

# Rural and urban households savings in China under different policy scenarios

by

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## Abstract

*Domestic saving in China, above 50% of GDP in 2008, is the highest in the world and it surpasses the investment share, which is very high by international comparison as well (around 43% of GDP). Given the remarkable Chinese current account surplus, understanding the saving determinants in China has become a central issue in the debate on global imbalances. We show that, notwithstanding the rising contribution of government and firms to national savings the core of the problem lies with the families. About 40 per cent of the national saving is done by Chinese households, whose saving rate is very high compared to other countries at analogous development levels as well as in historical terms. Recent opinion surveys reveal that the majority of households, despite their high propensity to save, would like to save more. Their main goals are provisions for retirement, health care and children education. Using provincial level data, we explore the determinants of saving distinguishing between rural and urban households' behavior. Following Loayza et al. (1999), we estimate a saving equation that includes many potential determinants of the Chinese households saving rate, we focus on the variables controlled by the Government to gauge the sensitivity of saving behaviour to the policy changes advocated by many observers. Our results suggest that in order to reduce the propensity to save of Chinese households it is necessary **to reduce the income gap between rural and urban areas**, to improve social services provision, to facilitate the access to credit by strengthening and rebalancing property rights in favor of households.*

**PRELIMINARY and INCOMPLETE**  
**(please do not quote without permission)**

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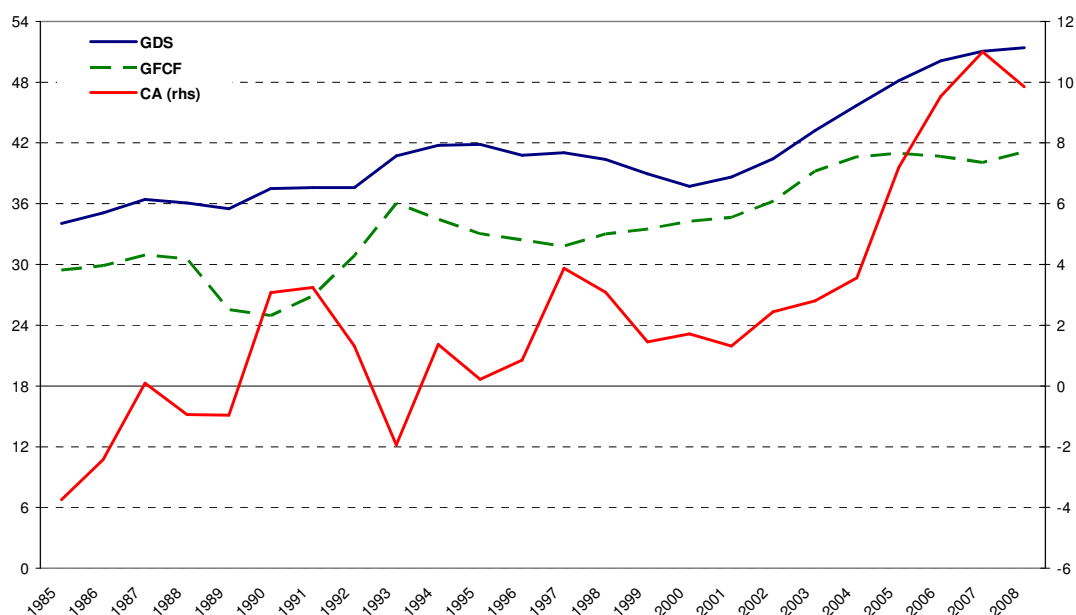
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## 1. Introduction

Domestic savings in China, well above 50 per cent of national income in 2008, are the highest in the world as a share of GDP. They have been constantly rising over the last decade, exceeding systematically investment expenditures, notwithstanding the quite sharp surge of the latter as a share of GDP, from 35 per cent in 2000 to 43 in 2008. This widening discrepancy translated into large current account surpluses. In terms of GDP, the current account surplus rose steadily as well, reaching a peak of 11 per cent in 2007 (Fig.1), with a resulting accumulation of foreign reserves close to 2.4 trillions of dollars at the end of last year (greater than annual imports and more than 50 per cent of China GDP).

**Fig. 1 China: Current account, Gross domestic saving and Gross fixed capital formation as % of GDP**



Source: CEIC and IMF.

Private consumption, on the other hand, fell as a share of GDP, from 46.2 to 34.5 per cent over the same period, mirroring a persistent erosion of households' disposable income, that has not kept up with the fast pace of the Chinese economic expansion, as well as their rising saving rate. *[to be added: firms financing and the banking system]* All the while China grew at the remarkable pace of 10.3 per cent per year and rose from 7.2 to 11.4 per cent of world GDP (at the PPP). These figures underscore the remarkable success of the Chinese developing model so far, but they also help to draw attention to possible weaknesses and inconsistency in this growth model.

Given the relevant size and the growing importance of China in the world economy, understanding the saving determinants in China has become a central issue in the debate on global imbalances.<sup>2</sup> The world leaders and the major international institutions and think tanks repeatedly warned against the dangers of a growth model based on an ever widening current account deficit and external debt of squanderer countries and a parallel growing surplus of thrifty economies.

*Ben Bernanke famously pointed to the "global saving glut" as the culprit ... Global imbalances and the crisis (Obstfeld – Rogoff),*

<sup>2</sup> See, Bernanke (2005), IMF (XXXX), BIS(XXXX), Krugman (willie coyote), Visco, etc.

*Riequilibrium, renminbi appreciation insufficient (reminiscent of big scare of Japan and pressures to appreciate the yen in the 80's<sup>3</sup>)*

*Analysis of survey data at provincial level. Equation, main results **TO BE COMPLETED***

The paper is organized as follows. In the second section we address the general question of whether China is saving too much, analyzing the different dimensions along which this might be a meaningful question. In section 3 we give a closer look at aggregate data to prove that the main cause of high savings lies in the household sector; the next section briefly discusses the differences between national level data used until that point and survey data on which the following analysis is based. In section 5 the analysis of provincial data is carried out and the main possible explanations of high households savings are evaluated.

## **2. Is China's savings rate too high?**

There are various ways in which the question “is China saving too much?” can be addressed. First of all one might want to compare China with other countries in a similar development stage to see if China, at least in some dimensions, sticks out also within this more homogeneous group; secondly one might look at the dynamic of saving to check if compared with its own past, China is saving more; finally one might ask whether the developing model followed by Chinese authorities based on high saving, high investment, low consumption, strong exports and a managed exchange rate is sustainable in the long run or some global rebalancing of demand, as advocated by many observers, is in order.<sup>4</sup>

Let us address the first point. A preliminary observation is necessary. International comparisons of saving rates are notoriously insidious: large gaps in saving behaviour across countries might be substantially reduced once relevant differences in accounting procedures and concepts are considered (see Hayashi, 1989, for a convincing case concerning US and Japan) and various definitions of “saving” can lead to different conclusions (‘net’ or ‘gross’ saving rates, domestic, private or household savings, see OECD, 2004). Further complications lay in the lack of coverage of many relevant phenomena for a sufficient time span in international statistics so that one is forced to lengthy searches in national digital archives thus increasing the risk of comparing poorly harmonized figures. The poor quality of the data also hinders the comparison, especially in the early phases of development when a coherent system of accounts is often not available. With this caveat in mind, in what follows we will rely mainly on international sources and use “gross” saving rates (i.e. inclusive of depreciation) in cross-countries comparisons.

