Do the Rich Save More?

Evidence from Japanese Microdata for the 2000s[†]

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Preliminary

Abstract

Using two household surveys for Japan, the *Family and Lifestyle Survey* (FLS) and the *Family Income and Expenditure Survey* (FIES), this paper investigates whether the saving rates of households with higher lifetime income are higher than those of households with lower lifetime income. The major difficulty in empirically answering the question is that a credible proxy for lifetime income is rarely available. We therefore construct a number of alternative proxies from the two surveys. While the estimated relationships between saving rates and lifetime income are sensitive to the choice of lifetime income measure, the patterns observed for working age households in Japan are generally consistent with those reported for Western countries: we find significant positive correlations when we use education and the type of occupation as instruments, while the positive correlations disappear when we use consumption measures as alternative instruments. In addition, an instrument that we newly introduce in this paper consisting of information on the prices households paid when purchasing certain goods and on households' asset holdings also appears to support, albeit marginally, that there is a positive relationship between saving rates and lifetime income. We further find that the saving-income relationship appears to differ depending on the life-stage of individual households. Older households with larger assets appear to be dissaving to some extent.

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1. Introduction

Do the rich, i.e., households with a higher lifetime income, save more? This is a longstanding empirical question in economics that has important implications for tax and macroeconomic policies. For instance, if, for some reason, the rich save more, we need to take into account how policy shocks are distributed across households with different wealth when we evaluate the effects of those policy shocks on aggregate consumption. In addition, it may be necessary to take measures to mitigate the regressive nature of consumption taxes when considering a higher tax rate. And when considering the case of Japan, measures to utilize the large amount of savings held by older rich households could play a role in revitalizing the economy.

While the majority of noneconomists would probably answer "yes" to the question, economists are probably less certain that the answer is necessarily "yes." Friedman's (1957) permanent income model of consumption predicts that those with a high current income save more, even if individuals' saving rate is unaffected by their lifetime income. The question was the topic of a heated and inconclusive debate in the 1950s and 1960s, but it has since received little attention, despite its important implications. Representative agent models used in macroeconomics *assume* that saving rates do not change in response to changes in total wealth.

Using microdata and econometric techniques not available to earlier generations of researchers, Dynan et al. (2004) revisit the old question to find that higher-lifetime income households in the United States save a larger fraction of their income. Studies for other countries following in their footsteps (Bozio et al., 2011, for the United Kingdom; Alan et al., 2013, for Canada) found similar evidence of a positive relationship between saving rates and various proxies for lifetime income. However, researchers have not yet reached a consensus on how to interpret these findings.

Against this background, this paper, focusing on Japan, empirically examines whether

households with higher lifetime income save a larger portion of their income than households with lower lifetime income. While household saving rates in Japan used to be the highest in the world (Hayashi, 1986; Horioka, 1990), in line with the lifecycle model they have been declining since the 1990s, given Japan's rapidly aging population. That being said, many think that older households in Japan, which continue to hold the bulk of household sector savings, are not dissaving enough, and the effective use of the savings of these households has been recognized as an important policy issue. Therefore, the topic of our study is of interest not only from an academic perspective, but also of considerable relevance for real policymaking in Japan.

The major difficulty in answering the question is that lifetime income cannot be observed and a credible proxy for lifetime income is rarely available. To deal with the problem, we use data from two household surveys for Japan, the *Family and Lifestyle Survey* (FLS) and the *Family Income and Expenditure Survey* (FIES), which contain useful information closely related to lifetime income and consumption, respectively. The FLS, which was designed by our research group to study household economic issues, provides information on subjective lifetime income, a direct measure of household lifetime earnings, as well as a wide range of household attributes vital for answering our question. The FIES, a nationally representative monthly survey, collects detailed information on household income, expenditure, asset holdings, etc. Using these two datasets, we construct a number of proxies of lifetime income, including one that is original to this study using information on the prices households paid when purchasing certain goods and on households' asset holdings. Employing these proxies, we then run median regressions of saving rates on these measures/predictors of lifetime income following the two stage estimation strategy by Dynan et al. (2004).

