Understanding the Rural and Urban Household Saving Rise in China

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Abstract

This paper analyzes the different factors that drive saving rate rises of both rural and urban households in China. Using data from the Chinese Household Income Project 1995 and 2002, I first show that the whole saving rate distribution shifts up for both rural and urban households. The shift, however, differs between rural and urban households and is heterogeneous across the distribution: while rural saving increased the most at lower percentiles, urban saving experienced a larger shift at higher percentiles. Moreover, decomposition in the saving distribution shows that most of the increase in the rural saving rate is due to rising income. In contrast, only a small portion of the increase in the urban saving rate can be explained by changes in household characteristics including income. The rising urban saving rates are instead explained by changes in quantile regression coefficients over time, especially at the top of the saving distribution.

Highlights

- Reasons for the rising rural and urban household saving rates are different in China.
- Rising income is the main contributor to rural household saving rate rise.
- Rising urban saving rates are explained by changes in "returns" to endowments.

Keywords: Household saving; Saving determinants; Rural-urban difference; Quantile decomposition; China
JEL Classification: D12; D14; E21; R29

1. INTRODUCTION

China's national saving rate has increased sharply in the last two decades and has now reached 50%. As rising household saving is one of the main contributors to the high rate of national saving, it has attracted the attention of policy makers and academic scholars. Important identified determinants of the high saving rate include the increasing proportion of working age population, which induces saving rate rises according to the life cycle theory (Modigliani & Cao, 2004), the precautionary saving motive, amplified by the underdeveloped financial system (Chamon & Prasad, 2010; Wen, 2009; Feng, He & Sato, 2011), the competitive saving motive under unbalanced sex ratio (Wei & Zhang, 2011), and the status seeking motive proposed by Jin, Li & Wu (2011). However, most household-level empirical research along these lines has studied aggregate saving determinants and has limited focus on heterogeneities, especially regional differences, in analyzing the dynamics of the saving rate. In particular, despite the large rural-urban disparity, there has been no rigorous analysis in the literature of the different forces driving the rise in household savings. This paper attempts to fill this critical gap in the literature by analyzing the driving forces of the saving rates for rural and urban areas separately. To the best of my knowledge, this is the first detailed examination of the difference in reasons behind the rising rural and urban household saving rates in China.

It is important to examine the saving determinants for rural and urban saving increase separately given the great differences between rural and urban households in China.[1] One the one hand, more often than not these households are subject to different government policies and face different constraints. While urban residents enjoy a series of social benefits such as unemployment insurance, health care and pension, rural residents generally do not. Moreover, policy reforms in China tend to

[1]The persistent rural-urban divide is made possible by the household registration system (the Hukou system), which tightly restricts permanent rural-urban migration(Wu & Treiman, 2004; Chan, 2009).

be sector-specific. For instance, the health care and pension reforms in late 1990s only targeted urban residents, with limited influence on rural residents. In addition, the relaxed migration restriction provided rural residents new income-earning channels by allowing them to work temporary in cities as migrant workers. All these factors can potentially lead to differences in saving incentives and behaviors between rural and urban households. On the other hand, there is a significant income gap between rural and urban households. This substantial difference in income, combined with the nonlinear relationship between income and marginal propensity to save documented in Mian et al. (2013), may also lead to different rural and urban saving rates. In addition, rural and urban households are expected to respond differently to nationwide reforms, such as the dramatically increased college tuition in mid 1990s, with different income levels. All these disparities are likely to result in a difference between the forces that drive the urban saving rate from those that drive the rural saving rate. In this case, there needs to be some revision of policy implications arising from previous literature, particularly that which concerns the "rebalance" of China's growth by boosting domestic consumption.

This paper also contributes to the literature by analyzing the contribution of each individual factor in boosting the household saving rate. While each of the proposed saving incentives have been documented to play a role in explaining the saving rate rise in China, their relative importance has not been systematically studied. Furthermore, the relative importance of these saving incentives may differ between rural and urban households. Using decomposition methods, I am able to examine the contribution of each saving determinant in explaining the household saving rise, for rural and urban areas separately. Unlike most related studies that focus on the determinants at either the mean or median of the saving distribution, I perform the decomposition analysis across the whole saving distribution. This distributional analysis allows me to check if the rural-urban differences are driven by outliers, to uncover possible heterogeneities in the relative importance of each saving determi-

nants across the saving distribution, and to provide a correct interpretation of the results.

Using data from the Chinese Household Income Project (CHIP), I show that there are indeed dramatic differences between rural and urban saving rate dynamics across the saving distribution. To provide visual evidence of these differences, I plot the saving distributions in 1995 and 2002 for rural and urban households separately. As shown in Figure 1, while rural saving increased the most in lower percentiles, urban saving experienced a larger shift in higher percentiles during this period.

[insert Figure 1 here, 2-column, 1 column per subfigure]

Can the increase in the saving rate and the difference in saving increase patterns between rural and urban households be explained by changes in household characteristics? If this is the case, then to what extent does it hold true? In order to address these questions, I adopt the semi-parametric reweighting method proposed by DiNardo, Fortin & Lemieux (1996) (DFL) to decompose the total saving rate increase into two parts for rural and urban households separately. The first of these parts is attributed to changes in household characteristics (hereafter referred to as "endowment effect") while the other is attributed to changes in "returns" to these characteristics (hereafter referred to as "return effect"). I further perform a detailed decomposition based on the unconditional quantile regression proposed by Firpo, Fortin & Lemieux (2009) to examine the contribution of each single household characteristic to the total saving change.

An interesting figure emerges from the comparison between urban and rural decomposition analysis. With respect to rural households, a dominant portion of the rise in rural saving rate from 1995 to 2002 can be explained in terms of changes in household characteristics, mainly the rising income. With respect to urban households, however, only a small portion of the shift in saving can be attributed to changes in

household characteristics. The more considerable return effect is likely to be driven by precautionary saving for education, housing, health services and old-age security, especially at the higher quantiles. The contrasting results of decomposition analysis highlights the differences between the underlying forces that drive rural and urban saving increases, thus providing a more comprehensive understanding of saving rate rises in China.

This study also provides important policy implications for contemporary China. China's growth has become consumption-led rather than investment-led or export-led. In 2014, consumption contributed to more than 50% of China's growth, surpassing the contribution of investment.[2] Given the importance of consumption, unleashing domestic demand has been a longstanding goal of Chinese government. However, Chinese consumers often prefer to save and the saving rate in China remains high.[3] Understanding the relative importance of the saving determinants and the differences between the underlying forces that drive rural and urban saving increases can potentially help better design consumption stimulating policies.

The rest of this paper is organized as follows. Section 2 discusses the data used in this study and Section 3 introduces aggregate (DFL) and detailed decomposition methodologies. The aggregate decomposition results are presented in Section 4, with further detailed decomposition results reported in Section 5. Section 6 concludes.

2. DATA AND VARIABLES

The data used in this study come from the 1995 and 2002 Chinese Household Income Project (CHIP). The rural sample covers 19 provinces and the urban sam-

[2]Source: 2014 Statistics Report: Comments, National Bureau of Statistics of China
[3]Source: The Economist, November 2008, "China Seeks Stimulation".

ple covers 11.[4] To ensure their representativeness, both the rural and urban samples were selected from parent samples drawn by the National Bureau of Statistics (NBS). The two rounds of the survey collected basic demographic characteristics of individuals and their families, as well as information about household income and consumption. Khan & Riskin (1998) and Khan & Riskin (2005) provide detailed descriptions of the survey.

In the main analysis, I define household saving rate as $ln(income/consumption)$ following Wei & Zhang (2011).[5] To check the sensitivity of my results to alternative saving definitions, I also report decomposition results using the conventional saving definition, $(income - consumption)/income$. The calculation of household income includes all wage and non-wage incomes from all family members, as well as the rental value of the household's dwelling. The total consumption is calculated as the annual total consumption expenditure plus the rental value of the household's dwelling minus taxes and fees. It excludes house purchase or construction expenditure and the proportion of medical consumption covered by the government or insurance. Rural household income and consumption also include self-consumed farm products. For rural and urban samples in both years, I drop observations in the top and bottom one percentile of the saving rate distribution to avoid unreasonable saving rates, possibly induced by misreporting.[6] I also drop 11 observations with heads of household less than 18 years old; this is the legal age in China to head a household.

Table 1 shows the rural and urban saving rates in 1995 and 2002. Even though both average rural and urban savings increased significantly from 1995 to 2002,

[4]Two additional provinces, Guangxi and Xinjiang, are covered in the 2002 rural sample.

[5]Using the logarithm of the income-consumption ratio as a proxy of saving makes the regression results less likely to be influenced by outliers.

[6]These excluded households either reported a negative income or an income level that was unreasonably low, i.e. less than one seventh of the consumption. Excluding them keeps the scale of the y-axis in decomposition figures within normal ranges for better graphical presentation. As a robustness check, I include these households in the regression analysis and the decomposition results are generally the same as the results reported in this paper.

the rural saving rate increased more, starting from a level below the urban saving rate in 1995, and rising to a level above the urban saving rate in 2002. Regardless of this increase, there were still families with negative savings, indicating income levels that could not fully cover their consumption expenditures. In addition, note that while the standard deviation of rural household saving fell over this period, the inequality of the urban saving rate increased. These facts shed light on the heterogeneous rise in saving rates across the saving distribution, which may be masked by only looking at the mean.

[insert Table 1 here, 1-column]

In order to examine these heterogeneous changes, I plot the cumulative distribution of saving rates for rural and urban areas separately in Figure 1. As shown in the upper panel, the whole distribution of the rural saving rate shifts upwards, with the sharpest increase at lower percentiles; and the magnitude of this increase narrows when moving up to higher percentiles. Compared with the shift in the rural household saving rate, the change in urban saving displays a drastically different pattern. The increase is relatively small at lower percentiles, and gradually becomes larger at higher percentiles. These heterogeneous shifts are consistent with the change in standard deviations as shown in Table 1.

Note that the observed differences in saving increase between rural and urban saving rate distributions in CHIP data is not likely to be mainly driven by the relocation of rural households to urban areas via migration. China experienced rapid urbanization during the studied period and urban population share grew from 28.9% in 1995 to 36.1% in 2000 and then to 43.0% in 2005.[7] However, the share of permanent urban residents, i.e. those who hold urban Hukou, only increased from 23.8% in 1995 to 24.7% in 2000 and to 25.8% in 2005. Most of the new urban residents are temporary migrants seek for non-agricultural employment opportunities while

[7]Source: 1995 % population survey data assembly, 2000 population census assembly and 2005 1% population survey data assembly.

their home villages remains to be their permanent registered place of residence. They often maintain a strong tie with family members left behind and whole-family migration is rare. A majority of rural migrant workers live in dormitories or the workshop itself (Wang & Zuo, 1999), and these places were not included in the CHIP urban survey sample, which focused on urban resident committees. In fact, only less than 1% of household heads in the 2002 urban sample held rural Hukou. Since the rural survey collected information on all household members, including residents and non-residents, migrant workers were included in the rural sample along with their rural families back home. Hence, the different changes in rural and urban household savings rate are expected to be mainly attributed to other factors than relocation of households.