As shown in the first two columns of table 1, domestic savings in China are much higher than those recorded in the rest of the world. This was already true at the beginning of the nineties, it became more striking by the end of this decade.

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<sup>3</sup> See FT debate...

<sup>4</sup> Blanchard (2010), Blanchard and Giavazzi (2005), IMF, October 2009.

**Table 1****International comparison of key indicators of overall economic structure and performance**

	Gross domestic savings (% of GDP)		Household final consumption (% GDP)		Industry, value added (% GDP)		Sector value added (% GDP - 2007)		GDP per capita, PPP (current international \$)		% growth in p.c. GDP (PPP)	
	1990	2007	1990	2007	1990	2007	Exports	Manufacturing	1990	2008	overall	annual
China	39.6	52.2	46.2	34.1	41.3	48.5	39.7	34.0	793.5	5970.8	752	11.9
India	22.7	35.2	65.6	54.7	26.9	29.5	21.2	16.3	871.7	2946.5	338	7.0
Indonesia	32.3	29.0	58.9	62.7	39.1	46.8	29.4	27.1	1506.6	3993.7	265	5.6
Korea, Rep.	36.4	30.9	51.7	54.4	41.6	37.1	41.9	27.3	8187.6	27657.8	338	7.0
Thailand	33.8	34.1	56.8	53.7	37.2	44.7	72.7	35.6	2859.2	8086.4	283	5.9
Vietnam	3.3	28.2	84.3	66.7	22.7	41.5	76.9	21.4	651.4	2787.3	428	8.4
Japan	34.1	25.8	52.5	56.3	39.7	29.3	17.6	21.2	18796.9	34129.5	182	3.4
Brazil	21.4	19.3	59.3	60.8	38.7	28.1	13.7	17.4	5181.7	10304.3	199	3.9
Russian Federation	30.3	32.9	48.9	49.9	48.4	37.7	30.3	18.5	9116.5	15922.5	175	3.1
France	21.2	20.3	57.1	56.6	27.1	20.4	26.5	12.3	17267.9	33058.4	191	3.7
Germany	23.1	25.3	57.6	56.7	37.3	30.4	46.9	23.9	18372.6	35373.9	193	3.7
Italy	22.5	21.6	57.3	58.7	32.1	27.5	29.0	18.2	17595.1	31282.6	178	3.2
United Kingdom	18.1	14.9	62.2	64.0	34.1	23.0	26.4	13.3	16319.5	35467.5	217	4.4
United States	16.3	13.2	66.7	70.7	27.9	21.8	12.1	13.7	23063.6	46350.4	201	4.0
High income	22.7	20.6	59.8	61.5	32.5	25.7	28.1	16.8	17992.2	37124.4	206	4.1
Middle income	26.5	31.3	60.1	55.0	37.2	37.4	32.7	21.7	2246.2	6213.5	277	5.8
Low & middle income	25.8	30.8	60.8	55.6	36.5	37.1	32.8	21.4	1998.6	5369.3	269	5.6
Low income	8.1	15.2	79.6	75.0	21.6	28.9	34.2	14.4	607.6	1351.9	223	4.5

Source: World Development Indicators, 2009 and authors' calculations

Even confining oneself to the other East Asian economies, countries where savings, partly for cultural reasons,<sup>5</sup> are traditionally high, China stands out with national savings that are 20 points (of GDP) higher than Korea, Indonesia and Vietnam, 15 points higher than India and 25 points more than Japan. The other striking feature that emerges from the data, is the very low level of consumption in terms of GDP, compared with all other countries (columns 3 and 4).

A closer look, focusing on Asian economies, shows that China is an outlier also considering private saving (*i.e.* domestic savings – government saving). In 2007 the Chinese private sectors saved 10 points of GDP more than the thriftiest country in the sample (see table 2). It was also well above the others in terms of capital accumulation, with a share of investment to GDP greater than 40%, that compares with rates in the mid thirties or mid twenties for most other Asian economies.

**Table 2****China and other main Asian economies: 2007**

	Gross private savings, current prices	Gross fixed capital formation, current prices	Net exports / GDP
China,P.R.: Mainland	<b>43.4</b>	<b>41.0</b>	<b>9.1</b>
India	33.5	34.2	-3.5
Indonesia	22.6	24.9	4.0
Philippines	17.4	14.7	0.2
Thailand	27.6	26.4	8.4
Vietnam	27.0	38.3	-15.9
Taiwan	25.4	17.8	10.1
Korea	15.0	25.1	0.2
Japan	22.9	23.1	1.9

One might object that this comparison is flawed since we are dealing with countries at very different stages of development. In table 3 we compare the performance of various economies in their takeoff phases: starting from a comparable level of development (in terms of GDP per capita)

<sup>5</sup> See among other Morishima () for Japan and the Governor of PBoC, Zhou Xiaochuan (2009) for China.

till the end of the period of fast growth. Results are robust with respect to small variations in the time periods chosen (see Modigliani and Cao for a similar comparison). **TO BE COMPLETED.**

**Table 3**

	Period	Average growth		GDP per Capita					Domestic Saving/GDP		Private Saving/GDP		Investment		
		Per capita GDP	GDP	Beginning of period value	End-of-period value	Beginning of period % US	End-of-period % US	2007 %US	beg	end	beg	end	growth	beg/GDP	end/GDP
China	1982-2007	6.9	8.1	1,186	6,303	6.5	20.1	20.1	35.3	52.0	30	43.4			
South Korea	1952-1979	6.3	8.6	835	4,294	8.1	22.9	61.4							
Taiwan	1950-1973	5.9	9.3	916	3,448	9.6	20.7	66.8							
Singapore	1959-1984	6.7	9.0	2,186	10,938	19.5	54.4	89.7							
Hong Kong	1950-1973	5.2	8.1	2,218	7,105	23.2	42.6	99.3							
Japan	1948-1973	7.9	9.2	1,725	11,434	19.0	68.5	73.2							
India	1990-2007	4.6	6.5	1,309	2,817	5.6	9.0	9.0	22.7	37.7	20.8	33.5		24.4	34.2
Indonesia	1990-2007	3.1	4.5	2,514	4,228	10.8	13.5	13.5	25.4	27.3	17.7	22.6		23.5	24.9
Philippines	1990-2007	1.6	3.8	2,197	2,877	9.5	9.2	9.2	18.7	20.3	19.8	17.4		22.8	14.7
Thailand	1990-2007	3.7	4.7	4,633	8,584	20.0	27.4	27.4	32.6	32.8	20.5	27.6		40.2	26.4
Brazil	1990-2007	1.4	2.9	4,920	6,196	21.2	19.8	19.8							
Italy	1949-1972	5.0	5.7	3,265	10,060	36.5	63.1	64.1							
United States	1900-1929	1.8	3.5	4,091	6,899	100.0	100.0	100.0							

Source: Maddison, IMF and authors computations

How does China saving behaviour compares with its own past? Gross domestic saving increased by almost 10 points of GDP over the last 20 years and a similar upward trend is shared by the private savings. With respect to the already high starting levels the last 20 years have seen an unprecedented growth in savings both by private agents and by the government.<sup>6</sup>

**Table 4**

China, P.R.: Mainland	Gross private savings, current prices	Gross domestic savings, current prices
1990	<b>34.3</b>	<b>39.2</b>
2007	<b>43.4</b>	<b>52.2</b>

Source: IMF

Is the current situation sustainable in the long run? There are at least two arguments that can be put forward to demonstrate that the answer might be “no”. First, as stated in the April 2010 WEO by the IMF, since in deficit countries demand is likely to remain much weaker than in the pre-crisis era “for surplus economies... the challenge is to rebalance growth from external sources to domestic sources and run smaller surpluses in the future”. Recent evidence shows that the temporary reduction in current account surplus experienced by China in 2008 and the first part of 2009 was mainly compensated by an increase in investment and not by a decrease in saving, that is to say, in the equation  $CA = S - I$  the reduction in  $CA$  was mirrored by an increase in  $I$ . Hence the adjustment that followed the contraction in world trade did not dent China’s fundamental growth strategy.

