The Double Transition and China's Export-led Growth

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Abstract

China's export-led growth is rooted in China's double transition of structural change and demographic transition. Accession to the WTO has allowed China to fully integrate into the world system and capture the gains of its comparative advantage in abundant labor supply. Structural change has a dampening effect on the Balassa-Samuelson effect so as to sustain China's competiveness in the world market. The double transition will take ten to fifteen years to finish; in this time period, China will likely continue its fast export-led growth. Along the way, export-led growth has also created serious structural imbalances highlighted by underutilized savings, slow growth of residential income and domestic consumption, and heavy reliance on investment. This linkage requires new thinking when global imbalances are to be tackled.

Keywords: double transition, export-led growth, global imbalances

China has managed nearly double-digit growth rates since it began economic reform and opening in 1978. The reform has transformed the Chinese economy from a planning economy to a mixed economy where the market plays a dominant role in resource allocation. Much of China's remarkable growth between 1978 and 2000 can be explained by the reform. However, the more recent and faster growth in the last decade has been mainly driven by exports. Joining the WTO in 2001 was a hallmark for China to fully integrate into the world system and allowed China to fully capitalize its large labor supply induced by the "double transition", namely, drastic demographic transition and a fast pace of industrialization. Using the growth trajectory of other East Asian economies as a reference, China can be expected to sustain fast economic growth for the next ten to fifteen years before its growth rate converges to its long-run steady-state rate.

Export-led growth has also created structural problems that have to be addressed for more balanced growth. The most significant problems are high savings and persistent current account surplus. At a low income level, China has been forced to export its savings to much richer countries. Related to this problem is the slow growth of domestic consumption and its declining share in GDP. This can be mostly attributed to the slower growth of household income relative to the growth of GDP. The other side of the story is faster growth of corporate income and government revenue. Enterprises have reinvested most of their profits and the government has spent a large proportion of its revenue on capital formation. As a result, China is still an investment-driven economy.

The fundamental cause of these imbalance problems can be traced to China's double transition. Because of the double transition, wage rates are suppressed and the benefits coming from the growth of trade have mostly accrued to capital returns and government taxes. As a result, the share of labor income declines, which in turn causes the share of consumption in GDP to decline. The other side of the coin then is the increasing share of national savings in GDP. Because of the diminishing marginal

return to capital, the growth of investment cannot catch up with the growth of savings, so the current account increases.

This paper is aimed at accomplishing three goals. First, it will provide a review of China's export-led growth and its links with China's double transition. Second, it will discuss the sustainability of China's export-led growth in the next twenty years. Third, it will analyze the structural problems created by export-led growth and show how those problems are linked to China's double transition.

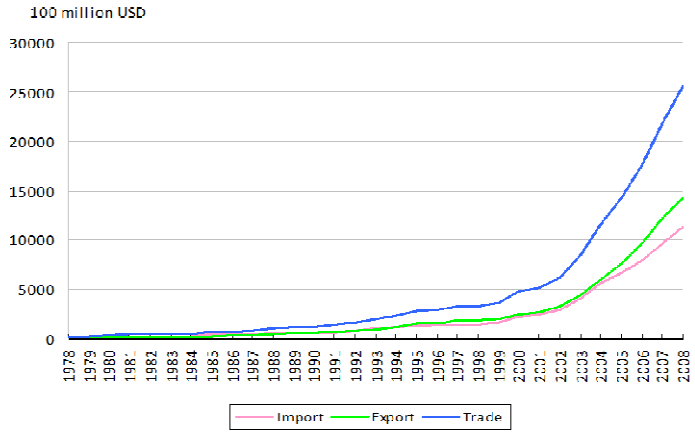
1. Exports and Economic Growth in China

China began its export-led growth in the mid-1980s, much inspired by the successes of its East Asian neighbors. In the 1980s, two theories had facilitated the adoption of the export-led growth model. One was the gradient theory (Xia, 1982). A version of the flying geese theory, this theory divides China into three regions, eastern, central, and western, that are assigned different levels of priority of development. According to the theory, the eastern (coastal) region should start economic development first, and then the central region and the western region. This theory was written into the government's seventh five-year plan for the period 1986-1990 (State Council, 1986). As a piece of evidence for its impact on government policy, the share of the central government's investment in the coastal region increased from 39.5% in the period 1953-1978 to 53.5% in the period 1979-1991 (Yao, 2008). The other theory was the theory of the great international circulation (Wang, 1988) that set processing trade as China's long-term strategy of economic development. Processing trade had already started in Guangdong province by mid-1980s. This theory was dramatic because it elevated processing trade to a national strategy.

Figure 1 presents China's volumes of trade between 1978 and 2008. Two periods can be clearly identified in the figure. One is before 2001 and the other is after 2001. China joined the World Trade Organization (WTO) in 2001, so it is not surprising to find that it became a watershed for China's foreign trade. In the first period, the growth rates of export and import were respectable, albeit not fantastic. In the second

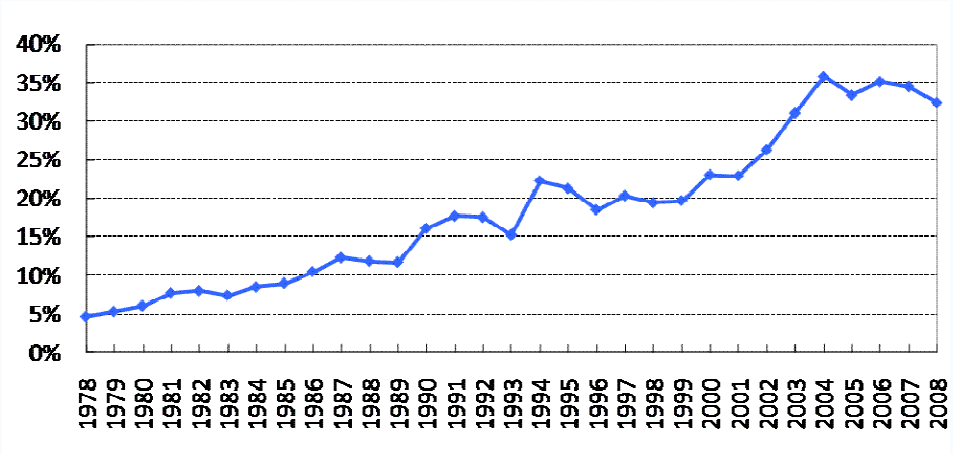
period, export managed to grow by a rate of 27.3% per annum while import grew by 24.8% per annum. This gap has contributed to the accumulation of China's current account surplus, especially after 2004. The fast growth of trade has substantially increased China's trade dependency; total trade volume as a share of GDP has reached 65% and export as a share of GDP has grown to 35%. Figure 2 presents the share of export in GDP for the period 1978-2008. The two periods found in Figure 1 can also be found in this figure.

Figure 1. China's trade volumes: 1978-2008



Source: NBS (2009).