What are the causes of the saving rate increases observed in the data? Can the shift in the saving rate distributions be explained by the change of household characteristics between 1995 and 2002? I apply decomposition methodologies in order to address these questions. Before proceeding to an introduction of the decomposition methods, I briefly discuss factors documented in the literature that affect the saving rate. They include characteristics of household head (gender, age, number of years of schooling, party membership and ethnic minority status), per capita income, household size, the proportion of disabled members, the proportion of elderly members and a set of province dummies to capture regional differences in saving rate. Income is measured in log terms and is deflated across time. Following Emran & Hou (2013), I further adjust the income using a spatial price deflator developed by Brandt & Holz (2006) to make it comparable across regions. Both rural and urban income increased from 1995 to 2002 as shown in Table 2 and Table 3.

[insert Table 2 here, 1-column]

[insert Table 3 here, 1-column]

Wedding is one important reason for saving in China. The 2002 round of the CHIP

rural survey collected information on households' two main objectives of saving. Among the households surveyed, 12.3% chose wedding as the most important reason and 20.3% chose it as the second most important. I use the proportions of unmarried household members aged under 17 and of the unmarried members aged between 18 and 29 to capture the precautionary saving for wedding, allowing the effect to be different for children and adults. In order to address the competitive saving motive that families with sons save to secure marriage, as documented in Wei & Zhang (2011), I construct two additional variables to capture the gender-specific wedding related savings: the proportions of single boys (age$\leq$17) and of adult males ($18 \leq age \leq 29$).

Education is another important reason for saving, according to the CHIP 2002 survey. 42.9% of rural households mainly saved for education and 8.6% confirmed it was the second most important reason for saving. In China, compulsory education consists of 6 years of primary school and 3 years of middle school. Each adolescent then choose either to work directly, or continue for either regular or technical high school. Those enrolled in regular high school have the opportunity to enter college upon graduation. During the period 1995-2002, the burden of education expenses largely shifted from government to households, due to the education reform. Before 1994, both technical high schools and colleges were heavily subsidized; governments were in charge of matching graduates to available positions. The goal of the education reform was to let households share part of the educational costs via tuition fees and to allow students to freely search for jobs after graduation. The reform covered 37 universities in 1995 as a trial, and was then extended to all tertiary institutions in 1997. A similar reform for technical high schools took place between 1998 and 2000. As shown in Table 4, the tuition for higher education increased dramatically during this period, especially for college. Given the lack of universal access to educational loans under the poorly functioning credit market, households have resorted to saving in order to cover these additional expenses.

[insert Table 4 here, 1-column]

I construct three variables to capture the effect of education on saving. The overall effect includes two parts: while future education expenses induce more saving, current tuition depletes saving. The proportion of preschool and primary school children captures the precautionary saving for future education since primary school tuition only accounts for less than 1% of household income in both rural and urban areas (Table 4). As technical high school and college are generally the final stages of education, I use the proportion of children in technical high school, college or above to capture the depleting effect of education on saving. Lastly, I group regular middle school and regular high school together and calculate the proportion of children in these schools. Since these two types of schools are at the intermediate stage of the schooling path, they capture both the precautionary saving and the depleting effects.

Housing is also an important factor for urban saving. The housing reform in 1998 resulted in substantial privatization of housing in urban areas. The proportion of urban households owning their dwelling increased from 41.9% in 1995 to 78.5% in 2002. Thus, I construct an urban-specific dummy variable that is equal to one if a household owns the house that its members live in, and zero if the household rents the dwelling. Descriptive statistics of all these household characteristic variables mentioned above are shown in Table 2 for rural, and in Table 3 for urban households.

3. EMPIRICAL STRATEGY

Decomposition methods have been widely used in economics to explain changes in home prices (McMillen, 2008; Nicodemo & Raya, 2012), changes in home marketing time (Carrillo & Pope, 2012), changes in home ownership(Carrillo & Yezer,

2009) and gender wage gaps (Albrecht, BjŽrklund & Vroman, 2003; Magnani & Zhu, 2011). To investigate how much of the increase in the saving rate is due to the change in household characteristics, I conduct a DFL aggregate decomposition for rural and urban saving rates separately. I further adopt the unconditional quantile regression introduced by Firpo, Fortin & Lemieux (2009) to decompose the endowment effect and the return effect into the contribution of each individual factor. This method allows the performance of an Oaxaca-Blinder (Oaxaca, 1973; Blinder, 1973) type decompositions across the whole distribution. I briefly review these two methods in this section.

3.1 Aggregate Decomposition

I outline the DFL approach using notations similar to Leibbrandt, Levinsohn & McCrary (2010) and Carrillo & Pope (2012). Let Y be the variable of interest, the saving rate, and T be a random variable of time with t_1 and t_2 denoting 1995 and 2002 respectively. The cumulative distribution function for the saving rate evaluated at y in periods t_1 and t_2 can thus be defined as

$$F(y \mid T = t_1) = P(Y \leq y \mid T = t_1) = \int F(y \mid x, T = t_1) h(x \mid T = t_1) dx \qquad (1)$$

and

$$F(y \mid T = t_2) = P(Y \leq y \mid T = t_2) = \int F(y \mid x, T = t_2) h(x \mid T = t_2) dx, \qquad (2)$$

where x is a realization of household characteristics from a random vector X and $h(x \mid T = t)$ is the probability density of household characteristics evaluated at x in period t.

In order to assess what the distribution of the saving rate Y in period t_1 (1995)

would look like if household characteristics were distributed as in period t_2 (2002), I denote this counterfactual cumulative distribution function as $F_{t_1 \to t_2}$ and write it symbolically as

$$F_{t_1 \to t_2}(y) = \int F(y \mid x, T = t_1) h(x \mid T = t_2) dx. \tag{3}$$

According to the Bayes's rule, $h(x \mid T = t)$ can be written as $P(X = x)P(T = t \mid X = x)/P(T = t)$. Therefore, the ratio of the two probability density functions in period t_1 and t_2 can be expressed as

$$\frac{h(x \mid T = t_2)}{h(x \mid T = t_1)} = \frac{\frac{P(T=t_2|X=x)}{P(T=t_2)}}{\frac{P(T=t_1|X=x)}{P(T=t_1)}} = \frac{\frac{P(T=t_2|X=x)}{1-P(T=t_2|X=x)}}{\frac{P(T=t_2)}{1-P(T=t_2)}} = \tau_{t_1 \to t_2}(x). \tag{4}$$

I define this ratio as $\tau_{t_1 \to t_2}(x)$ and plug it into equation (3). As a result,

$$F_{t_1 \to t_2}(y) = \int F(y \mid x, T = t_1) h(x \mid T = t_1) \tau_{t_1 \to t_2}(x) dx, \tag{5}$$

which only differs from equation (1) by the term $\tau_{t_1 \to t_2}(x)$. Thus, the counterfactual cumulative distribution function can be computed by reweighting the observations from t_1 with weights of $\tau_{t_1 \to t_2}(x)$. The estimation of weights summarized below is computationally simple. I follow this procedure for rural and urban savings separately:

1. Using data from both periods, estimate $\hat{P}(T = t_2)$ by the proportion of observations with $T = t_2$.

2. Using data from both periods, estimate $P(T = t_2 \mid X = x)$ by running a Logit regression of $T = t_2$ on a set of explanatory variables. Using the predicted value to estimate $\hat{P}(T = t_2 \mid X = x)$.

3. For the subsample of period t_1, generate counterfactual weights

$$\tau_{t_1 \to t_2}(x) = \frac{\frac{\hat{P}(T=t_2|X=x)}{1-\hat{P}(T=t_2|X=x)}}{\frac{\hat{P}(T=t_2)}{1-P(T=t_2)}}.$$

4. For the subsample of period t_1, estimate a weighted empirical cumulative distribution function using weights of $\tau_{t_1 \to t_2}(x)$.

This reweighting procedure constructs the counterfactual cumulative distribution function that describes what the distribution of the saving rate in period t_1 would look like if household characteristics were the same as in period t_2.

Although there are alternative methods available to estimate counterfactual cumulative distribution functions, these approaches generally require a specific parametric form. The semi-parametric DFL, however, requires minimal functional form assumptions. Moreover, as it is simple to implement and is asymptotically efficient, Fortin, Lemieux & Firpo (2011) recommend it as the best choice for aggregate decompositions.

3.2 Detailed Decomposition

To further examine each factor's contribution to the total saving rate increase, I resort to the unconditional quantile regression proposed by Firpo, Fortin & Lemieux (2009). This method enables the evaluation of the marginal effect of a change of each covariate on the unconditional quantiles, which is generally of interest to empirical researchers. The unconditional quantile regression is built on the concept of influence function (IF), which is a widely used tool in robust estimation. The IF shows the influence of an individual observation on distributional statistics such as quantiles. The re-centered influence function (RIF) can be obtained by adding back the influence function to the statistic of interest. Since one feature of influence

function is that its expectation is zero, the expectation of a re-centered influence function aggregates back to the expectation of the statistic itself.

The influence function of τ's quantile, q_τ, is known to be $IF(Y, q_\tau) = \frac{\tau - I(Y \leq q_\tau)}{f_Y(q_\tau)}$. Therefore, the re-centered influence function $RIF(Y, q_\tau)$ is equal to $IF(Y, q_\tau) + q_\tau$. The conditional expectation of $RIF(Y, q_\tau)$ can be modeled as a linear function of explanatory variables. This relationship can readily be estimated by simple OLS[8]:

$$E[RIF(Y, q_\tau) \mid X] = X\beta_\tau. \tag{6}$$

By iterating expectations, it can be shown that $E_x\{E[RIF(Y, q_\tau) \mid X]\} = E[RIF(Y, q_\tau)] = E[q_\tau] = E[X]\beta_\tau$. This shows that the estimated β_τ using the formula $(X'X)^{-1}X'RIF(Y, q_\tau)$ is the marginal effect of a small change in covariates X on the unconditional quantile. The empirical recentered influence function, $\widehat{RIF}(Yi, \hat{q}_\tau)$, can be estimated as $\hat{q}_\tau + \frac{\tau - I(Yi \leq \hat{q}_\tau)}{\hat{f}_Y(\hat{q}_\tau)}$, where q_τ is the empirical quantile and $\hat{f}_Y(\hat{q}_\tau)$ can be estimated using the kernel density approach.