Second, even if the world were to return to the previous situation the question is: can the growing level of Chinese savings and exports be absorbed? Growing at an average annual rate of 10% (in line with the latest IMF projections and with the pace of the first decade) by 2020 China would outweigh Japan in terms of GDP not only at the PPP but also in dollar term (see table 5). Chinese GDP would account for 1/6 of world total output and its saving therefore (if stable at more than 50% of GDP) would rise from little more than 4% to 8% of world GDP.

<sup>6</sup> The trends of different sectors will be analyzed in depth in the next section.

**Table 5**

	World	US	Japan	China
<i>Annual growth rate</i>	4	2.5	2	10
Weight in 2009 PPP	100	35	6.5	12.5
Weight in 2020 PPP	100	29.8	5.2	23.2
Weight in 2009 US-\$	100	33.5	10.5	8.5
Weight in 2020 US-\$	100	28.6	8.5	15.8

Source: IMF and authors' computations

This expansion would be financed mainly through the current account surplus and the accumulation of capital. A 10% surplus in net exports would translate in a twice as big rest of the world deficit compared with 2009. It seems highly unlikely that such a growing burden in deficit countries can be financed without rising stability risks.

Finally, the adjustment is desirable for China itself. So far the benefits of the rapid expansion have been shared unequally in China, and consumers have had the tougher deal. The mounting pressures for pay rises and the growing inequality between urban and rural families are warning signs that the system might be coming soon under stress.

### 3. A closer look at China's savings: whose saving is so high?

Flow of funds data allow to separate the contribution to China's overall savings of the main economic (institutional) sectors: household, corporate and government.<sup>7</sup> Domestic saving  $S$  is the sum of the savings in these 3 sectors (apart from a negligible contribution from financial institutions), the overall savings to income ratio (average saving rate can thus be expressed as:

$$s = \frac{S}{Y} = \sum_j \frac{S_j}{Y} = \sum_j \left[ \left( \frac{S_j}{Y_j} \right) \cdot \left( \frac{Y_j}{Y} \right) \right] = \sum_j (s_j \cdot y_j) \quad (1)$$

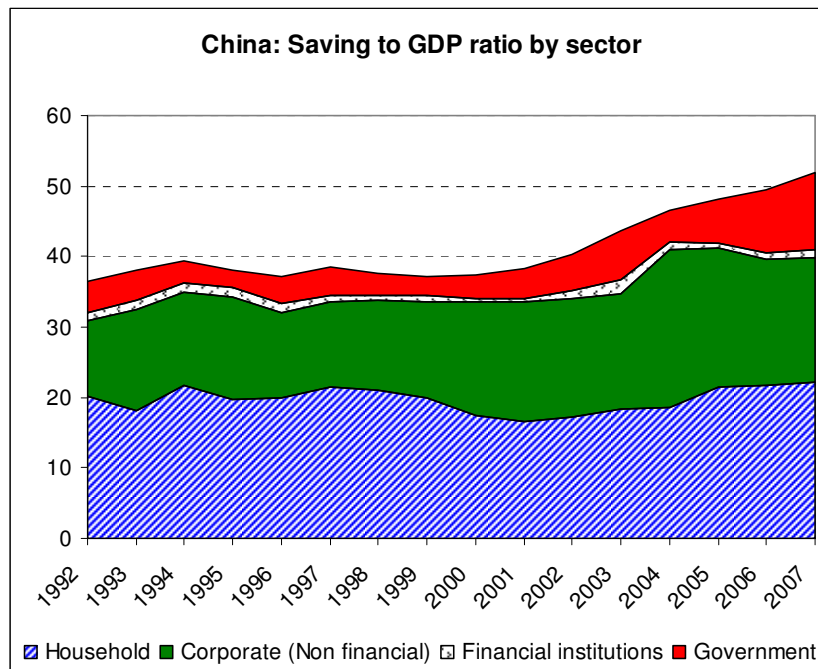
where  $S_j$  and  $Y_j$  are gross savings and disposable income in sector  $j$  and  $s_j$  and  $y_j$  are average saving rate and the income share of the sector, while  $j$  here stands for household ( $h$ ), corporate ( $c$ ) or government ( $g$ ).

Approximately half of national savings is formed within the household sector. Over the 1992-2007 period households saving as a share of GDP remained quite stable at around 20%.<sup>8</sup> On the contrary corporate saving and – since 2000 – government saving rose sharply and now account for about 18 and 11 percentage points (in GDP terms) up from 10 and 4, respectively, in the early nineties (see fig. 2).

<sup>7</sup> Flow of funds data are available only for the 1992-2007 period.

<sup>8</sup> It actually fell below this threshold (to less than 17%) in the late nineties and early 2000's to pick up in the last part of the current decade.

