

# Labour, Demography, and the Export-oriented Growth Model in China

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**Abstract:** In this paper, we argue that the export-oriented growth model in China is an unavoidable choice for China given its demographics and low level of urbanisation. The low dependency ratio and low urbanisation rate jointly determine a large amount of supply of labour and the slow growth of labour income, which in turn leads to the rapid accumulation of capital and the manufacturing sector. However, the two factors also determine a relatively small domestic market, and the only way to clear the market is to export. Judging by the pace of China's demographic transition and urbanisation, we expect that China's export-oriented model will continue up until 2025.

**Keywords:** Labour, Demography, Export-oriented Growth

**JEL Classification Numbers:** F0, J0

## 1. Introduction

Since World War II, developing countries have been investing optimum efforts to reach to the level of developed countries. Dissatisfied with the results of the import substitution strategy in which domestic industries are created under various trade protection instruments like tariffs and non-tariff barriers, many developing countries instead focus on export-oriented industrialisation. By exporting labour-intensive manufactured goods to developed countries, developing countries like China and other high performance Asian economies (HPAEs) are able to achieve remarkable economic growth in line with the idea of comparative advantage.

With the export-oriented strategy, China has experienced spectacular economic growth in the last three decades. Today, China is the third largest economy following the U.S. and Japan. In terms of purchasing power parity (PPP) calculation, China has a higher GDP than Japan and ranks second in the world. In the last quarter of the twentieth century, the average annual economic growth rate of China was consistent at around 10%. However, although 'China's Miracle' is acknowledged today, there still remains a question: What are the driving forces behind

the exceptional export-oriented industrialisation in China?

In this paper, we argue that China's export-oriented growth model is rooted in its unique population structure and demographic characteristics such as the large amount of labour in the countryside, low level of urbanisation, and the low dependency ratio. Driven by these three fundamental forces, China's export-oriented industrialisation has become a natural economic consequence. In other words, the export-oriented growth model is indicative of 'self-selection' behaviour.

The economic rationale is as follows. The large amount of labour in China's countryside leads to a slow and limited growth of its labour income. Similarly, largely due to its low level of urbanisation, China has a small domestic market, which in turn has to considerably rely on foreign markets. Equally importantly, the low dependency ratio in China leads to an imbalance in China's economic structure. Aggregated investment plays a more important role than aggregated consumption in China. Accordingly, China has to export many products in order to fulfil its excess domestic supply.

The remaining paper is arranged as follows. Section 2 presents evidence for surplus labour, urbanisation, and demographic transition. Section 3 explains the linkage between China's demography and its export-oriented growth model and presents evidence for the same. In particular, we compare China and India and show that the two countries are broadly similar in that both follow the trajectories determined by their demographics. Section 4 concludes the paper.

## **2. Surplus Labour, Urbanisation, and Demographic Transition**

### **2.1. Surplus Labour**

By the end of 2007, of the 1.3 billion people in China, 727 million people (55.1% of the total) lived in the countryside. In sharp contrast, the agricultural output in 2007 was 2,809 billion RMB, which accounted for only 11% of China's total GDP. Based on these facts, it is interesting to consider whether China has surplus labour in its countryside.

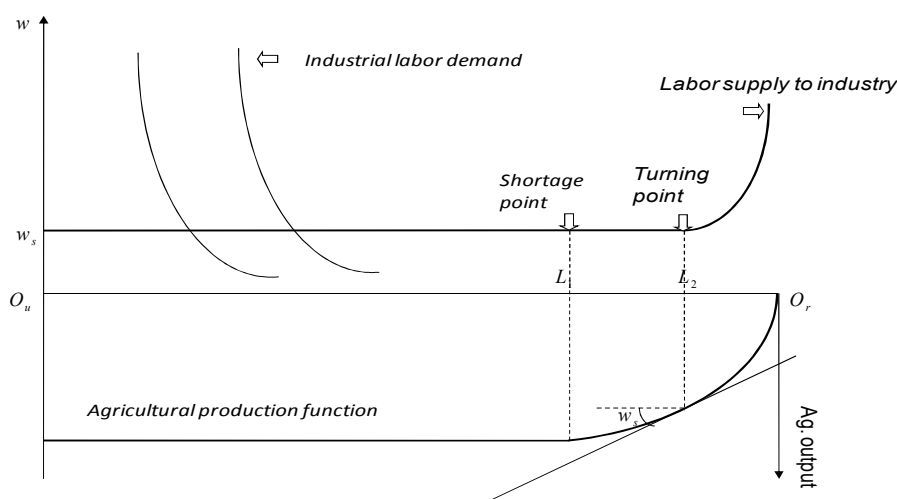
Given the stylized facts introduced above, at first glance, it seems that the abovementioned question is straightforward. However, this is not the case since it is related to a classic and controversial issue in development economics: Has China passed the Lewisian turning point?

According to Lewis (1955), the industrial wages in developing countries increase rapidly when the supply of surplus labour from the countryside tapers off. The Lewisian turning point, named after Lewis, is widely recognised in the context of China's rising wage rates. Some people (e.g. Garnaut and Huang, 2006; Cai, 2008) argued that China has already passed the Lewisian turning point; however, it is still inconclusive.

