Saving Rates of Urban Households in China

by

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Abstract.
We analyze urban household savings in China using micro data. We find that a number of factors can explain that change over time and the age profile of this important variable. In particular, households that migrated to the urban areas tend to save more. Also, home-owners who recently bought on the free market save more than tenants and home-owners who acquired their property long time ago or at the time of the housing reform. Finally, we investigate the role of pension reforms that took place in different years across different provinces.

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This paper is dedicated to the memory of Maria Weber

1. Introduction

In this paper we use household-level micro data on urban residents in China (the data set is the Urban Household Survey, UHS) to investigate the main determinants of household saving.
This task is particularly important, given the high and rising household saving rates (Chamon and Prasad, 2010) and against a background where the "one child policy" has major implications for inter-generational risk sharing. The cohorts now approaching retirement in China can rely less on the help of their children to meet their needs for health and long term care in old age. Modigliani and Cao (2004) stress that the difference in mobility of the young generations relative to their parents can further hinder intergenerational risk-sharing possibilities.

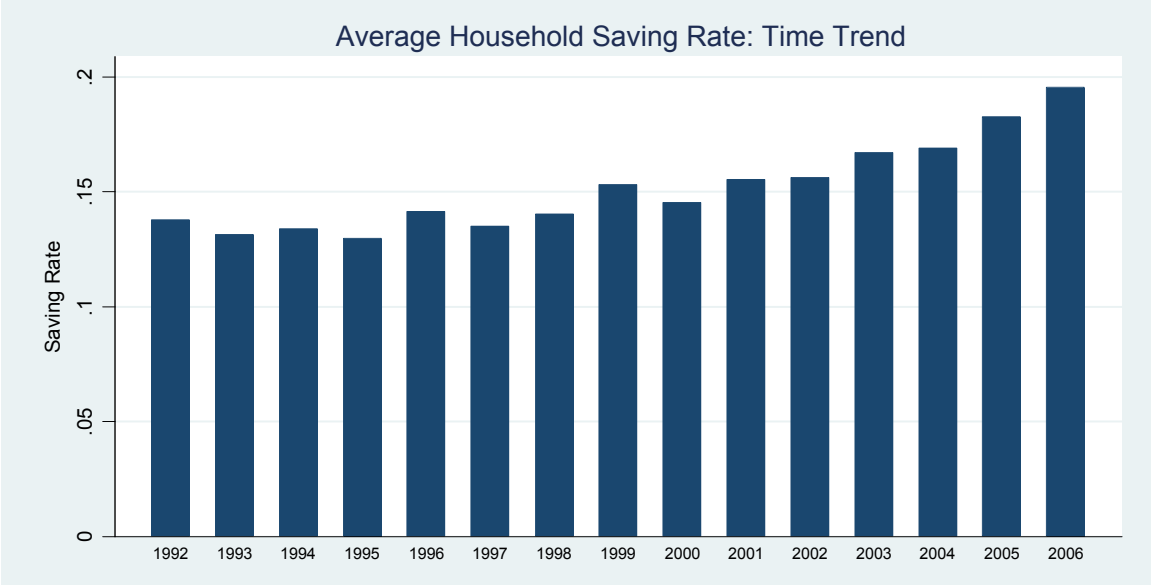
In this paper we find that there are major differences in saving behavior between households whose members are all long-term urban residents and those where at least some have (recently) migrated into the urban areas (migrants are defined as individuals who some time in the past moved into the urban area). This finding is in line with the hypothesis that individuals are affected by long habits, as suggested in Attanasio and Weber (2010): people born in rural areas who moved to a more affluent urban area take a long time to adapt upwards their standard of living. This may explain why they save when young. If they also have a transfer motive in their preferences, they may keep saving in old age to allow their children to fully enjoy the opportunities offered by their urban environment.
A different, but related argument was put forward by Ando, Guiso and Terlizzese (1994) in their attempt to explain the high household saving rates of the young observed in post WWII Italy and Japan. Ando et al. suggest that young consumers would save despite the prospects of high income growth because they anticipated moving to a different social environment where consumption needs are higher. This could also lead to an increasing relation between income changes and the saving rate.

In this paper we also investigate the effect of institutional reforms on household savings. In fact, during our sample period (1992-2006) China experienced a flurry of reforms concerning both the welfare system and the access of households to real and financial asset markets (e.g. housing market). Indeed the interaction between the housing reforms and the demographic changes discussed in the previous paragraph is of particular interest, and so are the pension reforms that were implemented at different pace across the provinces covered in our analysis.[1]

On the basis of China's statistics yearbook, Feng, He and Sato (2009) report that the urban household saving rate increased from 17% in 1995 to 23% in 2004 over the whole of the country.
In Figure 1 we show that average saving rates by urban households in our sample (covering 9 provinces out of a total of 31, namely Beijing, Liaoning, Zhejiang, Anhui, Hubei, Guangdong, Sichuan, Shanxi and Gansu) also increased over the period, reaching a peak of about 20% in 2006.

[1] Reforms took place over the last two decades, including housing (1998), social security (1997 and 2001-4) and health (1997) reforms.

Figure 1. Average urban household saving rates by year



Source: Own calculations on the UHS data

Figure 2. Average urban household saving rates by age

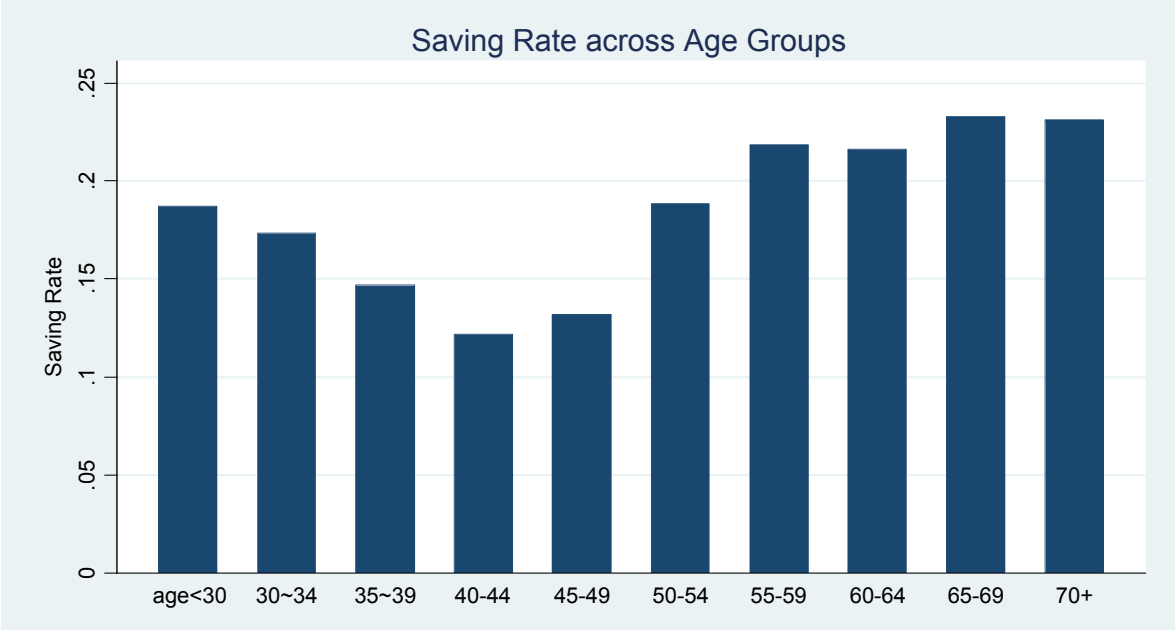
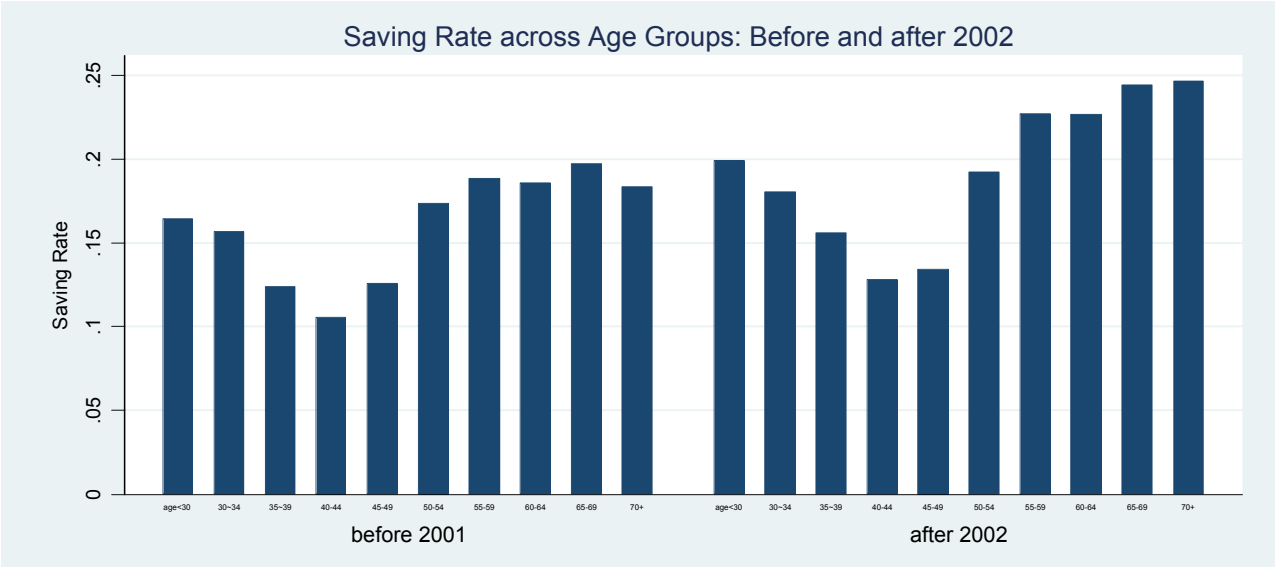