While the estimated relationships between saving rates and lifetime income are sensitive to the choice of lifetime income measure, the patterns observed for working age

households in Japan are generally consistent with those reported for Western countries: we find significant positive correlations when we use education and the type of occupation as our instruments, while the positive correlations disappear when we use consumption measures as alternative instruments. The results based on the proxy that is original to this study using the prices of goods households purchased and households' asset holdings appear to support, albeit marginally, that there is a positive relationship between saving rates and lifetime income. However, the saving-income relationship appears to differ depending on the life-stage of individual households. Older households with larger assets appear to be dissaving to some extent.

The paper is organized in as follows. Section 2 describes the two datasets, the FLS and the FIES, which are used for the empirical analysis in this paper. Next, Section 3 briefly explains our empirical methodology to identify the relationship between saving rates and lifetime income. Section 4 then presents the results, while Section 5 summarizes the findings and discusses their implications.

2. Data Sources

To examine the relationship between saving rates and lifetime income, we utilize two Japanese household datasets, the *Family and Lifestyle Survey* and the *Family Income and Expenditure Survey*, both of which contain unique and useful information regarding lifetime income.

Family and Lifestyle Survey (FLS)

The FLS is a registered consumer tester-based survey (conducted in December 2011 and 2012) designed by our research group to collect information on the economic activities of households

and households' basic attributes.[1] The sample consists of about 3,000 testers. While the survey is not necessarily nationally representative, the FLS questionnaire covers a wide range of household attributes such as family structure, educational background, jobs held in the past, household assets and liabilities, inheritances, etc., in addition to household annual income and expenditures. Among other things, the FLS asks survey households the following question about their expected lifetime/permanent income or their subjective lifetime income:

> Q. What do you think is the total amount of income you and your spouse will be able to earn over your lifetime? Please answer giving a rough estimate ("about X hundred million yen").
>
> Your lifetime income: About ____ hundred million yen.
> Your spouse's lifetime income: About ____ hundred million yen.
>
> For example, if you think you will work for 40 years earning about 5 million yen per year, and after retirement you will receive a pension of about 1 million yen per year for 20 years, then the answer would be about 220 million (=5 × 40 +1 × 20 million) yen.

One might expect answers to this coarse question to be rather unreliable. However, in the case of Japan, where employment tends to be quite stable and secure under the so-called "lifetime employment system," it is relatively easy for many employees to more or less accurately predict their lifetime earnings. In order to assess how reliable the subjective measure of lifetime income is, we run a simple regression to relate the *subjective lifetime income* and a variety of household attributes. The regression results reported in Table 1 indicate that the answer to the question, i.e. *subjective lifetime income*, shows a reasonably high correlation with variables related to lifetime income. That is, households that regard themselves as affluent, households with a well-educated head/spouse, and households whose head is or was a full-time employee at a large firm or a

[1] See Hori, Iwamoto, Hamaaki, and Murata (2013) and Hori, Iwamoto, Niizeki, Hamaaki, and Murata (2013) for details on the FLS and survey questionnaires.

full-time civil servant all tend to report high lifetime income.

Based on these findings, we use *subjective lifetime income* as a reliable predictor of lifetime income in our analysis below. In addition, since the estimated relationships indicate that *subjective lifetime income* is influenced by current economic conditions, which may be correlated with transitory components of income/expenditure, we also try two-stage instrumental variable (IV) regressions by regressing *subjective lifetime income* on factors that are generally fixed over the lifecycle, i.e., educational background and the longest job held, to deal with potential biases caused by temporary shocks and measurement errors.

Family Income and Expenditure Survey (FIES)

The FIES is a nationally representative monthly survey (based on the Statistics Act) that aims at providing comprehensive data on the income and expenditure of households in Japan. The survey covers about 9,000 households each month, and each household is surveyed for six months; one-sixth of the households are replaced by new households every month. As the monthly consumption data are compiled from a diary collected twice a month, the information can be assumed to be accurate and credible. While the FIES does not necessarily provide all the different types of information that we need (it does not provide information on household members' educational attainment), it does provide very detailed information on household income, expenditure, assets, and family structure for a far larger sample than the FLS.