By definition, an agrarian economy has surplus labour if reducing its labour does not reduce agricultural output. Consider a two-sector economy with agriculture and industry. The

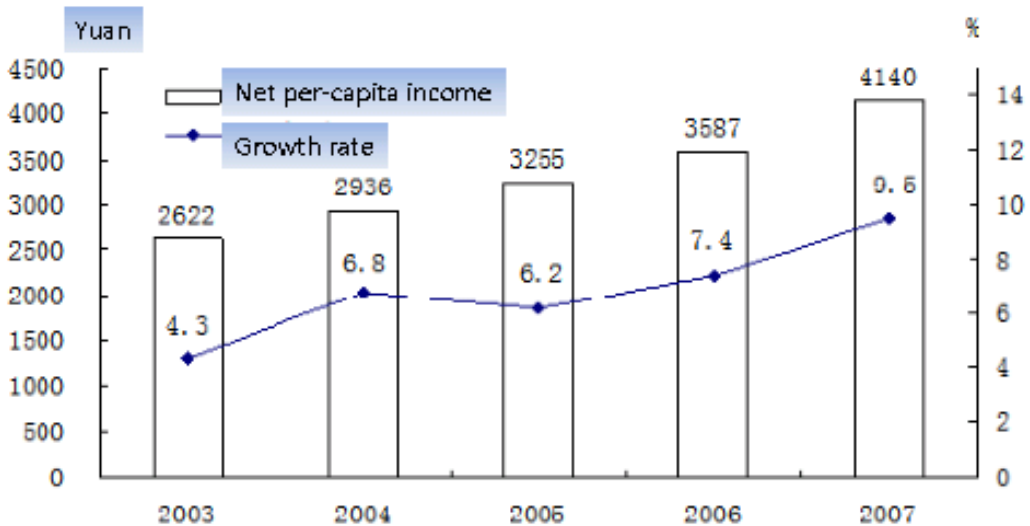
population is of size  $L$ , which could be allocated in the two sectors. As shown in Figure 1, agricultural output  $Q$  is produced by a short-run production function  $F(l)$  where  $l$  is the labour input. If the labour supplied in the agricultural sector is more than the cut-off point  $L_1$  (which is also known as the shortage point), then the marginal product of labour is zero. That is, there is surplus labour. In the equilibrium of a functioning labour market, the real wage equals the marginal product of labour. However, with surplus labour in the economy, the marginal product of labour is zero, which cannot be a wage rate. As a result, every worker receives institutional wage rate  $w_s$ , which is often considered to have been instituted by agrarian norms in order to allow subsistence for everyone. The Lewisian turning point  $L_2$  in the figure is defined as the point at which the marginal product of agricultural labour is equal to  $w_s$ . When industry hires more than  $L_2$  number of labourers, the marginal product of agricultural labour is less than  $w_s$ , and thus, industry can hire as many workers as it desires at the constant wage rate of  $w_s$ . This is known as unlimited supply of labour. When the amount of labour hired by industry passes the turning point, the marginal product of agriculture becomes larger than  $w_s$ , and the industry has to face an upward sloping supply curve. If a country passes the Lewisian turning point, it has to face increasing labour costs as an implication.

**Figure 1 The Lewisian Turning Point**



The wage rates for floor workers in China increased in the last few years. However, wage growth does not necessarily imply that China has passed the Lewisian turning point. Several other reasons could contribute to the recent increase in the wage rates in China. First, the growth of real wage may be caused by the growth of rural income. This leads to an increase in  $w_s$ , as shown in Figure 1. That is, the industrial labour supply curve makes a parallel move upward with no effect on the turning point. As observed from Figure 2, China's average rural net per capita income increased from 2,622 *yuan* in 2003 to 4,140 *yuan* in 2007, which is equivalent to \$616 by the exchange rate of 6.83 *yuan* to a dollar in 2007. In addition, this growth has accelerated in the recent years. The growth rate increased from 4.3% in 2003 to 9.5% in 2007.

**Figure 2 Rural Net per-capita Income and Growth**



Data Source: China Statistical Yearbook, various years.

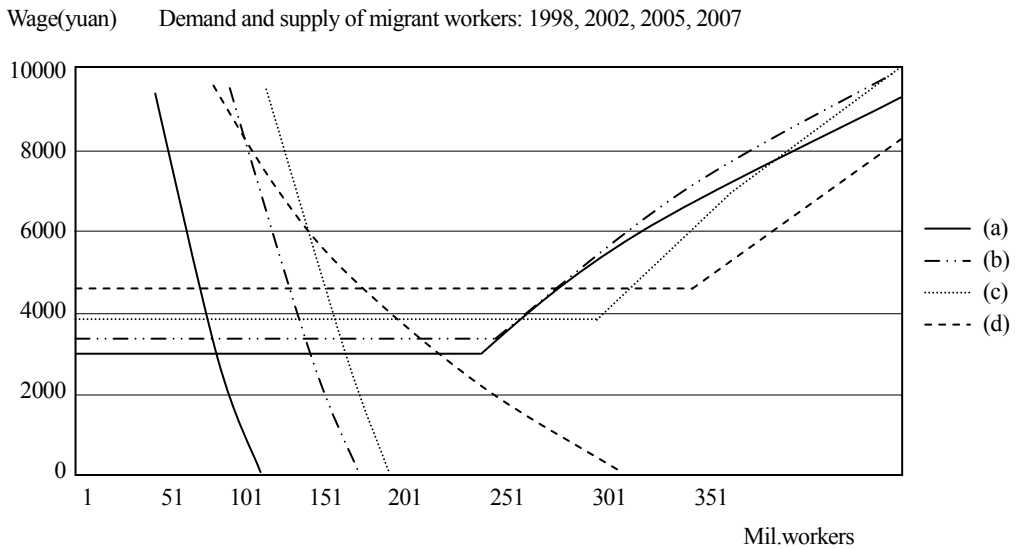
Second, the increase in the wage rates could be a phenomenon in the boom part of an economic cycle that shifted the demand curve rightwards to intersect the supply curve at the latter's upward portion. However, such demand shocks might be *temporary*, as evident in the current financial crisis when a large number of migrant workers had to return home. This also happened during the Asian Financial Crisis when a quarter of migrant workers lost their jobs in 1998 (Figure 4).

Finally, as mentioned above, there is still a significant amount of labour in the countryside. The contrast between 55% of total population and 11% of the total GDP is startling; it is difficult to understand it if one does not interpret it as evidence for surplus labour.