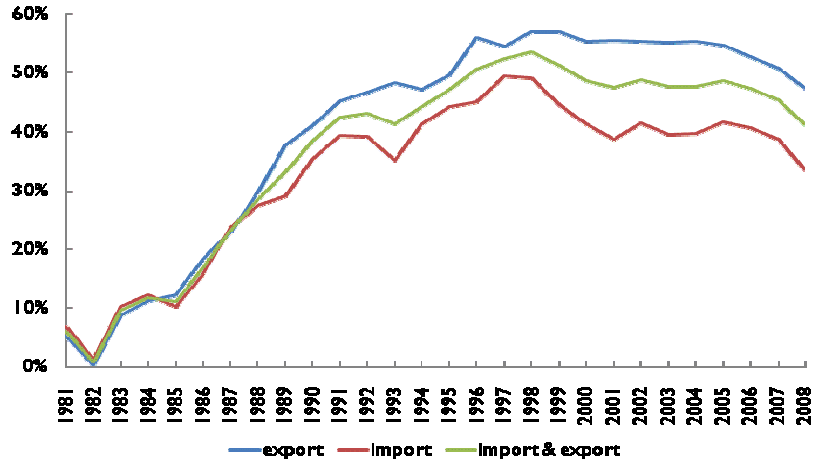
Figure 2. China's share of export in GDP: 1978-2008



Source: NBS (2009).

It is widely recognized that China's export relies heavily on processing trade. This is evident in Figure 3 that presents the shares of processing trade in total trade. The peak was reached at the end of the 1990s when processing trade accounted for 60% of China's total trade. Since then the shares of processing trade in both export and import have declined. Now about 50% of China's export is processing export, and about 40% of China's import is for processing export.

Figure 3. Shares of processing trade in total trade: 1981-2008



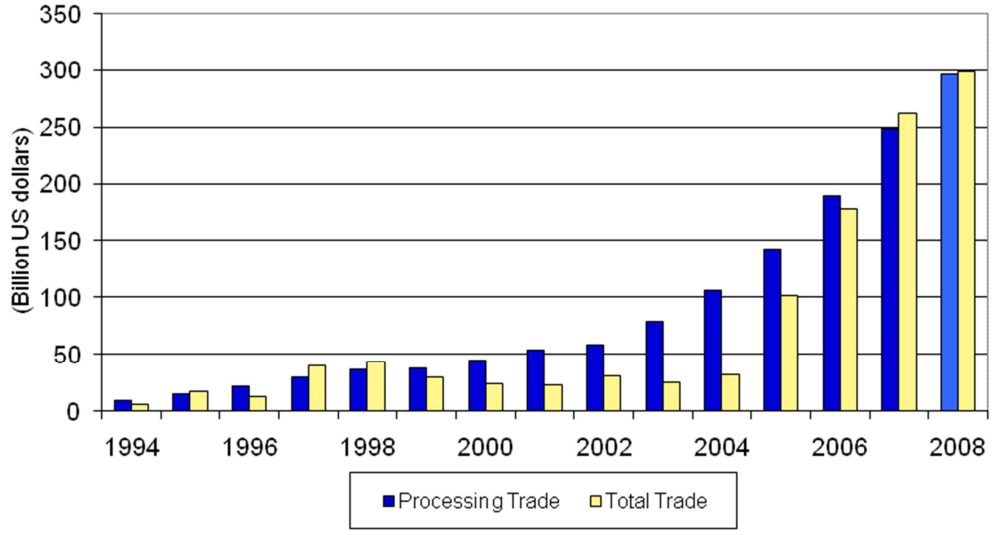
Source: NBS (2009).

It is noteworthy that processing trade by definition creates trade surplus. As a matter of fact, China's trade surplus has been entirely created by processing trade since early 1990s. Figure 4 shows China's surplus in processing trade and all trade. In most of the years before 2007, processing trade surplus was larger than all trade surplus, implying that regular trade incurred deficits. In the period between 2001 and 2005 when China's trade surplus surged, processing trade surplus was much higher than total trade surplus, even more than double the latter in 2003 and 2004. While China's domestic firms are engaged in processing trade, foreign firms are more significant players. For example, Apple's suppliers (most noticeably the Taiwanese company Faxconn) alone created 1.9 billion dollars surplus for China in 2007 (Xing, 2010). Labor is the most important input in processing trade production; foreign companies engage in processing trade in China to explore the low costs offered by

China's abundant labor supply.

Consistent with Figure 3, total trade surplus has been catching up with processing trade surplus in recent years and became larger than processing trade surplus in 2007 and 2008. The declining share of processing trade, however, has not resulted in declining total trade surplus, because the amount of processing trade surplus has been increasing.

Figure 4. Trade surplus in China



Source: Xing (2010).

The contribution of export to China's economic growth is significant. Net export alone has accounted for 6 to 12 percent of China's GDP between 2002 and 2008; the overall contribution of export to GDP is higher because of backward and forward linkages. Studies have found that the overall contribution of export to GDP ranges from 11% to 19% depending on the method used for the measure (Lin and Li, 2002; Shen and Wu, 2003; Li, 2003; Lu and Xu, 2005; Fan, Mao and Wang, 2005).[1] Using the average of those estimates, 15%, we reach the conclusion that export's contribution to China's GDP growth between 2002 and 2008 was 4.1 percentage points (15%*27.3%). Since China's GDP grew by an average of 10% per annum in

[1] Methods based on the input-output table generally produce lower figures, and methods based on regressions generally produce higher figures.

that period, the contribution of export to China's GDP growth was 41%. Export grew by 42% in the first half of 2010. This means that its contribution to GDP growth would reach 6.3 percentage points if this rate of growth were sustained for the whole year.

2. The Double Transition and Export-led Growth

The growth of China's trade since the country joined WTO can only be described as extraordinary. What are the factors leading to this extraordinary growth of trade? The prevailing view in the policy circle of the United States, the country with half of its trade deficit coming from China, seems to suggest that the undervalued yuan is the most important cause (PIIE, 2010). This view is based on two related premises: the yuan is severely undervalued and its appreciation will reduce Sino-American trade imbalances. While some studies (e.g., PIIE, 2010) find that the yuan is undervalued by 20% or more, other studies find more moderate figures. For example, Wang and Yao (2008, 2009), whose results will be introduced in Section 2.3, take structural change as a factor weakening the Balassa-Samuelson effect and find that the yuan was only undervalued by about 6% in May 2008. As for the effects of the yuan's appreciation, surprisingly there are few quantitative studies. One recent study is Li, Wang, and Xu (2010) who, in the framework of a cross-country CGE model, calculate the effects of the yuan's appreciation of 5%, 10%, and 20% against the US dollar. They find that moderate appreciation of 5% and 10% will actually increase China's trade surplus because of the low substitution between American and Chinese exports. A large appreciation of 20% will have significantly negative effects on the Chinese economy --- for example, employment will drop by 3.03% and GDP will drop by 3.18%, but it will have negligible effects on the American economy --- for example, both employment and GDP will only increase by 0.16%.

