively widening gap between the two curves further implies that, over time, the indicated productivity transfer has tended to accelerate along with the progress in industrialization. The contribution of industrialization to China's overall economic growth is thus not simply a reflection of the fact that industry is part of the

economy. It also reflects a dynamic process where industry serves as an engine of growth of the non-industrial sector.

[Figure 3]

In the relevant theoretical literature, structuralist development economics – which draws heavily on the theory of transformational growth developed by Post-Keynesian economics – tends to consider industry (or the manufacturing sector) as the area where dynamic increasing returns are especially strong. The renowned Kaldor-Verdoorn Laws are based on the argument that productivity growth is mainly underpinned by the interaction between the technical peculiarity of manufacturing and favorable demand factors.⁶ Neo-Schumpeterian theory of innovation further posits that, along with technical and demand factors, the properties of the economic institutions in question are of equal importance. Demand-pulled productivity growth typically take the forms of learning-by-doing, induced investment in technological renovation and upgrading, and an increase in the economy-wide specialized division of labor, all under the rubrics “collective learning effects”. And the properties of the economic institutions in question refer to their capability in utilizing the favorable demand conditions for the generation of collective learning. Finally, there also exists a proposition in the literature stating that collective learning requires rigid institutions, i.e., long-term-oriented relationships between major stakeholders of the business system. In other words, there is a necessary trade-off between productive efficiency of this kind and allocative efficiency – the

⁶ L. Taylor (1991) *Income Distribution, Inflation, and Growth: Lectures on Structuralist Macroeconomic Theory*, MIT Press, ch.9-10. M. Syrquin (1994) “Structural transformation and the new growth theory”, in L.L. Pasinetti and R.M. Solow [eds.] *Economic Growth and the Structure of Long-Term Development*, London: Macmillan.

latter, according to standard neoclassical economics, hinges on the existence of flexible, market-determined institutions.⁷

These theoretical propositions, with their emphasis on the structural and institutional characteristics of an economy in the growth process, offer good insights for the analysis of the Chinese experience. Reconsider Figure 3. It is of note that the two curves representing the relative productivity of industry vis-à-vis non-industry, measured at current and constant prices, respectively, both tended to move downwards in the 1980s but then moved upwards in the 1990s. The downward movement of the curves in the first half of the reform era seems anomalous, for, according to the Kaldor-Verdoorn Laws, industry is typically characterized by faster productivity growth than non-industry. The likely explanation of the anomaly is that Chinese economic growth during this period was propelled by labor transfer of massive scales from agriculture to industry. This movement, while being in line with China's relative scarcity, did have negative impact on the relative labor productivity of industry – as the new entrants into the industrial workforce were mainly unskilled and the rapid expansion of the workforce exerted downward pressure on the capital-labor ratio of industry. Conversely, the upward movement of the curves since the early 1990s indicates the resurgence of a capital-deepening path of industrialization and economic growth.

The inference above is confirmed by what is clearly observable from Figure 4. It can be seen that the incremental capital-output ratio of the Chinese economy as a whole decreased steadily from 2.02 in 1982 to a low level of 1.51 in 1993, but then turned to move upwards to reach the high level of 3.55 in 2003. It might well be argued that the downward movement of

⁷ For a review of these theories, see D. Lo and R. Smyth (2004) "Towards a reinterpretation of the economics of feasible socialism", *Cambridge Journal of Economics*, 28 (6), pp.1-18.

the ratio in the first half of the reform era was largely due to improvements in Chinese economic institutions in the utilization of capital inputs. Yet, it is equally plausible that the movement reflects a tendency of substituting labor for capital, which is a salient feature specific to reforming or “transitional” economies. Characteristic of the development strategy of Soviet-type economies are their emphasis on heavy industrialization, and the associated capital accumulation makes it feasible for pursuing a new strategy of substituting labor for capital in the first stage of the reform era. Conversely, upon the exhaustion of the opportunities provided by the pre-reform capital accumulation, resuming a capital-deepening path of industrialization and economic growth might well be reasonable in terms of feasibility. In terms of efficiency attributes, such a development path most likely contradicts the relative scarcity, and hence comparative advantage, of the Chinese economy. But, theoretically, it could be associated with fast technological progress and strong increasing returns. The regression analysis presented in the Appendix to this report does suggest that, in Chinese economic growth, the sacrifice of allocative efficiency has tended to be more than compensated by the improvement in productive efficiency. The capital-deepening growth path appears to be efficient and thus sustainable.

[Figure 4]

It is necessary to go beyond the immediate dynamics of economic growth (which is common to experiences of late development) to study the underlying, structural-institutional causes of the dynamics (which could be China-specific). In view of the relevant literature on industry-led growth, and on the Kaldor-Verdoorn Laws indicated above, it is often posited that productivity growth in an economy is typically generated by the interaction between

particular structural-institutional arrangements and the demand environment – the two aspects combine to form a particular path of economic growth. Hence, further investigation into the dynamics of China's economic growth needs to take as its point of departure the delineation of the two sides of the interaction. For the demand environment, what is the source of demand that has underpinned Chinese industrialization over the reform era? It is noted that, on the world scale during this period, a main factor that has impeded late industrialization comes precisely from demand-side constraints. Also recall that China's rapid industrial growth has been achieved in the context of starting in the late 1970s with one of the highest industry-to-GDP ratios in the world. There must exist some peculiarities with China's economic growth path in the reform era such that the accelerating pace of industrialization has found its necessary demand conditions.⁸

A popular, yet only impressionistic, judgment concerning the demand question is to focus on the external dynamics of China's economic transformation, i.e., to put the emphasis on the country's very fast export expansion. This is part of the more general judgment that China has followed a path of labor-intensive, export-oriented industrialization over the reform era. But, according to national income accounting identities, what counts as a constituent of aggregate demand is net export, not gross export. As can be seen from Figure 5, in the period from 1978 to 1993 inclusive, there were eight years out of the total of 16 where China actually registered

⁸ This is another conspicuous legacy of pre-reform accumulation. In 1980, industrial value-added accounted for an astonishingly high proportion of 44% of China's GDP. This is lower than the Soviet Union (54%), on a par with Brazil (44%), but higher than South Korea (40%) and India (24%) in the same year. The fact that, despite starting with one of the highest industry-to-GDP ratios in the world, China has been able to maintain very rapid industrial growth throughout the reform era, and with it to absorb labour transfer from the rural-agricultural sector, clearly should not be taken for granted.

trade deficits. And for the eight years that were with trade surpluses, the ratios of net export to GDP vary from 0.02% to 2.90%. It is only from 1994 onwards that China has registered persistent trade surpluses. Even then, the ratios of net export to GDP have remained low, with only four years where the ratio exceeded 3%. Given the low net export-to-GDP ratios in most parts of the reform era, it is an exaggeration to claim that export has served as the main source of demand for China's economic growth. Such a judgment is unlikely to be significantly altered even if one takes into account possible crowding-in effects of export on the expansion of the other two components of aggregate demand, i.e., consumption and investment.

[Figure 5]

From Figure 5 it is clear that, of China's aggregated demand, consumption accounts for a substantially bigger share in 1978-1992 than in 1993-2006. The opposite is true for the share of aggregate demand accounted for by investment. Corresponding to this change in the composition of demand is the evolution of the level of industrial labor productivity relative to the rest of the economy, shown in Figure 3. In the first half of the reform era, industrial growth (and hence overall economic growth) was to a large extent propelled by the transfer of unskilled labor from the rural-agricultural sector to the more productive industrial sector. This exerted downward pressures on industrial relative labor productivity. Since the early 1990s, however, industrial relative labor productivity has tended to rise, and at an accelerating pace. And the share of industrial labor employment in the national total has stagnated, in contrast to the persistent increases in the previous period (Figure 1). Clearly, there was a fundamental break in the early 1990s whereby Chinese economic growth shifted from consumption-led to investment-led, and from "industrial widening" to "capital deepening".

At this point, it can be posited that, before the break in the early 1990s, China's rapid economic growth was based on a nexus of causal relationships that could be characterized as the following: consumption induced investment and thus overall demand expansion, thereby making it possible to absorb transfer labor from agriculture and to improve industrial productivity via dynamic increasing returns. There was a virtuous circle between consumption and production, and between industry and the economy. This dynamics of China's economic growth over the first half of the reform era implies the existence of two necessary conditions. First, there was a process of structural change involving both a rapid expansion of the share of industry in the economy and the leading role of a wide range of new, consumer durables industries. The former aspect corresponds to the trend of labor transfer from agriculture to industry, and hence improving allocative efficiency, while the second aspect corresponds to the improvement in industrial productivity via dynamic increasing returns. Second, there existed an egalitarian pattern of income distribution, which underpinned mass-consumption, thereby inducing investment and overall demand expansion.