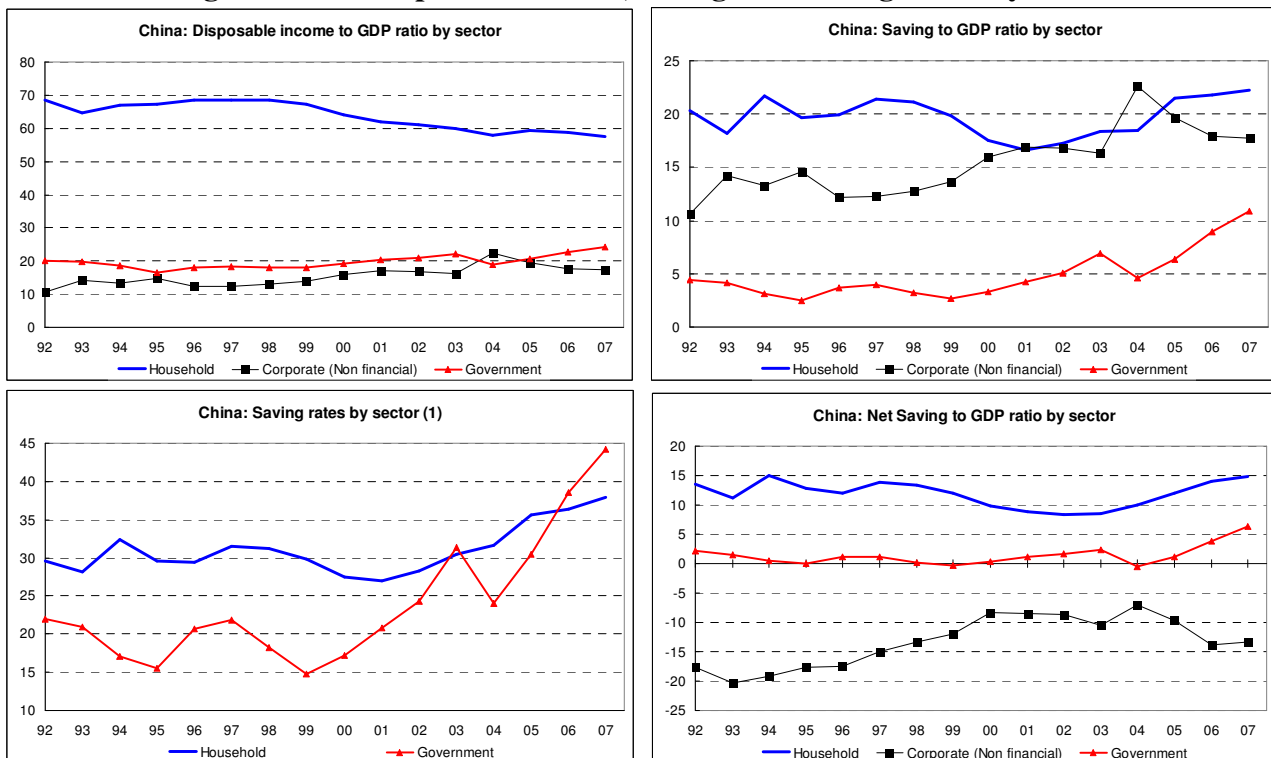
**Fig. 2**



Source: CEIC and authors' computations

One might therefore observe that the major driving forces behind the rise of Chinese national savings over the past 20 years can be traced back to non financial firms and to the government. While this is undoubtedly true a closer look at the data, taking stock of the decomposition in (eqn. 1), might point to a different conclusion regarding the agents' behaviour behind these numbers.

**Fig. 3 Chinese disposable income, savings and savings rates by sector**



Source: Flow of funds data CEIC

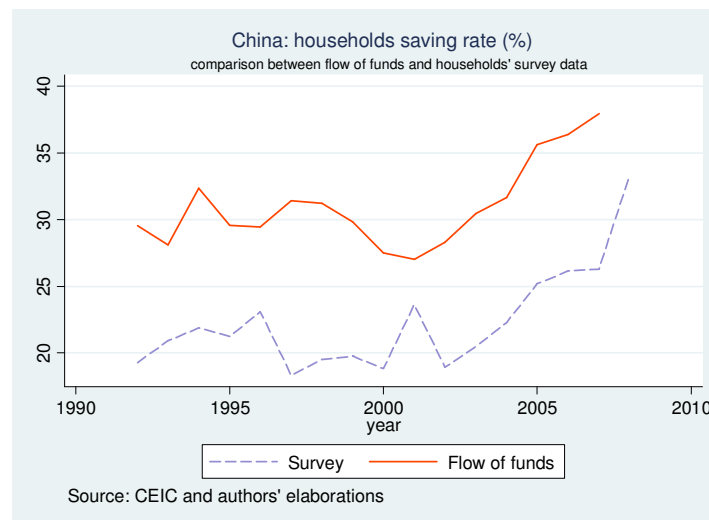
In fact, during this period, household disposable income fell as a share of GDP by more than 10 points, hence, the average propensity to save for the sector as a whole, increased sharply from 29.5 to 37.9% (see fig. 3). On the other hand the growth in corporate saving is part of a global trend (see ADB, 2009 and OECD, 2007) even though “the increase in Asian corporate saving has outstripped that in all other regions in the world”<sup>9</sup>. But while this rise was in general offset by an equal decline in household saving this was not true in emerging Asia and in China in particular. Furthermore, studying microdata at a firm level for a panel of countries Bayoumi et al., 2009, conclude that there is no evidence of a peculiar behaviour of the Chinese corporate sector. Hence we can conclude that *“to understand why China’s national savings rate is so high, the corporate sector is the wrong place to start. It is the high Chinese household savings that has no equal among major economies.”*<sup>10</sup>

Why Chinese households save so much and what might be the impact of changes in government policies on the saving behaviour is the question we address in the remainder of the paper.

#### 4. Comparability of survey data and flow of funds data

So far we relied on aggregate figures concerning China’s economy as a whole, mainly derived from national accounts and flow of funds data. In order to analyze household savings behaviour we have to turn to survey data. It is well known that national level statistics are seldom completely coherent with aggregations derived from survey and we do not expect this to be contradicted by data on China. However it is important to establish whether the main trends showed by national level data are borne also by the evidence derived aggregating micro data.

**Fig. 4 China households saving rate: flow of funds vs survey data**



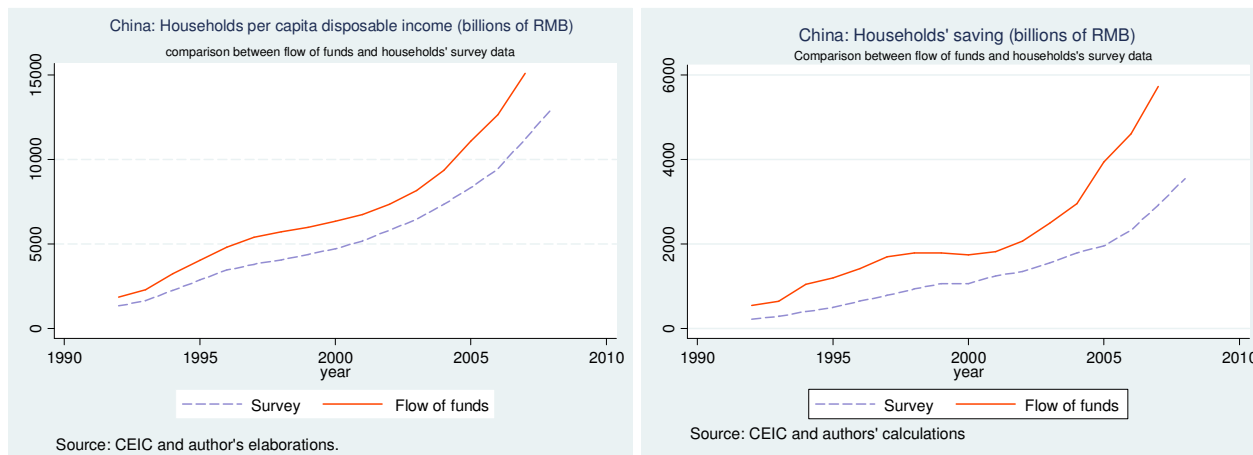
The overall time profile of aggregate households savings derived from survey response is quite similar to that of the flow of funds, in particular, both time series show the sharp increase in savings over the last decade. For the levels, though, a wide gap emerges (about 10 points of disposable income, fig. 4).

<sup>9</sup> ADB, 2009, p. 55.

<sup>10</sup> Shang-Jin Wei, “The mystery of Chinese savings”

Further insight can be gained by looking separately at the two determinants of the saving rate: income and saving per capita. As can be seen (fig. 5) in both cases survey data give a lower estimate in terms of levels and the gap between the series, almost constant considering disposable income, is widening in the case of savings.