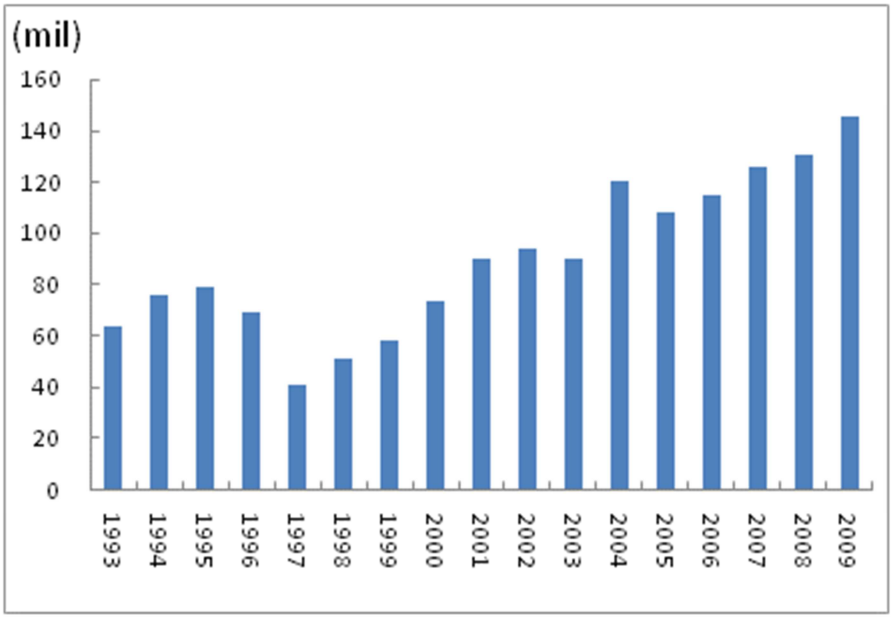
While the exchange rate is an important parameter determining international trade, focusing only on the exchange rate prevents us from studying more fundamental forces determining the international division of labor. In the case of China, the double

transition is one of such fundamental forces.

2.1 The Double Transition

The double transition refers to two profound transformations happening in China. One is its fast pace of industrialization and the accompanying rural-urban migration, and the other is the extraordinary demographic transition since China implemented the one-child policy in 1979.

Figure 5. Rural-urban migration: 1993-2009



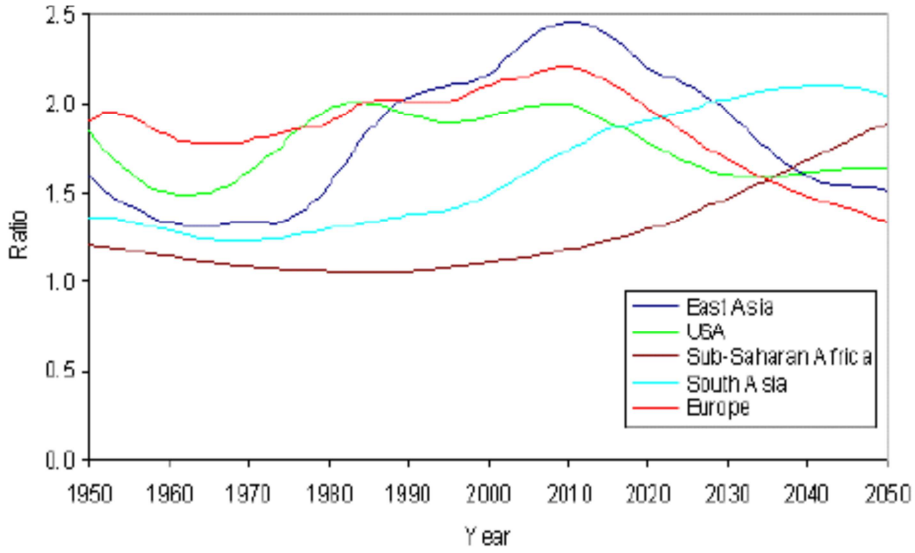
Source: MHRSS (2009).

In the 1980s, industrialization was mostly carried out by the indigenous township and village enterprises (TVEs) scattered in the coastal region and urban peripherals in inland provinces. In later years, industrialization has been mostly driven by exports. The coast has ubiquitous advantages over the inland and 90% of China's export comes from the nine coastal provinces and cities (Tong, 2008). The export industries draw labor from inland provinces. As a result, large labor migration happens. Figure 5 shows the amounts of migrant workers between 1993 and 2009. The number of migrant workers increased in the early 1990s until the Asian Financial Crisis brought a large setback in 1997. The growth of migration has been phenomenal since 1997. By 2008, the number reached 130 million. Despite this large scale of migration,

however, the countryside still has a labor force of 468 million, 45% of the national total. In comparison, agriculture only accounts for 11% of the national GDP. This discrepancy inevitably puts downward pressures on the wage rates of migrant workers.

The one-child policy is estimated by the Chinese authorities to have avoided 400 million births in the last 40 years (NBS 2009). Although the figure can be debated, it is evident that population growth has slowed down in China. One of the consequences has been the drastic increase of the working age ratio in China. Figure 6, adopted from Bloom et al. (2007), compares the working age ratios in different regions in the world. In the figure, the line of East Asia reflects the trend of China because the Chinese population accounts for nearly 90% of the East Asian total. Compared with other regions, especially South Asia, the second most populous region in the world, China's demographic transition has two distinctive features. One is that it is very abrupt, and the other is that the working age ratio reaches very high levels. Both features are results of China's one-child policy. Because the birth rate has declined sharply, the young age dependency ratio has dropped quickly. On the other hand, the old age dependency ratio does not increase immediately. The result thus is a fast increase of the working age ratio. However, this is only a short period of time because the old age dependency ratio increases quickly as people born in the 1940s and 1950s become old. In fact, 2010 is the turning point beyond which China's working age ratio will decline, and come back to the 1980 level by 2040. Compared with South Asia, this is a condensed demographic transition.

Figure 6. Working age ratios in the world



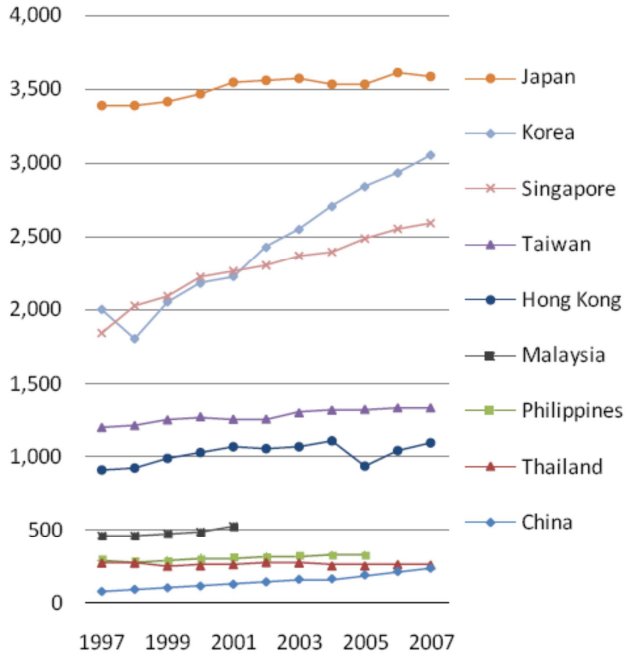
Source: Bloom et al. (2007).