Among the information available from the FIES microdata, we use the prices of goods that households purchased and households' asset holdings to construct the original instrument that we introduce in this study. If we assume that households that purchase more expensive items in a particular category of goods are well off, we can construct a predictor of lifetime income from information on the purchase price of goods. We collected purchase price

information (for each individual household) on 100 goods from the FIES and use a weighted average as a predictor of households' lifetime income.[2] We also construct households' net asset holdings, i.e., financial assets + real estate assets – liabilities, as our second predictor variable of lifetime income from the FIES microdata.[3] Since households' average asset holdings to a great extent depend on the age of the household head, we use age-adjusted asset holdings as a predictor of households' wealth or lifetime income. We expect this variable measuring net asset holdings to be a good predictor of lifetime income especially for older households that have retired and no longer earn labor income.

Table 2 compares the summary statistics of the two different datasets, i.e., the FLS and the FIES. The median/mean values for lifecycle income, which are available only from the FLS, indicate that the average Japanese household expects a lifetime income of about 230 million yen. As for the other variables, the basic statistics look quite similar for the two surveys, despite differences in the survey design and sample size.

3. Empirical Methodology

The objective of our study is to examine whether the saving rates of households with higher lifetime income are higher than those of households with lower lifetime income. Following Dynan et al. (2004), we assume that the relationship between saving rates and lifetime income is given by

[2] The weight is the expenditure share of each purchased good in a household's total expenditure.
[3] While the FIES provides information on households' financial assets and liabilities, it does not provide information on their real estate assets. We therefore matched information on whether households own their home as well as on the location and floor area of their home, which is available in the FIES, with land price information from the Koji-Chika (*Published Land Price Information System*) to estimate the value of individual households' real asset holdings.

$$s_{i,t} \equiv \frac{Y_{i,t} - C_{i,t}}{Y_{i,t}} = f(Y_{i,t}^{*}) + X_{i,t}\beta + \varepsilon_{i,t} \qquad (1)$$

where $Y_{i,t}$ is household i's current income in year t, $C_{i,t}$ is the household's current consumption, $Y_{i,t}^{*}$ is the household's permanent/lifetime income, and $X_{i,t}$ is a set of other determinants of saving behavior (including the age of the household head). To allow for the possibility that the saving rate, $s_{i,t}$, is nonlinear in lifetime income, we parameterize $f(\bullet)$ using a set of five dummies capturing the quintile of (lifetime) income to which each household belongs.

The key problem we face is that we cannot observe true lifetime income ($Y_{i,t}^{*}$). If we use current income as a proxy, the result will be biased upward, since either measurement errors or the smoothing of temporary income fluctuations will generate a positive relationship between saving and current income. In order to deal with this problem, earlier studies (Dynan et al., 2004; Bozio et al., 2011; Alan et al., 2013) employed a two stage estimation procedure using instruments correlated with lifetime income but uncorrelated with measurement errors and/or temporary income shocks, and we basically follow the same estimation strategy.

More specifically, we first regress income measures (age adjusted current income/subjective life income) on the instruments ($Z_{i,t}$): $Y_{i,t}^{*} = Z_{i,t}\alpha + u_{i,t}$. We then use the predicted value ($\hat{Y}_{i,t}^{*} = Z_{i,t}\alpha$) as a proxy for lifetime income and assign households to predicted lifetime income quintiles, and construct the quintile dummies. In the second stage, we estimate equation (1) using quantile (median) regression.

The key to our empirical strategy is obviously the choice of instrument/predictor for lifetime income. Instruments must be correlated with true lifetime income but not the temporary component/measurement error of current income. Given the data available in the two datasets, we try the following five instruments: (1) educational attainment and the longest job held (FLS) or the current job (FIES); (2) lagged income (FLS & FIES); (3) (nondurable) consumption (FLS

& FIES); (4) lagged consumption (FLS); and (5) information on prices households paid when purchasing certain goods and on households' net asset holdings (FIES).

