Why are Saving Rates so High in China?[*]

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Abstract

From international comparisons of national savings, we define "The Chinese Saving Puzzle" as persistently high savings at 30-50 percent of the GDP in the past three decades and the surge in saving rates by 10 percentage points in the last 10 years. Using aggregate data from the Flow of Funds Accounts and micro data from Urban Household Surveys, we present evidence that sheds light on the causes of China's high and rising savings for both enterprises and households. We argue that while the ongoing massive stimulus spending may help prevent a slowdown in the Chinese economy in the short run, sustained long-term growth will depend crucially on future structural adjustments that could successfully boost aggregate consumption.

Why are Saving Rates so High in China?

1. Introduction

China's spectacular economic growth in the past three decades has been associated with equally remarkable high savings. While China's gross national savings as a percentage of its GDP hovered just above 35 percent in the 1980s, the average yearly rate climbed up to 41 percent in the 1990s (see Figure 1). Since China's entry into the World Trade Organization (WTO), the growth in aggregate savings accelerated, surging from below 38 percent in 2000 to an unprecedented 53 percent in 2007. China's national savings rates since 2000 have been the highest among all countries in the world, far surpassing the rates prevailing in Japan, South Korea, and other East Asian economies during the years of their miracle growth.

The high and rising aggregate savings and thus the low and declining share of consumption in the GDP constitute a central feature of the Chinese economy. High savings are closely related not only with domestic liquidity, investment, economic growth, and income distributions among firms, households, and the government but also with China's international trade and capital flows. With the recent financial crisis and the subsequent implementation of government policies aimed at stimulating consumption and economic growth, there has been increasing attention focused on savings and aggregate performance. However, despite the bourgeoning literature on the subject, debate among economists regarding the underlying causes of China's high rate of savings continues. While some progress has been made to understand household saving behaviors, there remains a significant void in research on corporate savings. Hence, our main objective is to analyze systematic historical trends, to provide additional evidence on the determinants of high savings, and to

investigate the interplay between saving behaviors and current macroeconomic policies.

We will start with an overview of the major patterns in Chinese national savings over the past three decades. Drawing data from the World Development Indicators (WDI), China's Flow of Funds Accounts (FFA), and other sources of aggregate statistics, we will analyze and compare aggregate savings in China with representative economies and major country groups. A breakdown of aggregate savings into the components of enterprises, households, and the government will reveal the major sources of national savings since 1992. These analyses will help us define "The Chinese Saving Puzzle"—a set of unique features of aggregate savings in the historical context of China—in light of international comparisons. This is a puzzle because we still do not understand well the fundamental forces that have shaped the special patterns of Chinese savings.

Next, we will proceed to examine the causes of China's high and rising savings for enterprises and households. The analysis of enterprise behavior will lead to discussions on data measurement issues pertinent to the Flow of Funds Accounts, the most common source for documenting China's aggregate savings. We will discuss the role of firm profitability, labor compensation and dividend, imperfect capital markets, and government policies in shaping enterprise savings. Meanwhile, our analysis of household behavior will rely on the Urban Household Survey (UHS) data for six provinces covering the period from 1992 to 2006. We will summarize a set of stylized facts on household savings and explore the factors we believe have driven the recent upward trends in household savings. The role played by China's unique institutions, policies, and reform processes will be assessed as well.

Lastly, based on our understanding of enterprise and household saving behaviors, we will

discuss the effect of current macroeconomic policies on aggregate consumption and investment both in the short and long run. We will argue that while the massive stimulus package may have worked effectively to prevent a major slowdown in the Chinese economy in the short run, sustained long-term growth will depend crucially on future structural adjustments that could successfully boost aggregate consumption. Factors such as population aging, urbanization, social security reforms, aggregate labor compensation, and government policies can all contribute to the determination of national savings, thus influencing China's future economic growth.

2. Long-term Trends in Aggregate Savings

2.1. International Comparisons

To document the special features of Chinese national savings in light of international experience, we make a cross-country comparison of saving rates using the World Bank's World Development Indicators. For the WDI data, gross domestic saving is calculated as GDP less total, final consumption expenditures. In what follows, we compare China's saving rates from 1978-2008 with those of other countries of different income levels, the BRIC[1] economies, and selected developed countries.

Panel A of Figure 1 shows the level of China's national savings relative to major country groups by income and the world average since 1978, when China began systematic reforms. The aggregate savings in China stayed persistently above 34% of GDP for the entire period; the high saving is not a recent phenomenon. Since 2000,

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[1] The BRICs is an acronym that refers to the fast-growing developing economies of Brazil, Russia, India, and China, which was first coined and prominently used by Goldman Sachs in 2001. One of the main reasons that the world has paid much attention on the BRIC countries is that they could eclipse the combined economies of the current richest countries of the world by 2050, according to Goldman Sachs' estimation.

China's saving rate has increased steadily, reaching a startling 53% in 2007. Meanwhile, except for the high-income group, the saving rates of other country groups have also increased significantly, but at a rate much slower than that of China. Between 2000 and 2008, China's gross domestic saving rate surged by about 12 percentage points, while the rate for the middle-income group has also increased by about 5 percentage points. In 2006, the latest year when data are available to all country groups, China's saving rate (52.41%) was more than three times higher than that of the low income group (16.06%), and 1.4 times higher than the world average (22.12%).

China's saving rate has also been distinctively higher than other BRIC countries, as Panel B of Figure 1 shows. In 2008, China's national saving rate was about 49%, while the rates for Russia was 36%, India 33% and Brazil 19%. Notice that, aside from severe fluctuations in Russia's saving rates, the saving rates of Brazil and India have also increased remarkably since 2000. Therefore, there is a trend of rising savings in major far growing developing countries.

Panel C of Figure 1 reveals that China's saving rates are significantly higher than the selected developed countries in all years under the coverage. As a traditionally high saving country, Japan's saving rate began to decline since 1991, and decreased by 10 percentage points from 1991 to 2004. The disparity in gross domestic saving rates between China and Japan has widened significantly since 2000, rising from 5.8 to 27.2 percentage points in 2006. The saving rates of United States have gone down since 1997, and the rates for Euro area have stayed relatively stable at about 22%

since 1990. Therefore, along with the increase of saving rates in China, the difference in saving rates between China and these developed countries have grown, especially after 2000. In 2006, China's saving rate is about 40 percentage points higher than the US and about 30 percentage points higher than the EU regions.

2.2. Components of Aggregate Savings

Figure 1 suggests that China's aggregate saving rates have significant fluctuations since 1978, and the aggregate saving rates have continued to rise since 2000. To better understand the high aggregate saving rates in China, we look at the three components of total savings associated with households, enterprises and the government. Earlier studies have also analyzed the savings of different sectors, but only for selected time periods. These periods include 1978-1984 (Qian, 1988), 1978-1995 (Kraay, 2000), 1990-2003 (Kujis, 2005), 1996-2005 (Kujis, 2006) and 1992-2005 (Chamon and Prasad, 2007).

According to Qian (1988), there was a drastic change in the saving contribution among government, enterprises and households at the initial stage of reforms and opening up. For example, government saving accounts for a half of aggregate saving in 1978, but it was rather low from 1982 to 1984, only about 20%. Meanwhile, the share of enterprise saving dropped dramatically from 57% to 34% in total saving, and the share of household saving increased from 25% to 46% (Qian, 1988)[2]. Since 1995, the statistical yearbooks of China began to publish the Flow of Funds Accounts in

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[2] It should be noted that in Qian's definition on saving, government savings only include budgetary savings. Enterprise savings include state and collectively owned enterprise savings and local government extra- budgetary savings (mainly depreciation funds and after-tax profits handed over to local governments).

annual statistical yearbook according to physical transitions[3]. These data report the components of gross domestic savings from households, enterprises, and the government. Figure 2 provides a summary of the key findings. First, the aggregate saving rates have remained at a very high level since 1992, and it increased rapidly by about 11% during the period 2000-2006. Second, enterprise saving played an important role in aggregate savings. Enterprise saving was about 15% of the GDP from 1992 to 2002, and then rose to about 20% of the GDP in the last three years. Third, household saving mirrored the upward movement in enterprise saving in recent years, also rising from 16.5% of the GDP in 2000 to 21.73% in 2006. Therefore, households and enterprises contributed similarly to the increase in the aggregate saving rate. Finally, compared with household saving and enterprise saving, government saving counted for a relatively small share of the GDP, fluctuating between 5-10% during the entire period.

2.3 The Chinese Saving Puzzle

The decomposition of aggregate saving helps examine some general and conventional conclusions about China's high saving rate. One misunderstanding is that Chinese are very thrift. According to this decomposition, we can see that household saving can only partially explain the high aggregate saving rates in China, and the rising enterprise saving also play an important part in the rising aggregate saving rate. In summary, enterprise savings have played a more important role in total savings and household savings only partially explain the high saving rates in China (Hoffman and

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[3] The published data was lagged by three years. Up to now, we can acquire the data of 1992-2005 from China Statistical Yearbooks from 1995 to 2008.

Kujis, 2006; Aziz and Cui, 2007; Chamon and Prasad, 2007).

In light of historical trends and in comparison to savings in other countries, we define the Chinese saving puzzle as consisting of four elements: (a) Persistently high savings in the range of 34% to 53% of GDP in the past 30 years; (b) An outlier in international comparisons – having the highest rates since 2000, and an outlier in cross-country regressions of saving determination;[4] (c) The surge in national savings by about 10 percentage points in the past ten years; and (d) About 2/3 of the rise in aggregate saving in the past 30 years has come from increases in household saving. We call these observations a puzzle, because the fundamental forces that have shaped these special patterns of Chinese savings are still not well understood.

3. Enterprise Savings

In the planned economy, income distribution among households, enterprises and government was determined by the state's planned price and wage control. The state ensured high retained-earning in state-owned enterprises, especially those in the industrial sectors given high priority due to certain national industrialization strategy. Comparatively, household consumption was depressed due to the low wage for individuals, and household saving was low in the pre-reform area under the lower wage setting. Therefore, the aggregate high saving rates were mainly engineered by state's economic plan in planned economy. Nevertheless, such state-engineered saving began to diminish gradually since China's economic transition from planned economy, and enterprises' saving capacity no longer relied on income distribution determined by state's planned price.

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[4] Kraay (2000) uses a large sample of countries to investigate the cross-country determinants of saving and finds that economy-wide saving in China is significantly higher than what would be expected on the basis of standard determinant and China's saving rates are underestimated by nearly 10 percent after controlling some saving determinants.

Rising Profitability of Enterprises

The saving capacity of enterprises depends on their profitability. As defined by FFAs, the disposable income of enterprises is derived by their added value, net compensations of employees, net taxes on production, net income from properties and current transfer (including taxes on income, payment to social security, social security welfare, allowances and other items). Therefore, disposable income of enterprises is conceptually equal to the profit of enterprises. In FFAs, enterprise saving is defined as the disposable income of enterprises. As Figure 3 shows, the share of enterprise income in the GDP fluctuated in the range of 14-16 percent, but increased significantly from 14.32% in 2002 to 23.4% in 2006, indicating soaring profitability during this period.

The government revenue in GDP began to rise in 1995 after the tax system reform in 1994. This reform redefined the fiscal relations between central government and local governments. For the local government, the new taxation regime makes their budgetary revenue less than expenditure, and their expenditures partially depend on transfer payment from upper level of governments. Therefore, local governments have strong incentive to improve their taxation effort in order to improve their fiscal capacity. Therefore, government revenue in GDP goes up accordingly. Comparatively, the income share of households in GDP declined by 10%, from 69% in 1996 to 59% in 2006, which actually can be one of important determinants of the insufficient consumption demand of residents.

Besides income distribution among enterprises, government and households, we

can use enterprise profit and the ratio of enterprise profit to total value added to demostrate the profit growth of enterprises, as shown in Figure 4. The ratio of profit to industrial value added improved remarkably from 7.5% in 1998 to 20.5% in 2005, especially in 2004 and 2005, when enterprise profit increased dramatically. The increase of enterprises' probability can be explained at least from the following aspects.