With the aid of unconditional quantile regression, Oaxaca-Blinder type decomposition can be performed for each quantile, not just at the mean. The saving rate gap between the two periods t_1 and t_2 at quantile q_τ can be expressed as:

$$\hat{q}_{2\tau} - \hat{q}_{1\tau} = (\overline{X}_2 - \overline{X}_1)\hat{\beta}_\tau + \overline{X}_2(\hat{\beta}_2 - \hat{\beta}_1) + \hat{R}_\tau \tag{7}$$

where Y_1 and Y_2 are the saving rates for period 1 (1995) and period 2 (2002) respectively, $q_{1\tau}$ and $q_{2\tau}$ are the τ's quantiles of the empirical saving distribution of the two periods, $\beta_{1\tau}$ and $\beta_{2\tau}$ are the RIF-OLS regression coefficients for each year at quantile τ, and $\hat{R}_\tau$ is the approximation error. I use period 1 as the base group to match the aggregate decomposition results using DFL. The first term in equation

[8]Even though more complicated methods are available, which imposes less functional form restrictions, they normally generate similar results compared to OLS according to Firpo, Fortin & Lemieux (2009)

(7) represents the "endowment effect" and the second term shows the "return effect". These two components can be further decomposed into the contribution of each of the households' characteristics to the total saving rate increase. One major advantage of this detailed decomposition method is path independence (Firpo, Fortin & Lemieux, 2009). I conduct detailed decomposition according to equation (7) for rural and urban saving rates separately, and bootstrap to obtain standard errors following Magnani & Zhu (2011).

It has been noted in the literature that the detail decomposition results depend on the choice of the omitted group in case of categorical variables (Oaxaca & Ransom, 1999). While the "endowment effects" are not affected by the choice of the reference group, the overall "return effects" of a categorical variable differ by the choice of reference group as different parts of the effects are hidden in the intercept (Fortin, Lemieux & Firpo, 2011). To deal with this invariance issue, I follow Yun (2005) to impose the constraint that the coefficient of the first category equals the average of coefficients on other categories in regressions. The decomposition results do not depend on the choice of the omitted group under this normalization procedure.

4. AGGREGATE DECOMPOSITION

To evaluate how the changes of household characteristics contribute to the changes in the saving rate over time, I estimate the counterfactual cumulative density function for rural and urban separately, using the DFL method described earlier. These counterfactuals simulate the saving rate in 1995 assuming households have identical characteristics as in 2002. The gap between the counterfactual and the true saving rate distribution in 1995 measures the proportion of saving increase that can be explained by changes in household characteristics (endowment effect). The gap

between the counterfactual distribution and true saving rate in 2002 represents the leftover part that cannot be explained by changes in household attributes (return effect).

Figure 2a shows the aggregate decomposition results for rural savings. The change in household characteristics amounts to around two thirds of the rise in the rural saving rate during this period. This proportion slightly increases when moving up to higher percentiles. At the top quintile, the endowment effect almost fully explains the increased saving in rural area.

[insert Figure 2 here, 2-column, 1 column per sub-figure]

The aggregate decomposition results for urban saving are in sharp contrast to the rural results. As illustrated in Figure 2b, only a small part of the increase in the urban saving rate results from changes in household attributes. A large unexplained proportion of the urban saving gap between 1995 and 2002 may result from the change in "returns" to these variables. Decomposition results are similar when I use an alternative definition of saving rate, $(income - consumption)/consumption$, as shown in Figure A1.

Note again that the differences in the saving changes are not likely to be driven by the increasing number of rural-urban migrant residing in cities during rapid urbanization in China. As discussed in section 2, the urban sample in the data mainly consists of permanent urban residents and rural-urban migrants are included in the rural sample along with their original households given the sampling framework of CHIP. Hence, such dramatic differences in the aggregate decomposition results suggest that the rising rural and urban household saving rates are likely to be driven by different forces.

5. DETAILED DECOMPOSITION

In order to understand which factors have more explanatory power for the rising saving rates, I further decompose the aggregate "endowment effect" and "return effect" into the contribution of each household attribute variable. This method is based on the unconditional quantile regression results, which are used to perform an Oaxaca-Blinder type decomposition across the saving rate distribution. I first report the unconditional regression results and detailed decomposition result for rural households, and then proceed to regression and decomposition results for urban saving rates. For comparison, I also report the standard OLS estimates and the standard Oaxaca-Blinder decomposition results at the mean.

5.1 Rural Household Saving Rate

5.1.1 Unconditional quantile regression results

Table 5 reports the regression results for rural households' saving rate at the 10th, 50th and 90th percentiles and at the mean. The regression coefficients are generally different between 1995 and 2002 for all quantiles and the unconditional quantile regressions provide more adequate information of the saving determinants than OLS regressions. For instance, the marginal propensity to save (MPS) at the mean decreased from 0.722 to 0.562 during this period, indicating a larger fraction of income spent on consumption in 2002. However, this shift is not homogeneous across the saving distribution. The drop is around 18.9 percentage points (pp) at the 10th percentile, 11.9 pp at the 50th percentile and 22.1 pp at the 90th percentile. This decrease of MPS is further documented in Figure 3a. Except for the lowest quintile, the drop in MPS becomes larger when moving up to higher percentiles. This pattern of change in the MPS, combined with the rising rural income shown in Table 2, helps to explain the smaller saving rate increase at the top of the saving distribution.

[insert Table 5 here, 2-column]

[insert Figure 3 here, 2-column]

Education, measured by the proportions of household members enrolled in different school levels, also has a statistically significant and heterogeneous effect on saving at different quantiles in each survey year and the change in the regression coefficients from 1995 to 2002 varies across the saving distribution. As shown in Figure 3b, 3c, and 3d, the decrease of the "return" to all educational measures occurs below the 70th percentile, which grows at low quantiles. This change is consistent with the increased tuition at all school levels over this period. As technical high school and college are the final stages of education in general, the "return" to the proportion of children in higher education mainly measures the saving depleting effect, resulting from increased tuition fees. As would be expected, the "return" to the proportion of children in higher education is negative and statistically significant at all saving quantiles in 2002, reflecting a huge tuition depleting impact on rural saving. The substantially larger negative effect at lower quantiles may due to the fact that increased tuition constituted a significantly larger fraction of the household expenditure in 2002, and households affected the most by the tuition increase (i.e. a larger negative effect of the proportion of children in higher education) moved towards the bottom of the saving distribution.

In contrast to the findings in 2002, the proportion of children in technical highs school and college had a smaller adverse impact on rural saving rate at lower quantiles in 1995. One possible explanation for this difference between 1995 and 2002 is the increased income. As shown in Figure 2a, households at the bottom of the saving distribution had large negative saving rate. These households were likely to be too poor to support their children's education using saving at the first place. In addition, financial assistance was mainly need-based. Students from these households were likely to be eligible for scholarships, loans and work-study opportunities and

the impact of tuition on their families' saving was limited. The increased income in 2002 eased the credit constraint and dis-qualified many students from receiving financial assistance, leading to a statistically significant negative impact of higher education on household saving at the lower quantiles of the distribution.

At higher quantiles, the "return" to the proportion of preschool and primary school children is positive in 2002, though the estimate is not statistically significant. Since primary school tuition is only a small fraction of rural households' budgets, the "return" to the proportion of preschool and primary school children mainly captures the precautionary saving for education. The lack of statistically significance of the estimate may due to the facts that it is too early for families with young children to save for college and that the precautionary saving incentive is relatively weak given the uncertainty in children's future educational attainment and in future tuition policies.

5.1.2 Detailed decomposition results

Based on the unconditional quantile regression results on rural saving rate, I further decompose the aggregate endowment effect and return effect into the contribution of each household characteristic. As described in section 3.2, I decompose the raw saving gap according to equation (8): $\hat{q}_{2\tau} - \hat{q}_{1\tau} = (\overline{X}_2 - \overline{X}_1)\hat{\beta}_\tau + \overline{X}2(\hat{\beta}_2 - \hat{\beta}_1) + \hat{R}_\tau$.

Table 6 shows the detailed endowment effect decomposition results for the rural saving rate. Note that the increase in income fully explains the endowment effect at the 10th, 50th and 90th percentiles of the saving distribution. Since most of the rural saving rise is due to changes in household characteristics, the rising income is the major force that drove the saving rate up in the period of 1995 to 2002.

[insert Table 6 here, 1 column]

The increased rural income is likely to be driven by the relaxation of the internal migration restriction in China and the resulting massive rural-urban temporary migration. The number of rural-urban migrants increased from 80 million in 1995 (Meng & Zhang, 2001) to 132 million in 2006 (Démurger et al., 2009). Even though these temporary rural workers mostly engage in low-skilled jobs and are often discriminated against in the urban labor market, the non-agricultural employment opportunities in cities provide an additional important source of income for migrants' original households. In the sample used in this study, 33% of rural households had at least one member working as a migrant worker in 2002. On average, income from temporary migration constituted 36% of the household income among households with migrant workers.

The detailed decomposition results for the return effect are reported in Table 7. One interesting pattern emerges when I group the three education variables together, and analyze their net contribution to saving. Even though the average impact of education at the mean is muted, the impact is heterogeneous across the saving distribution. While the depleting effect of education dominates in lower quantiles, the precautionary saving motive takes over at higher quantiles. The return effect of education helps to explain around 5.5 pp increase in the saving rate at the 90th percentile.

[insert Table 7 here, 1 column]

5.2 Urban Household Saving Rate

5.2.1 Unconditional quantile regression results

Table 8 reports the unconditional quantile regression results at the 10th, 50th and 90th percentiles of the urban saving rate and OLS results at the mean. I plot the magnitude of the return effects at each decile for a few key variables in Figure 4.

Unlike the decreased marginal propensity to save for rural households, the overall MPS increases for urban households with higher income in 2002. The increments are 2.6, 4.6 and 6.6 pp at the 10th, 50th and 90th respective percentiles. The widened MPS gap at higher quantiles is consistent with the larger urban saving rate increase at the top of the distribution, shown in Figure 1b.

[insert Table 8 here, 2-column]

[insert Figure 4 here, 2-column]

The impact of having in-school children on saving changed drastically during the studied period. On average, having more preschool or primary school children depleted urban saving in 1995, but had almost no impact on saving in 2002. This change may reflect households' responses to the increased tuition fees in this period and the resulting precautionary saving for future education offsets the depleting effect of current tuition. While the coefficients of the proportion of preschool and primary school children shift upward overall, a bigger increase occurs at higher percentiles. As shown in Figure 4c, precautionary saving for education can also be found at higher percentiles for households with children in regular middle school. These households save more to prepare for higher education even after paying the increased middle school tuition fees. The "return" to the proportion of children in technical high school, college or above is more negative in 2002, possibly due to the increased tuition for these levels of schools. In contrast with the substantially larger gap for rural households at lower quantiles shown in Figure 3d, the change in depleting effect for urban saving is relatively stable across the urban saving distribution with only a slightly larger gap at lower quantiles (Figure 4d). One possible explanation for this difference is that tuition costs for higher education accounts for a smaller portion of average urban household income. The tuition costs are paid by depleting past savings, but not by reducing current consumption. As the "return effect" of education increases the most (or decreases the least) at the top of the

distribution for all level of schools, it supports the widened urban saving rate gap at higher saving quantiles.