Figure 2 displays the way saving rates change with age. Given that China is a fast growing economy, one might expect the young to have negative or zero savings. Their high savings (much higher in later years, see figure 3) is consistent with the hypothesis that rising house prices may be playing an important role.

A key feature that emerges from these figures is that the saving rate age profile is U-shaped, particularly in later years, as noted in Chamon and Prasad (2009). This U-shape is observed even if we consider the saving level and stands in sharp contrast with the life-cycle theory predictions.

Figure 3. Average urban household saving rates by age – before and after 2002



2. An overview of demographic changes and recent welfare state reforms

These trends in saving have to be related to the relevant demographic and social context.
China is an ageing country because of two main forces: the drop in the fertility rate and the increase in longevity. The total fertility rate has fallen dramatically: the decline started already in 1960 to reach 1.8 in 1990, also as a result of government policies targeted at reducing he number of children. The "one-child" policy was introduced in 1980 and its effects are fully felt in recent years: there is disagreement on the actual estimates of the total fertility rate, these range from 1.2 to 1.5 for the years 2000-2005 (OECD, 2010). In our UHS sub-sample 61% of the households have three members and 93% have only one child or even no children residing (see Table 1)[2].
Life expectancy at birth increased by 5 years between 1990 and 2006, however conditional life expectancy at age 70 increased just by one year. Hence it will be in the next fifty years that China will witness a substantial increase in the number of older people.
As a result the old-age dependency ratio (people aged 65 and over in relation to people of working age 15-64), which is currently 0.11, is estimated to reach 0.24 by 2030 and above 0.43 in 2050 (OECD, 2010). The other important demographic trend is urbanization, which takes place through migration: already by 2007, 45% of the population lived in urban areas, the target set by the Family Planning Commission is 70% by 2050. Typically migrants are younger on average and the OECD estimates that in urban areas the old-age dependency ratio in rural areas will be 0.34 by 2030, while it will be 0.18 in urban areas.
These transformations are also felt in the living arrangements of the household, while nuclear households are becoming more common particularly in urban areas, extended families are still widespread, particularly elderly widows living with their sons (Herd et al., 2010). This is quite an interesting recent development as, by law, support to the elderly has to be provided by their children[3].

Table 1. Family composition in a subsample of UHS

Family size	Freq.	Percent
1	107	1.2
2	1,874	20.98
3	5,427	60.77
4	1,087	12.17
5	369	4.13
6	53	0.59
7	14	0.16
Subsample	8,931	100

number of children younger than 25	Freq.	Percent
0	2,651	29.68
1	5,717	64.01
2	534	5.98
3	28	0.31
4	1	0.01
Subsample	8,931	100

[2] This table is based on a random draw of the main sample used for the econometric analysis.
[3] The Law of the People's Republic of China on the Protection of the Rights and Interests of Elderly People, 29 August 1996, Order n. 73 of the President of the People's Republic of China

In a life-cycle-theory framework the provision of public pensions may substitute for private saving, hence it is essential to look at the social security provisions and welfare reforms to disentangle the different motives for saving.
The public pension system covers only 55 % of urban employees and a very small part of the rural population. Pension expenditure was 2.5 % of GDP in 2008 and revenue from contributions was 2.7%.[4]
A reform phase emerged in the early years of the 1990s, as it was recognised that financial sustainability was seriously jeopardised by the expected demographic change. This led to an attempt to build a multi-pillar system with basic pensions topped up by mandatory individual accounts and, in addition, by voluntary pension savings.
In 1997 the World Bank published a report recommending for China a multi-pillar system, indeed the year 1997 represents a land-mark in pension reforms as the system shifted from one based on State-Owned-Enterprises (SOE) to a system administered by local governments. Before 1997 employers were mainly responsible for contributions for social security and there was basically no distinction between public sector employees and private sector employees, the system was PAYG and replaced about 75%-90% of the employee's wage. However the system appeared clearly unsustainable and in 1997 a major reform established that there should be a three pillars system. (i) the first pillar also named "pooling account" envisaged a payroll tax on the employer of 17% such that workers with 15 years of contributions had a replacement rate of 20% (35% as from 2006, see Impavido et al., 2009); (ii) the second pillar is based on both employer's and employee's contributions (11% total contribution of which 3% paid by the employer while the rest is paid by the employee)[5]. The two pillars together should make up a replacement rate of 58%, the replacement rate cannot go above 60%. A third pillar would be based on voluntary contributions, but this is still in its infancy. Retirement age is 60 for males and 55 for females.
Upon death of the employee or retiree the balance on the account was inheritable. Because of this and also the fact that the remaining average life expectancy at retirement was then already more than 10 years and will go on increasing in future, the system was never sustainable financially.
At the same time the reform changed (gradually) the benefit provision according to seniority: retirees (retired before 1997) called "old workers" would receive benefits according to the old PAYG regime, those who were not yet retired but working before 1997 (middle workers) were in a transitional plan with rules based on a pro rata system and "new workers", who started work after 1997 would be under the three pillars regime (Herd et al., 2009; Impavido et al., 2009; Hu and Davis, 2009; and OECD, 2010).
Hence "old workers" had a very generous treatment as no contributions were required from the employee and replacement rates were very high.

The system did not work in the way it was intended. In particular, with large-scale SOE restructuring, many laid-off workers were given immediate pensions at quite young ages (even at 40). Under these circumstances, the individual accounts broadly became empty as the administration used the revenues to pay the pensions of current retirees. In 2001, as a result of State Council Document No 42, a pilot programme was launched in Liaoning province, among other things separating the DB PAYG pillar from the individual accounts. A 20 % of wage contribution from employers went to the DB PAYG pillar, and the employee contribution was set to 8 %. In addition, employers were encouraged in various ways to make contributions to the voluntary pillar. For the first pillar, the new rules provided an incentive to make contributions beyond 15 years by raising the maximum pension to 30 % of city average pay.

[4] National Bureau of Statistics of China (NBS 2009), China Statistical Yearbook 2009. We refer above to revenue from contributions, while total revenue according to NBS (2009) was 3.2 % of GDP of which 0.5 % was a transfer from the government according to the Ministry of Human Resources and Social Security of China (MHRSS).
[5] In the beginning the contribution of the employee was set at 4% and was meant to gradually increase to 8%.

Document No 42 stated explicitly that ‘when the accumulation in the individual account runs out, the individual account pension will then be paid from the social pooling fund. The authorities thereby became liable for the deficit.