It was precisely the worsening of the pattern of income distribution under market reforms that led to the fundamental shift of China's growth path in the early 1990s. Though not a very good measure, the Gini index does indicate the trend of worsening income distribution. In 1978, the value of the Gini index in China was 0.16 for urban households and 0.21 for rural households, both being rather low in international comparison. By 1992, the value increased to a moderate level of 0.25 for urban households and a high level of 0.31 for rural households. By the year 2000, the value rose to high levels for both set of households: 0.32 urban, 0.35

rural.⁹ Thus, from the early 1990s onwards, the leading position of consumption has been taken over by investment in sustaining economic growth on the demand side. And, in contrast to the previously growth path, the contribution of the effect of labor transfer to economic growth has tended to weaken. What has been of increasing importance is dynamic increasing returns within industry.

Now, turn to the institutional side. It can be posited that the egalitarian pattern of income distribution in the first half of the reform era was based mainly on the conditions that the economy was dominated by public ownership, and that within the publicly-owned sector egalitarianism in distribution was the norm. Conceptually, China's enterprise reform has often been portrayed as a process of the state attempting to employ and induce entrepreneurial activities of the managerial layer. But, it is noted that this process occurred in a context where various stake-holders – local governments, workers, local communities, the banks and other business partners – were involved to form a web of check and balance governing the development of enterprises. This systemic feature was visible not only in state-owned enterprises (SOEs) but also in enterprises of other types of public ownership including the renowned collectively-owned township and village enterprises.

The economic performance of Chinese SOEs, and publicly-owned enterprises of other types, over the reform era has remained controversial in the relevant literature. Yet, there are two stylized facts that have been broadly agreed: first, that SOEs performed much better in the demand-expanding 1980s (and in 2000-2006) than in the demand-stagnant 1990s, and, second, that large-scale SOEs performed much better than small-and-medium-scale SOEs –

⁹ Data from Li Shi *et. al.* (*A Positive Analysis of Income Distribution in China*, Beijing: Shehui Kexue Wenxian Chubanshe, 2000) and *Renmin Ribao* (People's Daily) 9th July 2002.

and possibly all others including private firms – throughout the reform era. From these two stylized facts, it can be posited that, in the first half of the reform era, there was a basically appropriate match between mass consumption at the macro level and the long-term-oriented behavior of enterprises at the micro level, and, behind this, that between the egalitarian income distribution and the systemic feature of enterprises being accountable to major stake-holders.¹⁰

This nexus of demand expansion and structural-institutional arrangement was not compatible with deepening market reforms. The introduction of market practices might be necessary for the formation of micro-level incentives for economic development, but market reforms in the strict sense – i.e., principles of individualistic property rights – are bound to disrupt the match between the macro environment and the micro institutions detailed above. On the macro side, such reforms tend to reduce workers' income and threaten their job security, thereby undermining egalitarian income distribution and mass consumption. On the micro side, such reforms threaten the loyalty or long-term commitment of major stake-holders (again, workers in particular) to the firm, thus undermining the scope for collective learning. In the event, the Chinese enterprise system underwent a painful process of restructuring,

¹⁰ For analyses of the institutional attributes and economic performance of China's SOEs and collectively-owned township and village enterprises, see, respectively, D. Lo ("Reappraising the performance of China's state-owned industrial enterprises, 1980-96", *Cambridge Journal of Economics*, 1999, 23 (6): 693-718), and R. Smyth ("Township and village enterprises in China – growth mechanism and future prospects", *Journal of International Economic Studies*, 1998, 12: 101-117). Both studies observe that the reformed enterprise system – whether SOEs or township and village enterprises – has exhibited the kind of institutional rigidities and long-term orientation that are akin to the canonical Japanese system, and argue that this system has embodied the same kind of relative efficiency attributes – i.e., stronger in productive efficiency, weaker allocative efficiency.

downsizing and ownership change in 1995-1997. Then came the impact of the East Asian financial and economic crisis in 1997-1998, which, together with the enterprise restructuring, resulted in serious deficiency in macroeconomic demand and plunged the Chinese economy into a three-years period of deflation. In response, the state leadership shifted from pushing forward the marketization drive to forcefully implement a range of market-supplanting policies in 1998-2002 – Keynesian-type fiscal stimuli, welfare-state measures, policies to revitalize SOEs and state banks, and a cautious approach to reforming the regime of external transactions (in particular, to shelve the target of liberalizing the country's capital account).

The policy reversal in 1998-2002 did not result in the resumption of the previous pattern of economic transformation. What has emerged is a new pattern that exhibits strong resemblance to the canonical East Asian model of economic institutions and growth. At one level, the path of industrialization characterized by capital deepening has become firmly established, with the pace of capital deepening tending to accelerate. This is largely due to the fact that consumption expansion has continued to be sluggish, and its leading position has been taken over by investment. Meanwhile, at another level, consistent with capital deepening and economic growth based on increasing returns is the rapid expansion of large-scale enterprises: their value-added share in Chinese industry increased from 27% in 1998 to 36% in 2002. This is somewhat ironical, as it occurred in a period when there was widespread criticism on the East Asian model of capital-deepening industrialization carried out by large-scale industrial conglomerates.

This new pattern of economic transformation is different from that of the first half of the reform era. There is no trace of existing an appropriate match between egalitarian income

distribution and a systemic feature of enterprises being accountable to major stake-holders. True that, along with capital deepening and the indicated policy reversal, there has witnessed a phenomenal revival of the state sector. The value-added share of SOEs in Chinese industry increased from 33% in 1998 to 37% in 2004, amid the rebound of their profit rate to once again surpass the industrial average. Yet, in an institutional sense, this revival has been more than outweighed by the massive decrease in the employment share of SOEs in Chinese industry: it decreased from 38% in 1998 to 21% in 2004. And this reflects the broader trend of shrinking employment share of the public sector in the Chinese society as a whole. As was indicated earlier with respect to Table 4, of the total of urban employment, the combined share of state-owned and collectively-owned units decreased from 76% in 1995 to 27% in 2005. In the rural areas, the employment share of the collective township-village enterprises remained basically unchanged during this period, in contrast to the persistent increase in the first half of the reform era.

4. Policies in the Pursuit of Sustained Growth and Income-Enhancing Employment

The preceding section sets out the broader context of China's economic transformation, with a focus on the changing character of the prevailing economic growth path. In this section, we seek to analyze and assess, in relation to this broader context, relevant government policies that are aimed at achieving the twin targets of sustained rapid economic growth and income-enhancing employment expansion. These policies broadly fall into two categories: labor market policies, which are effected within the labor market, and macro policies, which are effected in other markets or in the economy as a whole and are designed to have an impact on labor employment. The specific focus of individual policies varies, but can be identified as concerning such areas as labor market regulation, income redistribution, welfare provision, macro demand management, as well as international transactions.

4.1. Macro Policies

China's economy was already on a downturn trend on the eve of the East Asian financial and economic crisis. Demand deficiency was the central issue, probably due to the upsurge in market reforms in the early- to mid-1990s. In particular, the privatization and downsizing of SOEs in 1995-97 resulted in mass unemployment, while the complete commercialization of state banks resulted in their behavior switching from excessive lending to excessively cautious lending. In the face of the worsening external environment caused by the East Asian crisis, the Chinese state leadership turned to adopt four major categories of anti-crisis policies between 1998 and 2002. These policies, namely, are:

- (1) Several Keynesian-type fiscal packages for expanding investment demand, which were financed by debt issuing of unprecedented scales;
- (2) A range of welfare-state policies, which included lifting up the benefits for retired or unemployed workers, raising the payments of public sector employees, and lengthening the paid holidays of workers – all aimed at reversing the trend of stagnant consumption expansion;
- (3) Policy measures to re-vitalize the state sector – including the setting up of four state asset management companies responsible for taking over a substantial share of non-performing loans from state banks and for a program of debt-equity swap, which were aimed at improving the financial conditions of SOEs and the balance sheets of state banks; and
- (4) A cautious approach to reforming the regime of external transactions – in particular, the leadership has in effect shelved the target of liberalizing the country's capital account.

These policies, in essence, represent a retreat from the previous stance of pursuing the uni-directional movement towards the idealized, canonical market economy. Thus, while designed to be short-term anti-crisis policies, they turned out to be very powerful in shaping the long-term path of economic development.