Home ownership status also influenced urban household saving rate differently in 1995 and 2002 as shown in Figure 4e. While home ownership had only slight and stable effect on the saving rate across the saving distribution in 1995, owning a home significantly boosted saving at lower quantiles and discouraged saving at higher percentiles in 2002. One possible explanation for such a change is the housing privatization in urban areas during the housing reform. The development of the housing market resulted in surging housing prices and increased rents. Those owning their dwellings save more than those renting at lower saving quantiles for two possible reasons: (1) they do not need to pay rent, which is counted as consumption; (2) they may have to pay back the mortgage, which is counted as saving. On the other hand, those not owning a home yet save as well to prepare for the down payment[9] required for home purchase in the future. If the precautionary saving for home purchase outweighs the current rent, those in this position save more than those owning a dwelling. This argument is consistent with the negative "return effect" of owning a home at higher quantiles.

The effect of the household head's age on the saving rate changes heterogeneously along the urban saving distribution (Figure 4f). Unlike its stable and close to zero impact on saving in 1995, the return effect is significantly larger at higher quantiles in 2002. There are two potential explanations for this significant effect of the age of household head on saving in 2002: pension reform and healthcare reform. The 1997 pension reform replaced the original pay-as-you-go system by a multi-pillar system. As argued by Feng, He & Sato (2011), this pension reform affects the replacement ratio differently for different age groups, with young workers influenced the most. They may start to save more in order to compensate for decreased re-

[9]The down payment for the first housing property in China is around 30%, which increases to 60% for the second one.

tirement benefits. Therefore, age is expected to have a negative impact on saving, which is consistent with the negative return effect found at the lower half of the distribution. On the other hand, the healthcare reform shifted the burden of health expenditure from the government to households in 1998. This shift increases precautionary saving for those having high health risk, including those with age ≥ 60 (Chamon & Prasad, 2010). This argument is consistent with the positive impact of age on saving in the upper half of the distribution.

5.2.2 Detailed decomposition results

According to the DFL aggregate decomposition results, a large portion of the urban saving rate increase cannot be explained by changes in household characteristics. The endowment effect only accounts for a small portion of the change in the urban saving rate and the rising income can almost fully explain the endowment effect. As shown in Table 9, the rising income explains 5.9 pp, 4.8 pp and 6.5 pp increases in the urban saving rate at the 10th, 50th and 90th percentiles of the saving distribution.

[insert Table 9 here, 1-column]

The detailed decomposition results for the "return effect" at the 10th, 50th, and 90th percentiles of the saving rate distribution are presented in Table 10. Housing privatization significantly contributes to the "return effect". Home ownership can explain the urban saving rise by 3.1 pp at the mean. It's contribution is larger, namely 10.4 pp, at the 10th percentile of the urban saving distribution.

[insert Table 10 here, 1-column]

Another key factor to the return effect is the age of household head. While the return effect of the age of household head does not have a significant impact on urban saving rate at the 10th and 50th percentiles, it significantly increases saving

by around 16.4 pp at the 90th percentile. The significant contribution of the return effect of household head's age on the urban saving rate is likely to result from the pension reform and the health reform in the late 1990s as discussed earlier.

The overall contribution of education to the return effect is small. According to the regression results, while the negative impact of having preschool or primary school children on urban household saving disappeared in 2002, this effect was offset by the larger saving-depleting effect of having children in higher education. The decomposition results in Table 10 show that the aggregate saving effect of education is muted at the mean, which is consistent with the findings of Chamon & Prasad (2010). Even though education is not a main contribution to urban saving at the mean, its contribution varies across the saving distribution. In particular, it increases saving by 2.7 pp at the 90th percentile.

Therefore, the increased burden of education, health, housing and post-retirement expenses can potentially explain the rising urban saving rate, especially at the top of the distribution. This result is in line with Chamon & Prasad (2010) and Feng, He & Sato (2011). Note that even after controlling for the above discussed factors, urban households still saving a larger fraction of their income with increased income during the studied period, as documented in Figure 4a. Other unmeasured factors, such as the overall uncertainty to future policies in China, may also play an important role in explaining the urban saving rise during this period

In general, the detailed decomposition results highlight the importance of increased income in explaining the rural saving rate rise. Income also plays a role in explaining the change in the urban saving rate, but the contribution is smaller. Changes in the "returns" to household characteristics, which are likely to be a result of policy changes such as education, housing, pension and health care reforms, are potential drivers of the urban saving rate increase. Again, decomposition results for both rural and urban areas are robust to the alternative saving definition, ($income -$

$consumption)/income$, as shown in Tables A1 to A4.

6. CONCLUSION

This paper compares the increased rural and urban saving rates from 1995 to 2002 across the whole saving distributions and investigates potential differences in their underlying causes. My results reveal that rural and urban households have different respective saving rate dynamics. The rural saving rate increases the most at lower quantiles, where households previously had negative saving. A significant portion of the saving rate increase can be explained by rising rural income. In addition, there is evidence to suggest that households at the higher quantiles have strong incentives to save for education as a result of increased tuition fees for higher education. Having children in school helps explain an increase of around 5.5 percentage points in the saving rate at the 90th percentile.

As opposed to rural saving, the largest increase in the urban saving rate occurs at higher percentiles. Only a small portion of the difference in savings between 1995 and 2002 can be explained by changes in household characteristics. The return effect, which is likely to be induced by policy changes such as tuition, housing, pension and healthcare reforms, explains a significant part of the saving rate increase at the top of the distribution.

This paper highlights the difference between saving rate increases of rural households and those of urban households in terms of the underlying causes driving these increases. This is particularly important in the current context in which the Chinese government is implementing a series of policies to stimulate consumption. Understanding the different underlying driving forces between rural and urban saving is the key to policy-making on this issue for contemporary China. In particular, policies need to be designed specifically for rural and urban areas.

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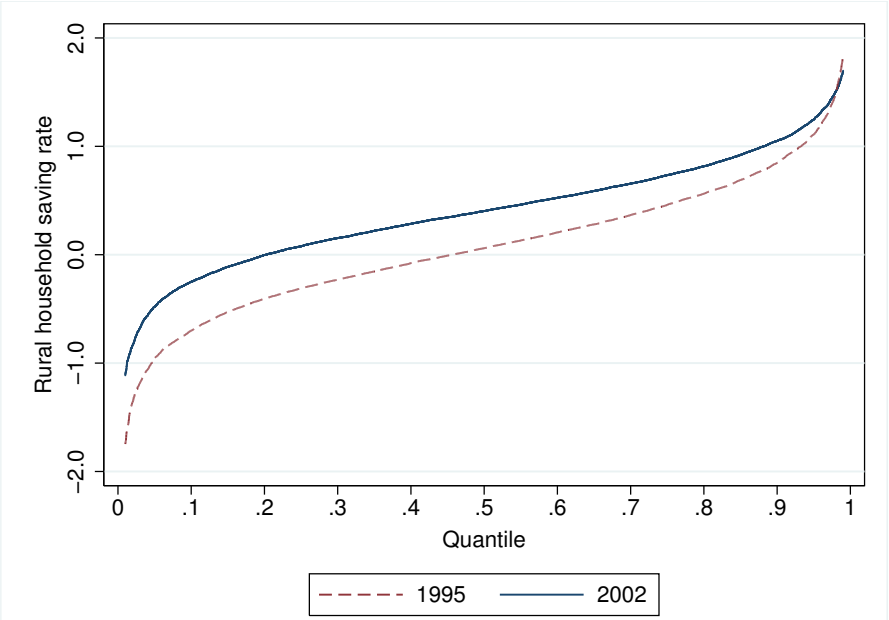
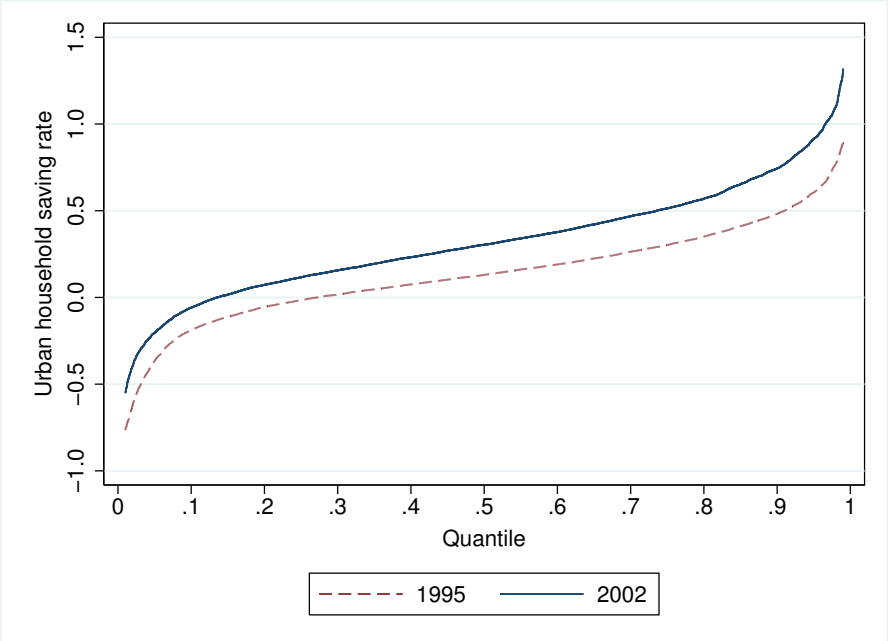
Figure 1: Distribution of Household Saving Rate