The educational attainment (as well as the type of job) of household members is typically fixed over the lifecycle and therefore correlated with lifetime income and uncorrelated with transitory shocks or measurement errors. However, educational attainment (and the type of job) may also be correlated with unobserved taste variables such as "patience" that influence both saving rates and lifetime income. Alan et al. (2013) argue that instruments of this type may not be valid, since an observed correlation does not necessarily mean a causal relationship. Lagged income can mitigate the problems cause by transitory income and measurement errors, although it is not a perfect instrument when the transitory component of earnings shows some persistence. Of the instruments used here, nondurable consumption is the instrument that most closely takes the permanent income hypothesis at face value, but the estimated relationship between saving rates and (consumption-proxied) lifetime income may be biased downward, since saving rates are negatively correlated with transitory components of consumption. Lagged consumption can be expected to mitigate the bias that arises when using current consumption. Finally, purchase prices and asset holdings, information for which we obtain from the FIES, are proxies not used in previous studies that we introduce here.

4. Results

4.1 Saving Rates and Current Income

We start by simply regressing the saving rate on current income without instruments to reconfirm that saving rates are indeed positively correlated with current income. To compare the saving-income relationship for households at different life-stages, we run separate regressions

for households with heads aged 20-60 and for those with heads over 60. If households smooth consumption over their life-cycle and save money in preparation for retirement, saving behavior should differ across life-stages. Especially for older households that are already in their dissaving stage, one would expect wealthier households with larger assets to spend more (save less), since they have more funds to draw down.

Since we are interested in the slope of the saving-income relationship, we test the null hypothesis that the coefficient on the dummy of a higher quintile is equal to the coefficient on the dummy variable of a lower quintile for all consecutive quintiles. The results of median regressions are shown in Table 3. Numbers in parentheses are bootstrapped standard errors, and †††/††/† indicate that the coefficient is significantly different from that for the previous quintile on the basis of a one-sided 1/5/10 percent test. Both in the FLS and in the FIES we find a clear positive correlation between saving rates and current income for working age households. Although the levels of estimated saving rates are lower, we observe a similar positive correlation for the older households as well.

4.2 Saving Rates and Subjective Lifetime Income

Replacing current income with our subjective lifetime income measure does not change the basic findings (see Table 4), although use of the latter measure appears to make the slopes less steep. The coefficients from the linear regressions (instead of the quintile based regressions) indicate that saving rates rise by roughly 5 percentage points when the lifetime income of a household increase by 100 million yen (a million dollars). However, the observed correlation could be biased upwards, because the *subjective lifetime income* still may be influenced by current economic conditions as is suggested by the regression results in Table 1.

4.3 Results Based on a Variety of Instruments

In order to deal with the bias caused by transitory shocks to saving rates and income, we now turn to the two stage IV estimation procedure. Earlier studies for other countries suggest that the estimated relationship between saving rates and lifetime income is sensitive to the choice of instrument to proxy lifetime income. Broadly speaking, researchers found a strong positive relationship between saving rates and lifetime income when using education as an instrument. In contrast, when researchers use household expenditure-related variables as instrument, they found a less positive/fairly flat relationship. In the following subsections, we report the results based on our five different instruments in turn.

Instrument 1: Education and the longest job held

The results of the median instrumental variable regressions using educational attainment and/or job types as instruments are reported in Table 5(a). We use a combination of educational attainment and the longest job held as our instruments for regressions with the FLS data. For regressions with the FIES data, we limit our sample to worker households and use current job types as our instrument, since the FIES does not provide information on educational attainment or previous jobs.

The results for households with a working age (20-60) head indicate that saving rates are significantly higher for households with higher lifetime income, although the slope is flatter than that reported in Table 3 (without instruments). However, for the older households, the positive correlations have largely disappeared in the IV regressions that use education and/or jobs as instruments.