In 2004-06, the Liaoning pilot was extended to ten other provinces (out of 31 provinces; these 11 cover 39 % of the Chinese population). The contribution shares of the central and local governments depend on the fiscal position of the pilot province. In 2008 the total transfer from various levels of the government was 0.5 % of GDP. One of the symptoms of the fundamental problems is that government financing became permanent and indispensable.

Coverage varies substantially across the population because of the history of the system and because of the graphical variation. Even within the urban areas coverage is very high for employees of SOEs, lower for private sector employees and almost non existent for the self-employed (OECD,2010)

An interesting distinction should be drawn between migrant workers and those who were long-term resident. Migrant workers are largely excluded from social insurance (OECD,2010) typically because they end up in less protected occupations and because mobility often implies losing one’s pension rights in the province of origin. This has important consequences also for those retired parents who move in with their working children into urban areas and whose pension income is therefore lost as a result.

Table 2 - The health system in China

	1949-1978	1978 "Economic liberalization policy"	1990's	2003 "Health system reform"	2007
Urban population	Labor Insurance Scheme (LIS) and Government Insurance Scheme (GIS) financed health care for state-owned enterprise (SOE) workers and government officials, respectively.		Basic Medical Insurance (BMI) to cover all urban formal-sector workers (but not their dependents) calls Urban Employee Basic Medical Insurance (UEBMI)		Urban Resident Basic Medical Insurance (URBMI)
Rural population	Cooperative Medical Scheme (CMS)			New Cooperative Medical Scheme (NCMS)	

Source: Xiaoyan Lei, Wanchuan Lin, 2009.

Reforms of China's health insurance system in urban areas were brought about by socioeconomic changes as well as due to the need to correct the health system deficiencies (see Table 2 for a summary). The urban health insurance system mainly consist of labour insurance schemes (LIS) that bore all costs of medical treatment, medicine and hospitalization for the workers and often their dependents as well, and government employee insurance scheme (GIS) under which medical costs were covered by government budgetary allocation. While GIS and LIS have played an important role in providing China's urban working population with health protection (Liu, 2002), several aspects of the original schemes contributed to China's rapid health care cost inflation and inefficient resource allocation in the 1990s. First, GIS and LIS are third party insurance, providing comprehensive benefits with minimal cost sharing to constrain beneficiaries on their consumption of medical services. Without any or limited consumer financial responsibility for the use health services, these urban insured have no incentive to seek the most cost-effective health care. Second, except for employees in large enterprises with their own hospitals and/or clinics, both GIS and LIS beneficiaries seek medical services from public hospitals, which are usually reimbursed on a fee-for-service basis according to a government-set fee schedule that gives providers incentive to over-provide services. Finally, since each organization under the original GIS and LIS systems in self-insured, it may not be able to reimburse employees beneficiaries for their medical expenditures in the case of deficit, rendering those individuals effectively uninsured.

To address these problems, in the 1980s, China implemented a whole series of reforms in the urban health insurance system that has gone through three major stages, the first from the early 1980s to 1991, the second from 1992 to 1998 with city-wide pilot reforms, and the third announced at the end of 1998. During the first stage the primary objective of reform was cost containment and major reform measures include introduction of demand-side and supply-side cost sharing. During the second stage, the health sector reforms address the issue of inadequate risk pooling. Two cities in Jiangxi and Jiansu Province began pilot reforms that use a combination of individual savings accounts and social risk-pooling funds to finance medical expenditures. Before an individual can access the social risk-pooling fund, however, he or she must first pay deductibles form a first tier of individual medical savings account and a second tier of direct deductible equal to 5% of annual income.

At the end of 1998, the Chinese government announced a major decision to establish a social insurance program for urban workers that replaced the existing LIS and GIS in the cities, known as Basic Medical Insurance (URBMI). Compared with the old GIS and LIS, the new program expands coverage to private enterprises and smaller public enterprises. Self-employed workers may buy into the program but are not required to enroll. Worker's dependent are not covered.
The program is financed by premium contributions from employers (6% of the employee's wage) and employees (2% of their wage). Retired workers are exempt from premium contributions; the cost of their contributions is to be borne by their former employers.
The program finances beneficiaries' health care services through three tiers: individual medical savings accounts (MSAs- 3.8% of the employee's wage goes into the MSA, which enrollees can only use for health care expenses); out-of-pocket spending by beneficiaries in the form of deductibles; and social risk pooling (SRP- 4.2% of the wage goes into the SRP which is used to cover large medical expenses). When the MSA exhausted, enrollees have to pay outpatient expenses out-of-pocket. When an enrollee incurred inpatient hospital expenses, he has to pay first a deductible that equal 10% of his annual wage. Expenses exceeding this deductible are paid by the SRP, but the patient paying a coinsurance, the rate of which will be decided by the local governments. The SRP limits its payment for each enrollee to four times the average wage of the workers in that city. Expenses exceeding this ceiling can be covered by supplementary insurance schemes, or must be paid by the patient out-of-pocket (Liu, 2002).
Compared with the old system of GIS and LIS, the benefit structure under the new system has two major gaps in coverage. First, the dependents of the urban workers, who used to receive partial coverage, are now not covered. Second, the new system has a ceiling on the insured amount of the individual medical expenditures (equivalent to four times the average wage in the region). Imposition of this ceiling is due to budget constraints as well as the political emphasis on the wide coverage but it leaves most catastrophic illnesses uncovered. It is estimated that the premium contribution based on the 8% of the current wage bill can only cover about 70% of the total outlay under the old systems of GIS and LIS (Ministry of Labor and Social Security, 1999). Moreover, Gao et al. (2007) show that the proportion of elderly covered by health insurance in urban China has declined over the period 1998-2007. This may be attributed to the reform of state-owned enterprises, which has resulted in many enterprises being closed and a substantial number of workers being laid off (Gao et al. 2001). As the Government of China has only guaranteed the minimum living allowance, the elderly who were laid off or whose employing enterprises were closed (as a result of the ongoing economic reforms process) may have lost their entitlements such as health insurance.

3. The effect of household composition and family circumstances on saving

We have emphasized how major demographic shifts have taken place in China in the last fifty years partly as the result of the implementation of important family policies, such as the "one-child" policy. Household composition, and particularly the presence of sons or daughters, may have an effect on saving through two main routes:

1) Elderly parents with a son are in a safer position than other elderly households, as, by law, they have the right to be protected in old age. Furthermore if the son is married, the daughter in law will look after them

2) Parents with a son, who is not yet married, may have to save to build up a "dowry" – to entice a girl to marry him. This is a result of the major gender unbalance resulting from selective abortions (Wei and Zhang, 2009)

In the UHS Survey we can distinguish the number of children (and their age and gender) within the household. On the basis of this information we have looked at simple graphs of the average saving rate in the presence and in the absence of children[6]. Unfortunately we do not know about children living outside the parent's residence.

Figure 4a. Saving by age of the head of the household, for households with children and without children