To further shed light on the issue, we simulate the supply and demand for migrant workers in China within the last decade using provincial data. Figure 3 shows the curves for the selected

years. China did not pass the Lewisian turning point in any year as the supply and demand curves always intersect at the flat portion of the supply curve.

**Figure 3 Simulated Demand and Supply for Migrant Workers**



Notes: The lines are the simulated results by authors' calculation. The (a), (b), (c), and (d) lines denote the simulated demand and supply curves in 1998, 2002, 2005, and 2007, respectively.

## 2.2. Migration and Urbanisation

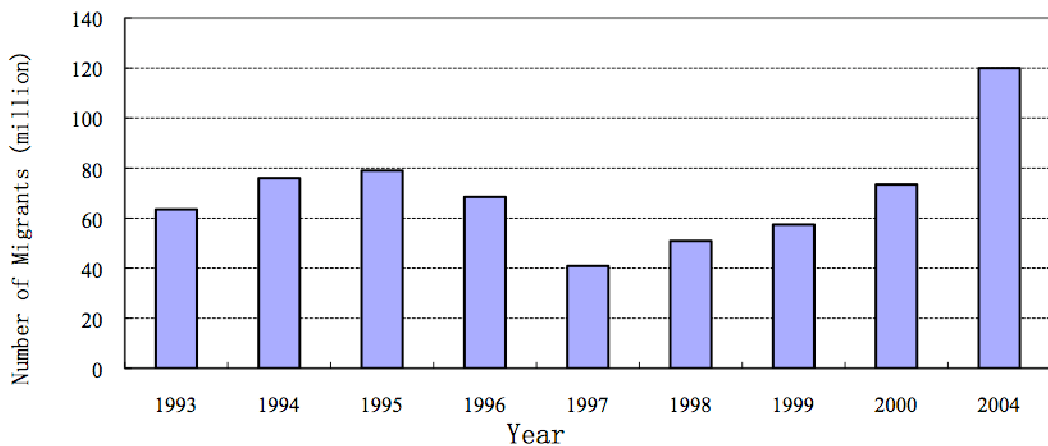
The rural-urban divide has been one of the most important phenomena in the Chinese economy. China established a highly rigorous system of residency registration in 1958, which is widely known as the 'hukou' system. It was one of the intrinsic requirements of the heavy-industry development strategy adopted by the Chinese government in the planning era (1949–1992). To guarantee sufficient capital accumulation in heavy industries, the government had to rely on the 'price scissors' against peasants. That is, by lowering the prices of agricultural goods while raising those of manufacturing goods, the government was able to extract agricultural surplus from peasants (Lin and Yu, 2008). However, for the 'price scissors' to be a success, the government had to restrict migration from the countryside to the city.

Since the economic reform, the 'hukou' policy has been substantially liberalised concurrent with three waves of rural-urban migration. The first wave was the small-town urbanisation strategy in the early 1980s. Rural residents were allowed to obtain the 'hukou' in a town or a small city if they found a job or bought a house there. The second wave began in the late 1980s. Due to the implementation of the export-oriented development strategy, many coastal cities,

especially those located in Guangdong province, had developed a strong demand for extra labour supply. As a result, there was large-scale migration and this eroded the ‘*hukou*’ system. The third and the largest wave began in the 1990s. As shown in Figure 4, there were around 60 million rural migrants in 1993, and the number doubled only after a decade.

Currently, people who originally have rural ‘*hukou*’ can obtain the official urban residency in several ways. First, graduates from universities are provided with urban ‘*hukou*’. Second, urban expansion annexes peripheral areas into the city and provides the residents with an urban status in place of their earlier rural status. Third, veterans with certain ranks can get urban jobs. Fourth, richer people can obtain the ‘*hukou*’ either by purchasing it at a relatively high price or by investing in a new business in the city (Naughton, 2006).

**Figure 4** China’s Migration (1993-2004)



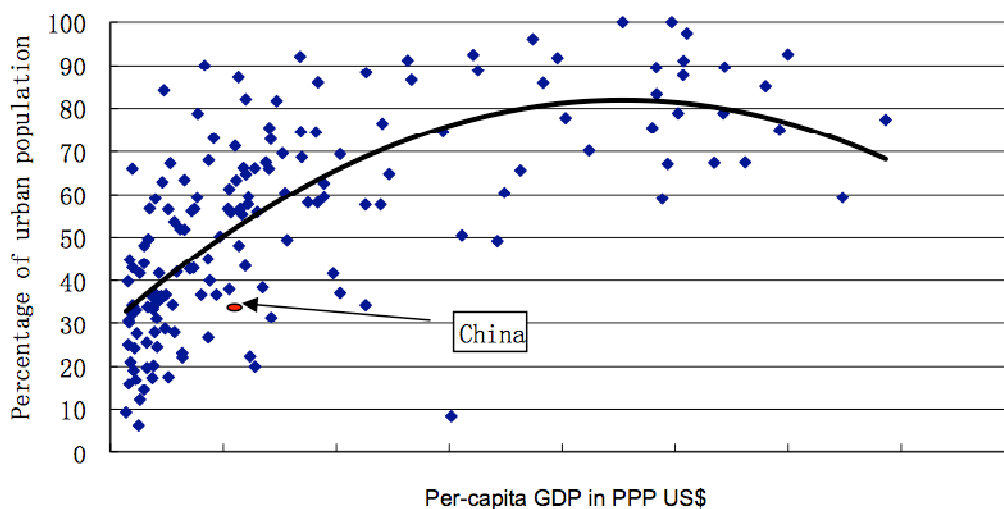
Sources: China Statistical Yearbook, various years.

Despite large-scale migration, China’s urbanisation lags behind its income level when compared with other countries. Figure 5 plots a non-linear relationship between the percentage of urban population and the per capita GDP (PPP US\$) across countries in 2003. As is seen, China is below the trend line.