(a) Rural Saving



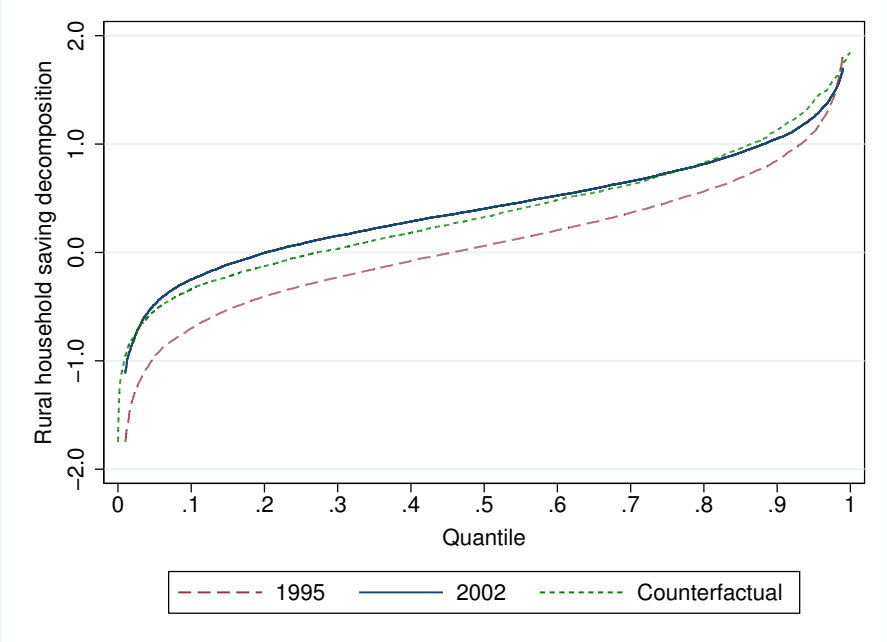
(b) Urban Saving



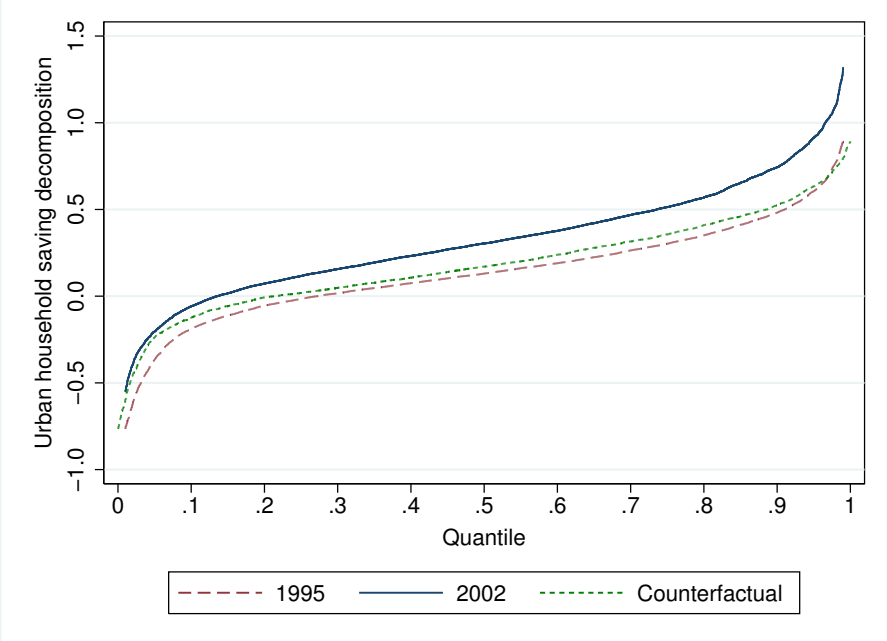
Note: Household saving rate is defined as $ln(income/consumption)$.

Figure 2: Aggregate Decomposition of Household Saving

(a) Rural Saving



(b) Urban Saving



Note: Household saving rate is defined as $ln(income/consumption)$. Counterfactuals simulate the saving rate distribution in 1995 assuming households have identical characteristics as in 2002.

Figure 3: Unconditional Quantile Regression Results for Rural Household Saving Rate

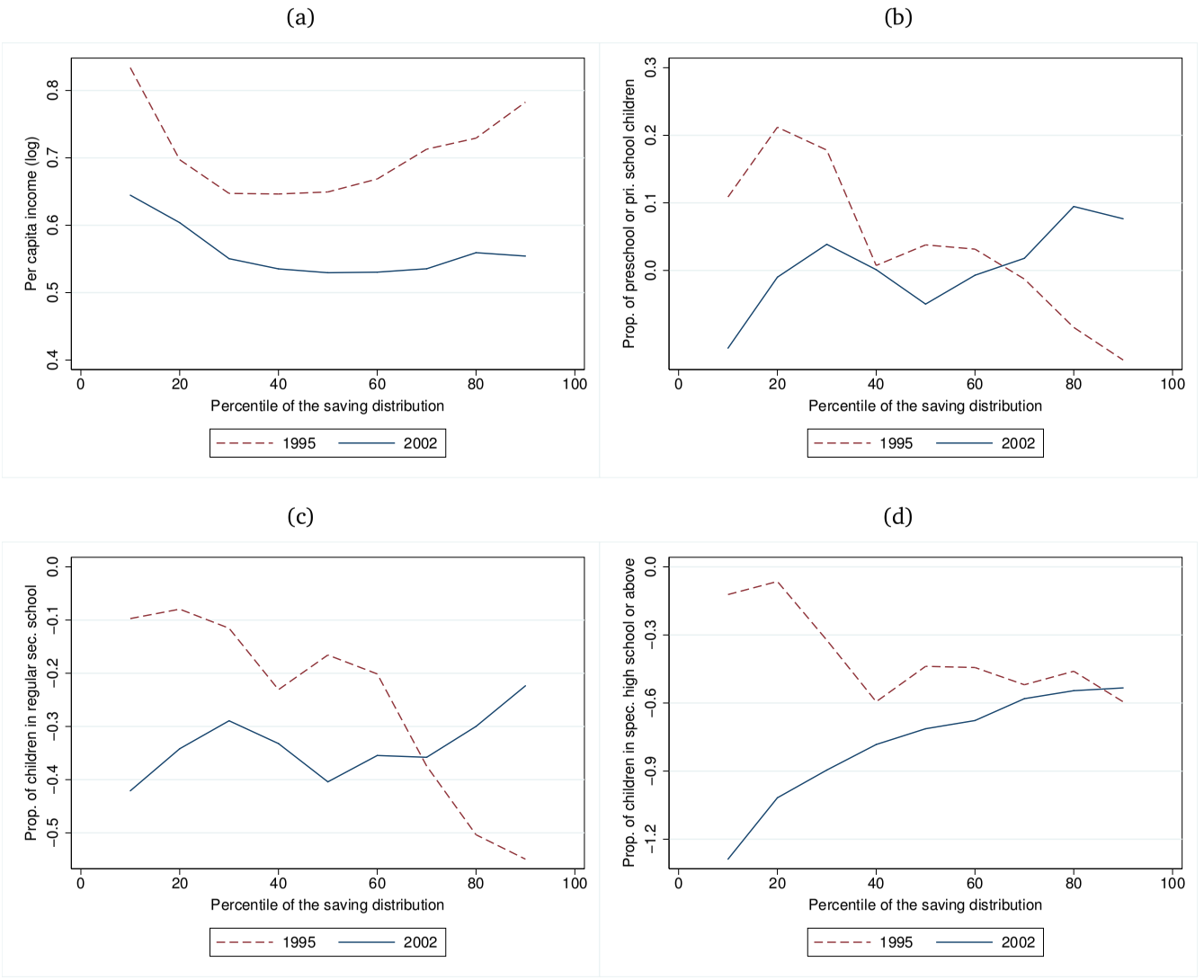


Figure 4: Unconditional Quantile Regression Results for Urban Household Saving Rate

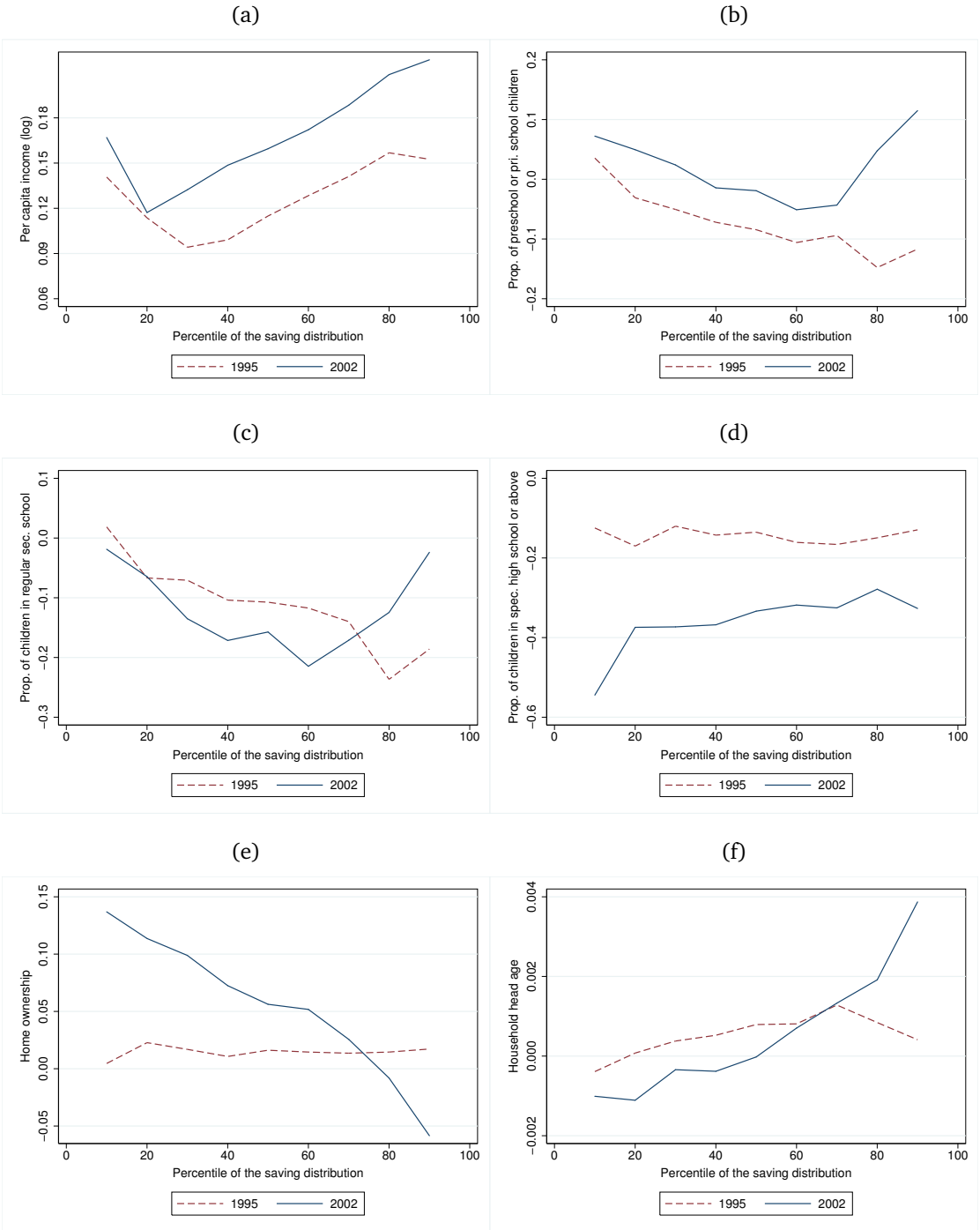


Table 1: Summary Statistics on Household Saving Rate

	Year	**Mean**	**Std. Dev.**	**Min.**	**Max.**	**N**
Rural						
	1995	0.070	0.586	-1.747	1.838	7771
	2002	0.400	0.488	-1.113	1.698	8916
Urban						
	1995	0.136	0.266	-0.765	0.892	6789
	2002	0.323	0.308	-0.548	1.317	6688

Note: Household saving rate is defined as $ln(income/consumption)$.