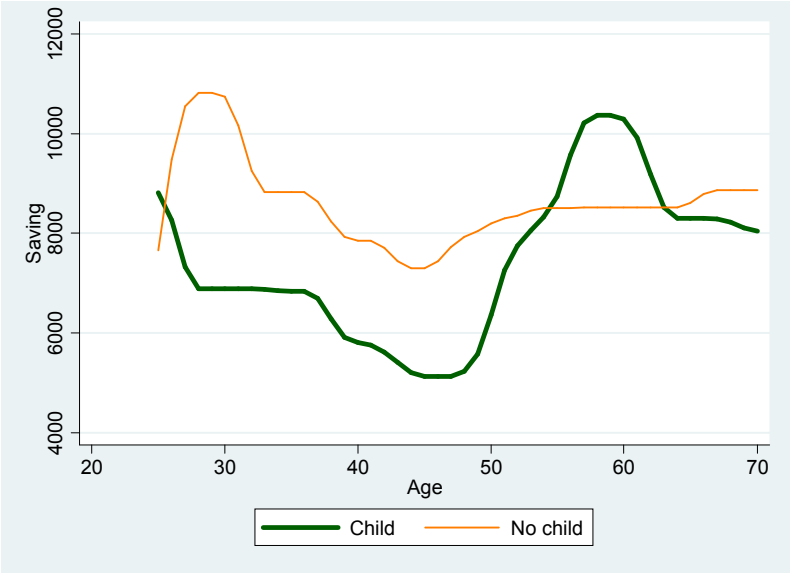
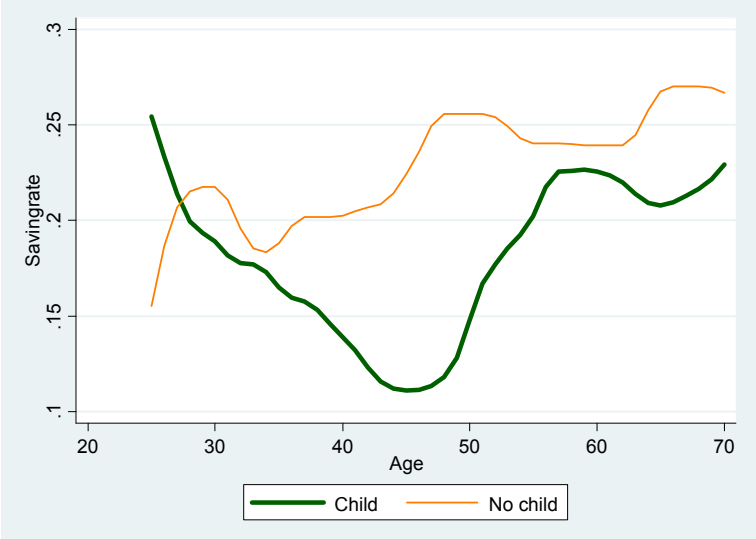
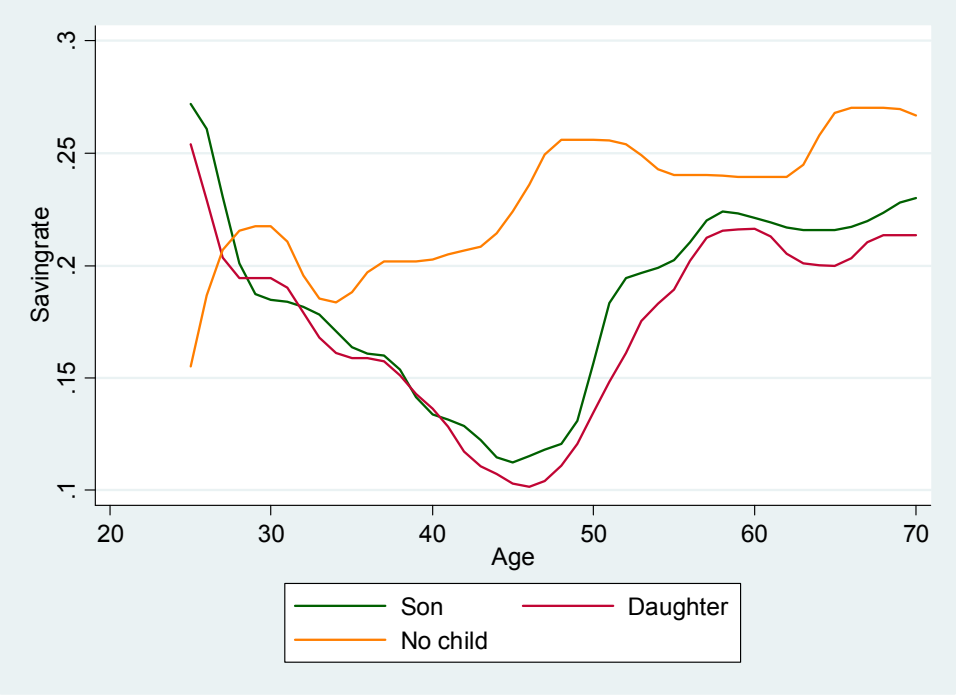


Figure 4b. Saving rate by age of the head of the household, for households with children and without children



[6] The saving rate is defined in the standard way as saving (disposable income-consumption expenditure)/disposable income.

Figure 5. Saving rate by age of the head of the household, for households with at least a son or at least a daughter and without children



Figures 4 and 5 taken together reveal some interesting patterns. At all ages the saving rate of households with no children is higher than that with children, which suggests that the presence of children provides some form of insurance, also for older ages. However in older ages the difference in saving rates between the two types of households is smaller, possibly reflecting the changing nature of the no-child condition. The no-child group includes in fact those who never had children and those whose children have left the parental home.
When we distinguish between the presence of a son or a daughter (Figure 5) a few facts emerge: (i) both the presence of a son or a daughter implies a lower saving rate; (ii) the saving rate of the with-son group and the with-daughter group is quite similar.
There is little prima facie evidence for the hypothesis that households with a son save more to build up a "dowry" (Shang-Jin and Zhang, 2009).

A related point is household composition. In fact if extended families are common (see OCED,2010) then household-saving may be the "sum" of the saving of the parents and saving of the children. Since it not obvious ex ante if younger generations or older generations are the individuals with the higher propensity to save in China, it might be hard to disentangle to true motives for saving. In turn the question is: who are the main earners in these households? Is saving higher if the principal earner is the son, and lower if it is the father?
This point will be taken up in the regression analysis presented at the end of the paper, in fact it is clear that we need to control simultaneously for the different demographic variables.

We have discussed in the previous section how the Chinese Government has fostered a migration policy toward the urban areas. These incentives have dramatically changed the socio-economic configuration of towns and cities (and of rural areas, becoming less and less populated, ageing fast and becoming poorer and poorer). For what matters in this paper one would expect that recent immigrants to cities may need to save more towards their accommodation (we will deal with the effects of housing reform on savings in section 5) and possibly to support their relatives living in rural areas. Given that we find such migrants to be quite often retired individuals, a possibility

worth exploring is that young urban Chinese let their ageing parents move in with them, and save towards the purchase of a larger home.
Starting with the 2002 wave, the UHS Survey allows us to see the year of first residency in the urban area, so that we can distinguish immigrants from households who are long-term residents in the city.

Table 3 Households according to migration status of their members (2002-2006)

province	Resident since birth	One migrant	Two migrants	Total
Beijing	57.88	18.28	23.84	100
Liaoning	50.9	17	32.1	100
Zhejiang	48.4	17.37	34.23	100
Anhui	42.74	20.52	36.74	100
Hubei	38.53	18.21	43.26	100
Guangdong	38.04	19.17	42.79	100
Sichuan	42.24	21.57	36.19	100
Shanxi	39.8	22.1	38.1	100
Gansu	43.59	17.03	39.38	100
Total	44.66	19.03	36.3	100

In the second column of Table 3 we report the fractions of households where all members are resident in the urban area since birth by province. Overall, 45% of all households have no migrants. All residents since birth households are more common in Beijing and in the Liaoning province. Having at least two migrants is quite common: 36% of all households. This percentage is highest in the Hubei and Guangdong provinces. One-migrant households account for 19% of the total, and are more evenly spread across provinces. [7]

In Table 4 we report descriptive statistics for these three groups of the population. First, we show the average and median saving rates. Two-migrants households save substantially more: their median saving rate at 25% is much higher than the median saving rates of households with no migrants (17%). This is not due to a lower denominator: in fact, mean and median household income is somewhat higher for two-migrants households compared to the other two groups.
The next panel in the table reports the proportions of households whose head is a private/public employee, self-employed or retired by the presence of migrants in the households. Comparing these percentages with the overall prevalence of migrant households (reported in the last line), we can see that resident from birth households are more frequently private employees, whereas two-migrants households are quite often retirees.
The next two panels tell us that two-migrants households are more likely to be composite households (household size four or above) and to contain two or more elderly individuals.

[7] Di Stefano (2010) also analyzes the effects of migration status on the saving rates, by looking at those individuals who very recently migrated to the cities. She uses a different data set, and finds that immigrants have much lower income, yet save as much as the rest of the population.