First, since reforms and opening up, the evolving labor market mobilizes and optimizes the allocation of human resource in China. Especially after Deng's south tour, the rapid development of non-state owned enterprises absorbed large scale surplus labor force in the agricultural sector, and boosted economic growth in China. The abundant and cheap labor force is regarded as one of key factors in driving China's economic growth. In the urban areas, China began to implement a large scale of privatization of state owned enterprises (SOEs) since 1998, aiming at improving corporate governance, but keeping SOEs' competitiveness and influential power in the national economy. With the reforms of SOEs, the employment in SOEs and collective owned enterprises dropped significantly, from 66% in 1997 to 25% in 2003 in the urban area.

Along with SOEs' reforms, cooperate governance has been improved significantly, and enterprises production is no longer to accord to the state's plan, but more market-oriented. Therefore, enterprises can utilize their resources in a more optimized way. Generally, a higher inventory investment of finished products generally means enterprise's production less satisfies the market demand. As shown in

Figure 5, the ratio of inventory investment to total capital formation of enterprises went down during the period of 1992-2006, especially from 1995 to 2000, which indicated that working capital of enterprises was more efficiently utilized and potentially improved enterprises' profit.

Second, the rising enterprise saving can also be explained by China's trade growth. The dramatic saving growth of enterprises is coincidence with the dramatic expansion of trade sectors after China's accession to TWO in 2001, and the trade sectors significantly fueled economic growth along with investment growth. Although FFAs does not give a distinction of trade and non-trade sectors, we can still conduct a quantitative analysis and give a further explanation about enterprise's profitability. Obviously, one of the fundamental factors for trade expansion is the affluent labor supply transferred from the agricultural sectors, which can maintain the labor cost of enterprises at a relatively low level. Therefore, given the relatively stable labor cost, the expansion of China's trade sectors in the world market boosts enterprises' probability because of revealed comparative advantage after China's accession to WTO.

In addition, trade expansion in China is also spurred by trade policies in China. Since 1998, after the Asian financial crisis, China began to implement the export-promotion policies by tax rebate for exports (TRB). Actually, TRB policy became one of important macroeconomic management policies since then, and the amount of TRB increased significantly after China's accession to WTO. As Figure 6 indicates, TRB increased from 115 billion in 2002 to 405 billion in 2005, and its share

in national tax revenue increased quickly from 6.5 percent in 2002 to 14.1 percent in 2004 and stayed at that high level for the following two years. In addition, the ratio of TRB to enterprise saving was about 10 percent. Therefore, if we interpret enterprises' high saving by the influence of China's accession to WTO, we need to know that the saving contribution by trade sectors is not only created by China's comparative advantage, mainly due to cheap labor cost, but also related with the trade policies in China.

Labor Compensations and Dividends to Households

In the FFAs, enterprise saving equals to enterprise disposable income, which is value added created by enterprises excluding compensation of employees and other production costs. Figure 7 shows that the fraction of employees' compensation in the added value of enterprises has declined significantly from 1992 to 2006. In particular, after the Asian financial crisis, the share of employees' compensation steadily declined until 2001. Although some stock holders can earn dividend as part of household income, enterprises' dividend payment only accounts for a very small proportion in the value added of enterprises. As Figure 7 reveals, despite an increasing trend in the dividend payments, its proportion is still less than 0.5% of the value added of the enterprises. This indicates enterprises are closefisted in distributing dividend to households.

Imperfect Capital Markets

In China, enterprises' high investment is also encouraged by local governments,[5] and the high saving motive of enterprises is also related to the high investment demand of enterprises under the weakness of the financial sector. Despite the dramatic financial reforms in the past decade in China,[6] China's capital market still plays a limited role as financial intermediaries. As the dominant players in the banking sector, the stated owned commercial banks are often criticized to provide limited financial support for small and medium-sized enterprises (SMEs), who generally lack collateral. Therefore, despite the high aggregate saving rate in China, the difficulty in accessing capital market constrains SMEs to expand production scale and create more employment opportunity.

Table 1 shows that more than half of China's investment is financed by self-raised funds, while domestic loans finance only accounts for less than 20 percent of total fixed investment. Thus, enterprise investment relies more on retained earnings, and the share of funds raised through self-raising in total investment have increased significantly from 48.81% in 1998 to 58.26% in 2005. Relatively, domestic loan's share in fixed investment tended to decline. The enterprises' high savings, particularly for the SMEs, can be interpreted as reflecting difficulties of obtaining financing because of lacking collaterals. This situation indicates the limited role played by domestic financial system in channeling financial resources to investment.

In addition, enterprise investment in fixed assets may be financed by informal

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[5] The political performance of local leaders is generally evaluated by local's economic growth rate in China, which creates the investment competition among jurisdictions. Local governments tend to provide preferential policies or cheap land for enterprises to promote investment, which can be used to formulate the pattern of economic growth in China, characteristic of investment motivation.

[6] In the middle of 1990s, the central government striped the non-performance loan from the state-owned banks and reconstructed them into commercial banks.

channels, or private financing. Table 1 shows that the "other part" also occupies a sizable share in total investment; it is nearly equivalent in size as the share of domestic loans. For some SMEs in China, their financing relies more on informal financial channels, which are can be very costly. Therefore, despite the development and commercialization of capital markets in China, inefficiency of capital allocation still prevails and constrains the financing of the SMEs to expand business opportunities. The weak financial sector in China creates incentives for enterprise saving.

The Role of the Government

Finally, government also plays a role in affecting enterprise investment, but their role varies over the years along with the redefined relation between government and enterprise and macroeconomic situations in China. On the whole, capital transfers from the government to enterprises as a proportion of total enterprise investment tend to decline in normal times, but increase during economic downturns. As Figure 8 shows, government capital transfers to enterprise investment is hump-shaped since 1998. The government's capital transfer accounted for 10% of total enterprise investment in 1998, and it increased to 20% in 2001. After that, the fraction of capital transfer declined substantially, and it was below 5% in 2005. Therefore, capital transfers served a supplementary role for enterprise investment after the Asian financial crisis, and it can be taken as an anti-cyclical macroeconomic policy to fight against the impact of negative economic shocks on the Chinese economy. During the current global financial crisis, the Chinese government has likely expanded capital transfers to enterprises in order to guide and fuel enterprise investment. We will

further discuss this issue later.

Besides direct capital transfer to boost enterprise investment, the government has strong motivation to attract investment for promoting local growth. For government officials, their performance is often evaluated by local economic growth, and expanding investment is a shortcut for local governments to achieve rapid growth. In fact, the long-lasting high economic growth has lead to strong growth addiction for local governments. In recent years, the central government tries to convert local governments from overly emphasizing economic growth to playing a more important role in providing public service, protecting environment, and assisting the disadvantaged groups. However, it cannot be accepted politically for local governments to sacrifice economic growth for social development if there is no sufficient transfer payment from the central government to local governments and proper evaluation criteria for local leaders' political performance. For many local governments, their budgetary revenue only covers part of their expenditure under the fiscal institution of tax-sharing system. Hence, local governments heavily rely on the transfer payment from the central government. If the transfer payment from upper level of governments cannot fill the expenditure gap, local governments cannot afford for their public expenditure. Thus, it is rational for local government to implement preferential policies to bid for investments to develop economy and cultivate tax base.

4. Household Savings

Along with economic growth, household saving in China rises significantly. Household saving rates were about 5% under central planning, but rose above 20% in

recent years, now hovering at a high level. In this paper, we use Chinese Urban Household Survey data to conduct a detailed analysis of urban household saving rates in China. A detailed analysis of urban household saving can help us to understand the uniqueness of China's saving issue.

4.1. Data and Stylized Facts

The data used in this study are drawn from the Chinese Urban Household Survey (UHS) between 1988 and 2006. The data collection adopts the method of sample rotation, and UHS data are the time series of independent cross sectional data. UHS data are very comprehensive, including individuals' employment status, demographic variables, household income, household consumption, and so on. The selected sample comes from six regions, including Beijing (BJ), Liaoning province (LN), Zhejiang province (ZJ), Guangdong province (GD), Sichuan province (SC), and Shannxi province (SX), and they are geographically representative in China.

The key variables in this paper include some demographic variables, household income and household saving rate. Household income is defined as household disposable income, which is the total household income subtracted by personal income tax. Household saving is the part of household income excluded household consumption. Household consumption in this paper includes expenditures on food, clothing, transportation, communication, entertainment, education, medical care, and other miscellaneous items. Aside from these variables, some demographic variables are also used in this study as control variables, such as the number of household earners and family size. In this paper, the sample coverage limits analysis to

households whose heads between 25 and 70 years old; exclude self-employed families due to difficulties of computing incomes.

According Table 2, household income in 2006 measured by 2006 RMB was about three times of household income in 1988, and household consumption in 2006 measured by 2006 RMB was 2.3 times of household consumption in 1988. For household saving rate, it increased from 5.6% in 1988 to 24.4% in 2006. Therefore, household saving rates increased significantly from 1988 to 2006.

Demographic Structures and Household Savings

According to Table 3, demographic structures of the households from 1988 to 2006 have several stable trends, which reflect the demographic transition after China's implementation of One-child policy. From household size and child dependence ratio, we can predict that the typical family structure for urban households is one couple plus one child. In addition, despite moderate increase of old dependence ratio, the increasing age of household head has shown the sign of the advent of aging society in China, and it increased by 5 years from 1988 to 2006. In addition, the schooling of household heads has an upward trend, and it is expected to continue to increase because the education policies, such as Compulsory Education Policy implemented in 1986 and the development of higher education since the mid-term of 1990s. Moreover, as one of the key determinants, the total dependence ratio has declined remarkably, from 69.54% in 1988 to 39.88% in 2006. Actually, this reconciles with the upward trend of household saving rates.

Household structure is an important determinant of the household saving rates.

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Figure 9 presents saving rates of different types of household, and we summarize the stylized facts as follows. First, there has been an upward trend in saving rates across all types of households. Second, the household saving rates have begun to diverge since 1997. The saving rates for households with elderly are higher than the average saving rates, and the saving rates for households with children are less than the average saving rate.

Age Profiles and Household Savings

Figure 12 presents age saving profiles of the households for the beginning and ending years of our coverage. Since the number of households for each age of household head is rather limited, especially in the initial years of survey, we report a three-age moving average of household saving for 1988 and 2006 in Panel A of Figure 12. For example, the saving rate for age 25 is the average saving rate for all families whose household heads are aged between 24 and 26. In Panel B, we report the average saving rates for all households for the years 1988-1990 and 2004-2006, again based on the age of household heads. Notice that the age saving profiles moved upward from 1988 to 2006 for all ages, especially among the young and the old. These patterns are consistent with the observations made by Chamon and Prasad (2007) for selected provinces over the period 1995-2005. The reversal of the hump-shaped age saving profile is a topic that deserves further investigation.

Saving Rates by Region

Figure 10 shows 3-year moving average saving rates by regions from 1988 to 2006.

Again, for all the regions, household saving rates increase and the disparity of household saving rates across regions is significant and large. Comparatively, for economic developed regions, such as Zhejiang, Guangdong and Beijing, they have higher household saving rates. The difference between the maximum and minimum values of household saving rates was about 8 percentage points in recent years. In addition, among the developed regions, there was also significant disparity on household saving rates. For example, household saving rates difference between Guangdong and Zhejiang was about 5 percentage points in recent years. In summary, economic development level can partially explain the disparity of household saving rates across regions.

Saving Rates by Income Level

Figure 11 reports the household saving rates by income level from 1988 to 2006. Comparing different income groups, we can see that the household saving rates of highest income group (75-100%) is much higher than that of the lowest income group (0-25%), and their difference is about 25 percentage points since 2003. In 1990s, their difference tended to enlarge. In addition, the household saving rates of the highest income group steadily increase over years, and that of the lowest income group increased only after 2003. From the pattern of household saving rates by income levels, we can predict that the increasing household saving rates of urban households is mainly contributed by the higher income groups. Therefore, potentially, the enlarging income inequality of urban household income can help to interpret the increasing household saving rate.

4.2. What Explains China's High Household Savings?

On the whole, household saving rates increase significantly over time according to Table 2. Actually, the saving rates of urban households rose by 8 percentage points, to about one quarter of disposable income from 1995 to 2005 (Chamon and Prasad, 2007). The patterns of household saving rates vary by family types, regions and household income level. In addition, from the age profiles of household saving rate, we can see that saving behavior of urban households in China does not show an inverted-U shape as predicted by the Life Cycle Hypothesis, but show a very different pattern with other countries from the age profile at old ages. In this section, we tentatively interpret the saving pattern of Chinese urban households. Our discussion confines in the following aspects: income growth, demographics, precautionary saving motive caused by economic transition, and income distribution among individuals.