We can provide a simple (but somewhat unrealistic) calculation to shed light on this point. Currently, China’s agricultural GDP accounts for 11% of its total GDP. In sharp contrast, the countryside accounts for 55% of China’s population. As a consequence, the rural per capita income is only one third of the urban per capita income. Thus, what would China’s urbanisation ratio be if all rural residents only worked in the agricultural sector and if the urban-rural income gap was maintained at the ratio of 3:1? Let the ratio between rural and urban population be  $x$ .

Next, we have  $(11/89)/x = 1/3$ , from which we obtain  $x = 0.37$ , or  $27/73$ . In other words, China's urbanisation rate would be 73% instead of 45% if all rural residents only worked in the agricultural sector and maintained the same income gap with their urban counterparts. In reality, rural people do obtain non-farm income. This estimate, therefore, can be read as an upper bound for China's urbanisation rate.

**Figure 5 Per-capita GDP and Urbanization in the World (2003)**



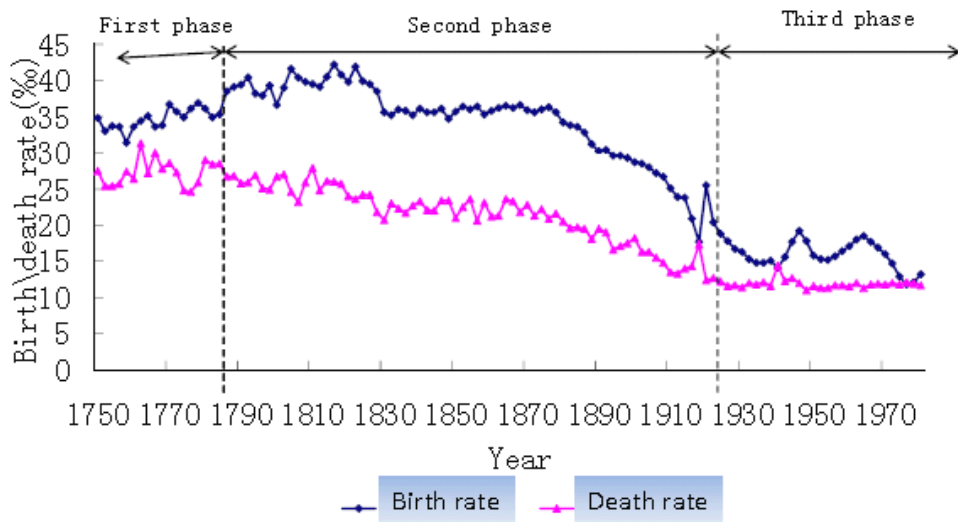
### 2.3. Demographic Transition

In addition to structural change, China's demographic transition is also a key reason to interpret China's choice of the export-oriented development strategy. To understand this point, we first compare the demographic transition between the Great Britain and China.

As the first industrialised country in the world, the Great Britain began its industrial revolution in the mid-eighteenth century after its Glorious Revolution in 1688. As seen from Figure 6, the demographic transition in the Great Britain was divided into three different phases during the period 1750–1980. The death rate in the Great Britain had a declining trend over these two hundred years. The only exceptions were the 1910s and 1940s when the death rate in the Great Britain increased during both World War I and World War II. We can classify the entire British history into three phases by its birth rates. The first phase was between 1750 and 1790, during which the birth rate increased from 35% to around 40%. However, since the death rate was also high, population grew gradually. The second phase was between 1790 and 1929, during which the birth rate increased in the early years but decreased for more than one century, and reached its trough in 1910 due to World War I. However, the death rate decreased even faster. As a result,

population grew rapidly, especially in the early stages of this phase. This was the period when the Great Britain enjoyed large amounts of population dividends. The third phase was between 1929 and 1980, which was characterised by low birth rates, low death rates, and low natural growth rates.

**Figure 6 Demographic Transition in the Great Britain (1750-1980)**



Sources: Maddison (2001).

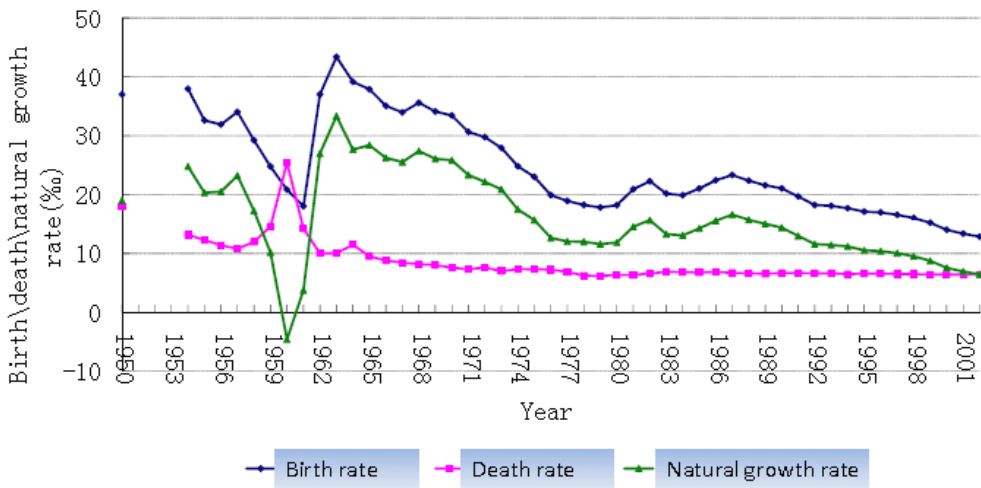
Figure 7 presents the data of China for the period 1950–1981. It provides three curves for the birth rate, natural growth rate, and the death rate. In the 1950s, China's birth rate decreased and reached its minimum in 1960 due to the Great Famine (1959–1962). On the contrary, China's death rate touched its maximum level of 25% during the period of the Great Famine. China implemented its 'One-Child' policy in 1979. As a result, the birth rate again had a decreasing trend. The most interesting revelation is that the natural growth rate of China, which is defined as the difference between birth rate and death rate, was consistent since the beginning of its Cultural Revolution in 1966. Barring the famine period, we do not consider the phase to be comparable to the first phase of the Great Britain. China has mostly been in its second phase. Today, it is approaching the end of this phase. Compared with the Great Britain where the second phase lasted for 140 years, the second phase in China was considerably compressed due to family planning.