2.2 The Double Transition and China's Export-led Growth

The double transition has determined China's extraordinary growth model, especially after China fully integrated into the world system through accession to the WTO. The double transition has given China vast comparative advantage in labor resources, and the accession to the WTO has allowed China to fully play this advantage. Figure 7, adopted from a recent Conference Board study, compares China's manufacturing wage rates with other East Asian economies. Clearly, China has the cheapest labor force among the economies shown in the figure. However, the Chinese labor force is relatively well trained. China catches up with the world average in terms of educational attainment although its per-capita income is ranked 110th in the world (UNDP, 2009). As a response, the East Asia manufacturing has gone through a reconfiguration centered at China. China became the assembly center and the surrounding countries became suppliers of materials and intermediate goods. The changes brought by the Asian Financial Crisis have helped this process. The major East Asian currencies experienced a free fall during the crisis. China did not devalue the yuan and avoided competitive devaluation in the region. China became a

favorable destination for exports from the surrounding countries, and Chinese exporters found it much cheaper to import intermediate goods from surrounding countries.

Figure 7. Monthly manufacturing wage rates in East Asian economies (2007 dollar)



Source: The Conference Board (2010).

Trade flow data clearly show that China has replaced the United States and Japan to become the engine of exports in East Asia. Table 1, adopted from Song et al. (2006), compares the shares of contribution of China, the US, and Japan to the ASEAN countries' exports in the period 1990-2003. While China lagged behind the US for the whole period, there was a clear trend that China was replacing the US to become the most significant destination for ASEAN exports. Between 1990 and 1995, China's demand only contributed 8.27% to ASEAN's total exports; between 2000 and 2003, the figure became one third.

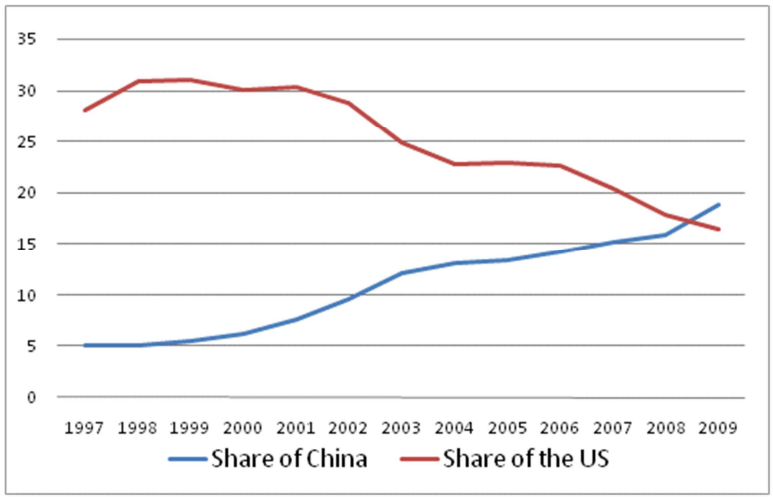
Table 1. Demand contribution of China, the US, and Japan for ASEAN exports (%)

	China	US	Japan
1990-2003	16.15	19.15	4.60
1990-1995	8.27	14.48	7.36
1996-2000	15.92	33.17	4.22
2001-2003	32.85	5.01	0.44

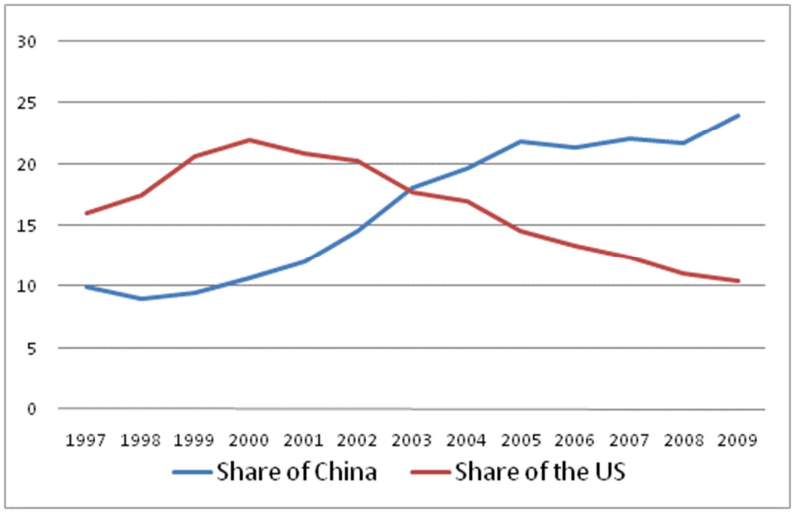
Source: Li and Song (2006).

Figure 8. Shares of Japan and Korea's exports to China and the US (%)

Japan



Korea



Source: author's calculation based on COMTRADE data.

Figure 8 presents the integration of the Chinese economy with its two most important regional trade partners, Japan and Korea. Japan's export to the US declined from more than 30% of its trade export at the end of the 1990s to 17% in 2009. In the meantime, its export to China increased from merely 5% in 1997 to 19% in 2009. The change happening to Korea has been no less dramatic. In the mid-1990s, no more than 10% of its export went to China; in 2009, the figure was close to 25%. In contrast, its share of export to the US declined from 22% (the highest since 1997) in 2000 to 10% in 2009. Both countries run surplus with China. In fact, China runs trade deficits with most economies in Eastern and Southeastern Asia (Xing, 2010), and its most surplus comes from North America and Europe.

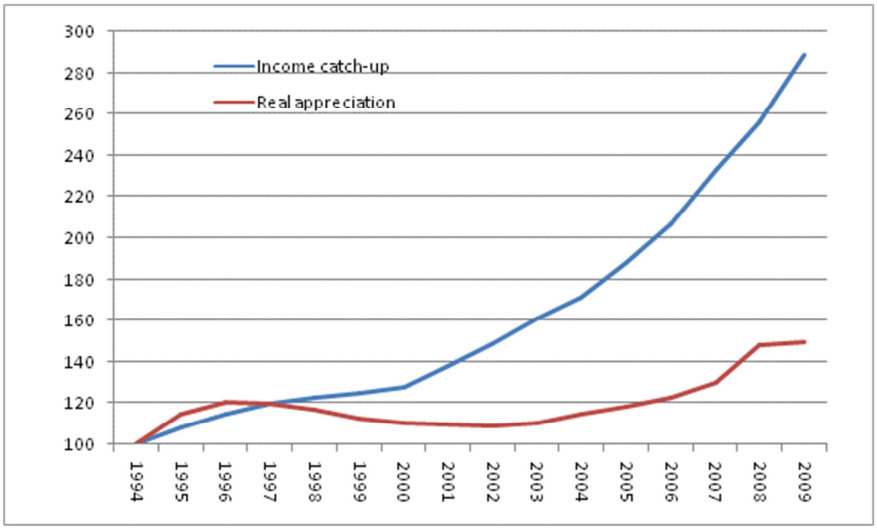
One recent study allows us to gauge the contribution of demographic dividends to China's export. Using panel data of world trade flows, Yao, Yu and Zhou (2010) incorporate the working-age ratio in the traditional gravity equation and find from a panel dataset of 192 countries for the period 1962-1998 that the working-age ratio has strong predicting power for bilateral trade. Applying the most conservative estimate to China, it is found that demographic transition has contributed to 12.6% of the country's growth of export between 1976 and 2006. In addition, China's export today would have been about 30% lower if China had followed India's path of demographic transition in the last thirty years. This shows the effect of family planning in China.