Instrument 2: Lagged income

When we use lagged income as our instrument (see Table 5(b)), we obtain positive correlations between saving rates and income quintiles, both in the FLS regressions and in the FIES regressions, although the estimated slopes are flatter than those without instruments. While the slopes estimated for older households are flatter than those for working age households, saving rates are still higher for households with higher lagged income.

Instrument 3: (Nondurable) Consumption

According to the life-cycle/permanent income hypothesis, consumption should be a good predictor of lifetime income. While earlier studies use nondurable consumption as an instrument, we use total consumption for the regression with the FLS data, since the FLS does not provide information on durable consumption. On the other hand, for the FIES regressions, we can use nondurable consumption.

The regression results are reported in Table 5(c). Regardless of the dataset used, we obtain a negative correlation between saving rates and lifetime income proxied by consumption. However, in light of the positive correlations obtained for most of the other instruments, it is reasonable to think that the negative correlation here is produced by the negative correlation between saving rates and temporary consumption.

Instrument 4: Lagged consumption

To eliminate the influence of the transitory component and measurement errors in consumption, we try lagged consumption as an alternative instrument (see the top half of Table 5(d). If we take the one-year lag of the total consumption instrument in the FLS regression, the correlations turn positive again, supporting our inference that the negative correlations in Table 5(c) are the result of the negative bias associated with transitory consumption.

Instrument 5: Purchase prices and net asset holdings

Finally, taking advantage of the rich information available from the FIES data, we use the predictor of lifetime income based on the information on the prices households paid when purchasing certain goods and on individual households' asset holdings. The results are reported in the bottom half of Table 5(d). While the positive relationship between saving rates and lifetime income becomes less distinct with this newly introduced instrument, for working age households saving rates nevertheless marginally increase with a rise in lifetime income and the slope is significantly different from zero. In contrast, the estimated slope for older households is negative, suggesting that older households with larger assets are dissaving, in line with the prediction of the lifecycle model as well as some earlier studies on the saving behavior of the aged in Japan (see, e.g., Horioka, 2010).

5. Conclusion

In order to empirically examine whether the rich in Japan save a higher share of their income, we regressed household saving rates on a variety of measures of lifetime income. While the estimated relationships between saving rates and lifetime income are sensitive to the choice of lifetime income measure, the patterns observed for working age households in Japan are generally consistent with those reported for Western countries: (i) we find significant positive correlations between saving rates and lifetime income when we use educational attainment, which is constant over the lifecycle, as our instrument; (ii) however, the positive correlations disappear when we use consumption measures as alternative instruments.

In earlier studies, the finding of a positive correlation when education is used as an instrument but no correlation when consumption measures are used as an instrument has given

rise to conflicting interpretations. However, if we take these results at face value, a possible explanation is as follows. The first finding probably (and at least partly) reflects the fact that there is an unobserved household characteristic such as "patience" that affects both saving rates and lifetime income. That is, "patient" individuals may tend to both save more and be more likely to go to university and get a better job. In that case, the rich save more not because they are rich, but because they place higher value on future consumption, and this preference is also reflected in the fact that they are more likely to have attended university. On the other hand, the second finding of no or even a negative correlation between saving rates and lifetime income when consumption-related instruments are used probably reflect the negative bias associated with transitory consumption. The results based on the proxies that we newly introduced in this paper, namely, the subjective lifetime income measure as well as information on purchase prices and asset holdings, appear to provide, albeit marginal, support for a positive relationship. Furthermore, we find that the saving-income relationship differs depending on the life-stage of individual households. Older households with larger assets appear to be dissaving to some extent.

To sum up, our results suggests that, in the case of Japan, for working age households there is indeed a positive relationship between saving rates and lifetime income. However, the extent of this relationship appears to be overestimated when using current income to gauge it. At the same time, it is difficult to prove that the rich save more because they are rich. (That is, it is possible that households that have certain characteristics that lead them to become rich also tend to like savings.) Economists, in their professional capacity, often refuse to recognize a relationship unless there is a clear-cut causal structure underlying such a relationship. However, in the case of our question here, the fact that the rich save more appears to have important implications for tax and macroeconomic policies, as mentioned in the introduction of this paper,

whatever the reasons are.