Income Growth and China's Saving Patterns

The permanent income hypothesis (PIH) states that individuals' current consumption is not determined by their current income but by their permanent income. The permanent income of an agent is determined not only by various forms of assets (e.g., bank deposit, shares, bonds, property, etc.), but also by his presented value of labor income, which is determined by human capital (such as education and experience). The PIH argues that individuals will consume a constant proportion of their permanent income, and transitory and short-term changes in income have little effect on individuals' spending behavior. Therefore, individual's current saving rates should

decline if they expect a higher income in the future, because current income is less than permanent income. However, household saving rates of Chinese urban households went up with increasing household income and the PIH seems to fail to explain that. The "failure" of the PIH in interpreting urban household saving behavior in China may lie in individuals' perception of household income growth. If individuals do not completely take the income growth as permanent, household saving rates tend to grow along with household income growth.

Another benchmark theory in consumption theory is the Life Cycle Hypothesis (LCH). Like the PIH, the LCH also interprets individuals' consumption behavior from the inter-temporal perspective. The LCH argues that individuals desire and try to maintain a constant standard of living throughout their lifetime according to their life-time resource. Therefore, the LCH predicts that household saving rates is lower in young and old households, but higher in middle-aged households (Ando and Modigliani, 1963). Hence, the LCH model predicts that the life cycle pattern of household asset holding should be hump-shaped, which can be examined by the age profile of household saving rates. However, from Figure 12, we cannot find hump-shaped age saving profiles for the Chinese households in recent years. Hence, China's recent saving patterns seem to conflict with the theoretical prediction of the LCH. One possible explanation is that, if households do not have a confirmative expectation about their future's income growth, the adjustment of household consumption tends to lag behind the increasing household income. As a result, household saving rates goes up along with income growth.

In summary, from the quantitative perspective, the increasing household saving rates is caused by a higher growth rate of household income compared with household consumption. Therefore, in analyzing household saving behavior, we cannot omit the important role of income growth. Although the traditional consumption theory, such as the PIH and the LCH, is less powerful in interpreting China's pattern, we can still use the PIH and the LCH as benchmark theory to shed some light on China's saving pattern. What is important is how individuals treat income growth (by PIH) or how individuals anticipate income profile towards future (by LCH).

Consumption Inertia

One full understanding of urban household saving behavior should explain why household consumption growth lags behind that of household income. The potential answers to this question includes consumption inertia (or persistence) and precautionary saving motives. Although they both cause saving rates to rise with income growth, they have different theoretical foundations. Consumption inertia is related to the past consumption, and precautionary saving motives is to prepare for the rainy days in the future.

Consumption inertia means that the consumption behavior is heavily affected by the past consumption. Thus, if the habit formation in consumption is hard to change, the change of income will have a minor effect on consumption. Carroll and Wei (1994) prove that increases in income growth lead to subsequent increases in savings both in developed and developing countries and argue that habit persistence is a likely source

of the relationship[7]. As for the empirical evidence in China, Horioka (2006) demonstrates that the main determinants of variations over time and over province therein are the lagged saving rates and the impact of the lagged saving rates provides evidence that consumption inertia or persistence is strong, which implies that there will not be a dramatic decline in China's household saving rate.

Precautionary Saving Motives

Since 1978, with the implementation of reforms and opening up, the rapidly changing economic environments under economic transition have provided sufficient reasons for precautionary saving motives of households. On the one hand, the employment institution has changed from the administrated employment allocation in the planned economy, characteristic of "iron bowl", to a flexible labor market.[8] Income uncertainty and unemployment risk potentially cause the possibility of budget constraints for households when the rainy days come (Meng, 2003). On the other hand, the traditional welfare institution based on unit system gradually collapsed, but the social security system was not been built up accordingly and the public provision of education, health care, and housing services substantially declined (Kuijs, 2006; Chamon and Prasad, 2007). Consequently, although the overall saving rates remains high, most people are still worried about their future retirement pensions and various

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[7] They check the relationship between income growth and saving using both cross-country and household data. and find that growth Granger causes saving, but saving does not Granger cause growth, using cross-country data. However, the empirical results using household data show that households with predictably higher income growth save more than households with predictably low growth. Therefore, we consider that Permanent Income Hypothesis cannot explain these findings, but a model of consumption with habit formation may.

[8] The employment institution in the urban area changed from the scheme of "iron rice bowl" to more diversified labor relations. According to China Statistical Yearbook 1999 and 2004, the proportion of employment in State-owned Enterprises and Collective-owned Enterprises dropped significantly from 99% in 1980 to 30.7% in 2003 in urban areas.

kinds of expenditures, such as on education, medical services and housing. Therefore, precautionary saving motive is naturally adopted to interpret the rising households saving rates in China.

On expenditure uncertainty, institutional transition redefines the obligation in providing education, health care and housing. Out-of-pocket expenditure of urban households increased on these items. According to Table 4, we can see that there is a remarkably structural change for urban household consumption, and expenditures on residence, medical care and education increased significantly. In particular, the share of medical care expenditure increased most, from only 2.01% in 1990 to 7.14 in 2006. On the whole, household expenditure on housing, medical care and education has occupied about one third of total household consumption. Meanwhile, there is a substantial decrease on the expenditure on food and clothing.

The empirical evidence on the precautionary saving motive is still limited. Meng (2003) uses urban household survey data to investigate how well urban households can smooth consumption and how well they can handle future income shocks, with a special focus on urban unemployment. The empirical results indicate that Chinese urban households have a strong motive for precautionary saving, and not only does past income uncertainty increase a household's propensity to save, but the predicted probability of displacement has an even stronger effect on saving for households without unemployed members.[9] Our recent studies use UHS data to construct

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[9] Furthermore, this paper provides evidence that income uncertainty imposes a negative impact on educational expenditure, which means that urban households in China are unable to smooth their educational expenditure. From the perspective of policy implications, government should take educational investment as a high priority and help to finance education expenditure for poor families, because the lack of education expenditure generally has a significant implication for intergenerational income mobility.

synthetic panel data to estimate relative prudence, one measure of the strength of precautionary saving motives (Kimball, 1990; Dynan, 1993; Carroll and Samwick, 1998; Carroll and Kimball, 2001), and the empirical results have three key findings: First, Chinese urban households have very strong precautionary saving motives. Second, relative prudence tends to decrease over the years. Finally, old cohorts behave more prudently in consumption compared to their young counterparts.

Demographic Factors

China has a very unique fertility policy, the One-Child policy, which has been strictly implemented in the urban area since the end of 1970. Triggered by the implementation of One-child policy for almost three decades, this policy has begun to affect China's demographic structure and accelerate China's demographic transition, as shown in Table 3. A lower fertility tends to reduce the young dependent ratio and increase the percentage of working population, and the demographic transition potentially increases household saving. However, previous studies offer mixed results about demographic impact on saving rate, and the inconsistency is perhaps related with the data used. Kraay (2000) uses province level data during the 1978-83 and 1984-89 periods to investigate urban and rural household saving rates determinants, and does not find evidence that demographics affect saving rate. Horioka (2006) also finds that age structure of the population usually does not have significant impact on household saving rate. However, Modigliani and Cao (2004) find that the demographic variable has a substantial impact on the saving rate[10].

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[10] In their study, they construct the demographic variable by the ratio of working population to nonworking young

Another perspective of demographics affecting household saving is sex ratio imbalance. Traditional son preference is considered to be particularly widespread in China, because son can carry the family name. After the establishment of family planning policy in China, the inexpensive type-B ultrasonic technology is adopted to screen the gender of fetuses, which causes some of female fetuses to be aborted and leads to the sex ratio imbalance, which then intensifies competition among men for potential wives and stimulates households with a son to spend thriftily to accumulate wealth in order to prepare wedding expenditure. Using this idea, Wei and Zhang (2008) use the provincial panel data (1978-2006) to test the impact of sex ratio imbalance on household saving. The empirical results show that the sex ratio imbalance significantly increases household saving rate, and approximately 68% of the increase in rural savings rates and 18 % of that in the urban can be attributed to the rise in the sex ratio[11].

However, there are also empirical studies denying the impact of demographics on saving rates. For example, using panel data of Chinese province level for the period 1995-2004, Horioka and Wan find that China's saving rates are very persistent and strongly related to income growth and the interest rate (in the case of rural, but not urban, households), but do not find that age structure of the population has any

people (denoted by E/M ratio in their paper), which reflects the effectiveness of the birth-control policy. According to their calculation, E/M ratio is relatively flat until the mid-1970s, and then increases appreciably and steadily. In their time series analysis, E/M ratio's positive impact is confirmed by various econometric specifications.

[11] Wei and Zhang (2008) use provincial panel data (1978-2006). The empirical results, derived from panel fixed effects regression, show that sex ratio significantly affects household saving rate, and its magnitude is higher in the rural area. In addition, considering the endogeneity of sex ratio, the authors use the share of minority in local population, penalty for violating family planning policy and dummy for extra penalty for higher order births as the instrumental variables, and conduct a 2SLS regression. From the IV regression, sex ratio's impact on saving rates are also confirmed, but its estimated coefficients seem to be less than that derived from panel fixed effects regression previously.

significant impact on the household saving rate, in part because the shortness of their sample limits the time series variation in demographic variables.

Income Distribution

Aggregate household saving is the outcome of individual saving contribution by heterogeneous households. Theoretically, the sign of the saving-inequality link is ambiguous (Schmidt-Hebbel and Servén, 2000). For example, precautionary saving motives and borrowing constraints tend to cause a positive relation between income inequality and the saving rate. Moreover, higher income inequality may also depress aggregate saving (Schmidt-Hebbel and Servén, 2000)[12]. Quantitatively, if household saving rates is not constant with household income, income distribution should have a large effect on the aggregate saving rate.

On income inequality in China, many empirical studies have found that it tends to deteriorate with economic transition and the development of the labor market in the urban area (Khan and Riskin, 1998; Yang, 1999; Meng, 2004; Meng et al. 2005; Knight and Song, 2005). According to Knight and Song (2005), wage inequality in the urban areas of China has increased sharply in recent years: the Gini coefficient rose from 0.229 to 0.307 between 1988 and 1995. Actually, the nature and causes of income inequality increase are different with the deepening of economic reforms[13].

Heterogeneity among households may involve many aspects, and previous

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[12] Income inequality causes social tension and political instability, which might negatively affect economic growth and saving.

[13] Meng (2004) finds that the nature and causes of income inequality increase are different between the stages of 1988–1995 (a moderate reform era) and of 1995–1999 (a radical reform era). In the moderate reform period, the increase in inequality was a result of some parts of the society sharing more of the economic gain than others, especially the regional income dispersion. However, during the radical reform period, income reduction at the lower end of the distribution is observed, and it is mainly due to the large-scale unemployment generated by labor reallocation.

sections have proved the disparity of household saving rates across households with different demographic structure, age of household head, household income and regions. In particular, the remarkable disparity among different income groups and saving rates are higher for richer families, as shown in Figure 11.

Moreover, we use the FFAs method to find the supportive evidence of income inequality's effect on aggregate household saving rate. From Figures 2 and 3, we can see that aggregate household saving rates went up from 2000, but the share of household income in GDP dropped significantly. One possible explanation is that income distribution among households favors the rich, who have higher saving propensity. Empirically, Wei and Zhang (2008) add the Gini coefficients into the explanatory variables, but do not find its estimated coefficients statistically significant. However, Zhou (2007) uses CHUS data (1988-2003) to construct synthesis panel data and measures within-cohort income inequality by the ratio of household income at two symmetric quantiles. The empirical results show that income inequality has a positive effect on household saving rate, which is robust by a sensitivity test.