2.3 The Role of the Balassa-Samuelson Effect

China's extraordinary growth of export and accumulation of official foreign reserves, standing at 2.5 trillion US dollars by the end of October 2010, would have led to the real appreciation of the yuan and eroded China's export advantages created by the double transition if the Balassa-Samuelson effect (the B-S effect) had held for the country. Then, Does the B-S effect hold for China? Figure 9 presents two series of data. One is China's per-capita GDP relative to the American per-capita GDP, and the other is the real exchange rate between the Chinese yuan and the American dollar, both for the period 1994-2009 and taking 1994 as 100. The year 1994 is chosen as the

starting year because China unified the dual exchange rates in that year. Per-capita GDP is highly correlated with a country's labor productivity in the tradable sector, so the series of per-capita GDP indicates the catch-up of the labor productivity of China's tradable sector relative to the labor productivity of the American tradable sector. The B-S effect then predicts this series should be positively correlated with the series of real exchange rates. This is indeed what is shown in the figure although the correlation coefficient is small: if China's relative per-capita income increased by one percent, the yuan would have a real appreciation of 0.26 percent. Indeed, there was real devaluation in the period 1996-2002 although income catch-up was robust in that period.

Figure 9. Income catch-up and the yuan's real appreciation



Source: Author's calculation based on data from the EIU database.

The weak evidence of the B-S effect deserves an explanation. One of the explanations is that the yuan was grossly overvalued in the planning period and there was a period of devaluation in the 1980s and early 1990s (Lu, 2006). Wang and Yao (2009) provide an explanation based on structural change. There are two channels for the B-S effect to happen. One is nominal appreciation, and the other is the increase of prices of non-tradable goods. For most of the time since 1994, China has adopted a crawling peg to the dollar, so the role of the first channel has been limited. The

function of the second channel is through the wage rate. Productivity growth in the tradable sector requires that labor be paid more in that sector. This will put upward pressures on the wage rate in the non-tradable sector because of free movement of labor. While the prices of tradable goods will not change because they are determined in the international market, the prices of non-tradable goods will increase in response to higher wages. However, structural change brings labor out of agriculture and suppresses wage growth, so it weakens price growth in the non-tradable sector.

Wang and Yao (2009) study China in a panel dataset of 186 countries and regions for the period 1960-2004. The share of rural population is used as the proxy for the stage of structural change. A higher share of the rural population indicates that a country is in an earlier stage of structural change and the wage rate increases more slowly when the productivity of the tradable sector increases relative to other countries. Then the following equation is estimated:

$$(1)\quad \ln rer_{i,t} = \alpha_i + \beta_1 \ln ry_{i,t} + \beta_2 (rural_{i,t} \times \ln ry_{i,t}) + \lambda Z_{i,t} + \gamma Year + u_{i,t},$$

where $rer_{i,t}$ is the real exchange rate of country i's currency with respect to the US dollar in year t, $ry_{i,t}$ is the ratio between country i's per-capita income and the US per-capita income in year t, $rural_{i,t}$ is the percentage share of rural population of country i in year t, $Z_{i,t}$ is a set of control variables, $Year$ is a set of year dummies, $u_{i,t}$ is an error term, and the Greek letters are parameters to be estimated. Following the literature, the relative income $ry_{i,t}$ capture a country's relative labor productivity in the tradable sector. We then expect β_1 to be positive. The parameter of interest is β_2 that measures the dampening effect of structural change on the B-S effect and thus is expected to be negative. Table 2 presents the key results for the full sample of 185 economies and for four income groups. It is shown that β_1 is positive in all samples and statistically significant in all but the high-income group. In the full sample, β_1 is estimated to be 0.7477, meaning that a one percent income catch-up would induce a

real appreciation of about 0.75 percent. This is much larger than the elasticity found for China in Figure 9.

Table 2. Structural change and the B-S effect

	Full sample	High-income countries	Higher middle-income countries	Lower middle-income countries	Low-income countries
$\ln ry_{i,t}$	0.7477	0.0249	0.5204	0.5217	0.9773
	(0.0341)	(0.0670)	(0.0585)	(0.0767)	(0.0590)
$rural_{i,t} \times \ln ry_{i,t}$	-0.0090	0.0105	-0.0046	-0.0040	-0.0122
	(0.0006)	(0.0025)	(0.0009)	(0.0012)	(0.0010)
# Countries	185	36	33	55	61
# Obs.	4,104	884	715	1,160	1,345
Adjusted R^2	0.75	0.73	0.61	0.61	0.58

Source: Wang and Yao (2009). Standard errors are reported in the parentheses.

China's low elasticity can be explained by its early stage of structural change. Table 2 shows that β_2 is negative and statistically significant in all but the high-income group. In the high-income group, β_2 is significantly positive. In high-income countries, urbanization has finished and there is a process of suburbanization. This may explain the unusual results found for this group of countries. The results for the other income groups indicate that the strength of the B-S effect is related to the stage of structural change. China is a lower middle-income country and its average share of rural population between 1994 and 2009 was 62.5%. So, according to the results for lower middle-income countries, the B-S effect for China in the period 1994-2009 is 0.27, almost exactly the elasticity obtained from Figure 9.

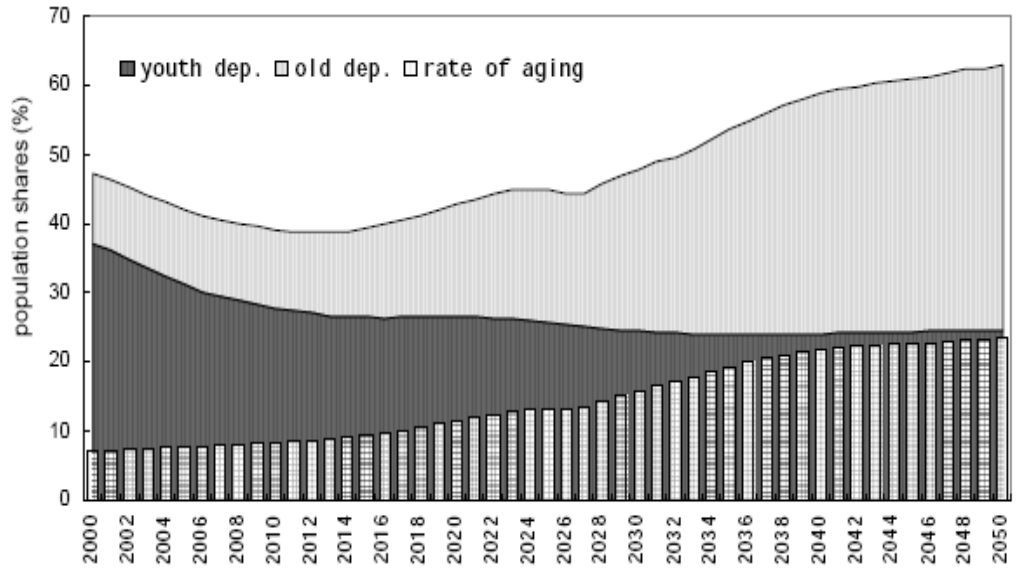
2.4 Long-term perspectives of Export-led Growth in China

The sustainability of China's export-led growth depends on the pace of China's double transition, which we have shown is the key factor determining this growth model. In this regard, two issues have much relevance for the long-run perspectives of

China's economic growth. One is when China will deplete its demographic dividends, and the other is whether China has passed the so-called Lewis turning point.