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Table 1. Regression of *subjective lifetime income* on possible determining factors

Dep. var.: Household lifetime income (in log)	Coef.		Std. Err.	Coef.		Std. Err.
	(1)			(2)		
Annual income (in log)	0.258	***	(0.016)			
Economic affluence evaluation dummy (Base=Normal)						
Very affluent	0.128		(0.135)			
Affluent	0.208	***	(0.042)			
Slightly affluent	0.139	***	(0.023)			
Slightly poor	-0.125	***	(0.024)			
Poor	-0.163	***	(0.041)			
Very poor	-0.187	*	(0.098)			
Household head occupation dummy (Base: Full-time, 1,000 employees or more)						
Housewife/Househusband	-0.495	***	(0.063)	-0.685	***	(0.065)
Self-employed	-0.103	***	(0.032)	-0.212	***	(0.034)
Business manager	-0.023		(0.061)	0.047		(0.066)
Full-time, civil service	-0.052	*	(0.028)	-0.085	***	(0.031)
Part-time worker	-0.367	***	(0.046)	-0.589	***	(0.047)
Full-time, 29 or fewer employees	-0.150	***	(0.033)	-0.296	***	(0.035)
Full-time, 30-449 employees	-0.114	***	(0.024)	-0.185	***	(0.026)
Full-time, 500-999 employees	-0.095	***	(0.035)	-0.123	***	(0.038)
Other	-0.107	***	(0.041)	-0.250	***	(0.042)
Spouse occupation dummy (Base: Housewife/Husehusband)						
Single (No spouse)	-0.146	***	(0.038)	-0.197	***	(0.037)
Part-time worker	0.008		(0.028)	-0.014		(0.030)
Full-time worker	0.089	***	(0.020)	0.094	***	(0.021)
Household head educational attainment dummy (Base: High school or less)						
Junior college	0.062	**	(0.027)	0.108	***	(0.029)
University	0.120	***	(0.022)	0.206	***	(0.023)
Graduate school	0.227	***	(0.039)	0.346	***	(0.042)
Spouse educational attainment dummy (Base: Single (no spouse))						
High school or less	0.210	***	(0.033)	0.257	***	(0.030)
Junior college	0.155	***	(0.035)	0.252	***	(0.033)
University	0.198	***	(0.038)	0.318	***	(0.037)
Graduate school	0.282	***	(0.086)	0.448	***	(0.094)
Engel's coefficient quintile dummy(Base: Quintile III)						
Q I : High	-0.076	***	(0.023)			
Q II	-0.003		(0.027)			
Q IV	-0.014		(0.028)			
Q V: Low	0.032		(0.029)			
Number of obs.	2,672			2,986		
Adj. R-squared	0.433			0.297		
Root MSE	0.422			0.481		

Notes: Coefficients are estimated using OLS. Standard errors are shown in parentheses.
***/**/* indicate significance at the 1/5/10% level, respectively.

Table 2. Summary Statistics: Saving, Income, Assets, etc.

2(a) ***Family and Life-style Survey, 2011, 2012***

	All Sample Households				60 or less				61 or more			
	Obs.	Median	Mean	Std. Dev.	Obs.	Median	Mean	Std. Dev.	Obs.	Median	Mean	Std. Dev.
Saving ratio	1,870	0.143	0.119	0.462	1,268	0.157	0.159	0.249	602	0.100	0.036	0.723
Disposable income	1,870	476	520	323	1,268	500	560	336	602	380	436	273
Consumption	1,870	360	392	179	1,268	400	413	186	602	350	349	155
Net assets	1,798	1,460	2,493	3,895	1,214	800	1,609	3,346	584	3,233	4,332	4,295
Financial assets	1,852	500	1,237	1,933	1,256	400	871	1,608	596	1,200	2,007	2,303
Real assets	1,820	1,355	1,952	3,008	1,227	1,000	1,645	2,930	593	1,750	2,587	3,071
Debts	1,847	0	704	1,549	1,251	175	915	1,734	596	0	260	916
Lifecycle income	1,768	18,000	18,687	7,784	1,188	17,500	18,520	7,563	580	18,583	19,030	8,213
Lifecycle income - female	1,707	5,000	6,819	5,593	1,124	5,667	7,356	5,827	583	4,333	5,785	4,955
Lifecycle income - male	1,867	22,667	23,931	10,264	1,268	22,500	23,872	10,387	599	23,000	24,056	10,007
Household head age	1,870	50.00	51.50	14.03	1,268	43.00	43.62	9.23	602	67.00	68.11	5.07
Number of family members	1,870	2.00	2.46	1.17	1,268	3.00	2.70	1.32	602	2.00	1.95	0.40