Cultural Tradition

One conventional explanation for China's high saving rates is from the perspective of China's cultural tradition. However, cultural tradition can be very inclusive, and it contains many aspects, such as the thriftiness of Chinese people and patriarchal altruism which causes the bequest motive of household saving for offspring. Modigliani and Cao (2004) argue that the traditional and commonsensical explanation (such as Chinese households are thrifty) counts little, if any. Actually, from 1950s to

mid-70s, China's saving rates were below 5 percent, and the sudden spurt happened only after 1978. However, Wei and Zhang (2008) actually show the patriarchal altruism, which causes households to increase savings for their sons, in order to improve their competitiveness in the marriage market.

Generally, old cohorts carry more cultural tradition than young cohorts. If cultural tradition affects household saving rates, household saving rates should be higher in old cohorts. Zhou (2007) uses CHUS data (1988-2003) to demonstrate that young cohorts have a high saving propensity after controlling for other saving determinants and argues that cultural tradition might not play a dominant role in determining household saving rates.

Summary

The discussion and analysis above just give our interpretation about China's saving pattern. Overall, we cannot use a singleton theory to interpret China's saving pattern under rapid economic growth and economic transition in the past three decades. Moreover, various determinants of saving rate, such as demographics, economic growth and social security system, are still evolving, and they might have interactive effects on saving rates.

5. Aggregate Savings, Macro Economic Policies, and Growth

We have not yet discussed a number of important policy questions. Are the high saving rates likely to persist into the future? What are the key factors that will likely influence the long-term trend in aggregate savings? Have the recent financial crisis

and subsequent macroeconomic policies had major effects on consumption, saving, and economics growth? We will attempt to answer these questions in the subsequent sections.

We will argue that while the massive stimulus package may have worked effectively to prevent a major slowdown in the Chinese economy in the short run, sustained long-term growth will depend crucially on future structural adjustments that could successfully boost aggregate consumption. Factors such as population aging, urbanization, social security reforms, aggregate labor compensation, and government policies can all contribute to the determination of national savings, thus influencing China's future economic growth.

[The following sections need major revisions]

5.1. Dynamics of aggregate saving under current global financial crisis

With the experience from Asian financial crisis, China responds very promptly after perception of the current global financial crisis' effect on China's economy. China has implemented several ambitious strategies to prevent economic slowdown. The central government has called on local governments at all levels to "maintain economic growth, improve people's livelihood and safeguard social stability". Under such political mobilization, the central government has released several grand plans, including 4-trillion stimulus packages, over 10 industrial-revitalization planning, and various People's livelihood projects. In this section, we mainly give a preliminary analysis of the effect of the central government's policy in promoting investment and household consumption.

The 4-trillion Stimulus package

From the experience in the 1990s, especially after the Asian financial crisis, government investment in GDP, including government direct investment and capital transfer to enterprises, went up significantly and offset the decline of enterprise investment in GDP partially. Since outbreak of the Asian financial crisis to 2005, there was a complementary relation between government investment and enterprise investment – the government investment tends to pick up the slacks observed in enterprise investment. In response to the current global financial crisis, China announced a 4-trillion stimulus package[14]. As the biggest emerging economy, the world has great expectations of China's role in pulling the world economy from economic recession, especially after the announcement of the 4-trillion stimulus package. Since the fourth quarter in 2008, the central government and local governments have began to carry out grand investment plan, combined with credit explosion.

At the First Session of the 11th National People's Congress, Prime Wen put forward to an economic growth target of 8% in 2009. In China's 2009 budget, the budgetary deficits scale amounts to 920 billion Yuan, including 200 billion for local governments. There is no doubt that this will significantly promote investment. Compared with the shrinking export and staggering household consumption, the proactive fiscal policy has a direct effect on economic growth. Furthermore, it also

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[14] According to Zhang Ping, the director of National Development and Reform Commission, the 4-trillion package covers subsidized-housing for low income group, rural livelihood and infrastructure, transportation and electricity grid infrastructure, medical care, cultural and education undertakings, ecological protection, autonomous innovation and economic structure adjustment, and reconstruction after earthquake.

spurs investment and improves enterprises' profitability, therefore causing the domestic saving increase. Hence, under the global financial crisis, China's grand stimulus package would enhance domestic saving rates. Up to now, the central government has officially declared that this stimulus package effectively stimulates economic growth and the economic growth target of 8% in 2009 can be guaranteed. Furthermore, from the experience of the Asian financial crisis, Chinese government may keep enthusiastic in investment for some years even the global economy may recover soon.

Although there seems to be an economic effect in the short-term, it is suspicious for the stimulus package to have positively significant effect on the structural adjustment in China from a long-term perspective. Actually, the 4-trillion stimulus package may cause distortion. The economic stimulus plan, proposed by the central government, needs good coordination of subordinate governments. However, competition among jurisdictions will intensify local governments' investment momentum and they tend to lobby the central government to finance some large projects. However, some of these projects may be not beneficial for development in the long run. In addition, the stimulus package may also squeeze private investment and make the financing of small and medium sized enterprises harder.

On the whole, these projects can boost economic growth in the short run, but might deteriorate the imbalance of economic structure, which is a characteristic of high investment and low consumption. Unlike the period after the Asian financial crisis, when infrastructure was considered as the neck-bottom sector for China's

economy, the current large-scaled investment may be less effective and form the surplus production capacity, especially some investment in the heavy industry. Therefore, the current large-scaled investment probably makes it harder for the central government to convert the pattern of economic growth in the long run. As for the aggregate saving rate, it will keep at a high level, because of the investment mobilized by the government, in the form of capital transfer or government's direct investment. In addition, the central government has implemented supportive policies for enterprise since 2008, such as reform of value added tax[15] and improvement of tax rebate for exports. These measures favor enterprises' profit and improve enterprises' saving capacity.

Subsidizing Consumption

After the Asian financial crisis, China began to recognize insufficient consumption after a long-time shortage economy. China's official documents publicly declared to alter economic growth strategy fundamentally by expanding domestic consumption in place of investment and exports and the macroeconomic management began to emphasize to expend domestic demand. However, aggregate consumption in GDP kept to decline, mainly due to the declining fraction of household income in GDP.

Under current global financial crisis, enterprise disposable income's fraction in GDP will likely drop along with the decline in exports, because the shrinking demand of world market for those made-in-China products will squeeze the enterprises' revenue and profit. This tends to reduce the aggregate saving rates for the important

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[15] This reform changes the production-type of value added tax to consumption-type of value added tax and there will be no value added tax for enterprises' fixed investment.

role of enterprise saving in total saving. However, the higher risk of unemployment and salary-cut for individuals also increase greatly due to economic downturn, which tends to depress household consumption. Therefore, it is not easy for China to rely on household consumption boost economic expansion under the current economic hardship, except that governments adopt some radical measures.

China began to carry out some programs to encourage household consumption. For example, some local governments in China issued consumption voucher in order to stimulate household consumption for the first time[16]. However, these initiatives to implement such policies have thus far been modest in scope, and the practice of stimulating economy in the urban area was only conducted in some developed cities.

In addition, China also hoped to expand consumption credit to boost household consumption. Generally, international experiences have suggested that financial market development would reduce household saving by reducing the number of credit-constrained people (Kuijs, 2006). For example, China issued draft rules for allowing non-deposit taking foreign institutions to offer consumer loans in May 13, 2009, which indicates that household consumption has been given higher expectation in expanding domestic demand. Nevertheless, these non-deposit taking foreign institutions have to satisfy certain conditions.[17] As for the use of credit, China is still at its initial stage. Based on reports by the UnionPay Cards, the only domestic credit card organiztion in China, the total number of credit cards increased rapidly since 2004,

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[16] For example, some cities distributed consumption voucher for tourism.
[17] Foreign and domestic institutions with minimum total assets of 80 billion Yuan ($12 billon) in the past year will be allowed to set up financing companies that provide consumers with loans for buying appliances and other goods, according to draft rules given by China Banking Regulatory Commission. In addition, loans for cars and housing mortgage are barred. Companies must have at least five years experience in providing consumer loans and have been profitable for the past two fiscal years (*Bloomberg, Last Updated: May 12, 2009 20:06 EDT*).

reaching 53.8 million in 2007. However, the supportive role of consumption credit still

has a limited effect on expanding household consumption (ACFB, 2008).

Comparatively, one more ambitious plan to expand domestic demand was carried

out in the rural area, called as the program of sending home appliances to

countryside[18] (hereafter SHAC policy). This program offers subsidies by government

as high as 13 percent for designated brands of household appliances, such as TVs,

refrigerators, mobile phones and washing machines. Expanding consumption in the

rural area has been considered as one of important aspects in stimulating domestic

demand since Asian financial crisis. However, only in recent years, the central

government implemented some preferential policies for farmers, such as canceling

agricultural tax, providing free compulsory education, constructing the socialism new

rural, and so on. Currently, SHAC policy is regarded as one policy innovation in

applying scientific outlook on development thoroughly and expanding domestic

demand positively.[19]

The SHAC policy reflects that governments are urgent to stimulate the economy

by various subsidies. However, this also raises the doubts about these measures'

equity and efficiency. The products for SHAC policy was designated by governments.

Therefore, the SHAC policy might introduce market distortions if its implementation

affects the normal market competition. In addition, as the temporal programs aiming

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[18] This policy was launched in December, 2007 in some selected regions, and extended to all over the country in February, 2009. This policy is the first time direct subsidy for household consumption and will be carried out for four years since its implementation for all the regions.

[19] As estimated by Minister of Commerce and Minister of Finance, the fiscal subsidy for SHAC policy amounted to 10.4 billion Yuan, and the budgetary expenditure of the central government planned to allocate about 20 billion Yuan in 2009. The government began distributing 5 billion Yuan of subsidies to help rural residents buy vehicles in March, 2009.

at boosting consumption, the SHAC policy cannot solve the structural problems formed in the long run and it is still unsolved on how to improve the income of farmers.

On the whole, in this global financial crisis, Chinese government will play an important role not only in curbing economic slump but also in pulling the world economy out of recession. It is necessary to expand household consumption and balance the relation of saving and consumption in the long run. However, household consumption cannot act as the engine to stimulate economic growth, and China needs to construct the mechanism to adjust income distribution and ensure household consumption with confidence.

In addition, like many other countries, Chinese government in this economic crisis also faces with substantial difficulties, because its role mentioned above heavily relies on its fiscal capacity, which is actually determined by economic situation. There is no doubt that China will issue bonds to finance investment or some people's livelihood projects, even after the fundamental recovery of the macro economy. During this process, the burden with the government debt will increase significantly, including not only government bonds but also various implicit debts which are formed by some low efficient investment guaranteed by government. Therefore, although government's input is necessary in this global financial crisis, government should consider not only the efficiency of various inputs but also the adjustment of economic structure.

5.2. Will China likely maintain the high saving rates in the long-run?

[The following sections need major revisions]

As said by the governor of People's Bank of China, Mr. Zhou Xiaochuan, China will not be able to reduce its savings rate quickly because it is a result of some deep-rooted social and cultural factors,[20] although China has made relentless efforts to cut its savings rate. On the whole, the extraordinary saving issue in China is considered as the result of two nearly coincidental sharp turns in two key policies: the movement initiated in the late 1970s toward a market-oriented economy and demographic policies (Modigliani and Cao, 2004). Actually, both of them are also the key factors of economic growth in China. Therefore, in forecasting China's saving trend, we need to figure out some key factors that affect aggregate saving rate, including economic growth, income distribution, demographic transition, and some potential policy change along with these trends.

Economic Growth

The impact of income growth on the rising household saving rates is widely recognized by many studies (Qian, 1988; Modigliani and Cao, 2004; Horioka, 2006). According to Modigliani and Cao (2004), the estimated coefficient of long-term growth (15 years) is 2.52[21] in the regression equation that the saving rate is the dependent variable. If we assume the long-term economic growth rate in China is 8

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[20] Xin Zhiming, "Zhou: No quick cuts in savings rates", China Daily, Updated: 2009-02-11.

[21] They utilize the data during the 1953-2000 periods to conduct a time series analysis and find that both the long term growth (15 years) and the growth from previous year minus long-term growth have a significantly positive effect on the saving rate. The parameter cited in this paper comes from Equation III.3 in Table 3. In addition, please note that the definition of the saving rates is different from the conventional method; therefore this is just a rough estimation about economic growth on the aggregate saving rate.

percent, we can give a rough estimation of economic growth's effect on the saving rate, which is about 20 percent.[22] Therefore, economic growth rate accounts for about 50 percent of aggregate saving rate on average. In brief, income growth should be regarded as the necessary condition of the increasing rising household saving rates, and as long as economic growth is high, household saving rates in China remain high.