There is not much disagreement on the first issue because demographic transition can be almost perfectly predicted with current data on birth and death rates. It is clear in Figure 6 that the working age ratio in East Asia as a whole will decline since 2010, but until 2025 it won't be below two, the cutoff point for demographic dividends. China should do better than this because Japan is already on the fast track of aging. Figure 10 presents a prediction for China by Cai and Wang (2005). Although aging will be a serious problem by 2040 (the share of people over 60 years old will reach one fourth of the total population) and old age dependency will rise fast in the coming decades, the overall dependency ratio will increase to above 0.5 (or the working-age ratio will decline below two) only after 2030. Therefore, it is safe to conclude that China would enjoy demographic dividends for another 15 to 20 years even if the one-child policy were not changed soon.

Figure 10. Prediction of dependency and aging in China



Source: Cai and Wang (2005).

However, there have been heated debates on the second issue related to the Lewis turning point. In his seminal paper, Lewis proposed the notion of "surplus labor", i.e.,

labor that does not contribute marginally to agricultural production. When a country is featured by surplus labor in agriculture, its industry can expand at a constant and low wage rate. The turning point refers to the point beyond which a developing country has depleted its surplus labor and its industry has to face rising wage rates. Some scholars believe that China is passing the Lewis turning point because the wage rates of migrant workers have been increasing with fast paces in recent years (Cai, 2008; Garnaut and Huang, 2006). This view, however, has been challenged by several other studies.

Table 3. Monthly wages of migrant workers: 2003-2009

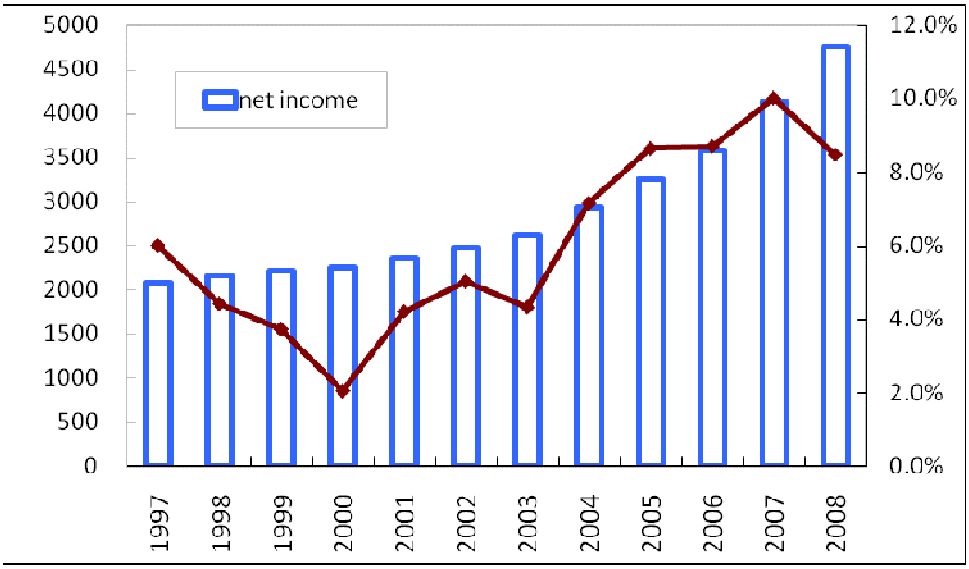
	Nominal wage (yuan)	Nominal wage growth (%)	Real wage growth (%)
2003	781		
2004	802	2.8	-1.1
2005	855	6.5	4.7
2006	953	11.5	10.0
2007	1060	11.2	6.4
2008	1156	9.1	3.2
2009	1348	16.6	17.3

Source: Knight, Deng, and Li (2010).

Knight, Deng and Li (2010) find in their multiple year surveys that migrant wage rates did not rise fast until 2009. Table 3 presents their data. Between 2004 and 2008, migrants' monthly wages only increased by an average annual rate of 4.6%, not only lower than the growth rate of urban wages, but also lower than the growth rate of rural income (Figure 11). Migrants' wages only increased drastically in 2009. This trend seems to have continued in the first half of 2010, symbolized by a 30% wage increase in Faxconn after a series of suicides in the company's Shenzhen factory and a 20% wage increase in a Honda part supplier after a worker strike in the company. However, even the wage increases were real and sustainable, they may not be taken as decisive

evidence for China to pass the turning point. The reason is that wage increases may be a result of the increase of migrant workers' reservation wages (or in Lewis' words, the institutional wage), rather than a result of permanent outward shifts of industrial demand.

Figure 11. Rural net income and its real growth: 1997-2008



Source: NBS website at www.stats.gov.cn.

Migrant workers' reservation wages are determined by their income in the countryside. As Figure 11 shows, rural net income has been rising fast since 2004. This growth has been driven by two factors. One is related to the change of government policies. The agricultural taxes were abolished in 2006, returning about 100 yuan to each rural resident. In addition, the central government provides direct subsidies to grain production. An average farm household can get 700 yuan per year. These two policies have raised the level of farm income, but have only one-time growth effect. In contrast, the second factor is related to unbalanced inflation and is more important to raise the growth rate of rural income. Since the early 1990s, China's inflation has been led by the growth of food prices. Table 4 compares the CPI and the growth of food prices between 2004 and 2009. The first two columns present the CPI and growth rates of food prices, and the last column presents the gap between them. It is evident that food prices increased much faster than the overall consumer

price in most of the years. It is reasonable to believe that this gap has contributed significantly to the real growth of rural income although not all of it goes to farmers.

Table 4. CPI and growth of food prices: 2004-2009 (%)

	CPI	Growth of food prices	Food prices growth - CPI
2004	3.9	9.9	6.0
2005	1.8	2.9	1.1
2006	1.5	2.3	0.8
2007	4.8	12.3	7.5
2008	5.9	14.3	8.4
2009	-0.7	0.7	1.4

Source: NBS website at www.stats.gov.cn.

The conclusion that the rise of migrants' reservation wages is the cause for rising migrant wages has been confirmed by an aggregate-level study by Yao and Zhang (2010). In this study, we use province-level data to estimate the demand and supply curves for migrant workers for each year between 1998 and 2007. The demand curve is conventional, in the following form:

$$\ln L_i^l = c + \gamma_1 w_i + \gamma_2 GDP_i + \gamma_3 P_i + e_i, \quad (2)$$

where L_i^l is the number of migrant workers in province i, GDP_i is the per-capita GDP in province i, P_i is its population, e_i is an error term, and the Greek letters and c are parameters to be estimated. Per-capita GDP is added to control the level of income, which could raise the industrial wage; and the size of population is meant to control the market size in a province that may raise the demand for industrial labor. The supply curve contains a portion of completely elastic supply, as suggested by Lewis' theory of surplus labor. Specifically, let A_i be the per-capita net income in the

countryside of province i, the institutional wage, w_i^*, sustaining the unlimited supply of labor then is estimated by the following equation