Consider fiscal stimuli. Initially, the annual budget approved by the National People's Congress in March 1998 maintained that fiscal deficits – which had persisted for every single year since 1982 (except in 1985 when an explosive upsurge in imports generated a huge customs revenue for the state budget) – be cut by 10 billion yuan from the 1997 level of 58

billion yuan (0.78% of GDP). This was already below what was needed to achieve the target, set in the 1994 fiscal system reform, of balancing the budget by the year 2000. Yet, from the second quarter of 1998, the leadership shifted to adopt an active fiscal policy to stimulate economic growth. The actual deficits in the year turned out to be a hefty 92 billion yuan (1.18% of GDP). Along with the continuous employment of the active fiscal policy, deficits expanded further in subsequent years: 174 billion in 1999, 249 billion in 2000, 252 billion in 2001, and 315 billion in 2002 – i.e., 1.94%, 2.51%, 2.29% and 2.62%, respectively, of GDP. In the mean time, over the five years of 1998-2002, the state issued a total of 660 billion treasury bills for long-term construction investment. These, together with complementary investment by other economic agents (central ministries, local governments, and enterprises), amounted to a total investment scale of 3200 billion yuan.¹¹

Viewed from a long-term perspective, the fiscal activism of 1998-2002 does represent a shift away from the pursuit of budget balance and minimal government intervention in the economy. This pursuit was clearly discernible in the fiscal system reform of 1994 and was pre-dominant in the design of government economic policies until early 1998. Yet, in the event, budget deficits did not diminish but rather expanded very substantially between 1998 and 2002. As can be seen from Figure 6, budget deficits as a ratio of GDP for the first time approached 2% in 1999 and it did exceed that level in the next four years. Perhaps even more conspicuously, government debt issuing for the first time exceeded 3% of GDP in 1997 and it has remained so thereafter.

[Figure 6]

¹¹ *Renmin Ribao* [People's Daily], 18 March and 10 December 2002.

In terms of its impact on the economy, official estimation states that, in the face of the persistence of deflation that was caused by the sluggish expansion in both domestic and external demand, government investment during 1998-2002 had the effect of contributing to 1.5-2 percentage points of the growth of GDP in each of the five years. Moreover, because the investment was concentrated mainly in infrastructure, it did produce significant crowding-in effects in the sense that it paved the way for the subsequent massive expansion in total investment in the economy as a whole from 2001 onwards.

On the whole, it could be argued that the Chinese state leadership was quite successful with its fiscal activism in the period 1998-2002. Central to the activism was the adoption of a range of expansionary fiscal policies to stimulate aggregate demand and therefore economic growth, with an objective of helping enterprises as well as the government to “grow out of indebtedness”. This is in sharp contrast to the policy recommendation from international financial institutions, for East Asian economies as well as for China during this period, which typically argue for balancing government budgets through austerity. In the event, China’s actual economic development indicates that the adoption of fiscal activism was justified. Apart from surviving the most difficult years of 1998-2001, from 2002 onwards, economic growth has reversed the almost ten-years downward trend and has indeed accelerated. Budget deficits, though remaining large in actual amounts, has thus tended to decrease as a ratio to GDP. The same trend of development has also been evident at the micro level. The reversal of the policy of downsizing and privatization did not result in worsening financial performance of enterprises. Instead, in the context of the rebound in economic growth, the profit rate of enterprises (including SOEs) has risen successively for every year since 1998.

The 1998-2002 fiscal activism has had a further, somewhat unexpected impact on the long-term development of the economy, in the form of strengthening the movement of the growth path towards capital-deepening. Because the government policies were mainly aimed at stimulating investment, the trend of the composition of aggregate expenditure increasingly skewing to investment has not been reversed but has rather accelerated (as is clearly indicated in Figure 5). This, while being helpful to the efficiency and sustainability of economic growth, has had serious deficiency in terms of employment growth. Moreover, it appears that even the investment expansion subsequent to the fiscal activism has been insufficient to compensate for the sluggish growth in consumption demand. The enlarging deficiency in aggregate demand is clearly evident in the massive expansion in the surplus of foreign trade in goods and services, which reached an astonishing high level of 7.3% of GDP in 2006.

4.2. Labor Market Policies

Essential to the Chinese state leadership's pursuit of "constructing a harmonious society" is the emphasis that the trend of increasing social polarization must not be left unchecked. And one important aspect of social polarization is the fact that, until the turn of the century, labor's compensation had experienced very sluggish growth – quite in contrast to the sustained rapid growth of the economy. Indeed, there have been widespread reports that, outside the formal, mainly state-related sector, the wage rate had been almost frozen for fully twenty years since the beginning of reform. This was especially true in the labor-intensive, export-oriented industries in the coastal provinces, owing to the almost unlimited supply of unprotected, un-unionized labor from the rural areas of inland provinces.

Even in the formal sector, the trend of evolution of the wage rate has seriously deviated from that of per capita GDP. As can be seen from Figure 7, before the turn of the century, the growth rate of the real urban wage rate persistently lagged behind that of per capita real GDP. Moreover, in the years of enterprise downsizing and mass unemployment in the 1990s, there was a situation of the two indicators moving in opposite directions: the growth of the real wage rate slowed down, amid the growth of per capita GDP accelerating. It is basically from the turn of the century onwards that there has emerged a reverse situation. Now, the growth of the real wage rate substantially exceeded that of per capita GDP, although both are in the same direction of moving upwards. It is likely that government policies have played an important role in this reversal.

[Figure 7]

In a sense, it would not be much off the mark to assert that, before the turn of the century, the government had basically adopted a *laissez faire* approach toward labor employment outside the state sector. This is particularly evident in the declining influence of the only existing, official trade union, the All China Federation of Trade Unions. Union members as a proportion of the total of employees with the secondary and tertiary sectors decreased from 49% in 1981 to 29% in 2000 (Figure 8). Nevertheless, in recent years, union membership has had a substantial rebound. As a proportion of the total of employees with the secondary and tertiary sectors, it climbed back to a level of 36% in 2005. This owes much to the enforcement by the central government of the stipulation that enterprises of all types of ownership are required to allow for the setting up of unions or for workers joining unions. This requirement has for a long time been sternly resisted by local governments, private employers, and most

notably foreign capital funded enterprises (particularly multinational corporations). Yet, from the point of view of the state leadership, this is essential to the promotion of collective bargaining over labor compensation. And collective bargaining is, in turn, considered to be indispensable for reversing the trend of decreasing labor's share in the national income.

[Figure 8]

This notwithstanding, there is no sign that China's enterprise system is to return to that of the formal sector in the first half of the reform era, where workers as a collective had a powerful influence over their compensation as well as over the division of enterprise surplus as a whole. The withering of public firms as a proportion of the corporate sector simply makes this impossible. Even in the public firms that remain, and even in large-scale SOEs (which are traditionally the core of the public sector), the bargaining power of workers vis-à-vis the management is minimal nowadays. This is because the employment relationship has already been fully marketized. The traditional system of life-time employment, which was characteristic of China's socialist system pre-reform, is now history. Instead, the employment relationship is now governed by market-determined contracts. As can be seen from Figure 9, it was still the case that labor contracts covered only 41% of total urban employment in 1995. By 2000, however, the proportion reached 95%.

[Figure 9]

In this connection, it is noted that the trend of wage rate growth rebound in recent years has also been ascribable to a variety of further factors. In addition to increased unionization, government protection of labor rights in the drafting and enforcement of employment contracts are reportedly of increasing significance. And the acceleration of economic growth,

together with its capital-deepening orientation, has also resulted in a very rapid growth in labor productivity, therefore contributing to the wage rate growth. It seems the twin targets of sustained rapid economic growth and compensation-enhancing employment expansion have been achieved thanks to the concerted working of the economic growth path itself and the appropriate government policies.

But, there is an intrinsic problem with this economic condition – namely, the problem of unemployment. The very fast wage growth since the turn of the century, shown in Figure 7, has not resulted in the rebound of the growth of consumption. Instead, as shown in Figure 5, the decline of consumption as a proportion of aggregate expenditure has accelerated precisely during this period. And the deficiency in aggregate demand has tended to worsen, as is also shown in Figure 5. The sustainability of the on-going economic growth path and employment expansion, at least in the social (if not economic) sense, is thus in question.

4.3. Assessment

By design or by default, it appears that the government policies detailed above in this section – together with other related policies such as the increased protection of labor rights, the enforcement of minimum-wage legislation, the emphasis on income redistribution to avoid further worsening social polarization, the expansion in social welfare provision, as well as the on-going attempts to reconstruct a government-funded health-care system – do have their coherence. They are all conducive to the pursuit of compensation-enhancing employment. They are also consistent with, if not also conducive to, the prevailing capital-deepening path of economic growth. The hope-for employment expansion thus ultimately rests on the

labor-absorption capability of the services sector, as has been emphasized by the government. In other words, the sustainability of the prevailing pattern of economic growth and employment expansion, and therefore the relevant government policies, depends on whether the fast productivity gains in industry can be effectively channeled to the development of the labor-absorption capability of services.

A question naturally arises as to why wouldn't (or shouldn't) the Chinese state leadership adopt an alternative policy line – of promoting a return to the labor-intensive path of economic growth that prevailed in the first half of the reform era. This alternative clearly fits better into principles of the market, particularly the principle of comparative advantage. And it has widespread supports from influential Chinese economists. It has been argued that this alternative growth path is not only (allocatively) efficient but also equitable, in the sense that it would create more jobs and thus its immediate benefits would be spread to a bigger proportion of the population. Insofar as it would result in a negative impact on labor compensation, the argument goes, this could be offset by redistributive government policies and the system of social welfare provision.