Table 4 Characteristics of households according to migration status (2002-2006)

	Resident from birth	One migrant	Two migrants
saving rate (mean)	14.57	16.72	21.00
saving rate (median)	17.48	19.11	24.57
disposable income (mean)	14,156.35	14,424.29	15,963.72
disposable income (median)	11,977.85	11,983.81	12,723.19
	percentage		
private employee	52.07	18.16	29.78
public employee	46.58	18.52	34.91
self-employed	44.67	18.44	36.89
retired	34.78	20.55	44.67
Overall	44.66	19.03	36.3
n° members of hh = 1	44.86	55.14	0
n° members of hh = 2	38.42	19.48	42.10
n° members of hh = 3	47.93	18.26	33.81
n° members of hh = 4	42.96	18.77	38.27
n° members of hh = 5	36.31	17.62	46.07
n° members of hh = 6	26.42	28.30	45.28
n° members of hh = 7	35.71	7.14	57.14
n° members age 55 ≥ 0	48.70	18.08	33.22
n° members age 55 ≥ 1	46.02	26.47	27.51
n° members age 55 ≥ 2	31.16	16.46	52.38
n° members age 55 ≥ 3	43.10	18.97	37.93
n° members age 55 ≥ 4	50.00	33.33	16.67
n° members age 55 ≥ 5	0	100	0

Figure 6a. Savings by age of the head of the household, for households where the head is migrant, both spouses are migrants and households which are long-term residents

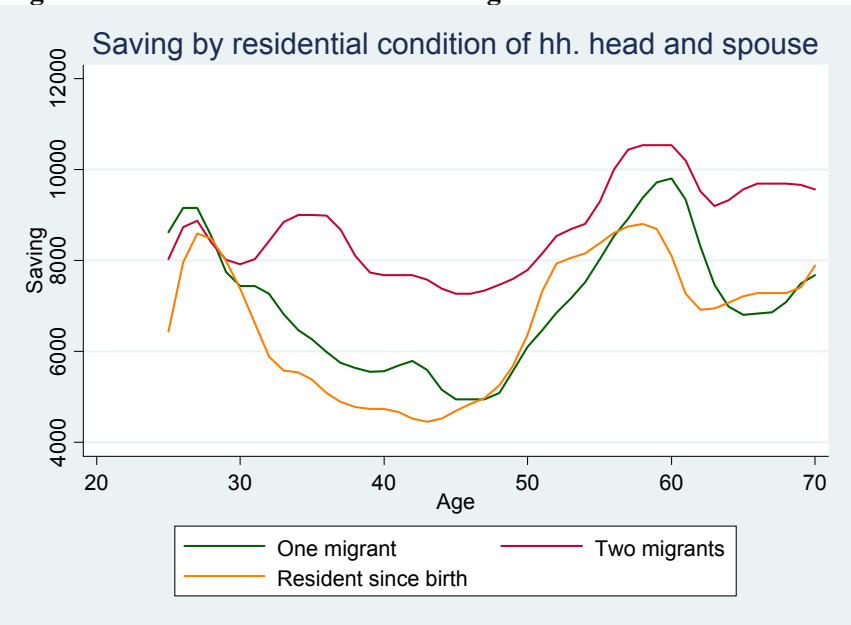
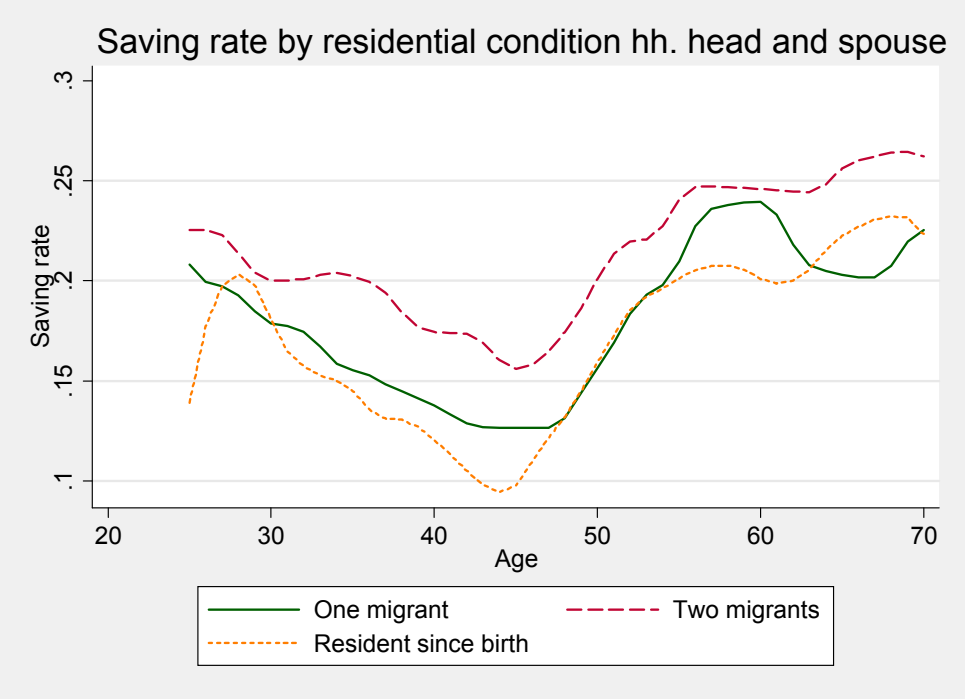


Figure 6b. Saving rate by age of the head of the household, for households where the head is migrant, both spouses are migrants and households which are long-term residents



Figures 6a, 6b and 7 compare the saving behavior of households which have a migration history versus long-term residents. In particular Figure A1 shows that if both spouses are migrant the saving rate (saving level) is highest, while households which were resident since birth have lower saving rates (saving level). This is prima facie evidence that those who moved need to build up their wealth stock and save more at all ages. A similar conclusion emerges from Figure 7. What exactly explains these patterns requires a more complete econometric analysis which takes account of both household composition and migration.

Figure 7. Saving rate by age of the head of the household, for households with at least one migrant and households which are long-term residents

4. Social Security and Health

An important motive for saving is providing for a stable standard of living in old age. However the presence of public pensions (social security) or occupational pensions reduces the need for accumulating wealth during the working years.

Over our sample period (1994-2006), two major social security reforms took place. The first, in July 1997 laid down broad principles and left scope for differing implementation by the provinces. Broadly, the document specified the first pillar — pure PAYG for Defined Benefits (DB) aimed at delivering, based on contributions paid over 15 years, a pension of 20 % of city average pay — and a second pillar of individual accounts. The retirement age was set at 60 for men, 55 for women in management cadre and 50 for women workers. Unfortunately, because of the low retirement ages and inadequate contributions the system was never financially sustainable. Also, with large-scale SOE restructuring, many laid-off workers were given immediate pensions at quite young ages (even at 40). Under these circumstances, the individual accounts broadly became empty as the administration used the revenues to pay the pensions of current retirees.
In 2001, a pilot programme was launched in Liaoning province, among other things separating the DB PAYG pillar from the individual accounts. In 2004-06, the Liaoning pilot was extended to ten other provinces (out of 31 provinces; these 11 cover 39 % of the Chinese population).

To summarize, there were two pension reforms over the sample period. The first, in 1997, that created a two-pillar system, but was not sustainable and coincided with a major health reform (URBMI), and a second, in 2001, that launched a pilot program in Liaoning province, among other things separating the DB PAYG pillar from the individual accounts, and creating a much stronger linkage between payment and benefit, later extended to ten other provinces.

We described the major health reform affecting urban households. It is yet to be established what was the impact of such reform on enrolment and out-of-pocket expenses. Lin, Liu and Chen, 2009 shows that, among the URBMI insured group, lower-income participants and those who used inpatient care in the past year are more likely to feel a financial relief.

5. Housing

Chamon and Prasad (2010) in their analysis of the saving motives of Chinese households observe that only 17% of households in the UHS sample owned their homes in 1990; by 2005, that figure had risen to 86 percent. In the past, housing was often provided by state enterprises to their employees. As part of the housing reform, much of that stock was sold to the workers, typically at below-market rates, but a smaller share of the younger households obtained their home through the housing reform. Most house purchases were financed by the withdrawal of past savings, suggesting that this had been an important motive for household savings over the past decade. However the authors suggest that just 3 percentage point increase in saving rates since the early 1990s could be explained by house purchases. This is because many houses purchased under the housing reform process are of low quality, suggesting that as income levels rise and the capacity to buy better houses increases, saving rates could stay high on account of this motive as the mortgage market is still underdeveloped. Households with good income growth prospects may continue to have high savings in order to climb up the housing ladder. Indeed, the authors find that owners of poor-quality homes (homes with values below the respective provincial median) have higher saving rates than those with better homes.