**Fig. 5 China households per capita income and saving: flow of funds vs survey data**



We can conclude that while major differences exist concerning the levels of savings and savings rates of Chinese households estimated by surveys or national accounts, the main trends we are interested in, *i.e.* the sharp rise in savings, are not affected by the choice of the data. We can therefore be confident that the analysis carried of the provincial level survey data has a bearing in explaining aggregate behaviour as recorded by flow of funds statistics.

## 5. Why Chinese households are saving so much?

### 5.1 Recent trends of household savings

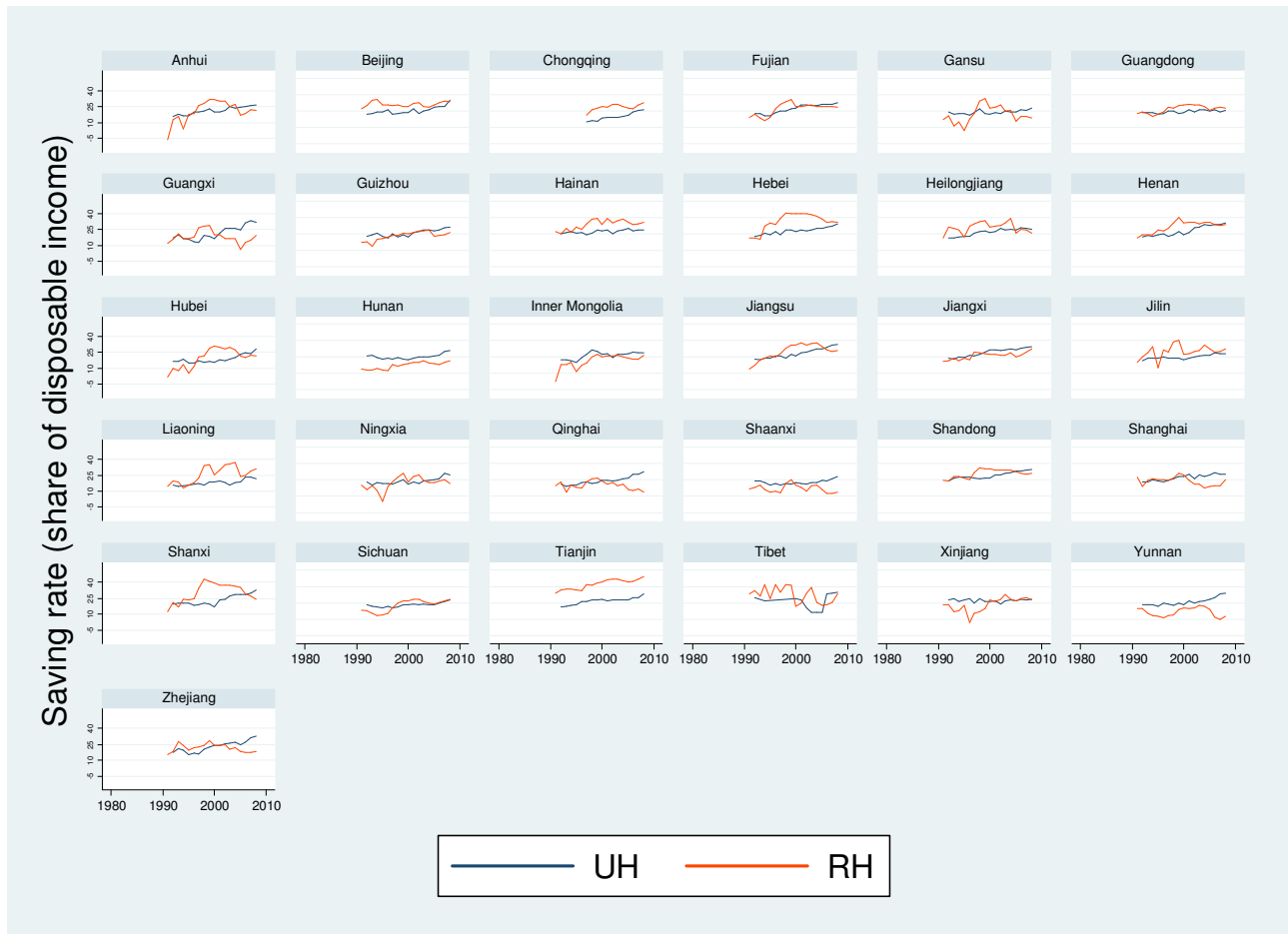
In the last twenty years household savings in China increased faster than disposable income in both urban and rural areas. According to NSBC's household survey data, from 1991 to 2008 in urban areas household savings grew by 12.9 per cent per annum in real terms, compared to an average growth of disposable income of 10.3 per cent, pushing the saving to income ratio up from 14.5 to 28.8 per cent; in rural areas savings and disposable income grew respectively by 8.5 and 6.4 per cent and the saving rate climbed to 23.1 per cent, from 12.6.<sup>11</sup> These numbers are quite impressive, not least because per capita income is on average still very low, around 4,000 dollars a year in urban areas and just 1,300 dollars in rural ones (expressed in 2008 purchasing power parities).

Although aggregate saving rates have risen in both urban and rural areas, they followed a different path over time and across provinces. In urban areas saving rates have increased steadily and quite evenly across provinces; in rural areas, instead, saving rates have been more volatile and more dispersed across provinces. Taking averages over the period 2001-2008, urban households

<sup>11</sup> According to flow of funds data the household savings reached 38 per cent of disposable income in 2007. The discrepancies between flow of funds and survey data are well known and highlighted often in the literature as puzzling. An inspection of the data reveals that survey data are more volatile and tend to underestimate both income and savings, the underestimation of the latter is more pronounced. All in all, however, the dynamics of the saving rate results quite comparable (see appendix).

saving rates ranges from 16.6 per cent in Chongqing to 30.1 in Jangsu, while that for rural households goes from 7.9 in Shaanxi to 48.8 per cent in Tianjin. Also, the saving rates of rural households, that in the past have tended to lie above that of urban households in many provinces, since 2000 have started to trend downward, in some provinces falling below that of urban counterparts (fig. 6). These trends are likely to reflect, among other things, the urbanization of youngest workers, which, despite the limitations imposed by the registration system (hukou), has probably grown considerably in the last few years.<sup>12</sup>