(3) $w_i^* = \alpha_1 + \beta_1 * A_i + u_{1i}$,

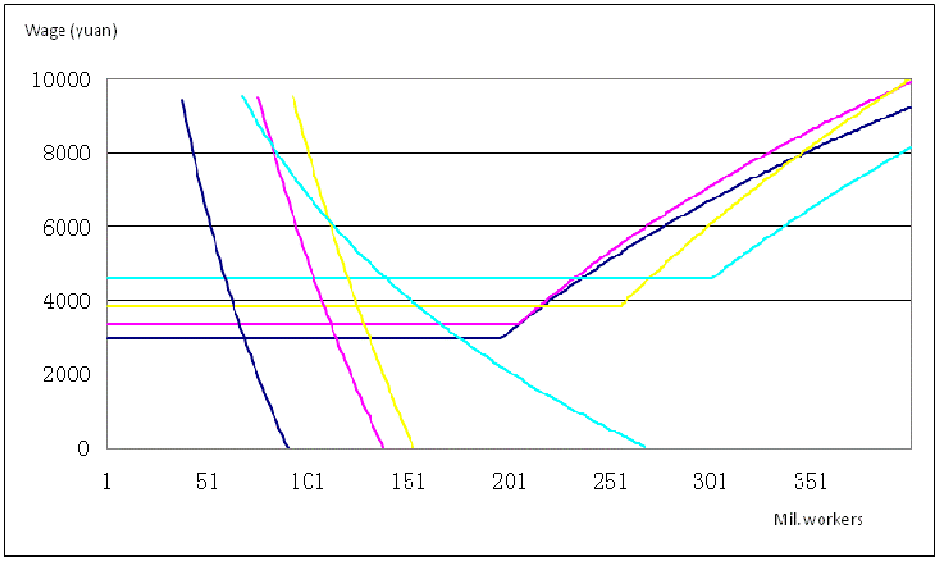
where α_1 and β_1 are parameters to be estimated and u_{1i} is the error term. Let w_i be the wage rate of migrant workers. Their labor supply curve then consists of two parts:

(4) $w_i = w_i^*$, if $w_i < w_i^*$; and

(5) $w_i = \alpha_2 + \beta_2 * \ln L_i^I + \beta_3 * \ln P_i^R + u_{2i}$, if $w_i \geq w_i^*$.

In equation (5), P_i^R is the rural population in province i, α_1, β_1, and β_2 are parameters to be estimated, and u_{2i} is the error term.

Figure 12. Demand and supply of migrant workers: 1998, 2002, 2005, and 2007



Source: Yao and Zhang (2010).

Equation (2) can be estimated with OLS. Equations (3) - (5) constitute an endogenous switching regression model and can be estimated by the maximum likelihood method. Figure 12 presents the demand and supply curves for 1998, 2002, 2005, and 2007. The demand curve is shifting out through the years, consistent with China's industrial expansion. The supply curve moves upward suggesting that migrants' reservation wages are increasing. The key message from the figure is that

the cross of the demand and supply curves has always been at the flat portion of the supply curve indicating that China has never passed the turning point. In fact, there are larger labor surpluses in more recent years. This seemingly puzzling result is consistent with the trend of technological change in Chinese agriculture featuring a substitution of machinery for manpower.

Yao and Zhang (2010)'s study does not tell us when surplus labor will be depleted in China. Knight et al. (2010)'s study allows us to gauge an answer for this question. Based on a probit estimation for migration using individual data, Knight et al. find that there were 80 million potential migrants who had not migrated in 2007. In the period 1998-2009, the number of migrants on average increased by 8.7 million each year. This means that it would take 9.2 years to absorb those potential migrants if this speed were maintained. It should be noted, however, urbanization won't finish in China even if the surplus labor is depleted. In the last thirty years, China's urbanization rate has been increasing by an average of one percentage point each year. Since the current urbanization rate is only 46%, it will then take a long time for urbanization to reach a steady state in China.

In summary, the double transition will likely last for another 15 to 20 years in China. In this period of time, China will continue its export-led growth and will be likely to sustain high economic growth rates. This will allow China to become the largest economy in the world in today's prices in the early 2030s. In current prices, the date will be much earlier, possibly in the early 2020s.[2]

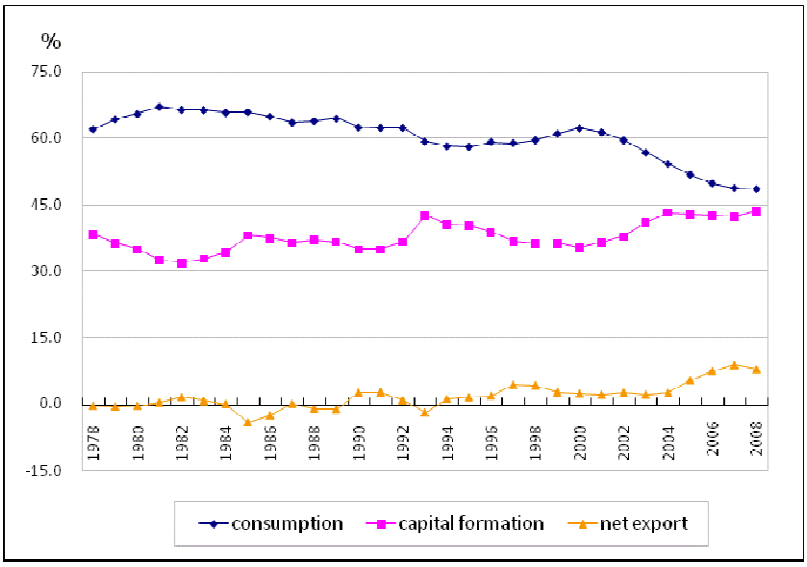
3 Structural Problems of China's Export-led Growth

The export-led growth has brought serious structural imbalance problems to China while sustaining high growth rates for the country. Among them, two are the most

[2] The exact years of real and nominal income catch-up are 2032 and 2022, respectively. The estimation assumes that China grew by 7% and the US grew by 2% in real terms, respectively. The estimation for nominal income catch-up also assumes that the inflation rates in the US and China kept their averages of the period 1981-2008, 3.5% and 5.9%, respectively, and the yuan appreciated by 2% per annum against the dollar.

noticeable: the share of consumption has declined sharply in the last decade, and there are persistently under-utilized savings. This is evident in Figure 13 that presents the expenditure components of Chinese GDP from 1978 to 2008. The share of consumption has been declining since 1978. Much of the

Figure 13. GDP expenditures: 1978-2008



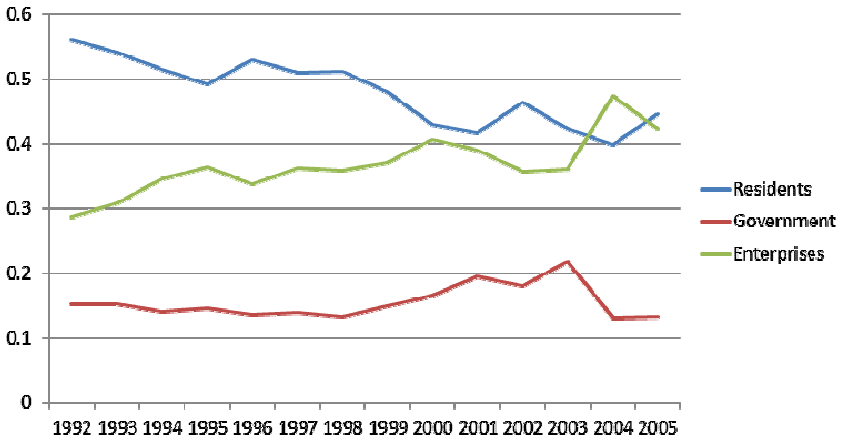
Source: NBS website at www.stats.gov.cn.

early decline can be explained by income growth. However, the sharp decline after 2000 cannot be easily explained by income growth. In the last several years, consumption dropped to less than 50% of GDP. The other side of the story is that savings increased to more than 50% of GDP. The trouble is, China cannot absorb this huge savings by its domestic investment. Standing at more than 40% of GDP, domestic investment still falls short of savings, leaving about 10% of GDP as net savings in the form of current account surplus, most of which are net exports.