2(b) ***Family Income and Expenditure Survey, from 2002-2012***

	All Sample Households				60 or less				61 or more			
	Obs.	Median	Mean	Std. Dev.	Obs.	Median	Mean	Std. Dev.	Obs.	Median	Mean	Std. Dev.
Saving ratio	101,349	0.173	-0.115	20.294	62,392	0.255	0.051	22.675	38,957	-0.004	-0.380	15.743
Disposable income	101,349	470	525	292	62,392	589	621	300	38,957	352	371	196
Consumption	101,349	396	440	210	62,392	425	469	218	38,957	357	393	186
Net assets	101,349	2,133	2,925	3,282	62,392	1,330	2,071	2,697	38,957	3,485	4,293	3,651
Financial assets	101,349	920	1,569	1,986	62,392	672	1,134	1,476	38,957	1,551	2,265	2,446
Real assets	101,349	1,454	1,792	2,052	62,392	1,295	1,587	1,936	38,957	1,635	2,121	2,186
Debts	101,349	0	436	945	62,392	20	650	1,086	38,957	0	93	495
Household head age	101,349	55.00	54.64	15.01	62,392	45.00	44.81	9.38	38,957	70.00	70.38	6.57
Number of family members	101,349	3.00	3.09	1.13	62,392	4.00	3.49	1.10	38,957	2.00	2.43	0.81

Table 3. Median Regressions of Saving Rate on Current Income Quintiles

	Households with head aged from 20 to 60			Households with head aged over 60		
Family and Lifestyle Survey , 2010, 2011						
Quintile 1	0.0000		(0.0190)	-0.0861	***	(0.0331)
Quintile 2	0.0667	*** ††	(0.0241)	0.0043	†††	(0.0243)
Quintile 3	0.1333	*** ††	(0.0186)	0.0700	** ††	(0.0277)
Quintile 4	0.1974	*** †††	(0.0193)	0.1425	*** ††	(0.0236)
Quintile 5	0.3000	*** †††	(0.0188)	0.2555	*** †††	(0.0328)
Sample size	1,268			602		
Pseudo R2	0.1025			0.0996		
Coefficient on income	0.00030	***	(0.00003)	0.00040	***	(0.00005)
Family Income and Expenditure Survey , 2002-2012						
Quintile 1	0.0125	** †††	(0.0054)	-0.6597	*** †††	(0.0138)
Quintile 2	0.2200	*** †††	(0.0045)	-0.0908	*** †††	(0.0101)
Quintile 3	0.2970	*** †††	(0.0039)	0.0456	*** †††	(0.0088)
Quintile 4	0.3435	*** †††	(0.0040)	0.1295	*** †††	(0.0084)
Quintile 5	0.4104	*** †††	(0.0049)	0.2201	*** †††	(0.0084)
Sample size	62,392			38,957		
Pseudo R2	0.0503			0.0676		
Coefficient on income/10000	0.00043	***	(0.00001)	0.0013	***	(0.00002)

Notes: Coefficients are from median regressions. Control dummies, including one for household head age, are also included in the regressions.
Bootstrapped standard errors are shown in parentheses. ***/**/* indicate significance at the 1/5/10% level, respectively.
†††/††/† indicate that the coefficient is significantly greater than that for the previous quintile on the basis of a one-sided 1/5/10% test.