On the contrary, the high saving rate is also one of the necessary conditions for economic growth as long as the bulk of investment is financed with domestic saving. The high investment/GDP ratio is very important for economic growth in China, because there are still huge surplus labor forces in the agricultural sectors. In addition, as aforementioned, local governments still have great passion for economic growth by attracting investment, by which local leaders' can reveal their political performance and expand the fiscal capacity. One of the nexus between economic growth and high investment in China is the rapid urbanization. Population migration and labor forces transfer from the rural area to cities induce large scale investment with urban sprawl. The ample labor supply also depresses labor cost's growth. Figure 13 shows that the share of total investment in urban areas increased continuously since 1996, and amounted to 85% in 2006. Therefore, the high investment also reflects the rapid urbanization process.

The rapid urbanization is also one of the most important factors for the development of the real estate sector. As one of dominant part of household assets, households need years' saving to buy houses, which will depress their current

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[22] This estimate come from 2.52*8%=20.16%

consumption. Currently, China's urbanization rate increases about 0.8-1 percent in recent years, which means about 10 million people entering into cities from the rural area annually. China's urbanization rate had reached to 45% in 2007, and it is expected to be as high as 70% at the mature stage of urbanization. If China's urbanization rate keeps a growth rate of 0.8-1 percent, China will transfer its one fourth of its population in the next three decades. Therefore, the long trend of urbanization is the fundamental driving force for the high investment demand, therefore high saving rates.

Income Distribution

Besides economic growth, income distribution also exerts an important effect on aggregate saving rates. With rapid economic growth, China should take serious consideration about how to reconcile income distribution among government, enterprises and households and between the rich and the poor under rapid economic growth. Actually, a sound income distribution not only has great significance to build a harmonious society for China, but also favors to achieve a suitable level of aggregate saving rates, which reflects the balance of saving and consumption. However, this is not easy because income distribution relies on comprehensive reforms, whose feasibility is subject to many prerequisites and trade-off among alternative policies.

For income distribution among government, enterprises and households, it is affected by labor market, capital market and some taxation policies; therefore it is

hard to change in the short-term because of some deep-rooted reasons[23]. Labor market is evolving under the unstoppable urbanization process and great education achievement promoted by some key policies, such as 9-year Compulsory Education implemented in 1986 and higher education reforms in the 1990s. The ample labor supply of both low-quality and high-quality makes the income distribution favor capital, especially when economy is booming.

In addition, a more efficient capital market should affect income distribution among government, enterprises and households. If the capital market can support financing of small and medium-sized enterprises, and reduce their credit constraints by lowing down the collateral requirements, small and medium-sized enterprises can absorb more surplus labor and young graduates from colleges and universities, which will make income distribution favor labors. According to Table 1, bank loan only accounts for 20% of enterprises investment. In factor, most of bank loan is lent to large enterprises, especially State-owned enterprises. Comparatively, small and medium-sized enterprises face substantial difficulty in accessing formal capital market. From Table 1, we can see that the fraction of "others" also explains about 15% of aggregate investment in 2006.[24] To some extent, financing capacity of small and medium-sized enterprises indirectly ameliorates income distribution among households, enterprises and government by creating more jobs.

Moreover, China's widening income disparity among individuals has become an

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[23] At the initial stage of economic transition, income disparity was permitted, like the slogan said that letting one part of people and region get rich in advance, letting the developed regions assist the development of underdeveloped regions and achieving the goal of prosperity for all eventually. On the whole, there are many kinds of income disparity in China, such as income gaps among regions, between the rural and the urban, and among individuals.

[24] The "other" part in Table 1 includes those financing by some informal financial channels.

indisputable fact in recent years and the huge income gap between the rich and poor

has approached to a stunning level[25], which potentially threats social stability.

However, the rich contributes very little personal income tax compared with their

income share. As reported by *China Daily*, one English newspaper in China, the

high-income people in China, with a 20 percent of population ratio, contributes less

than 10 percent of the tax burden. Therefore, tax evasion of wealthy people is very

serious, because their sources of income are more diverse and easy to be hidden from

tax authority. However, the salaried people contribute about 50% of personal income

tax, because their income is very transparent. Therefore, the inability of the

government taxing the rich limits its capacity of adjusting income distribution among

the rich and the poor. In fact, although household income accounts for a relative low

share of GDP, part of enterprise income should belong to individuals.

Reforms of personal income tax have received wide attention in China, and many

people arguer that the threshold of personal income tax should be improved

significantly, which is considered to be favorable for household consumption

expansion. However, personal income tax actually faces dilemma, because

improvement of the threshold will cause the decline of fiscal revenue from personal

income tax, which will reduce government's ability in redistributing income among

individuals.

On the whole, the role of income distribution should be emphasized in

interpreting China's high saving rate. Quantitatively, income distribution among

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[25] As reported by the CASS in its 2009 Blue Book on Chinese Society, the average income of 20 percent of the richest Chinese families 17 times higher than the poorest families.

individuals deteriorates along with economic growth, and it is positively correlated with the saving rate. Therefore, income growth rate might be overestimated due to omitting the role of income inequality in explaining the household saving rates. In another word, if the increasingly widening trend of income inequality could be avoided, the high saving rates would decline.

Population Aging and Social Security Institutions

As the fundamental and perennial factor that affects economic growth and saving rates, the population aging should negatively affect the aggregate saving rate. According to an UN Population Council's estimation, the fraction of aged 15-64 population in total population reaches to its peak around 2010 and the population aging begin to accelerate. Aggregate dependency ratio will reach a low at 27.8% in 2010, but will surge to 31.6% by 2025 and the old dependency ratio will go up rapidly from now on till 2040 according to Figure 14. From macroeconomic perspective, population aging will have important effects on China's economy in the long-run, especially on social security system. Traditionally, Chinese rely on family-based support for the aged, especially in the rural area. In the urban area, pension expenditure was mainly paid by enterprises. However, China has to build a formal social retirement pension system, because of demographic transition affected by the one-child policy and the collapse of employment institution and welfare system formed in the planned economy. More important, the population aging will aggravate

government's expenditure pressure on medical care and pension payment[26]. Hence, governments need more resources to finance these expenditures[27].

Currently, China is making effort to build a social retirement pension system based on a personal account combined with an overall social planning. However, personal account is actually empty now and the debt of total personal accounts for the governments might be enlarging with increasing number of the retired. The current pension system in China still largely follows Pay-as-you-go. Thus, during the establishment of social security system in China, governments have to undertake the function of redistribution and aggregate saving rates tends to decline because more old people need to be supported and government have to conduct generational transfer from the young cohorts to the old cohorts[28]. Therefore, a higher taxation levy will be imposed on the young cohorts, which will reduce aggregate saving rate.

Despite the high growth rate of pension income for urban households in recent years, it cannot constantly keep that high[29], because governments have to consider the affordability issue because of booming retirees and social security system's extension to the rural area[30]. To certain degree, the evolving social security system will play a pivot not only in coping with the unstoppable population aging and urbanization but also in rebalancing between saving and consumption. Therefore, it is necessary for

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[26] Add some comments on the reforms of medical care and booming retirees.

[27] In addition, the social security system will cover more people with its extension to the rural area and the development of urbanization.

[28] The pension income of the retired will rely on the social security institution in China. Although the reforms of social security institution in China launched over 20 years ago, they are far from finished, considering the expanding population coverage by social security system and the aging trend of population.

[29] From Figures 12 and 13, we can see that household with the elderly saves more, and the old families tend to have higher saving rates in 2006. The high saving rates of old households is mainly caused by pension income growth.

[30] In addition, the unstoppable trend urbanization also requires that the social security system should consecutively cover the new immigrants.

governments to set relevant policies to improve their redistribution capacity, which involves many aspects. China's fiscal policy should convert the current pattern of transfer payment from generous capital transfer to enterprises to enlarging expenditure to households, such as medical care and social retirement pension system, which can make households spend less prudently.

On the whole, China's aggregate saving rates are determined by many factors, such as economic growth, income distribution and population aging. Economic growth will still have an important role on China's high saving rate, considering the rapid urbanization and continuous optimization of labor force allocation. Population aging combined with urbanization push up the government's expenditure related to medical care, pension and tax levy in order to finance the inflated expenditure.

5. Concluding Remarks (**To Be Revised**)

In this paper, we explain China's high saving rates from both the macroeconomic and microeconomic perspectives and we can draw the following conclusions. The macroeconomic analysis explains China's high saving rates. First, the international comparisons of domestic saving rates show that China's saving rate is extremely high compared with other countries, such as countries of different income groups, the BRIC economies and selected developed countries, and China's pattern of saving rates-growth rates also indicates the uniqueness.

Second, China's high saving rates reflects the income distribution among households, enterprises and governments. The decomposition of the aggregate savings indicates that household saving is part of the aggregate savings, and only accounts for

no more than 50 percent of aggregate saving, and enterprises savings plays an important role in China's high saving rates. Enterprises' high saving indicates the improvement of profitability, which can be explained by the income distribution of favoring capital from the decreasing wage/value added ratio, a very small dividend/value added ratio and some preferential policies (such as tax rebate for exports).

Third, there is a very close linkage between saving and investment, because bank sectors account for about 20 percent of total investment and self-raising funds of enterprises become increasingly important in the aggregate investment. Fourth, government savings do not play a prominent role compared with households and enterprises and the state budget only occupies a very small percentage in total investment. However, local governments have very strong motivations to bid for investment and also support enterprises sectors by capital transfer.

In the microeconomic analysis of using Chinese urban household survey data (1988-2006), we have the following key findings. First, the saving rates of urban households in China have an obviously upward trend from 1988 to 2006 with household income growth. Second, there is a significant demographic transition with an obvious decline in the child dependence ratio and a moderate increase of old dependence ratio, and household saving rates significantly vary with household demographic characteristics. Third, the age profiles show very different patterns over years, partially reflecting the effect of household pension income on household saving rate. Fourth, there is a regional disparity for household saving rates and a remarkable

difference among different income groups. Fourth, we give very broad discussion of urban household saving rates from the perspectives of household income growth, consumption inertia, precautionary saving motives, demographic factors, income distribution and cultural tradition.

Finally, this paper analyzes the dynamics of aggregate saving rates in the short run and in the long run, and our main arguments can be summarized as follows. First, under the global financial crisis, China's proactive fiscal policies, such as 4-trillion packages and 920-billion budgetary deficits, have shown their positive effects in curbing economic downturn by mobilizing investment, and therefore these policies also increase the aggregate domestic saving rates in the short run. Second, the policies of expanding domestic demand, such as SHAC policy, can only play a limited role in spur economic growth, because the fundamental issue is income distribution. Third, in the long run, China's saving rates can still keep high as long as China's economic growth keeps at a relative high level and the rapid urbanization continues. Fourth, population aging in China can negatively affect the aggregate saving rate in the long run, and it impact on household saving rate is also related with social security institutions, which will play a more important role in affecting both domestic aggregate saving rate and household saving rate.