From the 1950s to the 1980s housing policy was planned and housing was heavily subsidized by the central government and (later) by the local government. Only after 1978 the central government changed its policy toward private housing development (Tang and Xie, 1992).
Fund were allocated to local government and to state-owned enterprises to build urban rental units, hence employees, especially those in government offices and state-owned enterprises, had, and still have, received housing allocations from their work-units for nominal rents.
Houses were allotted in accordance with the length of service, position, number or children and their age. The housing market had been virtually eliminated before the housing reform of the mid 1980's.[8]
Following the guidelines of Deng Xiaoping, experiments have been carried out in different cities with a focus on reorganizing housing production and promoting sales of public-sector housing to ensure a sufficient return from housing investments. During that period, the central government was reluctant to adopt fundamental structural reform in regard to property rights. In other words, the central government had not moved completely into privatization: competition was allowed into the economy without a complete privatization of public property. The central government pushed different state and local owned enterprises to compete with each other.
In February 1988 the State Council produced the document "Implementation Plan for a Gradual Housing System Reform in Cities and Towns", that implemented the "competition" principle in all urban areas. In 1991, the comprehensive housing reform was carried out. A new urban housing document titled "The Resolutions of the State Council about Actively and Appropriately Carry out Urban Housing Reform" was adopted. The goals and procedures of further housing reform were more specific (*The State Council Document*, 1991, no. 3; June 7th, 1991). The resolution recognized ownership of private housing purchased from the public sector, but private housing ownership was still vaguely defined and terms such as "standard price" and "prime-cost" price were introduced to bring public properties to the market.

[8] For major detail: Zhou Yu, 1999. "China's Urban Housing Reform – with specific emphasis on property ownership." § 3.14 The consequences of the housing policy, p. 8-10.

In 1996, although a housing market existed, most participants in the market were not yet individual buyers but work-units. The overwhelming majority of urban residents were still living not only in public-sector housing but also in housing tied to their employment (Wang and Murie, 1996). The work-units and local governments tended to purchase the housing from the market and provide them to their employees with a rent much lower than market rent. In July 1994 The State Council published an updated plan titled "The Decisions of the State Council on Deepening Urban Housing System Reform." The 1994 plan still focuses on promoting sales of public-sector housing.
There are three types of prices for housing adopted in the urban housing sector, which are market price, prime-cost price, and standard price.
In the 1994 plan, the central government tries to increase housing demand by lowering the housing sale price. Most public houses are sold at the standard price, which is lower than the prime-rate price. In that way, the central government provides more subsidization to the public housing buyer who has a lower average income level. However, the standard price is not a sustainable price, since it is far below the market price. This contradicts with the reform objective, which is to ensure a sufficient return from housing investments. At the same time the government increased the rents of the public rental housing. Workers would be provided with housing allowances, which may help stimulate the purchase of houses by individuals (The State Council Document, 1994 in Zhang, 1996).

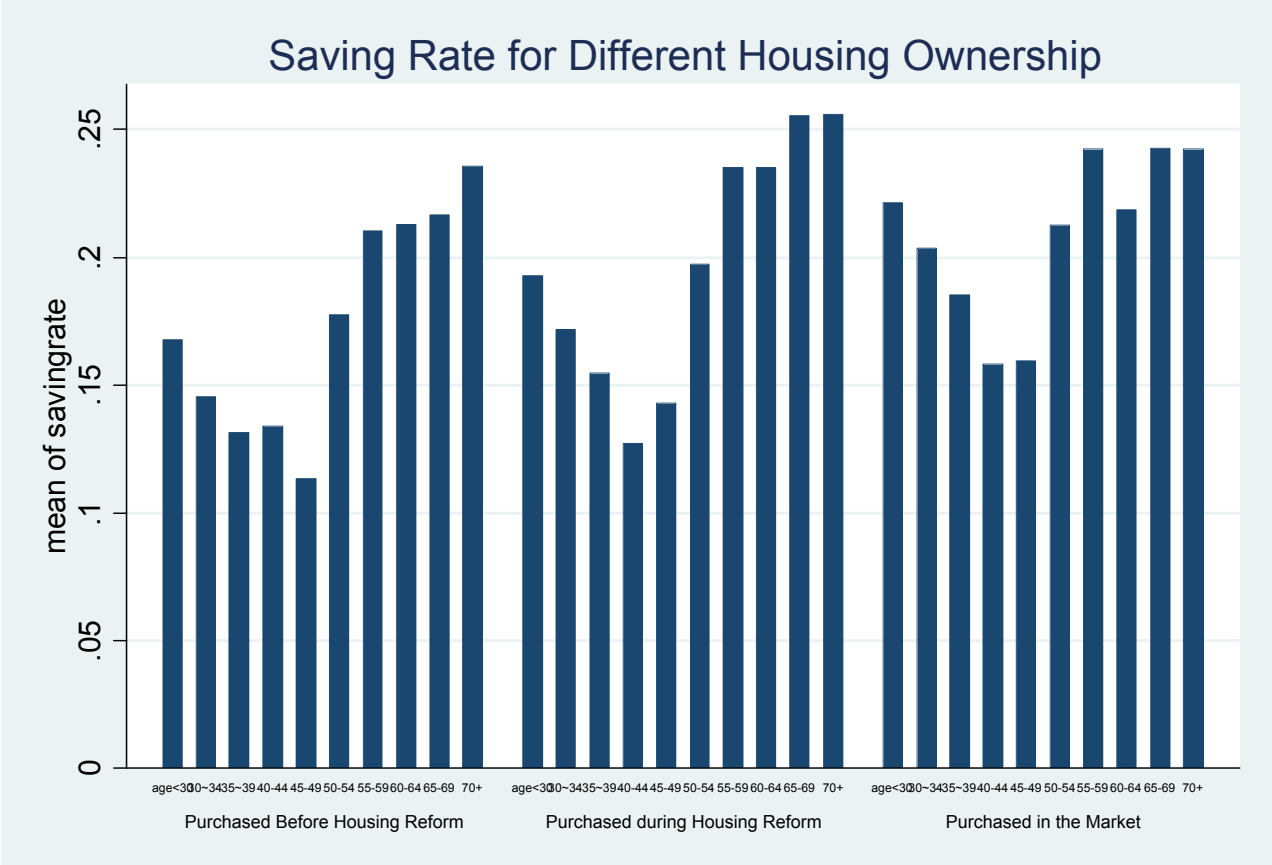
However at that point it was clear that private investors were reluctant to invest their capital in a market which they perceive to be unreliable, hence the 1994 reform had not produced the expected effects.
In July 1998, the new State Council recently adjusted the housing policy and issued an official document titled "the Resolutions on Continuing Urban Housing System Reform, Accelerating Housing Development." The aim is to stop the material distribution of housing, which will be completely replaced by subsidies. According to the new plan, no newly built apartments are allowed to be allotted according to the old system and all houses have to be sold in the market.

To understand why rising house prices force young people to save, it is worth looking at housing tenure choice in recent years for the UHS sample. Table 5 shows the percentages of respondents who rent their accommodation (public or private housing tenants), or who currently own their home. The numbers do not add to 100 because information is missing in a few cases.
The survey provides particularly valuable information because (since 2002) it breaks down current home-owners in three groups: long-term home owners (who purchased their home before 1998), home-owners who acquired their home thanks to the reform (typically, this housing stock was in a bad state, but was sold at a very low price), and home-owners who purchased their home after 1998 on the market.
It is clear from Table 5 that renting is becoming less and less common, and that the fraction of home-owners who purchased at market prices is steadily increasing. The effects of the housing reform are decreasing over time both because new generations are entering the housing market, and because the more affluent beneficiaries of the housing reform are selling the low-quality ex-public housing and buying new (and better) homes at market prices. This implies that rising housing prices induce savings among the young, and among those who wish to trade up in the housing market. Figure 8 illustrates the saving rate age profiles for the different groups of home-owners.

Table 5. Housing tenure of Chinese households

Year	Public housing tenant	Private housing tenant	Pre-reform home-owner	Home-owner after housing reform	Home- owner after market purchase
2002	13.46	1.91	11.90	63.00	8.15
2003	12.22	1.94	11.83	60.08	9.85
2004	10.98	1.73	11.63	59.02	13.79
2005	9.01	2.03	11.01	55.87	18.61
2006	8.90	2.09	10.44	54.19	21.59

Figure 8 Saving rate by age and house-ownership.