The assessment of the prevailing policy line thus needs to take into consideration its cost and benefit relative to its alternative. Note that, in principle, it is in no sense a straightforward matter of judging which of the two policy lines is better, or easier to pursue. Yet, for the sake of arguments, the assessment could be carried out in the following way. Consider growth. The productive efficiency associated with capital-deepening growth should be weighed against the allocative efficiency associated with labor-intensive growth. The net outcome of this trade-off is necessarily an empirical issue, and, as has been indicated earlier, the productivity and

output growth of the Chinese economy in the second half of the reform era appears to have out-performed that of the first half. In the context of a demand-constrained economy, where the scarcity of resources is not necessarily a binding constraint, it can be further argued that allocative efficiency is likely to be less important than productive efficiency in underpinning economic growth. Again, as indicated, it is evident that China has been in a state of serious and worsening deficiency in macroeconomic demand since the mid-1990s.

Turn to the consideration of employment. It seems straightforward that a labor-intensive growth path must create more jobs than a capital-deepening one. Yet, this is not necessarily the case for a demand-constrained economy, i.e., a situation of aggregate expenditure being less than the full-employment output level. If the situation is caused by factors unrelated to the wage rate being too high, just like what we have characterized in the preceding sections of the Chinese economy, a fall in the wage rate (for inducing the substitution of labor for capital) would not necessarily result in an increase in employment. Everything depends on, first, the net impact on labor's share in national income and thereby on macroeconomic demand, and, second, the balance between the distribution-induced impact on macroeconomic demand and the wage-induced impact on capital-labor substitution.

At this point, the issue of demand also implies a question of feasibility for pursuing a return to the previous, labor-intensive growth path. Note that the trend of China's aggregate expenditure skewing to investment rather than consumption has accelerated in recent years, despite all the redistributive and labor compensation-enhancing government policies. There is indeed a serious question, in the domestic front, as to what would be the sources of demand outlets for the increased labor-intensive, mostly consumer goods. Exporting might be a viable

alternative. And it has been, witnessed the ballooning trade surplus in recent years – and the fact that made-in-China labor-intensive manufactures are now flooding the world market. The consideration of market outlets, and thereby job creation, might even be an important reason behind China’s willingness to maintain a anomalous economic relationship with the United States in recent years. The relationship is such that the Chinese economy subsidizes the US economy simultaneously in two ways: first supplying cheap goods, then supplying cheap trade credits in the form of holding a tremendous and still rapidly expanding amount of low-yield US dollar-denominated financial assets as official foreign exchange reserves. Yet, even these double-subsidies do not guarantee that the relationship is sustainable. Trade frictions, and the pressure on China to contribute more demand to the world economy, have become a normalcy in China’s economic relationship with the USA and other major trade partners. On the whole, given all these hurdles in both the domestic and external fronts, the question of feasibility for the labor-intensive growth path appears to be at least no less serious than that of the capital-deepening growth path.

5. Conclusions

The achievement of the twin targets of rapid economic growth and compensation-enhancing employment expansion has been the prime target of China's state leadership, particularly since the turn of the century. Achieving these twin targets is essential to the leadership's objective of "constructing a harmonious society".

In the first half of the reform era, China was able to achieve both rapid economic growth and rapid employment expansion, based on a labor-intensive growth path. The drawback is that the growth of labor compensation tended to lag seriously behind that of economic growth. This contributed to worsening income distribution and macroeconomic demand deficiency, which, in turn, led to the breakdown of the prevailing growth path. Since the early-1990s, the Chinese economy has switched to a capital-deepening growth path. This has appeared to be capable of sustaining rapid growth and increases in labor compensation. The draw back is that its capability of job creation has been weak. Now, the sustainability of the growth path depends on whether productivity gains from capital-deepening industrialization can be channeled to the development of the labor-absorbing capacity of the services sector.

By design or by default, it appears that government policies in recent years have all been consistent with, even conducive to, labor compensation expansion and capital-deepening growth. These policies include using fiscal stimuli to boost investment, promoting the market power of workers, increasing the protection of labor rights, emphasizing income redistribution to avoid worsening social polarization, and expanding social welfare provision. There thus arises the question as to whether this policy line is justifiable, or whether the government

should rather shift to the alternative, more market-oriented policy line of promoting a return to the previous, labor-intensive economic growth path.

The desirability and feasibility of these two, alternative policy lines are assessed in terms of their potentials for achieving the indicated twin targets, and in relation to the broader economic conditions of institutional evolution, structural change and macroeconomic demand. The conclusion that follows the assessment: there are both relative advantages and disadvantages for the two policy lines, but, in view of the reality, the capital-deepening growth path appears to be more feasible than the labor-intensive one. To achieve the twin targets of rapid economic growth and compensation-enhancing employment expansion, a nuanced and internally-coherent approach is always needed in the design of government policies concerning labor employment as well as those concerning broader social and economic development.

Appendix: Regression Analyses of Labor Employment and Economic Growth

A.1. Employment, Investment and Export

Central to the analysis and exposition of this report is the proposition that there has been a fundamental change in the character of China's economic growth path over the reform era, from "industrial widening" and consumption-led during before the early-1990s to capital deepening and investment-led thereafter. To investigate into the impact of this change on labor employment, we carry out the following regression analyses.

First look at industry. We divide Chinese industry into two sectors: the formal sector represented by "township-and-above independently accounting industrial enterprises" before 1998 and "all state-owned industrial enterprises plus above-scale (of more than five million yuan by sales value) non-state-owned industrial enterprises" from 1998, and the rest of Chinese industry. The regression model takes the following form:

$$\ln L = \alpha + \beta \cdot DUM + \gamma \cdot \ln I + \delta \cdot DUM \cdot \ln I + \varepsilon \quad (\text{A.1})$$

Where, L is total employment (i.e., the number of employed workers), I is gross fixed capital formation which is taken to represent capital deepening. According to Chow's Breakpoint Test, there is a significant difference between the structural relationship of the two variables for the two period 1978-1990 and 1991-2005, both for the formal and informal sectors of Chinese industry. Hence, we use the dummy variable DUM which is assigned a value of 0 for the first period and 1 for the second period. The I data series is expressed in 1978 constant

prices. The price deflator for the first period is estimated as a weighted average of the price indices of industry and construction, the weight being 0.6 and 0.4, respectively. The deflator for the second period is official.

Table A.1 gives the result of the regression analysis of equation (A.1). It can be seen that all the explanatory variables are statistically significantly correlated to the dependent variable, but there are differences between the formal sector and the informal sector regarding the correlation between $\ln L$ and $\ln I$. In the period 1978-1990, the correlation between $\ln L$ and $\ln I$ is statistically significant for both sectors. The value of the correlation coefficient is 0.257 for the formal sector and 0.309 for the informal sector, suggesting that the former sector is more prone to adopt capital-intensive technology. Moving on to the period 1991-2005, however, the correlation became much less significant. In the case of the formal sector, the correlation became negative, i.e., $0.257 - 0.260 = -0.003$. As for the informal sector, the correlation remains positive but the value of the coefficient, $0.309 - 0.206 = 0.103$, is only one-third of that in the first period. These results imply that Chinese industry, both the formal and informal sectors, has indeed followed a capital-deepening growth path.

[Table A.1]

The approach adopted above can be extended to the analysis of both industry and the non-industry sector, i.e., the economy as a whole. We divide the Chinese economy into three regions: Eastern (coastal) provinces, Central provinces, and Western provinces. The reason for this division is that the three regions have form a pattern of specialized division of labor, where Eastern has a higher degree of specialization in manufacturing and Central and Western have a higher degree of specialization in primary products. This difference is especially

visible in their respective exports. We use the following regression model:

$$\ln L = \alpha + \beta \cdot DUM + \gamma \cdot \ln I + \delta \cdot \ln X + \mu \cdot DUM \cdot \ln X + \varepsilon \quad (\text{A.2})$$

where X is export value of the region, and is expressed in 1978 constant prices using GDP deflator, while all other variables are same as equation (A.1). The reason for using export as an explanatory variable is that export is a source of demand, and China has been largely specialized in exporting labor-intensive products.

Table A.1 also gives the result of the regression analysis of equation (A.2). It can be seen that, again, all the explanatory variables are statistically significantly correlated to the dependent variable. The correlation between $\ln L$ and $\ln I$ is basically of the same level for the three regions. In contrast, the correlation between $\ln L$ and $\ln X$ is substantially different between Eastern and the other two regions before the 1990s: the value of coefficient is 0.095 for Eastern, 0.146 for Central, and 0.159 for Western. Entering the second period of 1991-2005, the correlation between $\ln L$ and $\ln X$ substantially decreased for all the three regions: the value of coefficient become 0.024 for Eastern, 0.027 for Central, and -0.016 for Western. It appears that the same tendency of capital deepening also applies to China's export sector, and export sectors of all the three regions.