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Figure 1: Gross National Saving Rates of China and Other Economies, 1978-2008

A. China vs. Major Country Groups by Income

China — High income — Middle income — Low income —

B. China vs. the BRIC Countries

China — Brazil — Russian Federation — In

C. China vs. Developed Economies and Regions

China — Japan — United States — Euro area — Kor
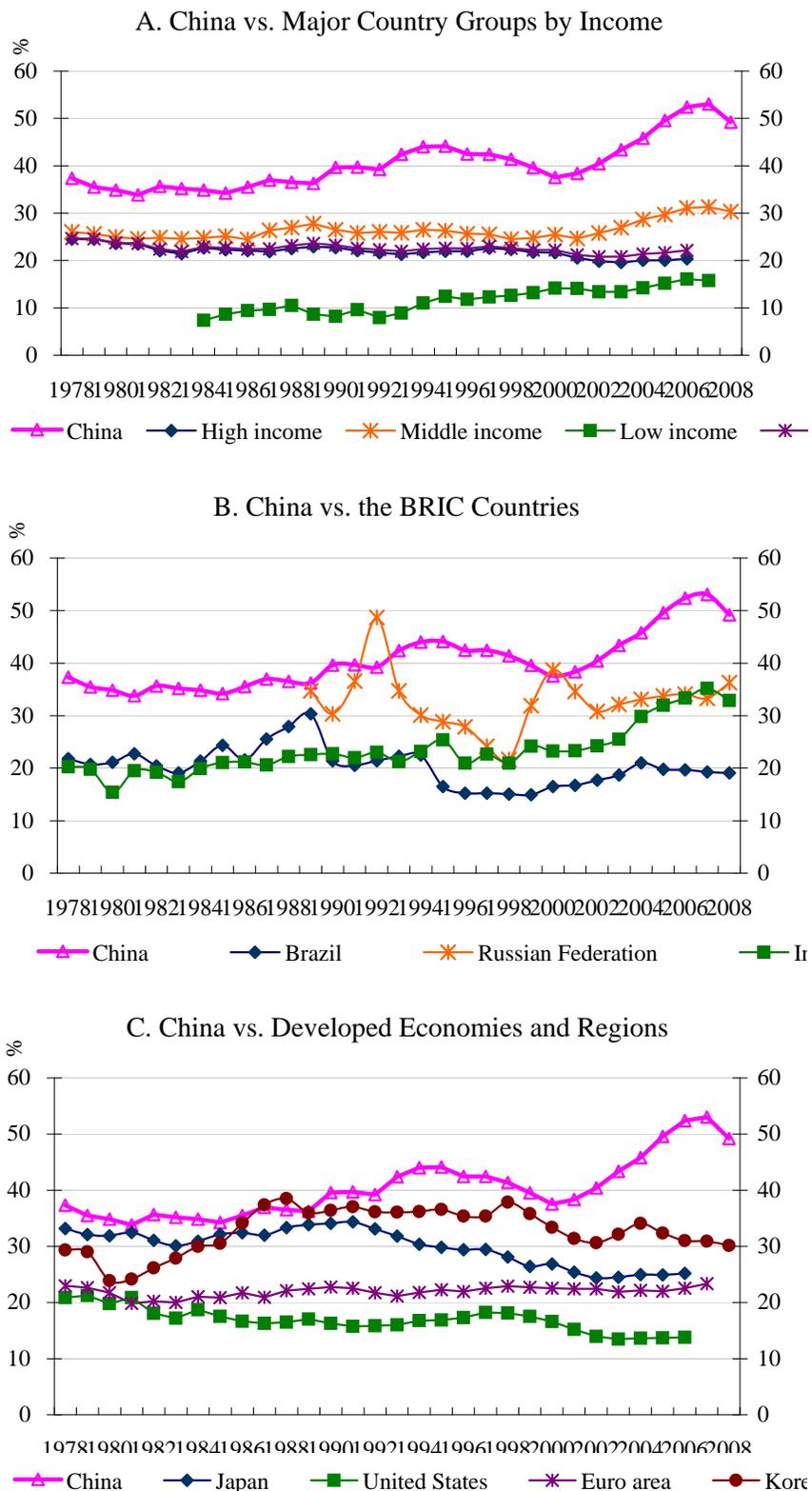
Source: World Development Indictors (World Bank, 2009)

Figure 2. Household, Enterprise and Government Savings as Percentage of the GDP, 1992-2006
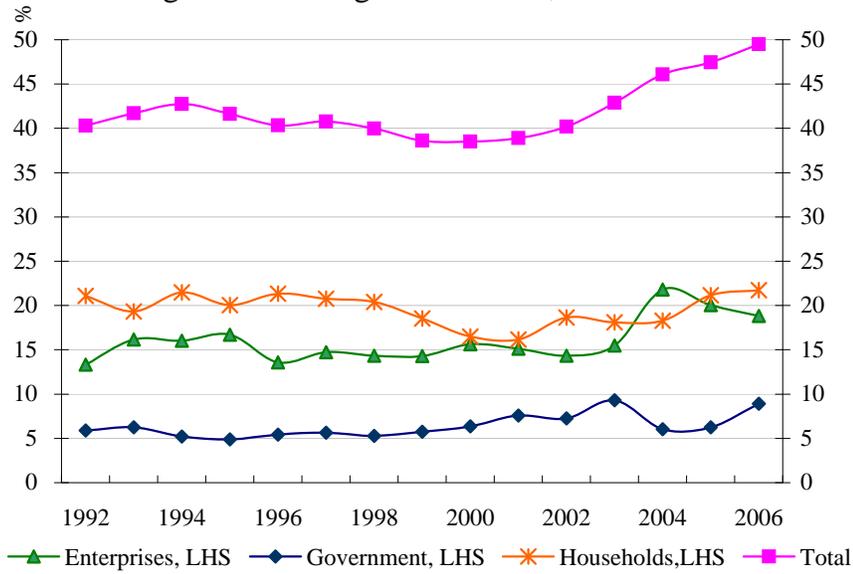
Source: NBS (1995-2009).

Figure 3. Income Distribution among Households, Enterprises, and the Government, 1992-2006
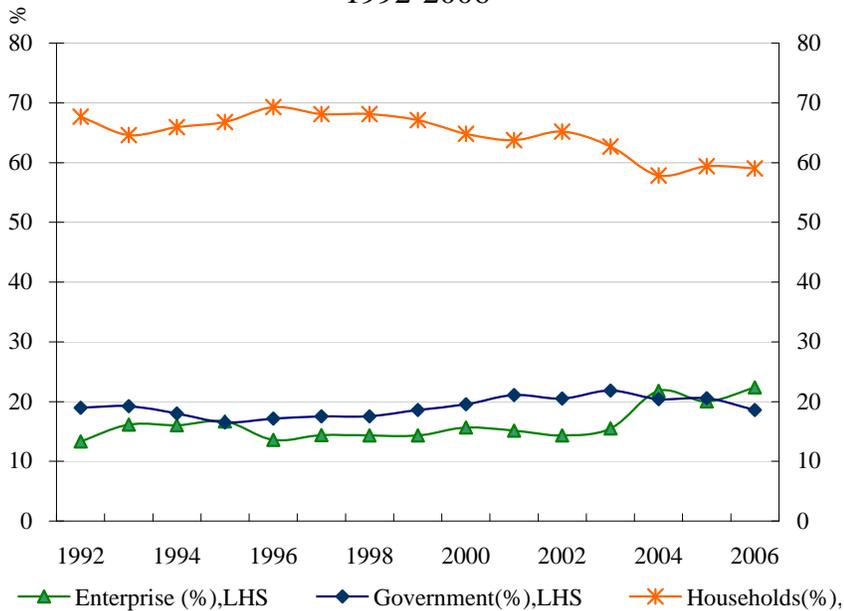
Source: NBS (1995-2009).

Figure 4. Enterpriese Profit and Added Value, 1992-2006
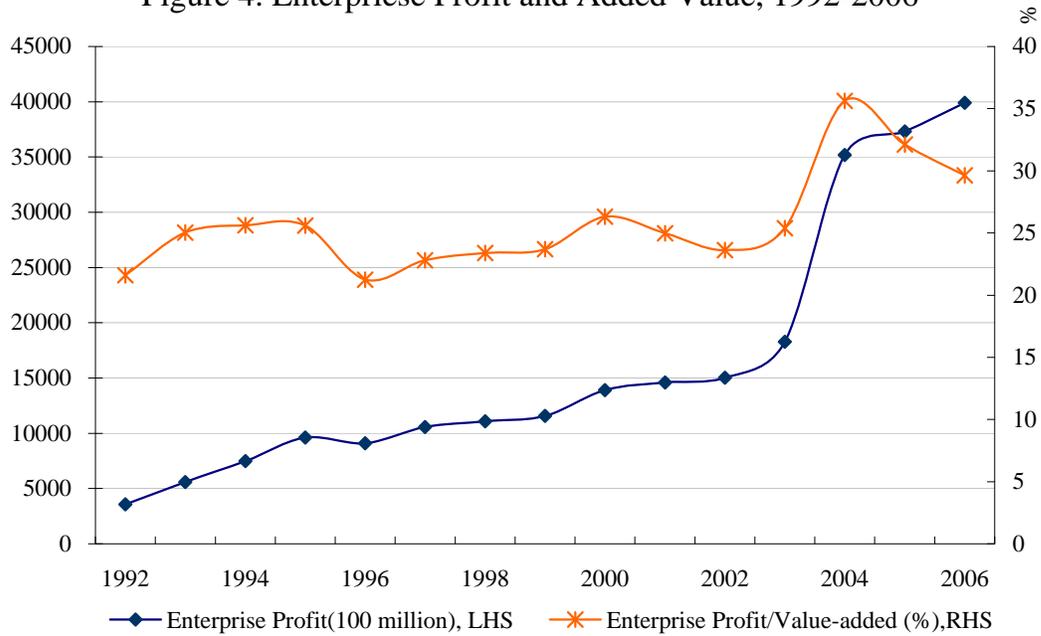
Source: NBS (1995-2009).

Figure 5. Capital formation and inventory investment (non-financial sectors), 1992-2006
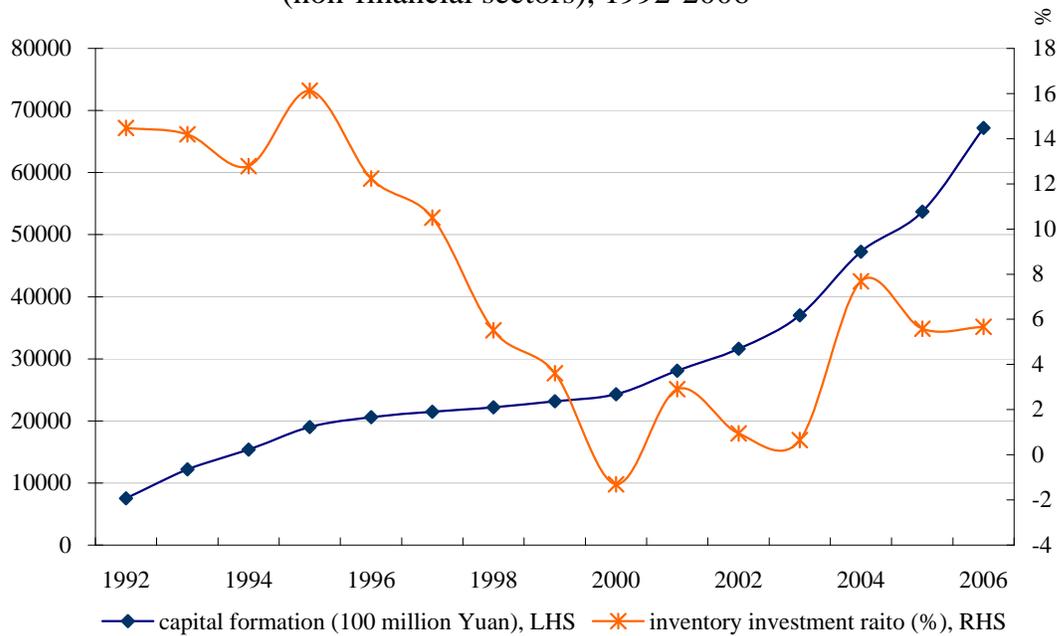
Source: NBS (1995-2009).