Family planning, however, led to a rapid decline in China's age dependency ratio, which, by definition, implies the ratio of population aged below 16 and above 64 relative to those aged between 16 and 64. According to China's Statistical Yearbook (2008), China's age dependency



ratio was only 0.4 in 2007, which is not only lower than the average level of East Asian countries but also one of the lowest in the world. This point is clarified by examining the ratio of working age to dependent population, which is exactly the inverse of the age dependency ratio. As shown in Figure 8, on average, the East Asian group currently has the highest working ratio, followed by Europe, the USA, South Asia, and Sub-Saharan Africa. In other words, the East Asian countries have the lowest age dependency ratio in the world. Nevertheless, it has never been lower than 0.4. Indeed, the increasing trend of its working age ratio since 1990 has been mostly driven by the same trend in China.

**Figure 7: Demographic Transition in China (1950-2001)**



Sources: China Statistical Yearbook (2008).

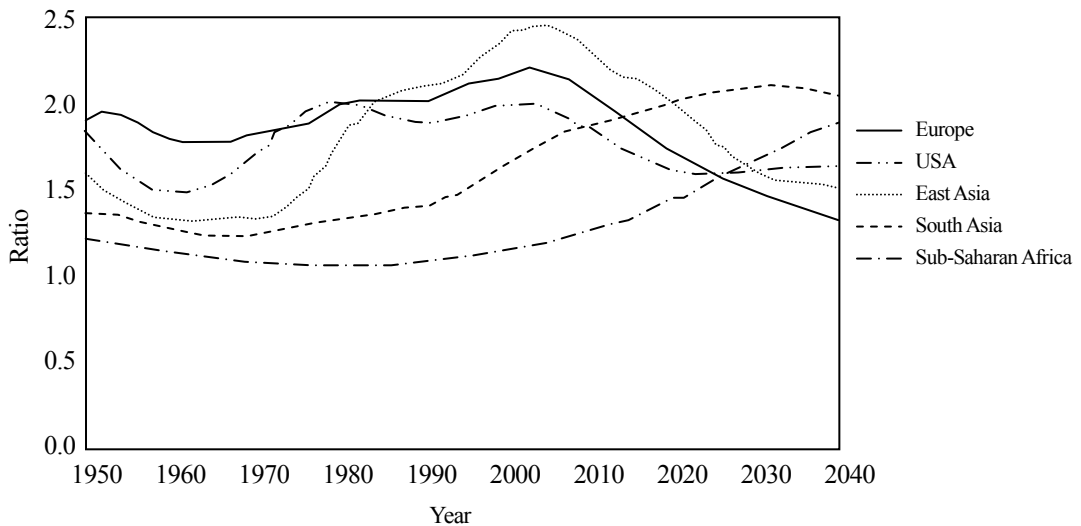
China’s low age dependency ratio has rich implications for its economic growth. First, due to the low age dependency ratio, China has a significant labour supply. Second, the lower the age dependency ratio, the more are the savings, and accordingly, the less is the consumption. Finally, the low ratio also renders a higher investment rate and faster capital accumulation. In sum, the low dependency ratio is the driving force behind China’s high economic growth since its economic reform in 1978.

The demographic dividend is usually used to describe a rise in the rate of economic growth due to the declining share of the age dependency ratio. Previous works like Bloom and Williamson (1998) have suggested that the demographic dividend can explain one fourth to two fifth of the East Asian Miracle and 17% of China’s growth.

How long will the remarkable demographic dividends last in China? It is certain that the dependency ratio will increase due to aging. In 2007, there were 111 million people above 64

years of age in China, accounting for around 9% of the 1.3 billion people. A recent official forecast suggests that this number will reach around 200 million in 2015 and 400 million in 2044 for those above 60 years of age. In sharp contrast, China's savings rate may not decline rapidly. The national savings rate in China was 50.3% in 2008<sup>1</sup>. Thus, there is no reason to believe that this a high saving rate will decline dramatically in the near future. This is supported by evidence from Japan and Korea where there was a time lag between demographic transition and economic growth.

**Figure 8 Ratios of Working Age to Dependent Population in the World**



Source: Bloom et.al. (2007)

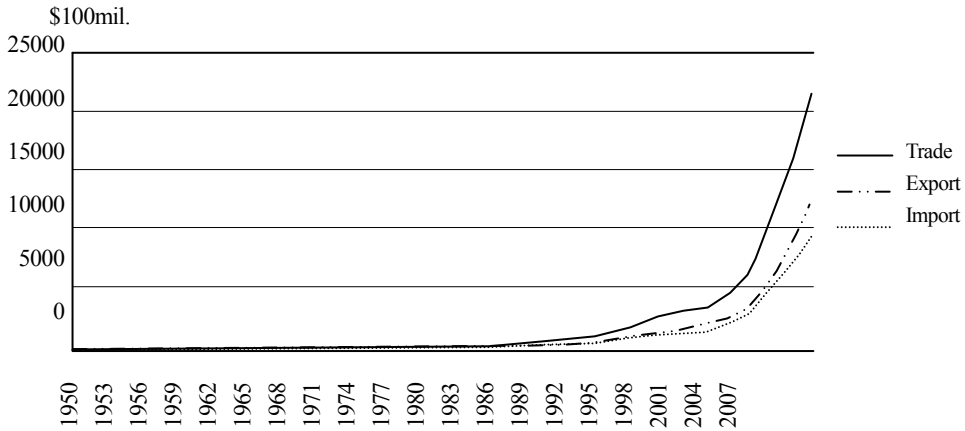
In summary, demography is the fundamental force behind China's growth pattern and its growth trajectory. Indeed, China has compressed its second phase of demographic transition so that its economic growth takes an extraordinary route. Moreover, the large rural population in China implies that China still can maintain its 'low-cost' economic growth for a reasonable long time period.