A.2. Growth and Efficiency Attributes

Starting with the Kaldor-Verdoorn Laws, it is postulated that, if dynamic increasing returns are present, there exists a positive correlation between the productivity growth and output growth of the manufacturing sector, that is,

$$\dot{\hat{x}}_t = \alpha + \beta \dot{Q}_t \quad (A.3)$$

Applying equation (A.3) to the analysis of data of Chinese industry and non-industry, and state-owned industrial enterprises (SOEs) and non-state-owned industrial enterprises (non-SOEs), of the period 1978-2005, the results are given in Table A.2. It can be seen that, considering the value of β , the value for industry is less than that for non-industry, while the value for SOEs exceeds that for non-SOEs. Yet, for all these four “sectors”, the value of β is significantly positive, implying that there might be dynamic increasing returns at the sector level. The following error-correction model could then be used to test the long-term relationship between the two series, of output growth and productivity growth, as well as the short-term adjustment for all the four “sectors”:

$$\Delta \dot{\hat{x}}_t = a - b(\dot{\hat{x}}_{t-1} - \dot{\hat{x}}_{t-1}) + c \Delta \dot{Q}_t \quad (A.4)$$

where the coefficient b is to indicate the short-term adjustment while the coefficient c is to indicate the long-term relationship.

The results are also given in Table A.2.

First, compare industry and non-industry. It is noted that the value of c for industry is more or less the same as non-industry. This result, somewhat surprisingly, does not support the proposition that industry is characterized by stronger dynamic increasing returns than non-industry. This is likely due to the China-specific development that, in the first half of the reform era, industrialization mainly took the form of widening rather than deepening – industrial growth and overall economic growth were in a large measure propelled by the massive transfer of unskilled labor from agriculture to industry. Regarding the estimates of b , the value for industry is less than that for non-industry (indeed, it is statistically insignificant

for industry). The results imply that industry are less capable of adjusting to cope with short-term fluctuations, i.e., with less allocative efficiency, possibly due to heavier fixed/sunk investment.

Second, compare SOEs and non-SOEs. It is noted that the value of c for SOEs exceeds that for non-SOEs. The opposite is true concerning the estimates of b , where the value for SOEs is less than that for non-SOEs. The results imply that SOEs, owing to their more rigid, long-term-oriented (or less flexible) institutions, are more capable of generating productive efficiency, but are less capable of adjusting to cope with short-term fluctuations.

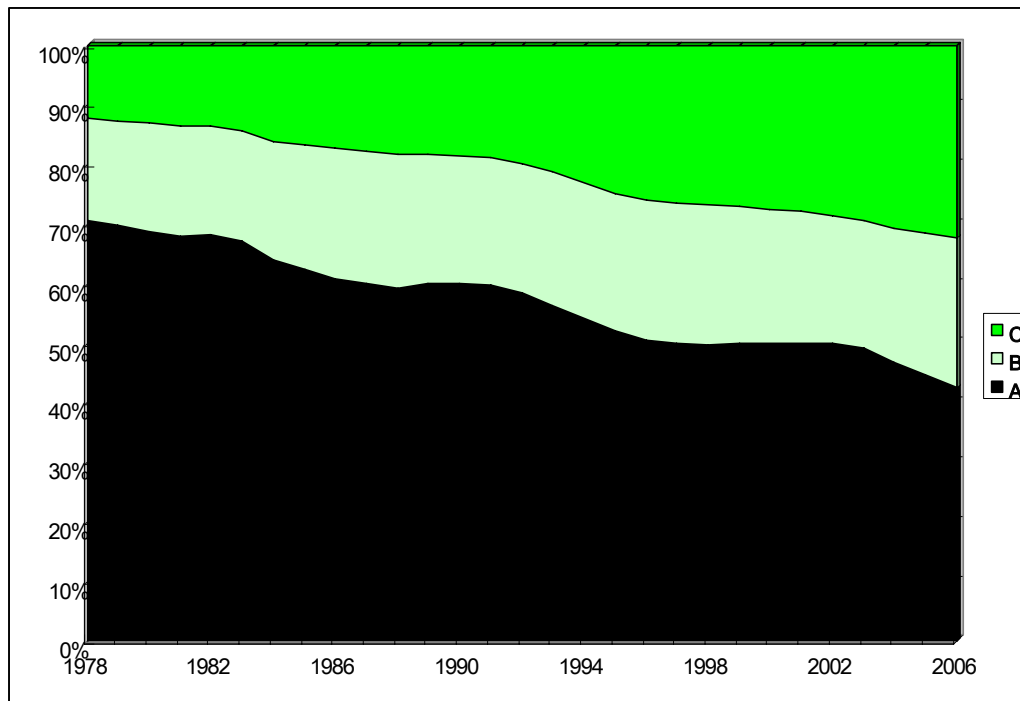
[Table A.2]

Table 1. Indices of China's Real GDP, Employment and Labor Force

	(a) Real GDP	(b) Employment	(c) Labor Force	(a)-(b)	(b)-(c)
1978	100.00	100.00	100.00	0.00	0.00
1980	116.00	105.50	105.46	10.50	0.04
1985	192.90	124.21	123.18	68.69	1.03
1990	281.70	161.26	160.57	120.44	0.69
1995	502.30	169.52	169.25	332.78	0.27
2000	759.90	179.53	181.88	580.37	-2.35
2005	1195.50	188.84	191.43	1006.66	-2.58
2006	1323.42	190.28	...	1133.14	...

Sources: National Bureau of Statistics, *China Statistical Yearbook 2006*; National Bureau of Statistics, *Statistical Communiqué of National Economic and Social Development in 2006*, www.stats.gov.cn.

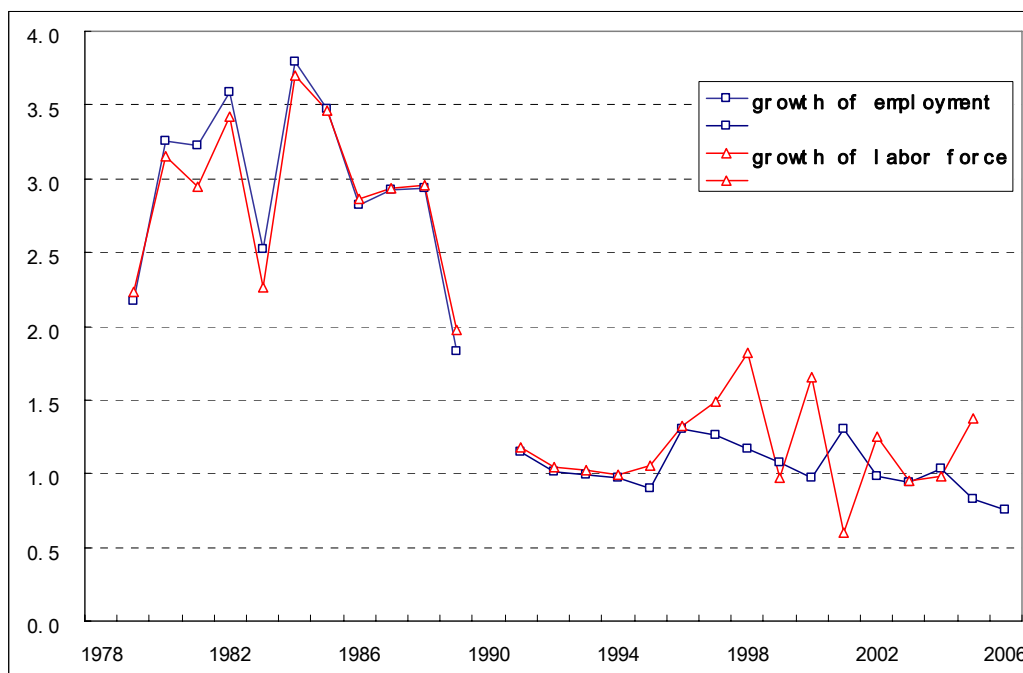
Figure 1. Composition of China's Labor Employment by Sectors



Sources: National Bureau of Statistics, *China Statistical Yearbook 2006*; National Bureau of Statistics, *Statistical Communiqué of Labor and the Development of Social Security in 2006*, www.stats.gov.cn.

Notes: A = primary sector (i.e., agriculture); B = secondary sector (i.e., industry plus construction); C = tertiary sector (i.e., services).

Figure 2. Annual Growth Rate of Labor Force and Employment



Sources: National Bureau of Statistics, *China Statistical Yearbook 2006*; National Bureau of Statistics, *Statistical Communiqué of Labor and the Development of Social Security in 2006*, www.stats.gov.cn.

Note: The statistical coverage of labor force and employment was revised in 1990. Hence, level data before and after 1990 are not comparable, although the comparability of growth data is unlikely to be significantly affected by the revision.