Table 2: Descriptive Statistics of Rural Household Characteristics

	1995 (N=7771)		2002 (N=8916)	
Variable	Mean	SD	Mean	SD
Household head gender (female=1)	0.041	0.199	0.041	0.198
Household head years of schooling	6.384	2.901	7.236	2.512
Household head age	44.095	10.496	46.391	10.315
Household head as a minority	0.068	0.252	0.124	0.329
Household head party membership	0.146	0.353	0.178	0.383
Per capita income (log)	7.307	0.701	7.731	0.647
Proportion of disabled members	0.015	0.066	0.014	0.066
Proportion of elderly members (age≥60)	0.074	0.165	0.089	0.194
Proportion of preschool or primary school children	0.196	0.204	0.128	0.169
Proportion of children in regular sec. school	0.064	0.125	0.085	0.142
Proportion of children in tech. high school or above	0.008	0.045	0.015	0.065
Proportion of unmarried members, age≤17	0.285	0.209	0.238	0.198
Proportion of unmarried members, 18≤age≤29	0.132	0.182	0.13	0.177
Proportion of unmarried male, age≤17	0.154	0.161	0.131	0.152
Proportion of unmarried male, 18≤age≤29	0.074	0.135	0.077	0.137
Household size	4.350	1.287	4.132	1.29

Table 3: Descriptive Statistics of Urban Household Characteristics

	1995 (N=6789)		2002 (N=6688)	
Variable	Mean	SD	Mean	SD
Household head gender (female=1)	0.341	0.474	0.326	0.469
Household head years of schooling	10.476	3.254	10.722	3.313
Household head age	46.039	11.505	47.883	11.126
Household head as a minority	0.04	0.197	0.039	0.193
Household head party membership	0.342	0.474	0.377	0.485
Per capita income (log)	8.319	0.524	8.744	0.595
Proportion of disabled members	0.004	0.038	0.004	0.036
Proportion of elderly members (age≥60)	0.128	0.271	0.128	0.276
Proportion of preschool or primary school children	0.119	0.161	0.087	0.144
Proportion of children in regular sec. school	0.079	0.144	0.078	0.141
Proportion of children in tech. high school or above	0.021	0.080	0.027	0.090
Proportion of unmarried members, age≤17	0.208	0.170	0.161	0.169
Proportion of unmarried members, 18≤age≤29	0.086	0.163	0.052	0.122
Proportion of unmarried male, age≤17	0.105	0.153	0.082	0.141
Proportion of unmarried male, 18≤age≤29	0.047	0.119	0.052	0.122
Household size	3.129	0.826	3.009	0.783
Home ownership	0.419	0.493	0.785	0.411

Table 4: Tuition Fees for Different School Levels

School Level	Year	Tuition	Urban hh income	Proportion of tuition to urban hh income	Rural hh income	Proportion of tuition to rural hh income
College						
	1995	896.77	18706.62	4.79%	8945.96	10.02%
	2002	3708.81	52738.48	7.03%	11737.28	31.60%
	Ratio	4.14	2.82	1.47	1.31	3.15
Specialized high school						
	1995	1001.79	18706.62	5.36%	8945.96	11.20%
	2002	1840.72	52738.48	3.49%	11737.28	15.68%
	Ratio	1.84	2.82	0.65	1.31	1.40
Regular high school						
	1995	267.20	18706.62	1.43%	8945.96	2.99%
	2002	993.43	52738.48	1.88%	11737.28	8.46%
	Ratio	3.72	2.82	1.32	1.31	2.83
Regular middle school						
	1995	79.07	18706.62	0.42%	8945.96	0.88%
	2002	163.33	52738.48	0.31%	11737.28	1.39%
	Ratio	2.07	2.82	0.73	1.31	1.57
Primary school						
	1995	41.82	18706.62	0.22%	8945.96	0.47%
	2002	94.60	52738.48	0.18%	11737.28	0.81%
	Ratio	2.26	2.82	0.80	1.31	1.72

Note: Author's calculated based on China Statistical Yearbooks and China Education Expenditure Yearbooks. Tuition fees for all school levels are measured in 1995 prices. The 9 years of compulsory education in China consists of 6 years of primary school and 3 years of regular middle school. Middle school graduates can choose either to work directly, or enroll in either specialized high school, which prepares students for working afterward, or regular high school, which leads to possible college enrollment later on.

Table 5: Unconditional Quantile Estimation for Rural Household Saving

	1995				2002			
Variables	10th	50th	90th	Mean	10th	50th	90th	Mean
Household head gender	-0.084	-0.041	0.014	-0.031	-0.084*	-0.023	-0.048	-0.043**
	(0.054)	(0.032)	(0.063)	(0.021)	(0.043)	(0.029)	(0.043)	(0.020)
Household head years of schooling	-0.003	-0.007***	-0.006	-0.007***	-0.010**	-0.006***	-0.009**	-0.008***
	(0.004)	(0.002)	(0.004)	(0.002)	(0.004)	(0.002)	(0.004)	(0.002)
Household head age	-0.002	0.000	0.001	0.000	-0.003**	-0.001*	0.003***	0.000
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Household head as a minority	0.046	0.028	0.114***	0.035*	0.043	-0.008	0.072***	0.027*
	(0.068)	(0.029)	(0.038)	(0.019)	(0.042)	(0.020)	(0.028)	(0.016)
Household head party membership	-0.041	-0.037**	-0.050	-0.034***	-0.093***	-0.056***	-0.076***	-0.071***
	(0.030)	(0.018)	(0.035)	(0.012)	(0.024)	(0.015)	(0.023)	(0.011)
Per capita income (log)	0.834***	0.649***	0.783***	0.722***	0.645***	0.530***	0.554***	0.562***
	(0.026)	(0.009)	(0.025)	(0.007)	(0.022)	(0.009)	(0.020)	(0.008)
Proportion of disabled members	-0.119	0.124	0.174	0.088	-0.145	-0.046	0.112	-0.026
	(0.191)	(0.104)	(0.175)	(0.064)	(0.161)	(0.080)	(0.118)	(0.062)
Proportion of elderly members	0.257***	0.048	0.089	0.065**	0.025	0.011	-0.021	0.006
	(0.088)	(0.045)	(0.080)	(0.030)	(0.057)	(0.033)	(0.050)	(0.024)
Proportion of preschool and primary school children	0.109	0.038	-0.133	0.038	-0.115	-0.050	0.076	0.011
	(0.118)	(0.060)	(0.107)	(0.041)	(0.094)	(0.055)	(0.085)	(0.041)
Proportion of children in regular secondary school	-0.097	-0.166**	-0.549***	-0.252***	-0.421***	-0.404***	-0.224***	-0.325***
	(0.120)	(0.065)	(0.117)	(0.044)	(0.093)	(0.054)	(0.086)	(0.040)
Proportion of children in tech. high school or above	-0.122	-0.438***	-0.595**	-0.364***	-1.288***	-0.713***	-0.533***	-0.797***
	(0.226)	(0.142)	(0.243)	(0.093)	(0.174)	(0.090)	(0.130)	(0.063)
Proportion of unmarried members, age≤17	0.425***	0.088	0.213	0.161***	0.310***	0.145**	0.091	0.166***
	(0.140)	(0.072)	(0.135)	(0.049)	(0.104)	(0.062)	(0.099)	(0.046)
Proportion of unmarried members, 18≤age≤29	0.236**	-0.023	0.036	0.070	0.133	0.159***	0.086	0.142***
	(0.118)	(0.066)	(0.125)	(0.044)	(0.093)	(0.057)	(0.092)	(0.042)
Proportion of unmarried male, age≤17	-0.125	-0.053	0.068	-0.002	0.022	-0.016	0.075	0.007
	(0.095)	(0.051)	(0.085)	(0.034)	(0.077)	(0.047)	(0.072)	(0.035)
Proportion of unmarried male, 18≤age≤29	-0.081	0.033	0.203	0.043	-0.010	-0.059	-0.063	-0.058
	(0.130)	(0.073)	(0.139)	(0.048)	(0.106)	(0.063)	(0.103)	(0.047)
Household size	0.064***	0.067***	0.092***	0.073***	0.072***	0.069***	0.069***	0.068***
	(0.010)	(0.006)	(0.010)	(0.004)	(0.009)	(0.005)	(0.008)	(0.004)
Province dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.219	0.398	0.224	0.625	0.174	0.297	0.147	0.445
# of Observations	7762	7762	7762	7762	8766	8766	8766	8766

Note: Asterisks *, ** and *** denote significant levels of 10%, 5% and 1% respectively.

Table 6: Detailed Decomposition for Rural Households: Endowment Effects

Percentile	10th	50th	90th	Mean
Endowment effects	0.282	0.245	0.310	0.261
Household head gender	0.000	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Household head years of schooling	-0.002	-0.006	-0.006	-0.006
	(0.004)	(0.002)	(0.004)	(0.001)
Household head age	-0.003	0.001	0.002	0.000
	(0.003)	(0.002)	(0.003)	(0.001)
Household head as a minority	0.003	0.002	0.006	0.002
	(0.004)	(0.002)	(0.002)	(0.001)
Household head party membership	-0.001	-0.001	-0.002	-0.001
	(0.001)	(0.001)	(0.001)	(0.000)
Per capita income (log)	0.354	0.277	0.334	0.307
	(0.019)	(0.010)	(0.018)	(0.008)
Proportion of disabled members	0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Proportion of elderly members (age≥60)	0.004	0.001	0.001	0.001
	(0.002)	(0.001)	(0.001)	(0.001)
Education	-0.010	-0.009	-0.007	-0.011
	(0.007)	(0.004)	(0.006)	(0.002)
Prop. of unmarried members, age≤17	-0.020	-0.004	-0.010	-0.007
	(0.007)	(0.003)	(0.006)	(0.002)
Prop. of unmarried members, 18≤age≤29	-0.001	0.000	-0.000	-0.000
	(0.001)	(0.000)	(0.000)	(0.000)
Prop. of unmarried male, age≤17	0.003	0.001	-0.002	0.000
	(0.002)	(0.001)	(0.002)	(0.001)
Prop. of unmarried male, 18≤age≤29	-0.000	0.000	0.001	0.000
	(0.001)	(0.000)	(0.001)	(0.000)
Household size	-0.014	-0.015	-0.020	-0.016
	(0.003)	(0.002)	(0.003)	(0.002)
Province	-0.029	-0.000	0.012	-0.008
	(0.009)	(0.007)	(0.018)	(0.006)

Note: Saving rate is defined as $ln(income/consumption)$. Bootstrapped standard errors with 500 replications are reported in parentheses.

Table 7: Detailed Decomposition for Rural Households: Return Effects

Percentile	10th	50th	90th	Mean
Return effects	0.158	0.097	-0.098	0.067
Household head gender	0.000	0.001	-0.002	-0.000
	(0.003)	(0.002)	(0.003)	(0.001)
Household head years of schooling	-0.050	0.007	-0.017	-0.005
	(0.042)	(0.025)	(0.040)	(0.018)
Household head age	-0.050	-0.069	0.117	0.009
	(0.097)	(0.052)	(0.080)	(0.036)
Household head as a minority	-0.000	-0.004	-0.006	-0.001
	(0.010)	(0.005)	(0.006)	(0.003)
Household head party membership	-0.009	-0.003	-0.004	-0.007
	(0.007)	(0.004)	(0.007)	(0.003)
Per capita income (log)	-1.460	-0.935	-1.801	-1.234
	(0.364)	(0.178)	(0.334)	(0.083)
Proportion of disabled members	-0.000	-0.002	-0.001	-0.002
	(0.003)	(0.002)	(0.003)	(0.001)
Proportion of elderly members (age≥60)	-0.020	-0.003	-0.010	-0.005
	(0.010)	(0.005)	(0.008)	(0.004)
Education	-0.074	-0.037	0.055	-0.016
	(0.031)	(0.016)	(0.029)	(0.011)
Prop. of unmarried members, age≤17	–0.027	0.014	-0.029	0.001
	(0.042)	(0.021)	(0.040)	(0.016)
Prop. of unmarried members, 18≤age≤29	-0.013	0.023	0.007	0.009
	(0.020)	(0.011)	(0.020)	(0.008)
Prop. of unmarried male, age≤17	0.019	0.004	0.001	0.001
	(0.016)	(0.009)	(0.015)	(0.006)
Prop. of unmarried male, 18≤age≤29	0.005	-0.007	-0.022	-0.008
	(0.013)	(0.008)	(0.014)	(0.006)
Household size	0.032	0.007	-0.095	-0.022
	(0.057)	(0.031)	(0.058)	(0.022)
Province	-0.022	0.002	0.015	-0.003
	(0.006)	(0.004)	(0.009)	(0.003)
Constant	1.828	1.099	1.693	1.349
	(0.400)	(0.199)	(0.354)	(0.099)

Note: Saving rate is defined as $ln(income/consumption)$. Bootstrapped standard errors with 500 replications are reported in parentheses.