6. Estimation results

In table 6 we present estimation results for the 2002-6 sample of a saving rate equation, where the explanatory variables include standard demographics (age and age squared, family size), occupation indicators (the control group is public sector employees), housing tenure dummies (the control group is public housing tenant) plus some more detailed demographic variables that we have discussed in the previous sections. In particular, in all specifications we control for the presence of one or two migrants – these indicators always have a positive, significant effect: two-migrant families have 4-5% higher saving rates compared to the control group of families where all members have always been resident in the urban area. In the first specification (column 1), we control for the presence of a child – this has a negative, significant effect, while family size has a positive effect. In column 2 a son indicator replaces the child dummy: as a result, the family size coefficient becomes negative, while the son indicator has a negative coefficient, but much smaller than the child indicator of column 1. Column 3 shows the results when we perform a similar exercise for daughters – results are broadly similar to column 2, and this indicates that the gender imbalance does not have a major impact on savings. Finally, in column 4 we present a specification where the number of children younger than 25 and the number of elderly individuals (55+) are considered. Family size has a positive coefficient of .014, the number of young children a large, negative coefficient of -.073 and the number of elderly individuals a positive coefficient of .014. These results overall suggest that families with children save less, as in most other countries.

Table 6 Regression analysis of the household saving rate, OLS estimates. UHS, 2002-2006

	(1) Coef	(1) Std. Err.	(2) Coef	(2) Std. Err.	(3) Coef	(3) Std. Err.	(4) Coef	(4) Std. Err.
Age	**-0.00302**	0.00072	**-0.00432**	0.00072	**-0.00429**	0.00072	**-0.00306**	0.00072
Age^2/000	**0.00489**	0.00072	**0.00675**	0.00071	**0.00424**	0.00073	**0.00417**	0.00074
Liaoning prov.	**-0.04390**	0.00322	**-0.04257**	0.00322	**-0.04252**	0.00322	**-0.04695**	0.00321
One migrant	**0.01032**	0.00309	**0.00952**	0.00309	**0.01029**	0.00309	**0.01088**	0.00308
Two migrants	**0.04186**	0.00255	**0.04596**	0.00255	**0.04503**	0.00255	**0.04352**	0.00254
Famsize	**0.00989**	0.00189	**-0.01360**	0.00159	**-0.00795**	0.00158	**0.01426**	0.00214
Not employed	**-0.12742**	0.00605	**-0.12627**	0.00606	**-0.12650**	0.00606	**-0.12800**	0.00603
Private employee	**-0.02893**	0.00355	**-0.02834**	0.00356	**-0.02832**	0.00356	**-0.02808**	0.00354
Self-employed	**-0.01457**	0.00518	**-0.01221**	0.00519	**-0.01232**	0.00519	**-0.00548**	0.00517
Other employees	**-0.08057**	0.00751	**-0.08038**	0.00753	**-0.08008**	0.00752	**-0.07692**	0.00749
Retired	**-0.00794**	0.00384	**-0.00364**	0.00384	**-0.00412**	0.00384	**-0.02170**	0.00398
Private rental	**-0.00611**	0.00873	**-0.00343**	0.00875	**-0.00270**	0.00875	**-0.00017**	0.00871
Home owned originally	**0.01964**	0.00502	**0.02618**	0.00503	**0.02520**	0.00502	**0.02344**	0.00500
Home bought with reform	**0.02696**	0.00364	**0.02838**	0.00365	**0.02786**	0.00365	**0.02658**	0.00363
Home bought in the mkt	**0.04514**	0.00437	**0.04781**	0.00438	**0.04722**	0.00438	**0.04690**	0.00436
Others (house)	**0.02997**	0.00711	**0.03293**	0.00713	**0.03260**	0.00712	**0.03261**	0.00709
Child	**-0.07638**	0.00377						
Son			**-0.00613**	0.00249				
Daughter					**-0.02730**	0.00252		
# Children aged<25							**-0.07344**	0.00322
# elderly >55							**0.01041**	0.00232
Year dummies	√		√		√		√	
Constant	**0.20852**		**0.20233**		**0.22558**		**0.2030168**	
Number of obs	77329		77329		77329		77329	
R-squared	0.0372		0.0332		0.0336		0.0422	

In table 6 we control for housing tenure. We find that individuals in private rented accommodation save marginally and insignificantly less than those who rent public housing. Home-owners instead save more, particularly those who bought in the market after the reform. This surprising result confirms findings by Chamon and Prasad (2010), and is consistent with the need to improve the quality of the housing stock or move up the housing ladder.
In table 7 we report a similar set of estimates, where potentially endogenous housing tenure indicators are dropped from all specifications. We see that results are broadly similar.
It is worth pointing out that in all specifications considered we persistently find U-shaped age effects, in line with the graphical evidence displayed in previous sections. The other observable variables have a limited impact on the estimated age profile.

Table 7 Regression analysis of the household saving rate, OLS estimates, UHS, 2002-2006

	(1) Coef	(1) Std. Err.	(2) Coef	(2) Std. Err.	(3) Coef	(3) Std. Err.	(4) Coef	(4) Std. Err.
Age	-0.00328	0.00072	-0.00464	0.00072	-0.00461	0.00072	-0.00339	0.00072
$Age^2/000$	0.00489	0.00072	0.00680	0.00071	0.00675	0.00071	0.00443	0.00073
Liaoning prov.	-0.04362	0.00319	-0.04265	0.00320	-0.04255	0.00320	-0.04682	0.00319
One migrant	0.01113	0.00308	0.01027	0.00300	0.01106	0.00309	0.01166	0.00308
Two migrants	0.04426	0.00252	0.04824	0.00252	0.04731	0.00252	0.04587	0.00251
Famsize	0.01022	0.00185	-0.01332	0.00158	-0.00757	0.00150	0.01430	0.00214
Not employed	-0.12944	0.00602	-0.12766	0.00604	-0.12789	0.00603	-0.02308	0.00360
Private employee	-0.02829	0.00354	-0.02743	0.00355	-0.02741	0.00354	-0.01231	0.00349
Self-employed	-0.01606	0.00506	-0.01260	0.00507	-0.01270	0.00507	-0.01225	0.00341
Other employees	-0.08506	0.00749	-0.08447	0.00750	-0.08411	0.00750	0.01352	0.00334
Retired	-0.00863	0.00384	-0.00437	0.00385	-0.00483	0.00384	-0.12930	0.00601
Child	-0.07710	0.00376						
Son			-0.00616	0.00249				
Daughter					-0.02775	0.00252		
# Children aged<25							-0.07329	0.00322
# elderly >55							0.01103	0.00230
Year dummies	√		√		√		√	
Constant	0.25344		0.28235		0.27349		0.24894	
Number of obs	77329		77329		77329		77329	
R-squared	0.0356		0.0305		0.0319		0.0406	

Table 8 presents estimation results for the same time period, including province, year and urban dummies. We also include in the specification (that broadly corresponds to column 4 of Table 7) interaction terms between the Hubei province dummy and a time dummy for the period (2006) when the pension reform came into force in this province. In column (1) we see that there is marginally significant positive coefficient on the interaction term, and this would suggest that households in Hubei increased their private savings at the time when the pension reform was implemented in their province. Column (2) controls for the logarithm of real, disposable income: in this case, the positive effect is stronger and more significant. However, as soon as we allow for similar interaction terms between the 2006 dummy and the other province dummies, the estimated effect of the pension reform in Hubei becomes negative and insignificant. This suggests to us that the effect of the pension reform cannot be captured by looking at just one year of implementation.

For this reason we analyse the effects of pension reform by taking a longer sample period: 1998-2006. Half the way through this period (2001) the pilot pension reform was implemented in Liaoning. Extending the sample period has a cost, though, because we lose information on migrants in the household.