Table 2. Working-age Population, Labor Supply and Employment (10,000 persons)

	Average annual growth of working-age population	Labor participation rate	Average annual increase in labor supply	Average annual increase in employment
1981-1985	1655	73.5%	1216	1537
1986-1989	1843	75.0%	1382	1349
1991-1995	1085	85.2%	924	644
1996-2000	1650	84.3%	1391	739
2001-2005	1205	82.7%	996	700
Sources: Calculation based on data from National Bureau of Statistics, <i>China Statistical Yearbook</i> , various issues.				

Table 3. Urban Employment

	Working-age population (10,000)	Economically-active population (10,000)	Labor participation rate (%)	Employment (10,000)	Estimated unemployment rate (%)	Registered unemployment rate (%)
1978	10347.0	10044	97.1	9514	5.3	5.3
1979	11189.5	10567	94.4	9999	5.4	5.4
1980	11579.7	11067	95.6	10525	4.9	4.9
1981	12203.5	11493	94.2	11053	3.8	3.8
1982	13210.2	11807	89.4	11428	3.2	3.2
1983	13843.3	12017	86.8	11746	2.3	2.3
1984	15082.7	12465	82.6	12229	1.9	1.9
1985	15922.1	13047	81.9	12808	1.8	1.8
1986	16900.6	13556	80.2	13293	2.0	2.0
1987	17918.9	14060	78.5	13783	2.0	2.0
1988	18744.3	14563	77.7	14267	2.0	2.0
1989	19511.2	14768	75.7	14390	2.6	2.6
1990	20140.1	17615	87.5	17041	3.3	2.5
1991	20812.4	18065	86.8	17465	3.3	2.3
1992	21460.7	18491	86.2	17861	3.4	2.3
1993	22129.7	18922	85.5	18262	3.5	2.6
1994	22883.0	19333	84.5	18653	3.5	2.8
1995	23636.9	19830	83.9	19040	4.0	2.9
1996	25068.3	20737	82.7	19922	3.9	3.0
1997	26821.4	21761	81.1	20781	4.5	3.1
1998	28401.6	23066	81.2	21616	6.3	3.1
1999	29932.4	23809	79.5	22412	5.9	3.1
2000	32180.1	25058	77.9	23151	7.6	3.1
2001	33640.0	25347	75.3	23940	5.6	3.6
2002	35424.6	26400	74.5	24780	6.1	4.0
2003	37365.0	27282	73.0	25639	6.0	4.3
2004	39192.3	28099	71.7	26476	5.8	4.2
2005	40472.6	29383	72.6	27331	7.0	4.2

Sources: Calculation based on data from National Bureau of Statistics, *China Statistical Yearbook*, various issues.

Table 4. Employment by Ownership Sectors (10,000 persons)

	1980	1985	1990	1995	2000	2005
Urban total	10525	12808	17041	19040	23151	27331
State units	8019	8990	10346	11261	8102	6488
	(76%)	(70%)	(61%)	(59%)	(35%)	(24%)
Collective units	2425	3324	3549	3147	1499	810
	(23%)	(26%)	(21%)	(17%)	(6%)	(3%)
Rural total	31836	37065	47708	49025	48934	48494
TVEs	3000	6979	9265	12862	12820	14272
	(9%)	(19%)	(19%)	(26%)	(26%)	(29%)
Sources: National Bureau of Statistics, <i>China Statistical Yearbook</i> , various issues.						
Notes: Figures in parentheses are percentage shares in the relevant sub-totals. TVEs = township and village enterprises.						

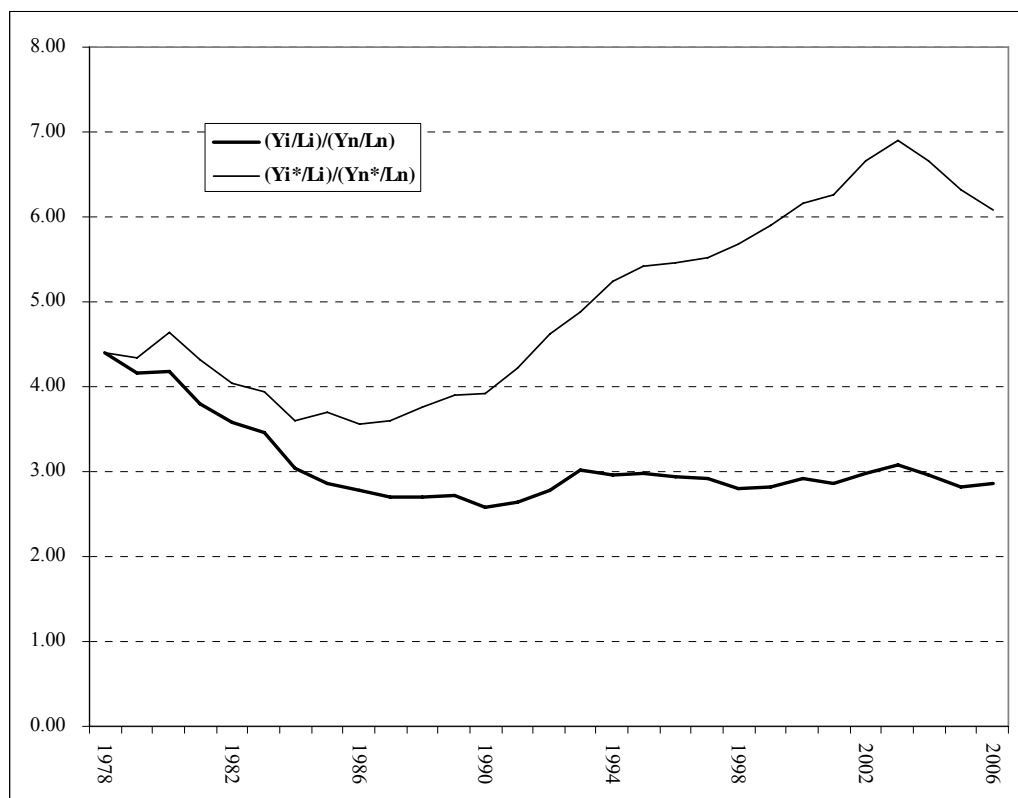
Table 5. Elasticity of Employment with Respect to Economic Growth

	Average annual real growth rate of output (%)				Average annual growth elasticity of labor employment			
	Total	A	B	C	Total	A	B	C
1979-1989	9.6	5.4	10.5	12.3	0.34	0.21	0.57	0.58
1991-1996	11.9	4.3	16.6	10.6	0.09	-0.38	0.16	0.66
1997-2002	8.4	3.0	9.2	9.8	0.13	0.34	-0.05	0.28
2003-2005	10.1	4.7	11.8	9.8	0.09	-0.54	0.40	0.41

Sources: Calculation based on data from National Bureau of Statistics, *China Statistical Yearbook*, various issues.

Note: A = primary sector; B = Secondary sector; C = Tertiary sector.

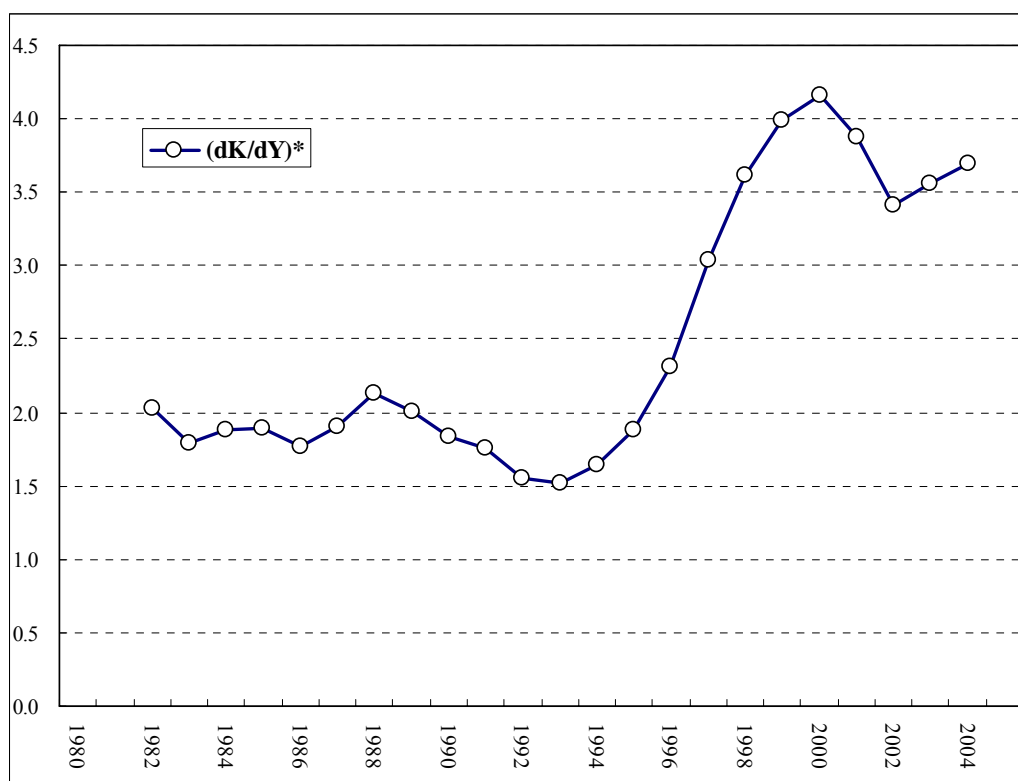
Figure 3. Relative Labor Productivity of Industry



Sources: National Bureau of Statistics, *China Statistical Yearbook 2006*; National Bureau of Statistics, *China Statistical Abstract 2007*.