Table 8: Unconditional Quantile Estimation for Urban Household Saving

	1995				2002			
Variables	10th	50th	90th	Mean	10th	50th	90th	Mean
Household head gender	0.010	-0.002	-0.032***	-0.008	-0.009	-0.008	-0.043***	-0.021***
	(0.014)	(0.008)	(0.012)	(0.007)	(0.014)	(0.009)	(0.016)	(0.008)
Household head years of schooling	-0.003*	0.001	0.004**	0.001	-0.002	-0.002	0.004	-0.001
	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)	(0.003)	(0.001)
Household head age	-0.000	0.001	0.000	0.001	-0.001	-0.000	0.004***	0.001
	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Household head as a minority	0.033	0.022	0.012	0.019	0.034	0.014	0.034	0.013
	(0.032)	(0.018)	(0.028)	(0.016)	(0.027)	(0.022)	(0.042)	(0.019)
Household head party membership	0.005	0.019**	0.012	0.015**	0.013	0.016*	0.008	0.014*
	(0.014)	(0.008)	(0.013)	(0.007)	(0.013)	(0.009)	(0.017)	(0.008)
Per capita income (log)	0.141***	0.115***	0.153***	0.135***	0.167***	0.160***	0.219***	0.174***
	(0.016)	(0.009)	(0.014)	(0.007)	(0.016)	(0.017)	(0.024)	(0.007)
Proportion of disabled members	-0.111	-0.097	-0.228**	-0.103	-0.308	-0.112	0.519**	-0.012
	(0.180)	(0.082)	(0.101)	(0.083)	(0.205)	(0.114)	(0.264)	(0.098)
Proportion of elderly members	0.012	-0.031	-0.031	-0.014	0.077***	-0.010	-0.023	0.004
	(0.035)	(0.019)	(0.034)	(0.018)	(0.029)	(0.022)	(0.046)	(0.018)
Proportion of preschool and primary school children	0.035	-0.084**	-0.117*	-0.066	0.072	-0.019	0.115	0.015
	(0.081)	(0.043)	(0.068)	(0.040)	(0.083)	(0.053)	(0.084)	(0.044)
Proportion of children in regular secondary school	0.019	-0.107***	-0.186***	-0.109***	-0.019	-0.157***	-0.024	-0.111***
	(0.075)	(0.040)	(0.064)	(0.038)	(0.072)	(0.046)	(0.075)	(0.038)
Proportion of children in tech. high school or above	-0.125	-0.135***	-0.129	-0.126***	-0.544***	-0.334***	-0.327***	-0.352***
	(0.090)	(0.048)	(0.082)	(0.045)	(0.095)	(0.050)	(0.075)	(0.043)
Proportion of unmarried members, age≤17	-0.134	0.023	-0.136*	-0.032	-0.008	-0.044	-0.152	-0.065
	(0.094)	(0.049)	(0.079)	(0.045)	(0.088)	(0.058)	(0.097)	(0.048)
Proportion of unmarried members, 18≤age≤29	-0.065	-0.020	-0.066	-0.039	0.026	-0.037	0.018	-0.016
	(0.074)	(0.041)	(0.072)	(0.037)	(0.065)	(0.046)	(0.087)	(0.038)
Proportion of unmarried male, age≤17	0.053	0.005	0.045	0.030	0.015	-0.019	-0.010	-0.010
	(0.053)	(0.027)	(0.039)	(0.025)	(0.055)	(0.037)	(0.057)	(0.031)
Proportion of unmarried male, 18≤age≤29	0.113	0.071	0.051	0.069*	0.137*	0.088*	0.010	0.053
	(0.075)	(0.043)	(0.078)	(0.040)	(0.071)	(0.046)	(0.079)	(0.039)
Household size	0.047***	0.029***	0.042***	0.036***	0.038***	0.041***	0.030**	0.037***
	(0.010)	(0.005)	(0.009)	(0.005)	(0.009)	(0.007)	(0.012)	(0.005)
Home ownership	0.005	0.016**	0.017	0.012*	0.137***	0.056***	-0.058***	0.051***
	(0.014)	(0.007)	(0.012)	(0.007)	(0.019)	(0.011)	(0.019)	(0.009)
Province dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.018	0.061	0.047	0.086	0.069	0.108	0.069	0.166
Observations	6633	6633	6633	6633	6687	6687	6687	6687

Note: Asterisks *, ** and *** denote significant levels of 10%, 5% and 1% respectively.

Table 9: Detailed Decomposition for Urban Households: Endowment Effects

Percentile	10th	50th	90th	Mean
Endowment effects	0.059	0.054	0.076	0.062
Household head gender	-0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Household head years of schooling	-0.001	0.000	0.001	0.000
	(0.001)	(0.000)	(0.001)	(0.000)
Household head age	-0.001	0.002	0.001	0.001
	(0.002)	(0.001)	(0.002)	(0.001)
Household head as a minority	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Household head party membership	0.000	0.001	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Per capita income (log)	0.059	0.048	0.065	0.057
	(0.007)	(0.004)	(0.006)	(0.004)
Proportion of disabled members	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Proportion of elderly members (age≥60)	0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Education	-0.002	0.002	0.003	0.002
	(0.003)	(0.001)	(0.002)	(0.001)
Prop. of unmarried members, age≤17	0.006	-0.001	0.006	0.002
	(0.005)	(0.002)	(0.004)	(0.002)
Prop. of unmarried members, 18≤age≤29	-0.001	-0.000	-0.001	-0.000
	(0.001)	(0.000)	(0.001)	(0.000)
Prop. of unmarried male, age≤17	-0.001	-0.000	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Prop. of unmarried male, 18≤age≤29	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Household size	-0.006	-0.003	-0.005	-0.004
	(0.001)	(0.001)	(0.001)	(0.001)
Home ownership	0.002	0.006	0.006	0.004
	(0.005)	(0.003)	(0.004)	(0.002)
Province	0.002	-0.000	-0.001	0.000
	(0.001)	(0.001)	(0.002)	(0.001)

Note: Saving rate is defined as $ln(income/consumption)$. Bootstrapped standard errors with 500 replications are reported in parentheses.

Table 10: Detailed Decomposition for Urban Households: Return Effects

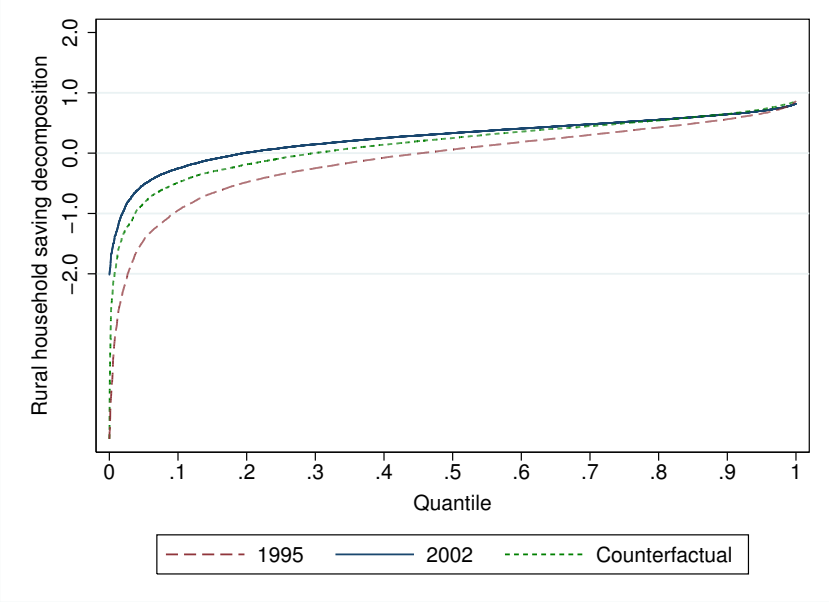
Percentile	10th	50th	90th	Mean
Return effects	0.069	0.120	0.186	0.125
Household head gender	-0.006	-0.002	-0.004	-0.004
	(0.006)	(0.004)	(0.006)	(0.003)
Household head years of schooling	0.013	-0.032	-0.001	-0.015
	(0.030)	(0.021)	(0.036)	(0.018)
Household head age	-0.034	-0.039	0.164	-0.001
	(0.064)	(0.039)	(0.074)	(0.035)
Household head as a minority	0.000	-0.000	0.001	-0.000
	(0.002)	(0.001)	(0.002)	(0.001)
Household head party membership	0.002	-0.002	-0.002	-0.000
	(0.007)	(0.004)	(0.008)	(0.004)
Per capita income (log)	0.226	0.393	0.589	0.340
	(0.211)	(0.169)	(0.263)	(0.167)
Proportion of disabled members	-0.001	0.000	0.003	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Proportion of elderly members (age$\geq$60)	0.009	0.003	0.001	0.002
	(0.006)	(0.004)	(0.008)	(0.004)
Education	-0.012	-0.004	0.027	0.001
	(0.019)	(0.011)	(0.018)	(0.009)
Prop. of unmarried members, age$\leq$17	0.019	-0.010	-0.004	-0.005
	(0.021)	(0.012)	(0.019)	(0.010)
Prop. of unmarried members, 18$\leq$age$\leq$29	0.008	-0.001	0.008	0.002
	(0.009)	(0.006)	(0.011)	(0.005)
Prop. of unmarried male, age$\leq$17	-0.003	-0.002	-0.004	-0.003
	(0.006)	(0.004)	(0.006)	(0.003)
Prop. of unmarried male, 18$\leq$age$\leq$29	0.001	0.000	-0.002	-0.001
	(0.006)	(0.003)	(0.006)	(0.003)
Household size	-0.023	0.036	-0.038	0.003
	(0.042)	(0.026)	(0.044)	(0.022)
Own a house	0.104	0.031	-0.060	0.031
	(0.018)	(0.011)	(0.018)	(0.010)
Province	0.054	0.044	0.066	0.047
	(0.017)	(0.010)	(0.017)	(0.008)
Constant	-0.287	-0.296	-0.558	-0.270
	(0.228)	(0.178)	(0.282)	(0.172)

Note: Saving rate is defined as $ln(income/consumption)$. Bootstrapped standard errors with 500 replications are reported in parentheses.