### 3. Demography and China's Economic Model

Driven by China's demographic transition, the Chinese economy has two important features. First, the choice of export-oriented industrialisation is market-driven and self-selected. The low age dependency ratio and the large rural population in China imply a small domestic market.

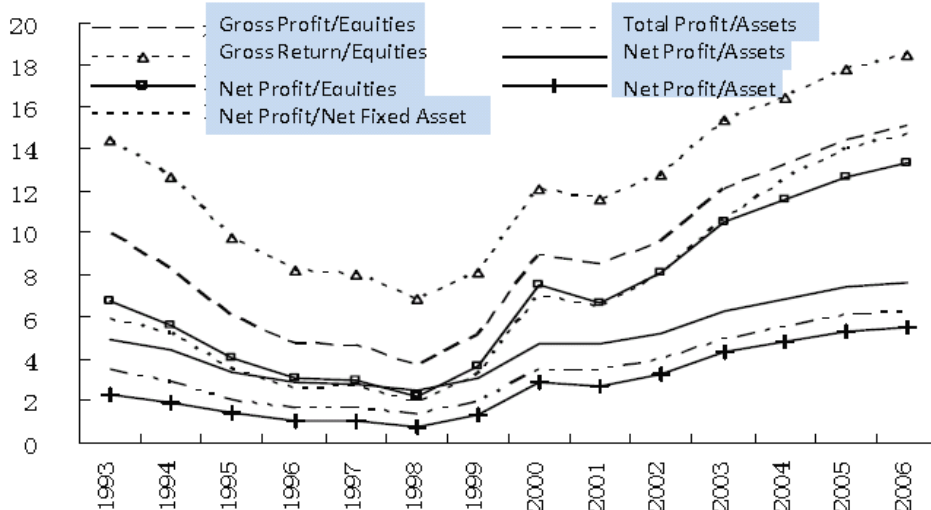
Accordingly, the excess-supplied manufacturing goods have to sell abroad. This process was accelerated after China joined the WTO and completely integrated itself in the world economy. This is clear in Figure 9 that presents China’s export and import data for the period 1950–2007.

**Figure 9 China’s Foreign Trade: 1950-2007**



Source: Tong (2008).

**Figure 10 The Profit Rates of Chinese Enterprises**

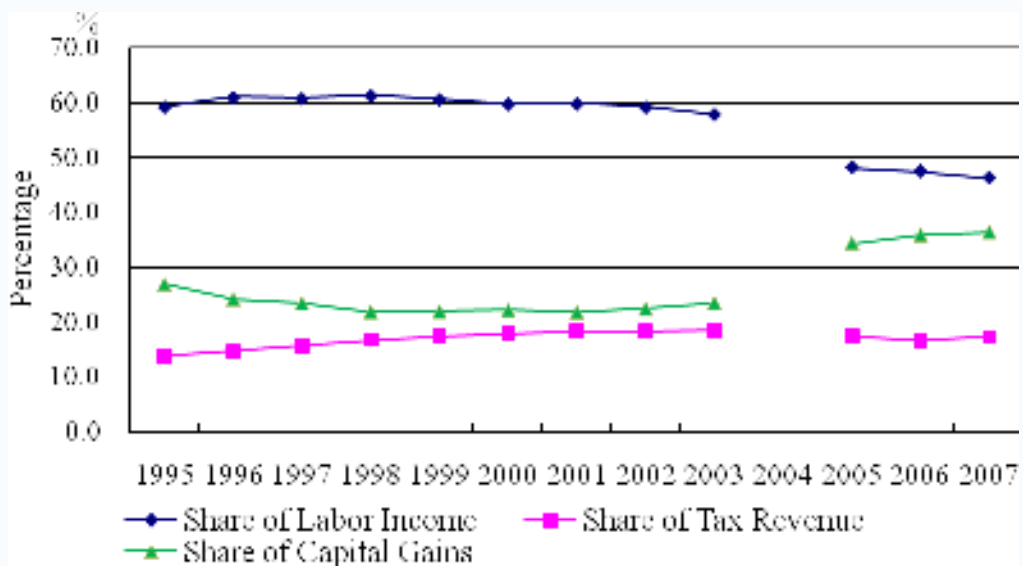


Source: CCER Research Team of “China Economics Observers”(2007).

In addition to export, China’s demographic transition also implies a large share of investment

and a small share of consumption. The rapid growth of investment is due to enterprises' rapid accumulation of profits, which in turn are a consequence of low wage rates. The average profit rates of China's all state-owned enterprises (SOEs) and non-SOEs whose annual sales are higher than 5 million *yuan* had increased rapidly since 1998. As shown in Figure 10, several key accounting indices such as ratio of gross profit to equities had increased from 5% in 1998 to around 14% in 2006.