Figure 6. Tax Rebate for Export in China, 2002-2008

- Tax Rebate for Export (100 million), LHS
- Tax Rebate as % of Tax Revenue, RHS
- Tax Rebate as % of Enterpise Saving, RHS
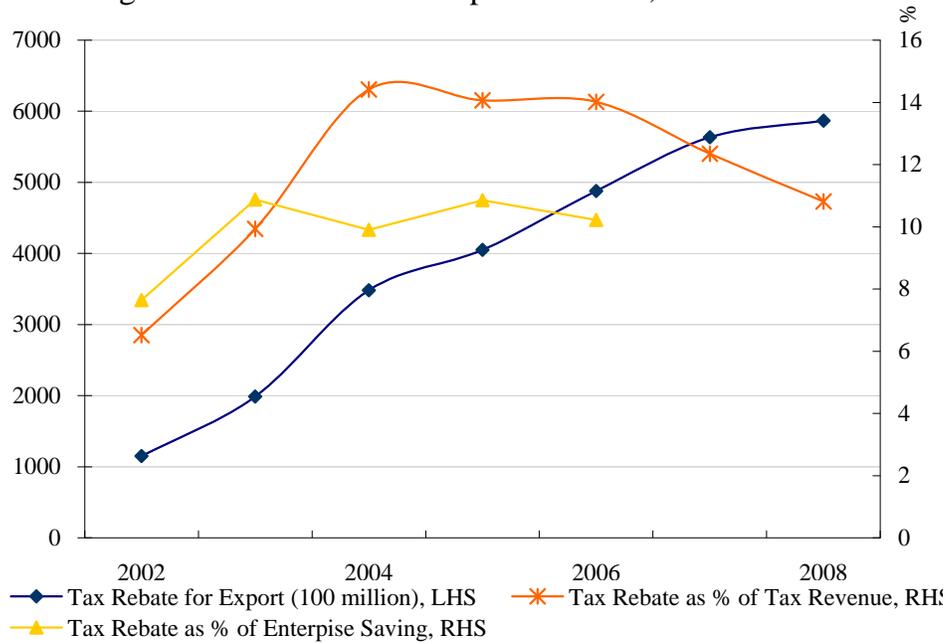
Source: China Statistical Yearbook, 2003-2009 editions.

Figure 7. Employees' Compensation and Dividend Distributed to Households, 1992-2006

- Compansation of Enterprises Employees/Added Value of Enterprises (%),LHS
- Household Dividend Income/Added Value of Enterprise (%), RHS
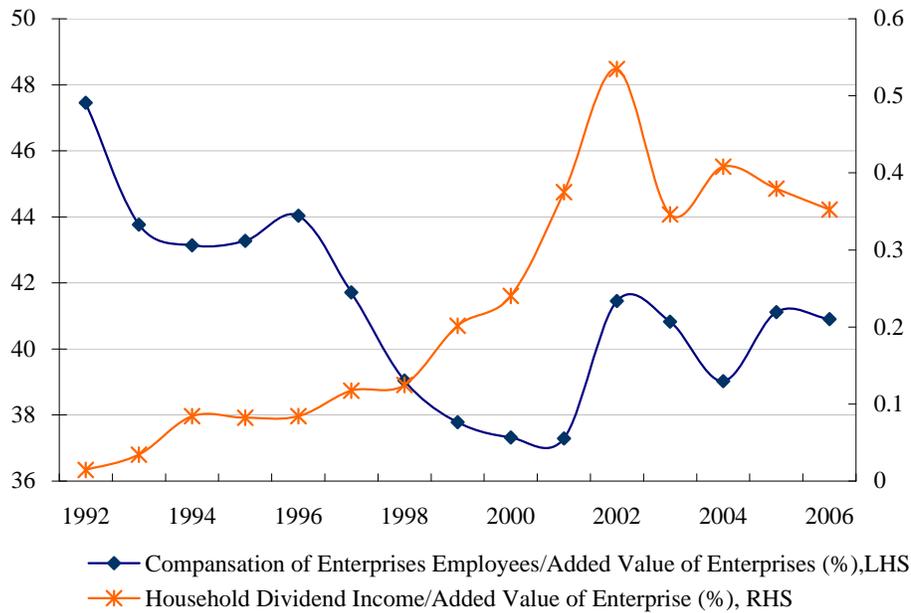
Source: NBS (1995-2009).

Figure 8. Capital Transfer to Enterprises from Government, 1992-
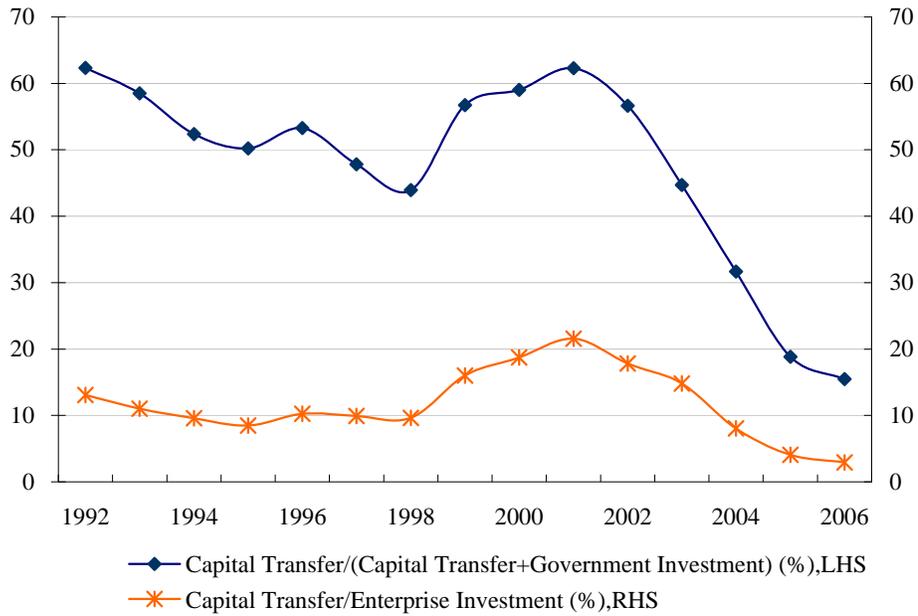
Source: NBS (1995-2009).

Figure 9. Household Saving Rates and Demographic Structures, 1988-2006
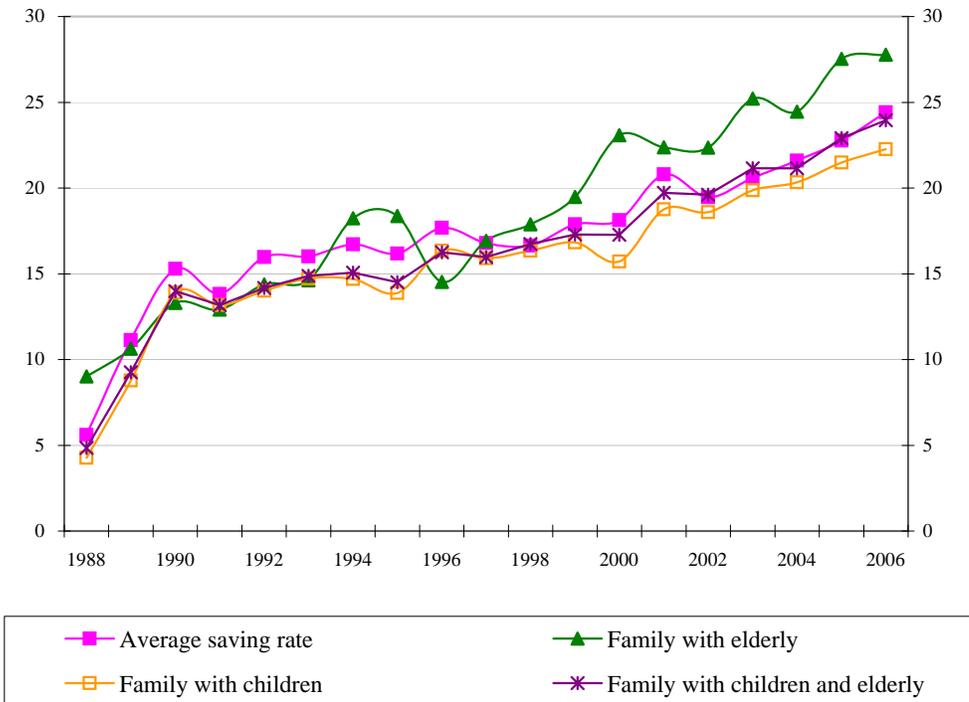
Figure 10. 3-year Moving Average Saving Rates by Regions, 1988-2006

Legend: Beijing, Liaoning, Zhejiang, Guangdong, Sichuan, Sh...
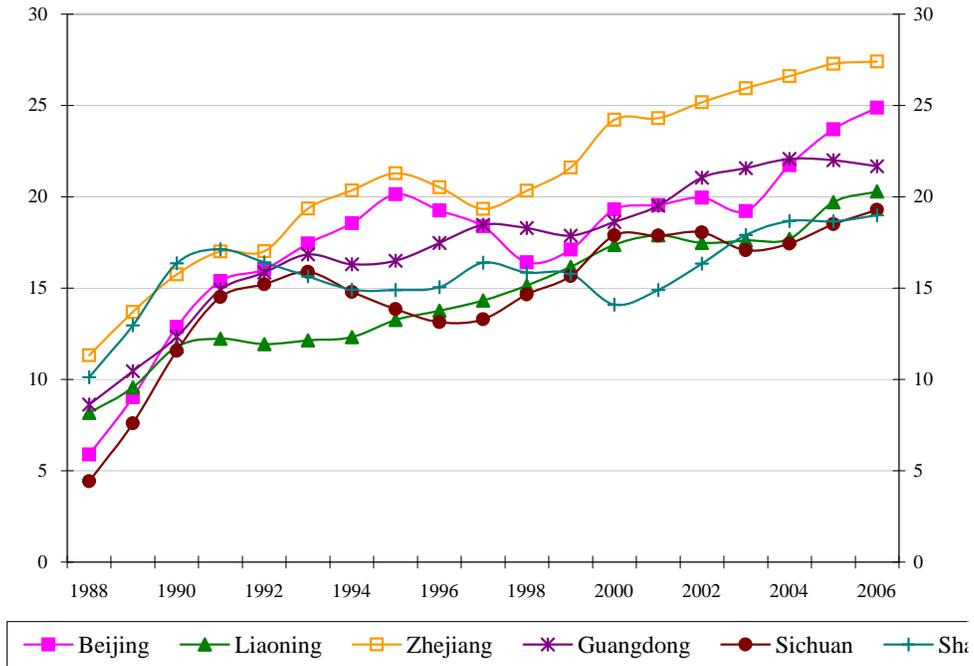
Source: UHS data, 1988-2006.

Figure 11. Saving Rate by Income Levels, 1988-

Legend: 0-25%, 25-50%, 50-75%, 75-100%
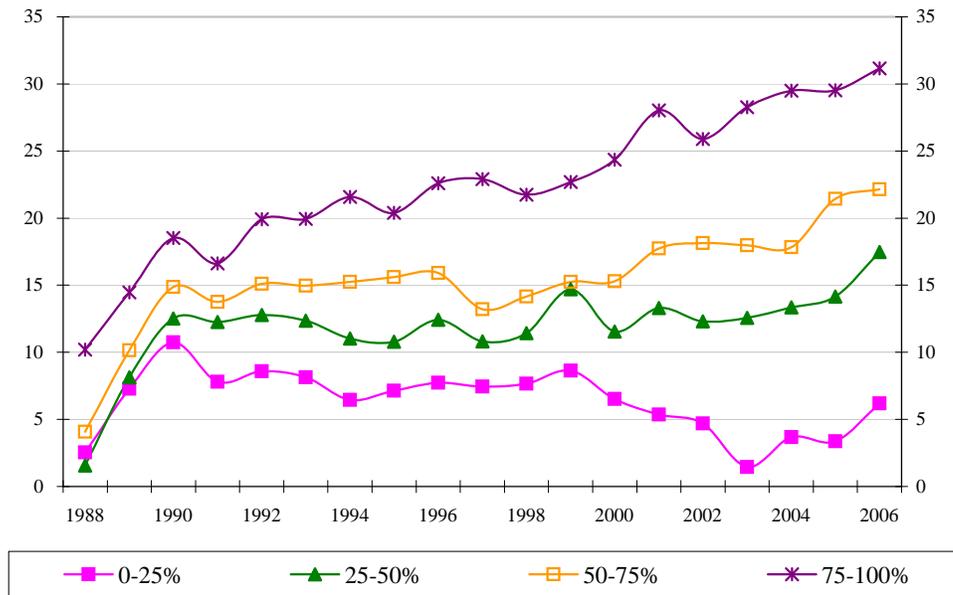
Figure 12. Age Saving Profiles by Age of Household Head