Table 8. Regression analysis of the household saving rates, UHS, 2002-2006

	2002-2006					
	(1) Coef	Robust Std. Err.	(2) Coef	Robust Std. Err.	(3) Coef	Robust Std. Err.
ln (real disp. income)			0.190***	0.010	0.190***	0.009
Age	-0.005***	0.001	-0.004**	0.001	-0.004**	0.001
$Age^2/000$	0.006***	0.001	0.005**	0.001	0.005**	0.001
Child	-0.055***	0.011	-0.057***	0.011	-0.057***	0.011
Num. Children of age<18	-0.032***	0.005	-0.005	0.005	-0.005	0.005
Num. of elderly >55	0.017**	0.005	0.013**	0.005	0.013**	0.005
Ethnic minority	-0.004	0.010	-0.002	0.010	-0.002	0.010
Marital status	0.019***	0.004	0.007*	0.003	0.007*	0.003
Famsize	0.011*	0.006	-0.020***	0.006	-0.020***	0.006
Years of education	0.007***	0.001	-0.005***	0.001	-0.005***	0.001
One migrant	0.015**	0.005	0.008	0.005	0.008	0.005
Two migrants	0.041***	0.007	0.023***	0.005	0.023***	0.005
Hubei province	-0.009***	0.002	0.094***	0.005	-12.386***	1.858
post2006	0.012***	0.002	-0.006	0.003	-0.002	0.002
Hubei prov. X post2006	0.007**	0.003	0.016***	0.003	-0.004	0.003
Not employed	-0.111***	0.010	-0.035**	0.010	-0.035**	0.010
Private employee	-0.030***	0.008	-0.009**	0.004	-0.009**	0.004
Self-employed	-0.002	0.010	0.013	0.009	0.013	0.009
Other employees	-0.069***	0.012	0.007	0.009	0.007	0.009
Retired	-0.008	0.005	-0.008	0.006	-0.008	0.006
urban dummies			√		√	
year dummies	√		√		√	
province dummies	√		√		√	
yearXprov. dummies					√	
Number of obs	77329		77329		77329	
R-squared	0.050		0.131		0.131	

*** p<0.01, ** p<0.05, * p<0.1

Estimation results are presented in Table 9. In the first column, the saving rate is regressed on demographics, years of education, occupation dummies, urban, province and year dummies. In the second column, the logarithm of real disposable income is added to the specification, to control for possible effects of non-homotheticity in preferences.

In both columns we present the Liaoning and Hubei province dummy coefficients, the post-reform dummy coefficients (2002 and later in Liaoning, 2006 in Hubei) and their interaction terms. As usual, the coefficient on the interaction terms could be interpreted as the response of the saving rate to the reform, even though a formal causal interpretation requires that no pre-existing province-specific trends are in place.

In column (1) the estimated effect of the pension reform in Liaoning is highly significant and negative. In Hubei, instead, it is positive but much smaller. The effects are larger and more

significant in column (2), where we control for income. In particular, the reform has the effect of reducing by 3% the saving rate in Liaoning, it has the effect of increasing it by 1.8% in Hubei.

Table 9. Regression analysis of the household saving rates, UHS, 1998-2006

	(1)	(2)
ln (real disp. income)		0.184***
		(0.009)
Age	-0.006***	-0.006***
	(0.001)	(0.001)
Age^2/000	0.007***	0.007***
	(0.001)	(0.001)
Child	-0.060***	-0.059***
	(0.010)	(0.009)
Num. Children aged<18	-0.034***	-0.008*
	(0.004)	(0.004)
Num. of elderly >55	0.016***	0.012**
	(0.004)	(0.004)
Famsize	0.019***	-0.013**
	(0.004)	(0.005)
Years of education	0.007***	-0.004***
	(0.001)	(0.001)
Liaoning prov.	-0.013***	0.072***
	(0.004)	(0.005)
post2001	0.019	-0.016
	(0.012)	(0.012)
Liaoning X post2001	-0.025***	-0.030***
	(0.005)	(0.008)
Hubei province	-0.004**	0.087***
	(0.001)	(0.004)
post2006	0.030**	-0.025
	(0.010)	(0.014)
Hubei prov. X post2006	0.009**	0.018***
	(0.004)	(0.005)
Not employed	-0.121***	-0.045***
	(0.011)	(0.009)
Private employee	-0.031***	-0.010**
	(0.008)	(0.003)
Self-employed	-0.003	0.015*
	(0.009)	(0.008)
Other employees	-0.077***	-0.000
	(0.012)	(0.009)
Retired	-0.013**	-0.011*
	(0.005)	(0.006)
urban dummies		
year dummies	√	√
province dummies	√	√
Number of obs	99005	99005
R-squared	0.043	0.120

Note: *** p<0.01, ** p<0.05, * p<0.1

The results presented in Table 8 suggest the pension reforms may have played a role, but more work is needed to understand their effects. For instance, a distinction should be drawn between working-age individuals and the rest of the population, given that the latter should not have been directly affected by the specific reform under consideration.

Conclusions

Our analysis of urban household saving rates in China has highlighted the role of a number of factors that can explain the changes over time and age of this important variable.

In particular, we have stressed that households that recently migrated to the urban areas tend to save more – to the extent that this type of migrations will peter down over the years, we should see a drop in the saving rate in years to come (as advocated, for instance, by Blanchard and Giavazzi, 2005). This finding is in line with the hypothesis that individuals are affected by long habits: people born in rural areas who moved to a more affluent urban area take a long time to adapt upwards their standard of living, and save as a result (possibly with a view to foster their children's education and economic success).

Also, we confirmed the important role of the housing market. We find that home-owners who recently bought on the free market save more than tenants and home-owners who acquired their property long time ago or at the time of the housing reform at much reduced prices.

Finally, we investigated the role of pension reforms that took place in different years across different provinces. Our results are mixed. In the case of the province that was first affected (Liaoning) we find that the pilot reform had a sizeable, negative effect on private savings. In another case, where the reform was implemented at the end of our sample period (Hubei), the effect on savings was instead much smaller, but positive.

APPENDIX

Characteristics of the China Urban Household Survey (sub sample of 8931 observations)

Table A1 Number of employees by household size

Household size	number of employee (%)							Total
	0	1	2	3	4	5	6	
1	51.4	44.86	2.8	0	0.93	0	0	100
2	39.38	30.74	29.78	0.05	0.05	0	0	100
3	5.21	22.7	66.52	5.55	0.02	0	0	100
4	7.45	25.11	54.83	11.04	1.56	0	0	100
5	6.5	21.68	52.57	14.09	4.88	0	0.27	100
6	7.55	16.98	43.4	18.87	11.32	1.89	0	100
7	0	28.57	21.43	28.57	7.14	7.14	7.14	100
Total	13.27	24.88	55.84	5.46	0.5	0.02	0.02	100

Table A2 Number of retired people by household size

Household size	number of retired (%)					Total
	0	1	2	3	4	
1	47.66	51.4	0.93	0	0	100
2	39.75	28.98	31.27	0	0	100
3	74.7	16.33	8.84	0.13	0	100
4	54	30.73	14.9	0.37	0	100
5	24.39	29	44.44	1.9	0.27	100
6	22.64	26.42	50.94	0	0	100
7	28.57	21.43	50	0	0	100
Total	62.06	21.74	15.98	0.2	0.01	100

Table A3 Households according to the presence of children

	Percentage
at least one child	78.64%
only one son	34.86%
only one daughter	30.59%
more than one child	13.19%

Table A4 Characteristics of households according to the presence of children

	more than one child	**only one son**	**only one daughter**	**no child**
saving rate (mean)	16.93	14.92	15.00	24.78
saving rate (median)	19.30	18.77	17.21	28.11
disposable income (mean)	15,982.17	14,912.41	14,989.40	13,912.34
disposable income (median)	12,953.64	12,349.31	12,365.91	11,560.14
	percentage			
private employee	7.40	40.83	36.89	14.89
public employee	8.24	39.80	36.54	15.43
self-employed	19.26	34.02	31.76	14.96
Retired	23.32	22.43	14.82	39.44
n° members of hh = 1	0	0	0	100
n° members of hh = 2	0	6.78	5.18	88.05
n° members of hh = 3	1.42	51.34	44.83	2.41
n° members of hh = 4	69.83	13.71	14.81	1.66
n° members of hh = 5	74.53	13.82	11.11	0.54
n° members of hh = 6	100	0	0	0
n° members of hh = 7	100	0	0	0
n° members age 55 ≥ 0	8.24	41.22	37.93	12.61
n° members age 55 ≥ 1	23.05	29.44	24.46	23.05
n° members age 55 ≥ 2	20.83	19.57	13.01	46.58
n° members age 55 ≥ 3	29.31	15.52	10.34	44.83
n° members age 55 ≥ 4	16.67	66.67	0	16.67
n° members age 55 ≥ 5	0	0	0	100

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