**Fig. 6 Urban and rural household saving rates by provinces**

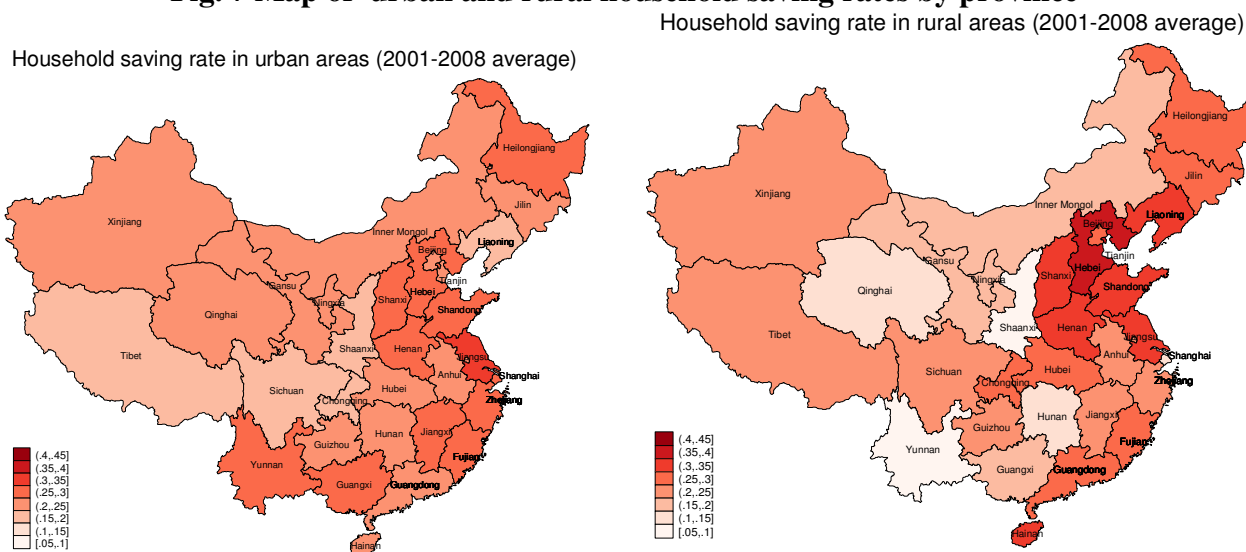


Source: CEIC and author's calculations

A quick look to the map reveals that the households residing in the richest provinces along the coast are those that save more out of disposable income, while those residing in the poorest provinces located in central China in general can afford to save less, particularly in rural Shaanxi, Hunan, Yunnan and Guizhou (fig. 7).

<sup>12</sup> Unfortunately, to our knowledge, there are no data that allow to estimate internal migration flows from rural to urban areas by age. Nevertheless, it is plausible that such flows consist primarily of young working-age individuals. Assuming that those workers were formerly employed in rural areas, when they move to urban areas the working-age population in rural areas decreases and so does the average saving rate there, while in urban areas, where such a population increases, the average saving rate tends to increase.

**Fig. 7 Map of urban and rural household saving rates by province**



Source: CEIC and authors' calculations

## 5.2 Searching for the determinants: demographic changes and the life cycle hypothesis (LCH)

Searching for the determinants of the households' saving behavior in China, one important candidate is the age structure of the population. Following the population control measures introduced by the government in 1979, namely the so called "one-child-policy", the age structure of the population has changed rapidly in China. In particular, according to United Nations (UN) in the last thirty years the young dependency ratio, given by the ratio of population aged 0-14 to the working-age population (15-64), has reduced dramatically (from 59 per cent in 1980 to 28 per cent in 2008) while the old dependency ratio (the ratio of population aged 65 or older to the working-age population) has slightly increased (from 8 to 11 per cent), therefore the gross dependency ratio (young plus old) actually declined over time.

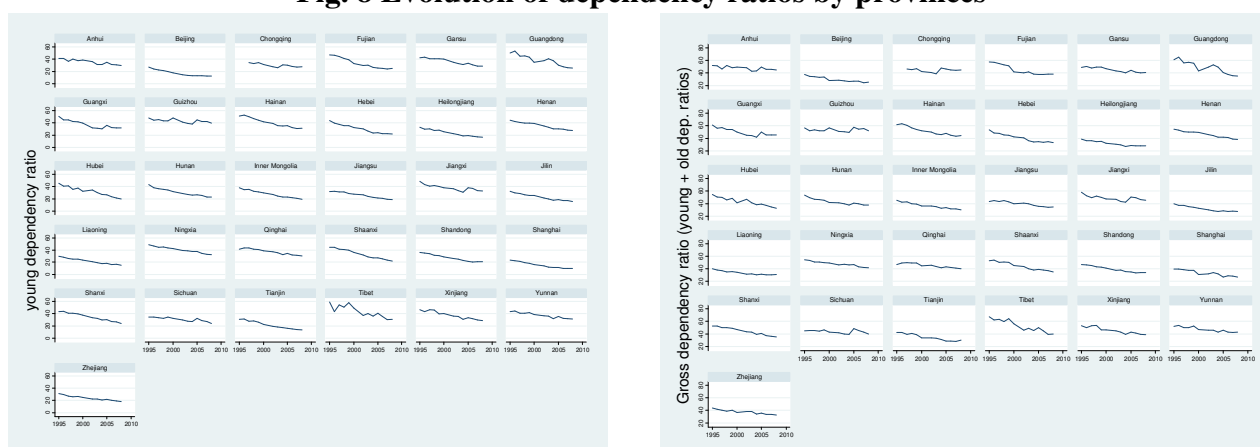
In 2010 the share of working-age population to total population in China reached 71.9 per cent, a very high share by international comparison;<sup>13</sup> it was below 60 per cent in 1980. According to the life cycle hypothesis (LCH), as the saving rate rises progressively during the working life reaching its peak in the middle of it, the increase in the proportion of the working-age population in China could be one of the major causes for the observed pattern for savings (Modigliani and Cao, 2004).

It is worth saying, however, that, if the increase in the proportion of the working-age population is an important factor affecting household savings in China, such a factor is, indeed, only temporary. According to UN projections, in fact, starting from 2020 the share of working-age population will start to decline progressively, due to a more rapid ageing of Chinese population, therefore, the number of savers will reduce while that of dis-savers will increase, gradually reducing the aggregate saving rate.

If we look at the evolution of dependency ratios across provinces, available from national statistics from 1995 on, the dispersion within the country is quite large (Fig. 8).

<sup>13</sup> According to UN data, since 1950 such a high share was never reached in countries like Japan, United States or Western Europe, while India is projected to reach a maximum value of 69.6 for this proportion only in 2040.

**Fig. 8 Evolution of dependency ratios by provinces**



Source: China Statistical Yearbook, various years.

Empirical analysis testing for the life cycle hypothesis in China found mixed evidence. Modigliani and Cao (2004) by looking at aggregate data confirm the validity of the hypothesis; Horioka and Wan (2007) using provincial-level data for rural and urban household find only a weak evidence of it and finally Chamon and Prasad (2008) using household-level data find no evidence at all; and, indeed, they find that, in contrast to what the LCH would predict, the saving rates in urban China have increased across all demographic groups, following a u-shaped age profile, with saving rates being higher among the youngest and the oldest.

Looking at simple correlations in our panel of 31 Chinese provinces over the period 1995-2008 households saving rates and young dependency ratios show a mild, though significant, relationship. Correlations are negative and generally stronger for urban households, on average equal to -0.5, and weaker for rural ones (-0.15). Such correlations become almost zero if we look only at the cross-section of provinces. It seems, therefore, that the LCH can perhaps explain long-run aggregate trends but not cross-sectional variations within Chinese provinces or households.

### 5.3 Searching for the determinants: income levels and growth

Another variable that is usually considered an important determinant of the saving-to-income ratio is the level of income. At low levels of income there is little or no room for savings as households can just afford a subsistence level of consumption. As income increases consumption needs increases proportionally less and the saving rate is higher.

If we look at the pattern of saving rates across provinces in China we find that in urban areas it follows quite closely that of real per capita income (on average the correlation coefficient is equal to 0.6); in rural areas, instead, saving rates often have tended to diverge from net income (the correlation coefficient is on average equal to 0.3).<sup>14</sup> As a matter of fact, rural households saving rates are much more dispersed across provinces and more volatile over time, presumably reflecting greater income disparities across provinces and higher income uncertainty over time.