A. 3-year Moving Average Saving Rates

| — ■ — Year 1988 | — ▲ — Year 2006 |

B. 3-year Average Saving Rates 1988-1990 and 2004-2006

| — ■ — 1988-1990 | — ▲ — 2004-2006 |
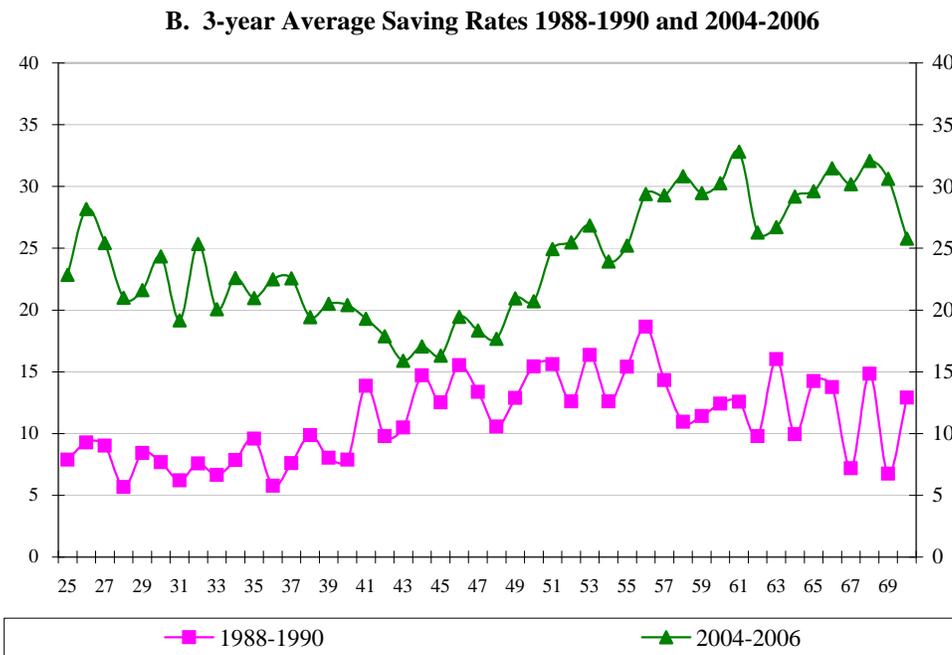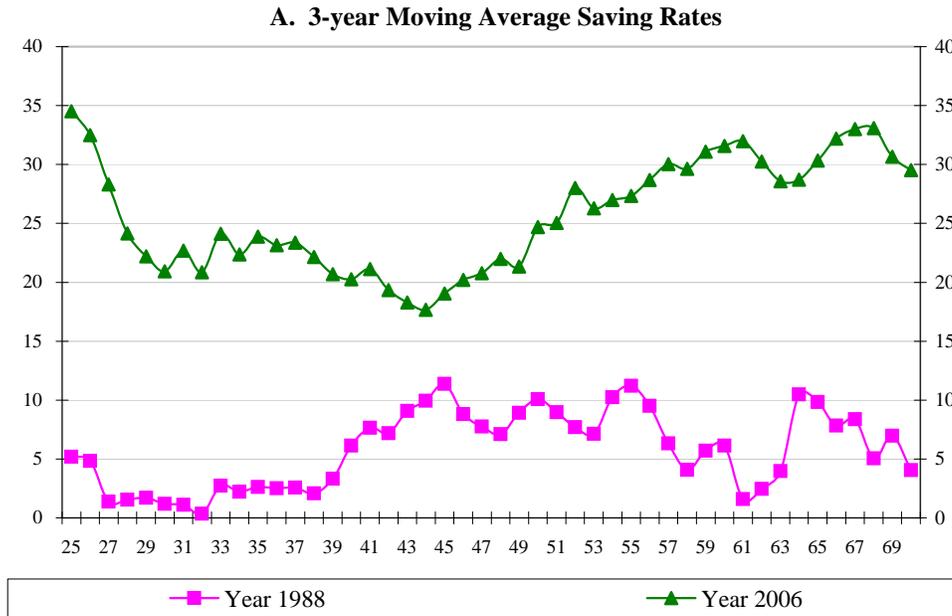
Source: UHS data, 1988-2006.

Figure 13. Urban Investment and Investment in the Real Estate Sector
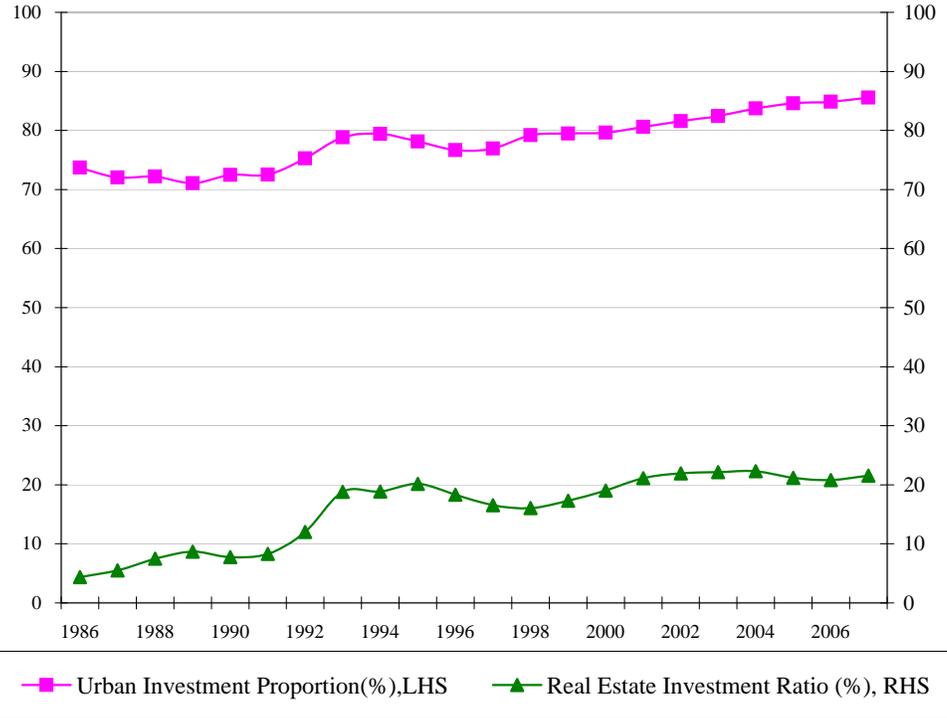
Source: Chinese Statistics Summary 2009.

Figure 14. China's Long-Term Population Trends (percentage): 1950-2050
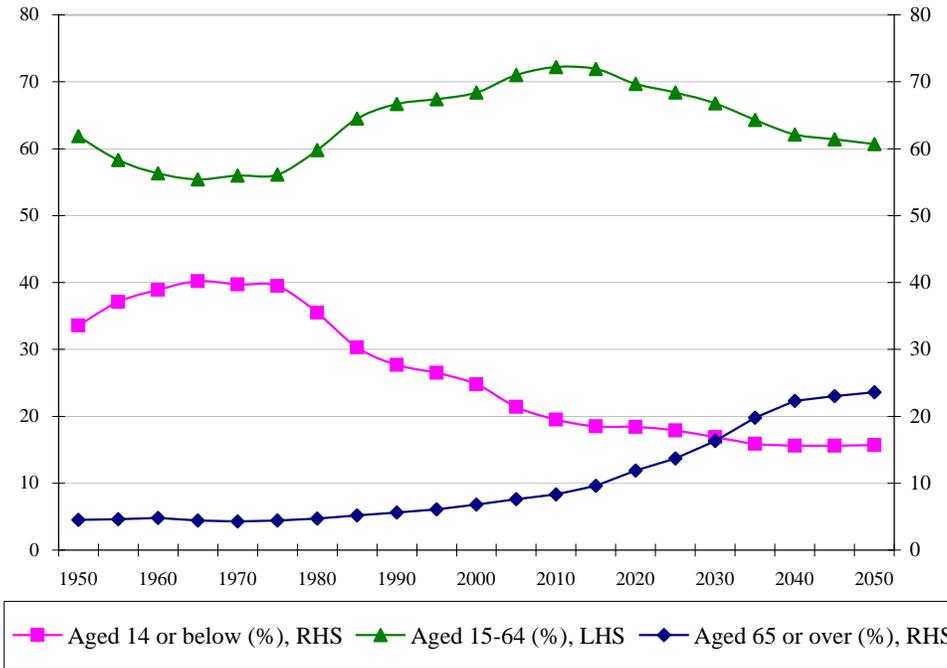
Table 1. Sources of Funds for Fixed Assets Investment (%)

Year	State Budget	Domestic Loans	FDI	Self-raising Funds	Others
1995	3.03	20.46	11.19	51.88	13.45
1996	2.68	19.58	11.76	47.74	18.24
1997	2.76	18.93	10.63	49.71	17.97
1998	4.17	19.30	9.11	48.81	18.61
1999	6.22	19.24	6.74	49.20	18.59
2000	6.37	20.32	5.12	49.28	18.91
2001	6.70	19.06	4.56	49.79	19.89
2002	7.02	19.67	4.63	50.65	18.04
2003	4.59	20.55	4.43	53.65	16.78
2004	4.37	18.49	4.41	55.35	17.39
2005	4.39	17.25	4.21	58.26	15.89
2006	3.93	16.47	3.64	59.75	16.21
2007	3.88	15.28	3.40	60.59	16.84
2008	4.35	14.46	2.90	64.79	13.50

Source: China Statistical Yearbook 2009.

Table 2. Summary Statistics of Urban Household Samples, 1988-2006

Year	No. of Observations	Income (2006 RMB)	Consumption (2006 RMB)	Saving Rate (% of Income)
1988	2,869	13,600	12,838	5.6
1989	2,683	13,231	11,758	11.1
1990	2,977	14,083	11,931	15.3
1991	2,998	14,984	12,913	13.8
1992	3,673	17,277	14,519	16
1993	3,698	18,472	15,515	16
1994	3,713	20,399	16,991	16.7
1995	3,727	20,954	17,565	16.2
1996	3,717	21,630	17,804	17.7
1997	3,704	22,378	18,619	16.8
1998	3,782	23,498	19,588	16.6
1999	3,680	24,099	19,787	17.9
2000	4,077	26,602	21,780	18.1
2001	3,656	28,959	22,936	20.8
2002	9,813	27,358	22,034	19.5
2003	10,906	28,714	22,800	20.6
2004	12,748	32,192	25,243	21.6
2005	14,459	35,569	27,471	22.8
2006	14,206	39,422	29,793	24.4

Source: CHUS data, 1988-2006.

Table 3. Demographic Structures of the Households, 1988-2006

Year	Household Size	Age of Household Head	Schooling of Household Head	Child Dependence	Old Dependence Ratio	Total Dependence
1988	3.5	43.2	10.1	64.41	10.63	69.54
1989	3.5	43.8	10.3	61.87	11.67	68.51
1990	3.4	44.5	10.3	59.12	11.08	65.44
1991	3.3	43.9	10.6	59.91	9.61	65.24
1992	3.3	44.7	10.9	57.83	10.45	63.6
1993	3.2	45.2	10.9	55.65	10.17	61.33
1994	3.2	45.7	11	53.38	11.63	60.27
1995	3.2	45.5	11.1	51.89	11.62	59.08
1996	3.2	46.1	11.2	48.83	12	56.44
1997	3.2	45.7	11.2	47.3	12.07	54.81
1998	3.2	46	11.3	45.03	12.56	52.67
1999	3.1	46.4	11.3	42.12	12.31	50.08
2000	3.1	47.2	11.4	40.08	13.83	49.47
2001	3.1	47.3	11.4	38.13	12.91	46.96
2002	3	47.9	11.4	35.05	12.23	43.59
2003	3	47.8	11.5	33.89	11.32	41.8
2004	2.9	48.2	11.6	31.24	12.23	40.07
2005	2.9	48.2	11.6	32.33	12.56	41.5
2006	2.9	48.3	11.7	31.12	12.05	39.88

Source: CHUS data, 1988-2006.

Table 4. Urban household expenditure structure (%)

Item	1990	1995	2000	2006
Food	54.25	50.09	39.44	35.78
Clothing	13.36	13.55	10.01	10.37
Residence	6.98	8.02	11.31	10.4
Household Facilities, Articles and Service	10.14	7.44	7.49	5.73
Health Care and Medical Services	2.01	3.11	6.36	7.14
Transport and Communication	1.2	5.18	8.54	13.19
Education, Cultural and Recreation Servic	11.12	9.36	13.4	13.83
Miscellaneous Goods and Services	0.94	3.25	3.44	3.56

Source: CHUS data, 1988-2006.