Notes: Y = GDP and its components at current prices, with *denoting data at 1978 constant prices. L = total labor employment. The subscripts i and n denotes the secondary sector (i.e., industry plus construction) and the rest of the Chinese economy, respectively.

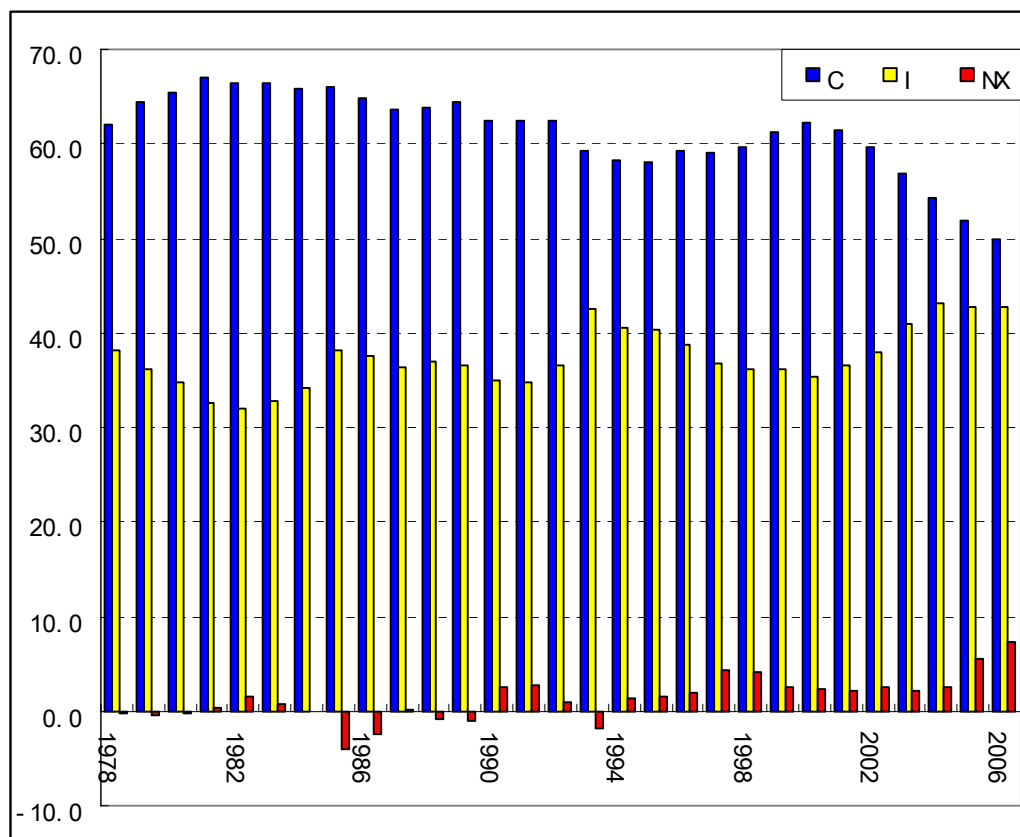
Figure 4. Incremental Capital-Output Ratio (5-Year Moving Averages)



Sources: National Bureau of Statistics, *China Statistical Yearbook 2006*; National Bureau of Statistics, *Statistical Communiqué of National Economic and Social Development in 2006*, www.stats.gov.cn.

Note: Incremental Capital-Output Ratio = dK/dY , where dK = total fixed-asset investment, dY = GDP of current year minus GDP of last year.

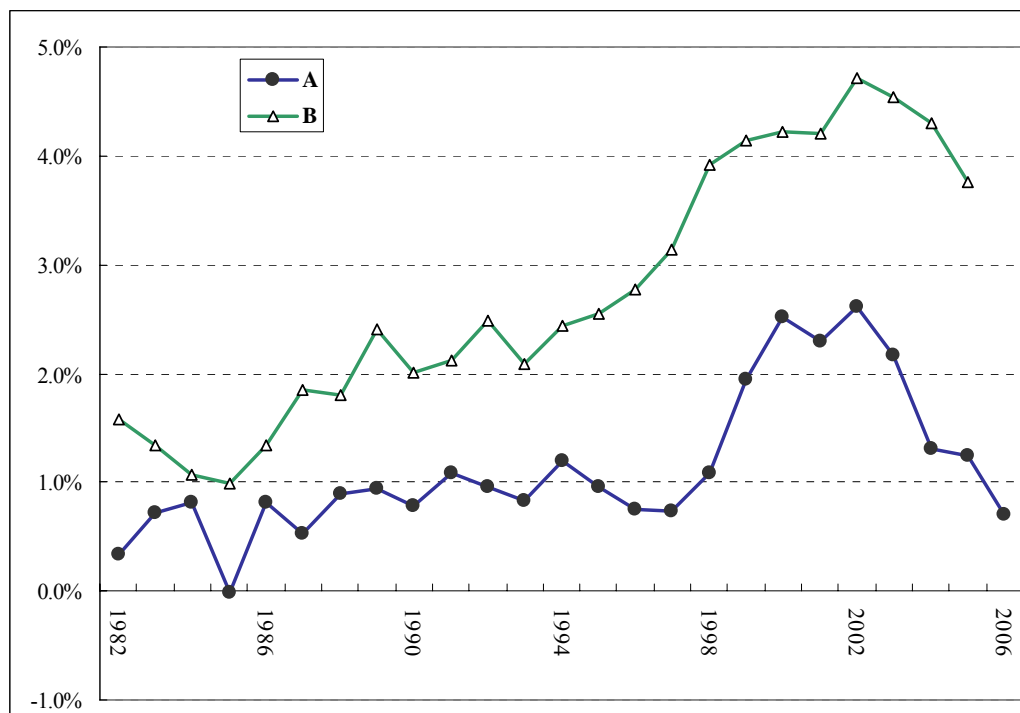
Figure 5. Composition of GDP by Expenditures (%)



Sources: National Bureau of Statistics, *China Statistical Yearbook 2006*; National Bureau of Statistics, *China Statistical Abstract 2007*.

Note: C = final consumption; I = investment; NX = net export of goods and services.

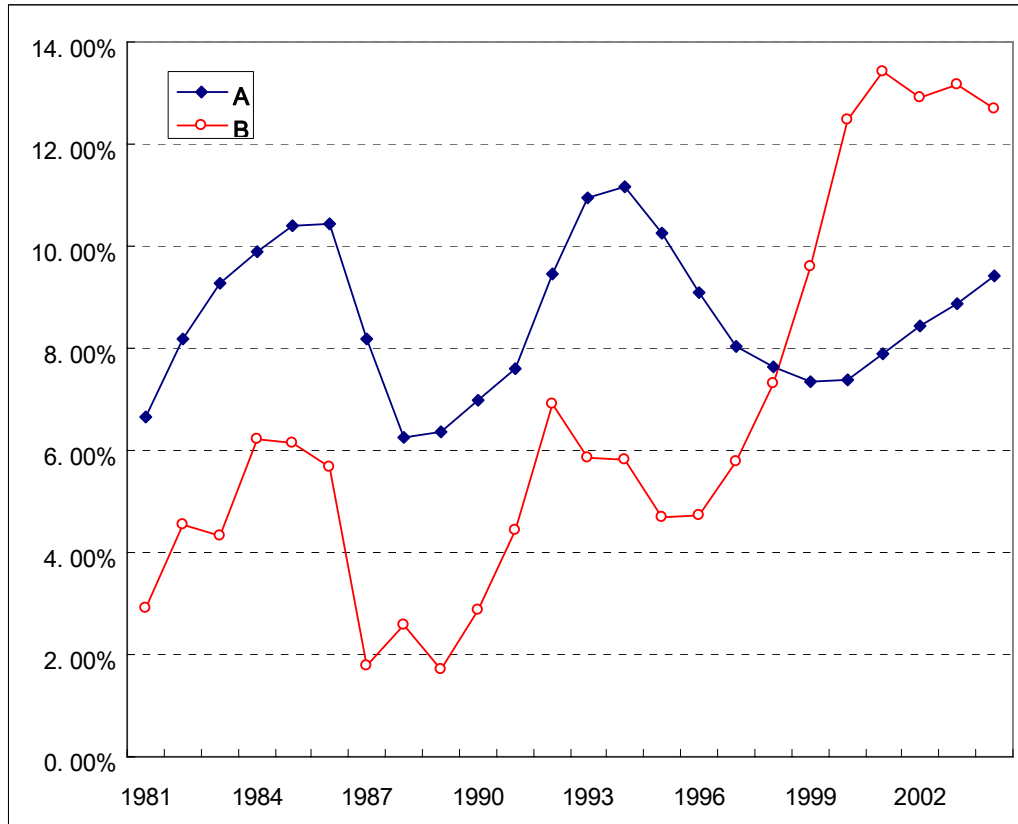
Figure 6. Budget Deficits and Government Debt Issuing as Percent of GDP



Sources: National Bureau of Statistics, *China Statistical Yearbook 2006*; National Bureau of Statistics, *China Statistical Abstract 2007*.