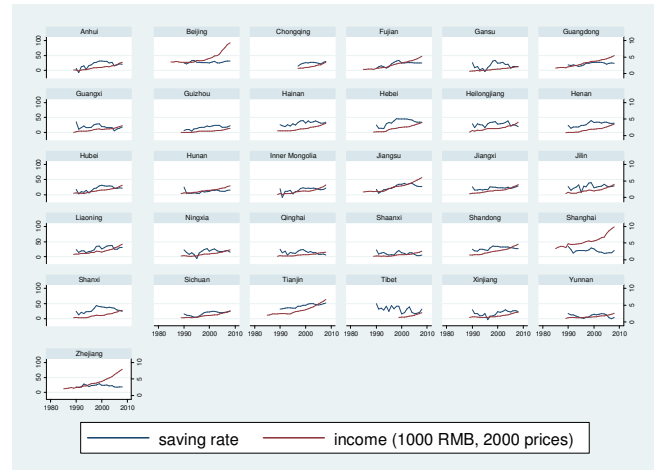
**Fig. 9 Evolution of saving rate and real disposable income by provinces**

<sup>14</sup> Controlling for region-specific fixed effects, a simple regression of the saving rate on the log of real per capita income to fit urban household data better than rural ones (the adjusted-r-squared is equal to 0.71 and 0.61 respectively).

## Urban households



## Rural households

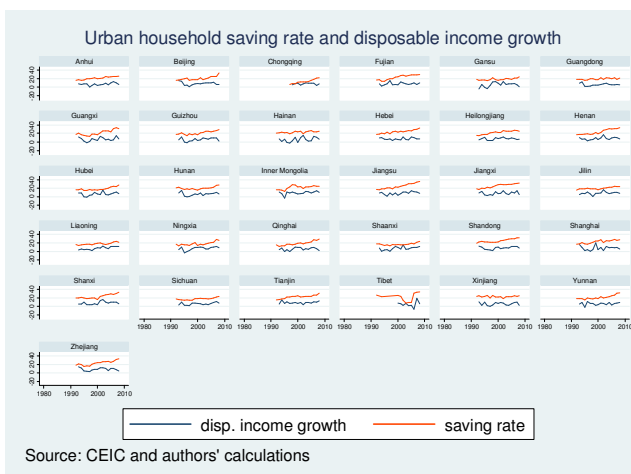


Source: CEIC and authors' calculations

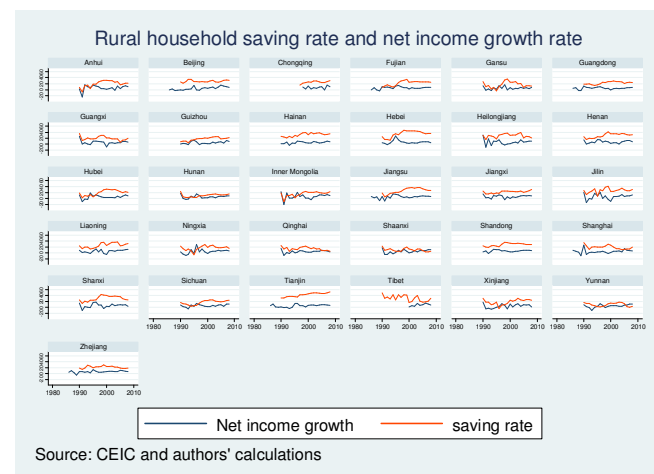
Several theories also consider the role of income growth. At aggregate level the relationship between saving rates and income growth is positive; in standard growth models the direction of causation goes from saving rates to growth rates. The evidence, however, suggests that the causation could also run in the other direction, with the saving rate responding to income growth, both at aggregate and microeconomic level (Carroll, 2001). The LCH reconciles the evidence with the theory arguing that in fast growing economies, like China, young generations in their saving phase being much richer than older generations in their dissaving phase push progressively up the average saving rate of the economy. Additional refinements to the theory include the habit formation hypothesis (HFH) according to which individuals care about both the level and the rate of growth of consumption, smoothing the two. As a consequence, following a positive (negative) income shock consumption adjusts slowly and the saving-to-income ratio increases (decreases).

Indeed an inspection of our provincial data reveals that the correlation between the saving rate and income growth is positive for urban households but negative for rural ones. Simple correlations do not represent of course conclusive evidence about the relationship between variables, as they may be spurious or distorted by other factors, however they offer a preliminary evidence of the fact that the saving behavior in urban and rural China is indeed different.

**Fig. 10 Evolution of saving rate and real disposable income growth by provinces**



Source: CEIC and authors' calculations



Source: CEIC and authors' calculations

## 5.4 Searching for the determinants: precautionary saving

A number of studies suggest that the precautionary motive is one of the major driver of household savings in China.

Since the introduction of the reforms, in 1978, aimed at transforming China into a market economy, traditional safety nets have progressively eroded in both rural and urban areas, increasing the need for individuals to save in order to self-insure against adverse shocks. In China, as well as in many other Asian countries, children have the obligation to take care of the elderly, not only by social norms but also by law.

In rural areas, where no other forms of government support was in place until very recently, elderly have traditionally relied on their children; however, the rapid urbanization of younger generations together with the evolution of social norms have progressively put at risk such an extended-family arrangement (OECD 2010). In 2009 the government launched a new rural pension scheme, aimed at providing a universal coverage by 2020. The chosen level of benefits, however, are very low, reaching at most 35% of average household income in the area of the contributor.

In urban areas, instead, the pension system, previously based on state-owned enterprises (SOEs), where the majority of urban workers were employed in the past, has been subjected to significant changes in the last fifteen years. The downsizing of the public sector and the restructuring process of the SOEs has led to a drop in the number of workers and to a gradual dismantling of benefits for those still employed there; the burden of social spending has been shifted from enterprises to local governments.<sup>15</sup> The new pension system has set the replacement rate at 58.5% of average earnings on retirement, down from 80% in the pre-reform period. Such a replacement rate, however, will be hardly reached, as the interest rate used to revalue part of the contributions is considerably lower than the rate of growth of average wages. In 2005 the ratio of the average pension to the average wage was 49% (it was 77% in 1990) and it is projected to decline further, provoking a considerable cut in the pension wealth for the youngest cohort in the labor force (OECD 2010).

According to the recent OECD Survey (2010), while almost all the workers employed in SOEs are covered under the new pension system, the participation is much lower for workers employed in private enterprises and almost nil for self-employed and workers without labor contract. These last two categories, which account for 66% of total employment in urban areas, are largely composed by immigrants. In 2007 the participation rate into the urban pension system was estimated to be around 61%. One important reason why workers may choose not to participate is because the system is fragmented in thousands of different municipal systems. As different municipalities have different dependency ratios, contribution rates differ among them while benefits are still hardly portable from one municipality to the other. For highly mobile workers the lack of portability represent a strong limitation.

Another important source of anxiety is represented by health care expenditures. Analogously to the pension system, the health care system is managed locally: medical insurance is based on local schemes and insured patients can access health care only in the area of residency. As a consequence, migrant workers and their family have no coverage in the city where they live if they are not resident there. Medical care outlays have grown fast in recent years, impacting uninsured as well as insured people, which still have to pay 45% of their own medical expenses (OECD, 2010).