Why is China saving so much? One explanation is that Chinese people love to save because of a saving culture, the lack of social security, and uncertainty about the future. While those factors do contribute to a high residential savings rate, it is wise to realize that the share of household savings in national savings was declining while the shares of corporate and government savings have increased substantially between

1992 and 2005, as Figure 14 clearly shows.[3] It begs the researcher to find an explanation for those two opposite trends.

Figure 14. Components of national savings as shares of GDP: 1992-2005



Source: NBS. *The Financial Flows Table*, various years.

While other factors, especially distorting government policies, have contributed to the imbalance problem,[4] China's double transition, i.e., demographic transition and structural change, have been the fundamental force driving the declining share of consumption in GDP and declining shares of household savings in the national savings. It is also the fundamental force for increasing shares of net savings. The following paragraph provides a narrative model for those claims. It will be followed by several sets of evidence.

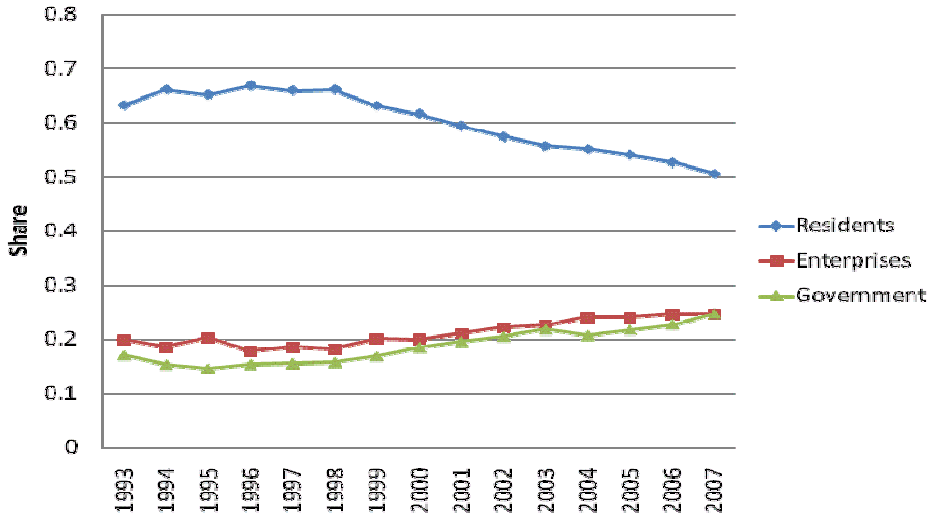
As we showed in the previous section, the double transition determines low wage rates in China as compared to other countries (Figure 7) and gives China comparative advantage in exporting labor-intensive products. In particular, China becomes a major site of processing trade production for which labor is the single most significant domestic input. Facing slowly growing wage rates, income generated by the

[3] There was a redefinition of government income in 2004. Before that year, income coming from firms with government controlling shares were counted as wholly owned by the government; after that year, income has been counted by the shares held by the government. This caused a sudden drop of government savings and a sudden increase of corporate savings.

[4] For example, Huang and Tao (2010) have found that corporations have obtained subsidies equivalent to more than 10% of GDP through government policies that have under priced key factor inputs.

expansion of export accrues disproportionally to corporations. Capital becomes cheaper, and corporations invest more. As a result, labor productivity increases. Because wage rates do not increase with the same pace, the share of labor income in GDP declines. Because labor income is the major component of household income and corporations reinvest most of their profits, the share of consumption in GDP declines. The other side of the coin is the increasing share of savings in GDP. However, because household income as a share of GDP declines and the average propensity of household savings does not change very much, the share of household savings in national savings declines. Lastly, because of the diminishing marginal return to capital, the rate of growth of corporate and government investment cannot keep up with the rate of growth of the national savings. As a result, the current account surplus increases.[5]

Figure 15. Distribution of national income



Source: Bai and Qian (2009).

Between 1991 and 2009, labor productivity in the manufacturing sector grew by 12.3% per annum (Lu, 2010), but the wage rate grew only by 7.1% per annum

[5] Notice that our discussion does not rely on the life-cycle theory to make the linkage between the double transition and high savings rates in China. While empirical evidence for the life-cycle theory is weak, here we emphasize the channel of abundant labor supply. That is, the double transition increases labor supply, so wage growth is suppressed, and the benefits of the expansion of trade accrue disproportionally to corporations and the government.

(Conference Board, 2010). The accumulative effect of this large gap cannot be underestimated. Indeed, it has led to a sharp decline of household income and drastic increases of corporate income and government revenue as shares of national income (Figure 15). In 1997, household income accounted for 67% of national income. Ten years after, the ratio dropped to 50%.

One recent study allows us to link China's demographic transition to its current account surplus. Using panel data of OECD countries, Xu and Yao (2010) find that the age dependency ratio is a significant contributing factor to a country's current account surplus. If the age dependency ratio declines by one percentage point, the share of current account surplus in GDP will increase 0.2 percentage points. Applying this result to a comparison between China and India, one finds that demographic dividends would allow China to have a ratio of current account surplus in GDP 4.4 percentage points higher than India's.

In summary, China's imbalance problems have its roots in China's double transition. Taking this view, one realizes that the imbalance problems will be gradually eased as China moves to finish the double transition in the next 15 to 20 years. However, this is a relatively long period of time. In between, the imbalance problems may lead to serious social and political unrests that disrupt China's growth trajectory.

4 Conclusion

Export-led growth has sustained high growth rates in China. The fast growth of export is a result of the combination of China's double transition and its full integration into the world system. Export-led growth will continue for another 10 to 15 years before China finishes the double transition in demography and industrialization. Along the way, export-led growth has also created serious imbalance problems, especially a large quantity of savings with a large part of it being

under-utilized. The evidence reviewed in this paper shows that like export-led growth itself, the imbalance problems are also rooted in China's double transition.

This last conclusion has a strong implication for the current debates on global imbalances. While other factors (such as the exchange rate, distortion of factor prices, a weak financial sector, and an investment-oriented government) also contribute to China's imbalance problems, the double transition is more fundamental than those factors. The double transition is an inevitable process and helps China's fast economic growth; it requires new thinking to deal with China's, and for that matter, the world's imbalance problems. Two points are particularly worth mentioning here. First, focusing on nominal parameters such as the exchange rate will not solve the imbalance problems. And second, the purpose of structural adjustment should not be directed to eliminating imbalances, but should be geared toward how to utilize the savings created by the surplus countries. China's savings are created by its double transition. We will see other emerging countries, noticeably India, to export savings even if savings from China dries up as it finishes the double transition.

Some of the findings of this paper are preliminary and can be further improved. For example, more theoretical and empirical work can be done on the mechanisms for the double transition to generate current account surplus.

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