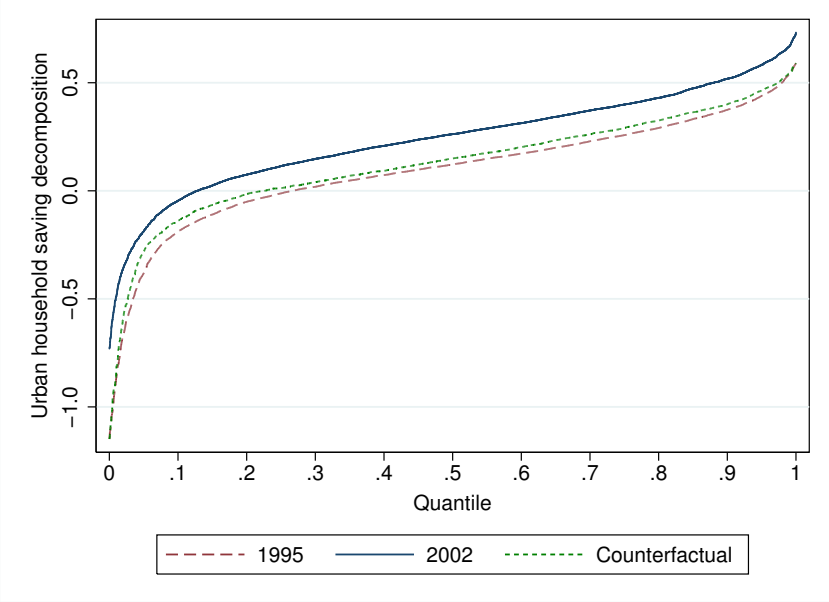
Appendix

Figure A1: Aggregate Decomposition of Household Saving: Alternative Definition

(a) Rural Saving



(b) Urban Saving



Note: Household saving rate is defined as $(income - consumption)/consumption$.

Table A1: Detailed Decomposition for Rural Households Using Alternative Saving Definition: Endowment Effects

Percentile	10th	50th	90th	Mean
Endowment effects	0.549	0.226	0.139	0.279
Household head gender	0.000	0.000	-0.000	0.000
	(0.001)	(0.000)	(0.000)	(0.000)
Household head years of schooling	-0.005	-0.006	-0.002	-0.008
	(0.008)	(0.002)	(0.002)	(0.002)
Household head age	-0.007	0.001	0.001	-0.001
	(0.007)	(0.002)	(0.001)	(0.002)
Household head as a minority	0.005	0.001	0.003	0.002
	(0.008)	(0.002)	(0.001)	(0.002)
Household head party membership	-0.003	-0.001	-0.001	-0.001
	(0.002)	(0.001)	(0.001)	(0.001)
Per capita income (log)	0.687	0.255	0.153	0.340
	(0.055)	(0.010)	(0.006)	(0.012)
Proportion of disabled members	0.000	-0.000	-0.000	-0.000
	(0.001)	(0.000)	(0.000)	(0.000)
Proportion of elderly members (age≥60)	0.007	0.001	0.001	0.002
	(0.003)	(0.001)	(0.000)	(0.001)
Education	-0.020	-0.008	-0.003	-0.013
	(0.013)	(0.003)	(0.003)	(0.003)
Proportion of unmarried members, age≥17	-0.038	-0.004	-0.004	-0.011
	(0.013)	(0.003)	(0.003)	(0.003)
Proportion of unmarried members, 18≤age≤29	-0.001	0.000	-0.000	-0.000
	(0.002)	(0.000)	(0.000)	(0.000)
Proportion of unmarried male, age≥17	0.006	0.001	-0.001	0.000
	(0.005)	(0.001)	(0.001)	(0.001)
Proportion of unmarried male, 18≤age≤29	-0.001	0.000	0.000	-0.000
	(0.001)	(0.000)	(0.000)	(0.000)
Household size	-0.028	-0.014	-0.010	-0.017
	(0.005)	(0.002)	(0.001)	(0.002)
Province	-0.055	0.001	0.003	-0.014
	(0.019)	(0.006)	(0.008)	(0.006)

Note: Saving rate is defined as $(income - consumption)/consumption$. Bootstrapped standard errors with 500 replications are reported in parentheses.

Table A2: Detailed Decomposition for Rural Households Using Alternative Saving Definition: Return Effects

Percentile	10th	50th	90th	Mean
Return effects	0.143	0.045	-0.059	0.069
Household head gender	0.003	0.001	-0.001	0.000
	(0.005)	(0.001)	(0.001)	(0.001)
Household head years of schooling	-0.046	0.018	-0.003	0.025
	(0.074)	(0.019)	(0.017)	(0.019)
Household head age	-0.002	-0.049	0.044	0.009
	(0.158)	(0.045)	(0.036)	(0.041)
Household head as a minority	-0.005	-0.004	-0.004	-0.001
	(0.018)	(0.004)	(0.003)	(0.004)
Household head party membership	-0.006	-0.001	0.000	-0.004
	(0.012)	(0.003)	(0.003)	(0.003)
Per capita income (log)	-6.513	-1.936	-1.187	-2.857
	(0.974)	(0.147)	(0.105)	(0.131)
Proportion of disabled members	0.001	-0.002	-0.001	-0.002
	(0.006)	(0.002)	(0.001)	(0.002)
Proportion of elderly members (age≥60)	-0.042	-0.004	-0.005	-0.008
	(0.017)	(0.004)	(0.004)	(0.005)
Education	-0.095	-0.020	0.024	-0.027
	(0.052)	(0.014)	(0.012)	(0.014)
Proportion of unmarried members, age≥17	-0.111	0.005	-0.012	-0.018
	(0.074)	(0.018)	(0.017)	(0.019)
Proportion of unmarried members, 18≤age≤29	-0.040	0.016	0.002	-0.004
	(0.036)	(0.010)	(0.009)	(0.009)
Proportion of unmarried male, age≥17	0.037	0.004	-0.000	0.003
	(0.028)	(0.008)	(0.006)	(0.008)
Proportion of unmarried male, 18≤age≤29	0.014	-0.005	-0.009	-0.004
	(0.023)	(0.006)	(0.006)	(0.006)
Household size	-0.144	-0.068	-0.068	-0.104
	(0.102)	(0.027)	(0.023)	(0.026)
Province	-0.028	0.004	0.006	-0.004
	(0.010)	(0.003)	(0.004)	(0.003)
Constant	7.120	2.086	1.154	3.065
	(1.008)	(0.161)	(0.119)	(0.143)

Note: Saving rate is defined as $(income - consumption)/consumption$. Bootstrapped standard errors with 500 replications are reported in parentheses.

Table A3: Detailed Decomposition for Urban Households Using Alternative Saving Definition: Endowment Effects

Percentile	10th	50th	90th	Mean
Endowment effects	0.070	0.047	0.049	0.055
Household head gender	-0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Household head years of schooling	-0.001	0.000	0.001	0.000
	(0.001)	(0.000)	(0.000)	(0.000)
Household head age	-0.001	0.001	0.001	0.001
	(0.002)	(0.001)	(0.001)	(0.001)
Household head as a minority	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Household head party membership	0.000	0.001	0.000	0.000
	(0.001)	(0.000)	(0.000)	(0.000)
Per capita income (log)	0.070	0.042	0.042	0.052
	(0.009)	(0.004)	(0.004)	(0.004)
Proportion of disabled members	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Proportion of elderly members (age≥60)	0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Education	-0.002	0.002	0.002	0.001
	(0.003)	(0.001)	(0.002)	(0.001)
Proportion of unmarried members, age≥17	0.007	-0.001	0.004	0.002
	(0.005)	(0.002)	(0.002)	(0.002)
Proportion of unmarried members, 18≤age≤29	-0.001	-0.000	-0.000	-0.000
	(0.001)	(0.000)	(0.001)	(0.000)
Proportion of unmarried male, age≥17	-0.002	-0.000	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Proportion of unmarried male, 18≤age≤29	0.001	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Household size	-0.007	-0.003	-0.003	-0.004
	(0.002)	(0.001)	(0.001)	(0.001)
Home ownership	0.002	0.005	0.004	0.003
	(0.006)	(0.002)	(0.003)	(0.002)
Province	0.003	-0.000	-0.000	0.001
	(0.002)	(0.001)	(0.001)	(0.001)

Note: Saving rate is defined as $(income - consumption)/consumption$. Bootstrapped standard errors with 500 replications are reported in parentheses.

Table A4: Detailed Decomposition for Urban Households Using Alternative Saving Definition: Return Effects

Percentile	10th	50th	90th	Mean
Return effects	0.073	0.093	0.095	0.091
Household head gender	-0.007	-0.001	-0.000	-0.003
	(0.007)	(0.003)	(0.004)	(0.003)
Household head years of schooling	0.019	-0.026	-0.007	-0.007
	(0.035)	(0.017)	(0.021)	(0.016)
Household head age	-0.033	-0.034	0.080	-0.011
	(0.073)	(0.030)	(0.039)	(0.030)
Household head as a minority	-0.000	-0.000	0.000	-0.000
	(0.002)	(0.001)	(0.001)	(0.001)
Household head party membership	0.002	-0.002	-0.001	-0.000
	(0.009)	(0.004)	(0.005)	(0.003)
Per capita income (log)	0.050	0.150	0.117	0.022
	(0.255)	(0.131)	(0.133)	(0.131)
Proportion of disabled members	-0.001	0.000	0.002	-0.000
	(0.001)	(0.000)	(0.001)	(0.000)
Proportion of old members (age$\geq$60)	0.009	0.002	0.001	0.002
	(0.007)	(0.003)	(0.004)	(0.003)
Education	-0.012	0.000	0.018	0.001
	(0.020)	(0.009)	(0.011)	(0.008)
Proportion of unmarried members, age$\geq$17	0.023	-0.008	0.001	-0.001
	(0.024)	(0.010)	(0.012)	(0.010)
Proportion of unmarried members, 18$\leq$age$\leq$29	0.010	-0.000	0.005	0.003
	(0.011)	(0.005)	(0.007)	(0.005)
Proportion of unmarried male, age$\geq$17	-0.004	-0.002	-0.003	-0.003
	(0.007)	(0.003)	(0.007)	(0.003)
Proportion of unmarried male, 18$\leq$age$\leq$29	0.000	-0.000	-0.001	-0.001
	(0.006)	(0.003)	(0.003)	(0.002)
Household size	-0.045	0.015	-0.036	-0.019
	(0.048)	(0.020)	(0.027)	(0.020)
Home ownership	0.108	0.021	-0.032	0.034
	(0.021)	(0.008)	(0.010)	(0.008)
Province	0.056	0.030	0.029	0.033
	(0.018)	(0.008)	(0.009)	(0.007)
Constant	-0.100	-0.051	-0.075	0.043
	(0.272)	(0.135)	(0.141)	(0.134)

Note: Saving rate is defined as $(income - consumption)/consumption$. Bootstrapped standard errors with 500 replications are reported in parentheses.