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<sup>15</sup> In 1978, out of 95 millions of urban workers 75 were employed in SOEs, enjoying generous benefits, for pensions, health insurance, schooling and housing. In 2008 65 millions of urban workers, out of 302, were employed in SOEs, with considerably lower benefits.

It is difficult to quantify how much of the household saving is due to precautionary motives. Jin et al. (2009) estimated the impact of the mid-1990 pension reform on urban savings and have found that it increased the saving rate by 6 percentage points for young cohorts and by 3 percentage points for the cohort aged 50-59. Barnett and Brooks (2010) estimated the impact of government spending on health care on household's savings and found that in urban areas for each yuan increase in government health spending savings decrease by 2 Yuan. Balducci et al. (2010) based on a panel of 24 OECD countries find a negative non-linear relationship between government social spending and household saving rate. Applying the estimated coefficients to China, they find that a 1 percent of GDP increase in social spending could reduce savings by 0.6-1 percent of GDP. The impact of health spending could be much higher, around 2 percent of GDP, while a one percent increase in education spending could reduce saving by 1.3 per cent of GDP. Therefore, as found also in Chamon and Prasad (2008), precautionary motive can help to explain the high saving rate of elders, for which health care expenditures are of a growing relevance, as well as of young households with children for which education spending could be a major saving motive.

## 5.6 Regression results

In order to assess the significance of the main determinants of the household saving behavior singled out in the previous section we run regressions on household survey data for a panel of 29 Chinese regions over the period 1995-2008.<sup>16</sup> We run separate regressions for urban and rural household. Our aim to compare our results particularly with those in Baldacci et al. (2010), using data for China. We estimate the following equation:

$$SR_{it}^h = \alpha^h + X_{it}'\beta^h + G_{it}'\gamma^h + v_i^h + \varepsilon_{it}^h$$

where  $h$  denotes the type of household ( $h$ =urban, rural);  $i$  and  $t$  denote region ( $i=1,\dots,29$ ) and year ( $t=1995-2008$ ). The dependent variable is the household saving rate, defined as  $\frac{\text{disposable income} - \text{consumption}}{\text{disposable income}} * 100$ .  $X$  is a vector of explanatory variables and includes:

household real disposable income growth (**RDY\_G**); the log of household real disposable income at the beginning of the period (**Log\_RDY**); the log of household real disposable income at the beginning of the period squared (**Log\_RDY^2**); the regional young dependency ratio (**DR\_young**) the regional old dependency ratio (**DR\_old**).  $G$  is a vector of regional government spending variables in percent of regional GDP.  $G$  includes: total government spending excluding health care and education (**GE\_exSS**) and its squared level (**GE\_exSS^2**); the sum of government spending in health care and education, that we use as a proxy of social spending, (**GSS**) and its squared level (**GSS^2**). Unfortunately social security spending is available only for the last two years, so we could not include it. To smooth out some business cycle variability all variables are expressed as 3-year moving averages and all explanatory variables are lagged by 2 periods.

Regression results are reported in table XX.

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<sup>16</sup> China has 31 provinces, we excluded Tibet and Chongqing because data were missing for several years.

**Table XX. Household saving in rural and urban China:  
panel regression on 29 provinces in China, 1995-2008**

<b>Explanatory variables</b>	<b>Urban Household</b>	<b>Rural Household</b>
RDY_G	0.14***	-0.1
Log_RDY	8.7	8.68
Log_RDY^2	0.65	2.71
DR_young	0.12	0.43***
DR_old	-0.13	-0.98**
GE_exSS	-0.56*	-0.10
GE_exSS^2	0.01	-0.004
GSS	3.83**	0.91
GSS^2	-0.20*	0.03
Regional dummies	YES	YES
Observations	301	301
Adj-Rsquared	0.86	0.86

Note: Standard errors are robust. Asterisks indicate the significance level (\*\*\*) stands for 1 percent; \*\* stands for 5 percent; \* stands for 10 percent).

Preliminary results confirm that the determinants of the household saving behavior are very different between rural and urban China.

The growth rate of disposable income has a positive effect on the saving rate only for urban households, indicating that consumption tends to adjust slowly in urban areas where households are likely to be less credit constrained and well above a subsistence level of consumption. In contrast to what simple correlations show, once we control for other effects, the initial level of income do not play any significant role in explaining the saving rate across provinces in rural and urban China.

Again, in contrast to what simple correlations reveal, demographic variables play a significant role only in rural China, where a higher young dependency ratio tend to increase the saving rate of households while a larger proportion of elders tend to reduce it. These findings do not contradict either those in Modigliani and Cao (2004), nor those in Chamon and Prasad (2008), as the former was based on aggregate data, while the latter on survey data for urban households.

Turning our attention on our variables of interest, government spending, the first thing to note is that these variables are not significant in the regression for rural households. One explanation may lie in the counterbalancing effect exerted by the fact that in rural areas government spending, largely performed by local governments (which represents 70 per cent of total government spending), is mainly financed through revenues from land confiscated to farmers and to be sold for commercial use (see also Marconi and Santoro, 2006). As far as urban households are concerned, the effect of general expenditure (excluding education and health care, GE\_exSS) is different from that of social spending (GSS). The former tend to reduce the saving rate linearly, a 1 percentage point of GDP increase in public expenditure tend to reduce the saving rate of urban households by 0.56 percentage points. As urban household income represents at least 72 per cent of total

household disposable income in China and the latter is about 54 per cent of GDP, we might conclude that a 1 percentage point increase of government expenditure (excluding education and health care) could reduce savings by 0.22 per cent of GDP.

As for education and health care spending, the effect is instead non linear: at low levels of government spending in education and health care the saving rate increases with government spending, however, when the minimum spending threshold of 9.6 per cent of regional GDP is reached, more social spending would effectively reduce the saving rate. As illustrative example, if total spending in education and health care were equal to 12 percent of GDP, the same level as the average OECD countries, then an increase of 1 GDP percentage point would reduce the household saving by 1 percentage point and total saving in China by at least 0.4 percent of GDP.

Our findings are more conservative with respect to those found by Baldacci et al. (2008), and show that China cannot be assimilated to OECD countries when trying to assess the effect of government spending, and in particular of social spending. Yet, the result must still be interpreted as preliminary, since we could not extrapolate social protection spending in China and other controls might be missing in the regression.

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Alternative to table 1 (values for China are higher)

### China and other main Asian economies: 2007

	Gross private savings, current prices	Gross national savings, current prices	Private consumption expenditure, current prices	Gross fixed capital formation, current prices	Current account balance
China,P.R.: Mainland	<b>43.4</b>	<b>54.2</b>	<b>36.3</b>	<b>41.0</b>	<b>9.1</b>
India	33.5	37.7	55.4	34.2	-3.5
Indonesia	22.6	27.3	63.5	24.9	4.0
Philippines	17.4	20.3	69.4	14.7	0.2
Thailand	27.6	32.8	53.4	26.4	8.4
Vietnam	27.0	33.3	64.8	38.3	-15.9
Taiwan	25.4	28.5	60.6	17.8	10.1
Korea	15.0	24.1	65.7	25.1	0.2
Japan	22.9	26.4	57.2	23.1	1.9