**Figure 11 Components of China's GDP**

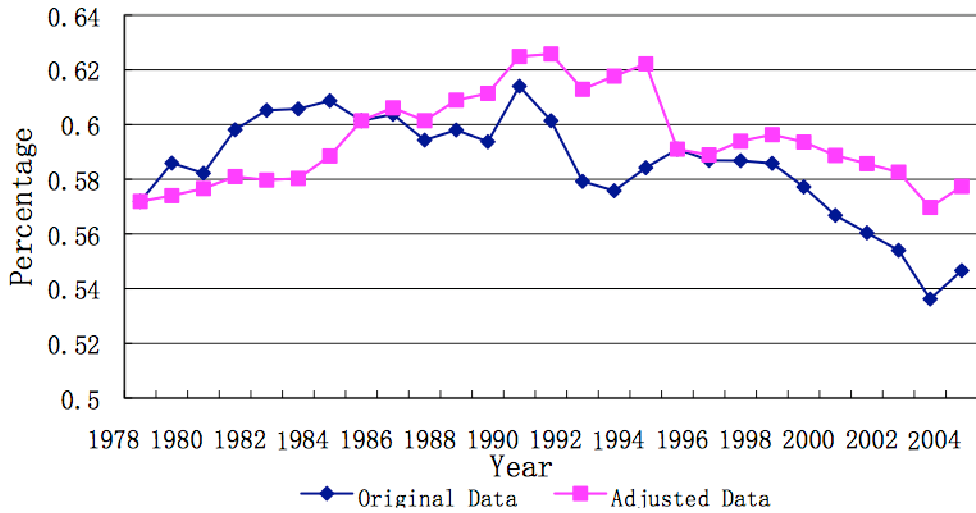


Notes: Data sources are from the *China Statistical Yearbook*, various years. Data are missing in 2004 since no data are reported.

On the other hand, the share of labour income in national income is declining over the years. In particular, as seen from Figure 11, this share decreased from around 60% in 2000 to 46.3% in 2007. This trend becomes clear if we investigate a longer time period, that is, since 1978. Bai et al (2009) suggested that the official data have some problems and recalculated the labour shares. Figure 12 shows their results. Even by their adjusted figures, China's labour share in the national GDP decreased by 5% between 1995 and 2004. The declining share of labour income implies that people are becoming relatively 'poorer' compared with China's growing size of GDP. This explains why China has a 'small' domestic market.

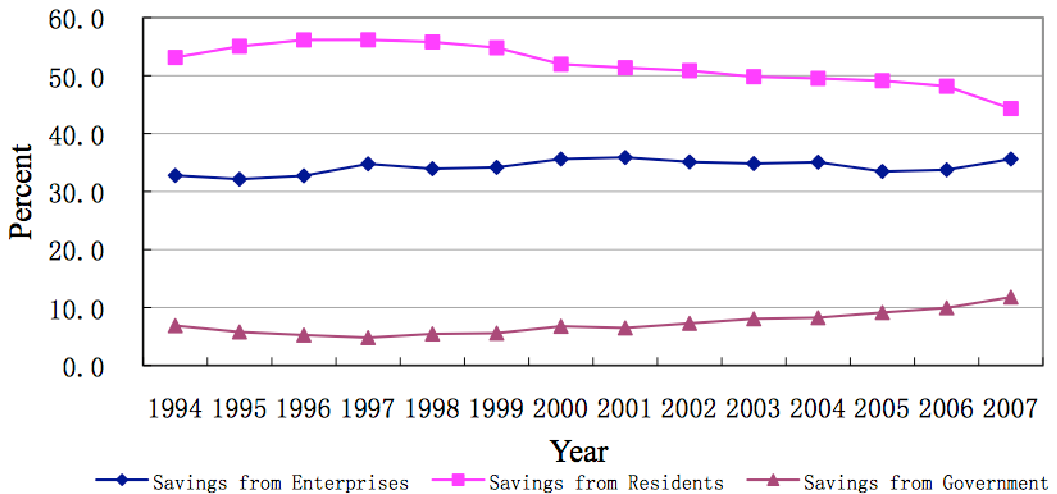
The flip side is that enterprises and the government are becoming relatively richer. The share of capital income increased from 22.2% in 2000 to 36.5% in 2007. Most of such capital incomes came from the profit of enterprises. On the other hand, the share of government

**Figure 12 Share of Labor Income of China's GDP**



Sources: Bai, *et.al* (2009).

**Figure 13 Components of Savings in Commerical Banks**



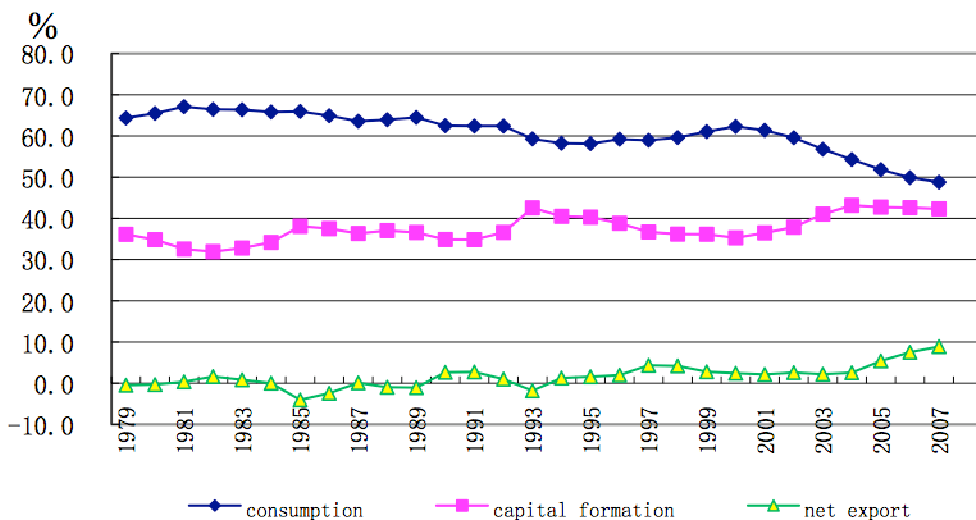
Sources: *China Statistical Yearbook*, various years.

revenue increased in the 1990s but was stabilised in the 2000s. Due to this asymmetry between labour income and enterprise and government income, the most recent growth of savings in

China has been contributed by enterprises and the government. This is clear in Figure 13 that shows the components of savings in commercial banks.

The share of consumption in GDP has consistently declined, and the shares of capital formation and net exports have increased (Figure 14). The share of consumption began to decline in the early 1980s, but has considerably accelerated in more recent years. Between 2000 and 2007, it declined for more than 10% to reach only 48% of the GDP expenditure. In the meantime, capital formation reached 43%, and net exports increased to 9% of the GDP.