Note: A = budget deficits as percent of GDP; B = government debt issuing as percent of GDP.

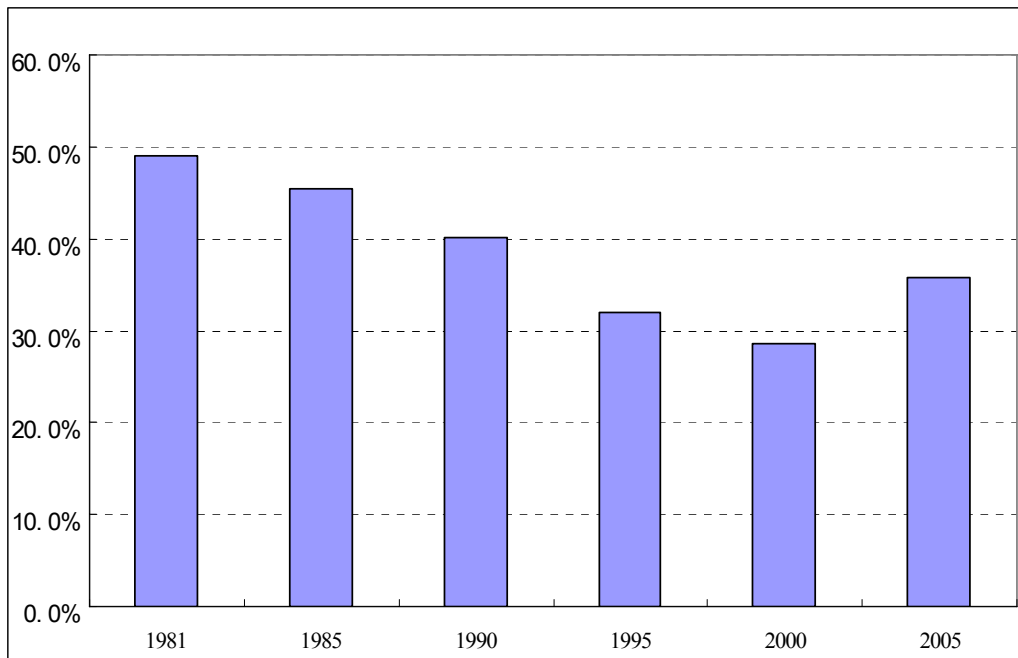
**Figure 7. Annual Growth Rate of Per Capita Real GDP and Real Urban Wage Rate
(5-Year Moving Average, %)**



Sources: National Bureau of Statistics, *China Statistical Yearbook 2006*; National Bureau of Statistics, *China Statistical Abstract 2007*.

Note: A = per capita real GDP; B = urban real wage rate.

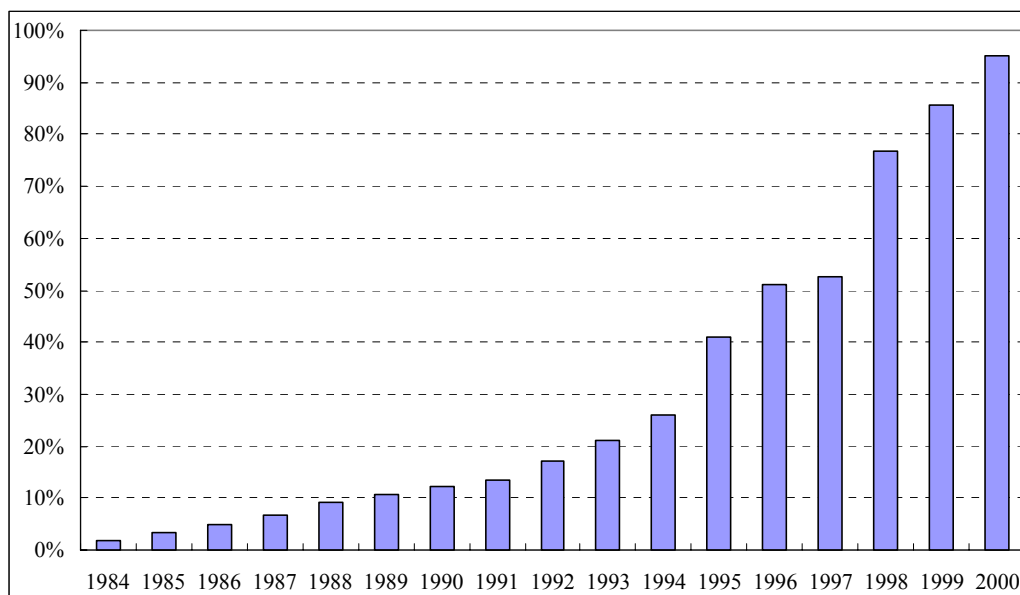
Figure 8. Proportion of Unionized Workers (%)



Sources: National Bureau of Statistics, *China Statistical Yearbook 2006*; All China Federation of Trade Unions, *China Statistical Yearbook of Trade Unions*, various issues.

Note: Figures are the number of members of All China Federation of Trade Unions divided by the total number of employees in the Secondary and Tertiary sectors.

Figure 9. Proportion of Urban Employment Covered by Employment Contracts (%)



Sources: National Bureau of Statistics, *China Statistical Yearbook 2006*; All China Federation of Trade Unions, *China Statistical Yearbook of Trade Unions*, various issues.

Sources: National Bureau of Statistics, *China Statistical Yearbook*, various issues; National Bureau of Statistics, *Statistical Communiqué of Labor and the Development of Social Security*, various issues, www.stats.gov.cn.

Table A.1. Regression Analysis: Employment, Investment and Export

Equation (A.1) : $\ln L = \alpha + \beta \cdot DUM + \gamma \cdot \ln I + \delta \cdot DUM \cdot \ln I + \varepsilon$						
(Data are of Formal and Informal sectors of Chinese industry, 1978-2005)						
	α	β	γ	δ		Adj- R^2
Formal	7.136 (15.084)***	1.721 (2.020)*	0.257 (3.409)***	-0.260 (-2.163)**		0.306
Informal	8.572 (55.923)***	1.576 (8.764)***	0.309 (14.548)***	-0.206 (-8.622)***		0.974
Equation (A.2) : $\ln L = \alpha + \beta \cdot DUM + \gamma \cdot \ln I + \delta \cdot \ln X + \mu \cdot DUM \cdot \ln X + \varepsilon$						
(Data are of the economies of Eastern, Central and Western regions, 1978-2005)						
	α	β	γ	δ	μ	Adj- R^2
Eastern	8.730 (151.011)***	0.524 (7.452)***	0.081 (3.426)***	0.095 (4.662)***	-0.071 (-7.380)***	0.992
Central	8.348 (117.978)***	0.895 (9.817)***	0.067 (2.851)***	0.146 (8.786)***	-0.119 (-9.739)***	0.992
Western	8.623 (64.833)***	0.856 (4.134)***	0.057 (1.996)*	0.159 (10.592)***	-0.175 (-4.195)***	0.976
Sources: National Bureau of Statistics, <i>China Statistical Yearbook</i> , various issues.						
Note: Figures in parentheses are t-ratios; ***, ** and * are significant at 1%, 5% and 10% confidence levels, respectively.						

Table A.2. The Structural and Institutional Characteristics of China's Economic Growth

	α	β	A	b	c	Adjusted-R ²	
						Equation (A.3)	Equation (A.4)
Industry	0.391	0.771*** (4.575)	-0.087	0.184 (1.415)	0.821*** (7.894)	0.434	0.716
Non-Industry	-5.369	1.342*** (5.277)	-0.027	1.091*** (5.288)	1.096*** (3.898)	0.508	0.620
SOEs	1.723	1.064*** (7.672)	0.276	0.234* (1.931)	0.789*** (8.706)	0.465	0.750
Non-SOEs	-0.880	0.765*** (9.341)	-0.029	0.486** (2.550)	0.763*** (12.953)	0.768	0.882

Sources: National Bureau of Statistics, *China Statistical Yearbook* and *China Statistical Abstract*, various years.

Note: Data analyzed are Chinese data of 1978-2005. Figures in parentheses are t-ratios; ***, ** and * indicate statistical significance at 1%, 5% and 10% confidence levels, respectively.