**Figure 14 Components of China's GDP Expenditure**



Sources: *China Statistical Yearbook*, various years.

To explore the interactions among age dependency ratio, savings, and investment, we now offer some international comparisons between China and India since World War II. As is observed from Table 1, China and India have similar age dependency ratios in the 1960s. However, after four decades, today, China has a much lower age dependency ratio than that of India. An important point to be noted from the table is that the savings rate increased as the age dependency ratio decreased in both the countries. China has had higher savings rates than India in all the years, but the gap between the two countries has been almost held constant at 13%. This implies that the savings rate has increased faster in India than in China as the age dependency ratio decreases.

The other side of the story is that the share of consumption in GDP decreases with the decline

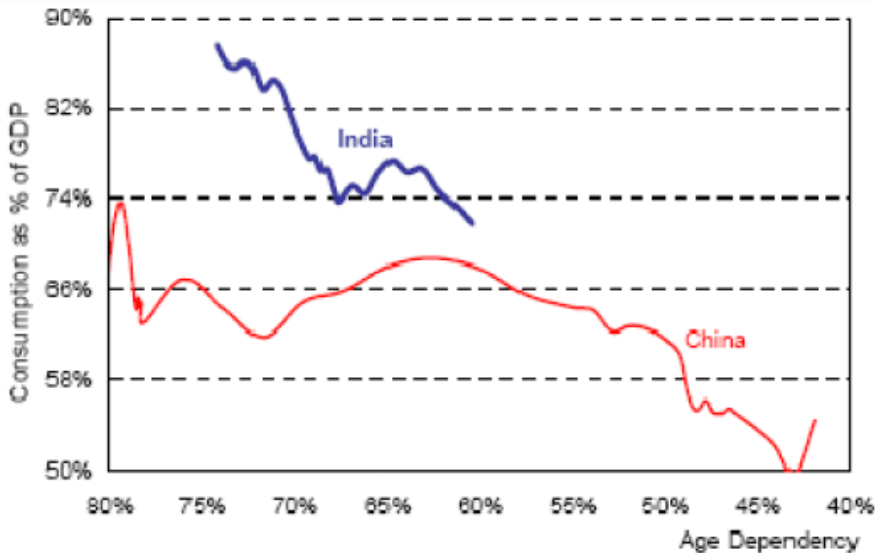
of the age dependency ratio. Figure 15 plots the share of consumption as the percentage of GDP against the declining age dependency ratio for China and India, respectively. The result is striking. While the share of consumption in China has declined rapidly since its age dependency ratio became lower than 65% (around the early 1980s), the share of consumption in India has declined even faster along the path of declining age dependency ratio.

**Table 1 A Comparison between China and India**

	1960s	1970s	1980s	1990s	2000-05
<b>India</b>					
Age Dependency	77.8%	76.8%	71.7%	67.0%	61.8%
Savings	13.0%	18.0%	19.9%	23.8%	26.3%
Investments	15.1%	18.1%	21.8%	25.2%	26.0%
<b>China</b>					
Age Dependency	79.0%	74.8%	57.4%	48.1%	43.6%
Savings	25.6%	34.7%	35.4%	38.5%	39.8%
Investments	26.1%	34.8%	34.8%	40.6%	42.2%

Sources: Ahya *et. al.* (2006).

**Figure 15 Share of Consumption in GDP Tracking Demographics**



Source: Ahya *et. al.* (2006).

The above comparison reveals two things. First, the Chinese model is not unique; it fits into the theory on the relationship between demography and economic structure. Second, the usual contrast between China and India is misleading. The seemingly different models adopted by

these two countries are actually the different stages on the same development trajectory.

#### **4. Concluding Remarks**

In this paper, we argued and presented empirical evidence that the export-oriented growth model is an unavoidable choice for China based on two key features of the Chinese economy: its low age dependency ratio (and associated high demographic dividends) and low level of urbanisation. We compared China with India and showed that the seemingly different growth models adopted in those two countries are actually the different stages on the same path of growth determined by demographics. This has important policy implications for both China and other developing countries, including India.

For China, the export-oriented growth model comes with the cost of accumulating large amounts of under-utilised savings, manifested by the burgeoning foreign reserves. However, reducing the imbalance in China's balance of payment by cutting its exports is the wrong approach. Exporting is the optimal choice for China to completely explore its comparative advantage to human resources. Although increasing the domestic consumption is the right approach, it is difficult to do that in the short run. This is because the relatively small domestic market is determined by the long-term factors related to demographics and urbanisation. To increase domestic consumption, China has to adopt serious structural adjustments among which accelerating the pace of urbanisation is an important one.

The gain from accelerated urbanisation could be significant. Given the fact that on average, an urban resident consumes 2.57 times of his counterpart in the countryside, if the urbanisation rate is raised to 73%, the counterfactual rate we reached in Section 2.2, the national consumption will increase by

$$(27\%+73\%*2.57)/(55\%+45\%*2.57) - 1 = 25.8\%,$$

which is obtained without any growth of income of urban or rural residents. As a result, the share of consumption in national GDP would increase to 61% from the current 49%, much closer to the level in developed countries. It should be noted that this calculation only accounts for the direct effect of consumption. Urbanisation will lead to the expansion of the service sector, which in turn will increase consumption because the service sector provides more labour income than the manufacturing sector.

For other developing countries, the Chinese experience shows that following a country's comparative advantage, usually in labour-intensive industries, is a way to attain rapid economic growth. The Chinese model is not unique but a natural choice considering China's demographics. Other developing countries may not need to follow the Chinese model, but they



should follow what their physical and labour endowments allow them to. This is particularly relevant for India. As a country with demographics similar to those of China, the optimal choice for India is to develop its manufacturing sector, and if it does so, exporting will be unavoidable.

## Notes

<sup>1</sup> The official website of NBS is [www.stat.gov.cn](http://www.stat.gov.cn).

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