Table 4. Median Regressions of Saving Rate on Subjective Lifetime Income Quintiles

Family and Lifestyle Survey , 2010, 2011

	Households with head aged from 20 to 60			Households with head aged over 60		
Subjective lifetime income						
Quintile 1	0.0333		(0.0356)	0.0000		(0.0226)
Quintile 2	0.0375	*	(0.0209)	0.0450		(0.0370)
Quintile 3	0.1159	*** †††	(0.0181)	0.0972	***	(0.0322)
Quintile 4	0.1300	***	(0.0162)	0.1000	***	(0.0245)
Quintile 5	0.2250	*** †††	(0.0168)	0.1566	***	(0.0443)
Sample size	1268			602		
Pseudo R2	0.0484			0.0153		
Coefficient on income/100000000	0.0655	***	(0.0077)	0.0539	***	(0.0110)

Notes: Coefficients are from median regressions. Control dummies including that for household head age are also included in regressions.
Bootstrapped standard errors are shown in parentheses. ***/**/* indicate significance at the 1/5/10% level, respectively.
†††/††/† indicate that the coefficient is significantly greater than that for the previous quintile on the basis of a one-sided 1/5/10% test.

Table 5(a). Median Instrumental Variable Regressions of Saving Rate on Income Quintiles

	Current Income				Subjective Lifetime Income			
	Households with head aged 20 to 60		Households with head aged over 60		Households with head aged 20 to 60		Households with head aged over 60	
Family and Lifestyle Survey								
Inst1: Education & Job type								
Quintile 1	0.0786 ***	(0.0231)	0.0483	(0.0303)	0.1111 ***	(0.0213)	0.0383	(0.0305)
Quintile 2	0.1261 ***	(0.0253)	0.0667	(0.0478)	0.1111 ***	(0.0436)	0.1000 *	(0.0584)
Quintile 3	0.1342 ***	(0.0179)	0.0909 ***	(0.0223)	0.0944 ***	(0.0208)	0.0667 ***	(0.0237)
Quintile 4	0.1397 ***	(0.0203)	0.0889 ***	(0.0321)	0.1230 ***	(0.0182)	0.1000 ***	(0.0202)
Quintile 5	0.2000 *** †††	(0.0235)	0.0822 **	(0.0392)	0.2092 *** †††	(0.0208)	0.0933 ***	(0.0357)
Sample size	1268		602		1268		602	
Pseudo R2	0.0218		0.0026		0.0198		0.0056	
Coefficient on income	0.00029 ***	(0.00005)	0.00011	(0.00010)	0.0582 ***	(0.0161)	0.0269	(0.0221)
Family Income and Expenditure Survey								
Inst1: Job type (Workers' households only)								
Quintile 1	-0.0432	(0.0561)	0.1570 ***	(0.0535)				
Quintile 2	0.2078 *** †††	(0.0067)	0.2179 ***	(0.0329)				
Quintile 3	0.2569 *** †††	(0.0073)	0.2250 ***	(0.0328)				
Quintile 4	0.2691 *** †	(0.0078)	0.1866 ***	(0.0374)				
Quintile 5	0.3150 *** †††	(0.0063)	0.1584 ***	(0.0344)				
Sample size	28,581		3,650					
Pseudo R2	0.0169		0.0073					
Coefficient on income	0.00053 ***	(0.00002)	-0.00015	(0.00013)				

Notes: See notes for Table 3.

Table 5(b). Median Instrumental Variable Regressions of Saving Rate on Income Quintiles

	Current Income				Subjective Lifetime Income			
	Households with head aged 20 to 60		Households with head aged over 60		Households with head aged 20 to 60		Households with head aged over 60	
Family and Lifestyle Survey								
Inst2: Lagged Income								
Quintile 1	0.0000	(0.0125)	-0.0289	(0.0307)	0.0000	(0.0127)	-0.0208	(0.0369)
Quintile 2	0.0714 *** †††	(0.0206)	0.0411 †	(0.0311)	0.0684 ***	(0.0203)	0.0003	(0.0303)
Quintile 3	0.1429 *** †††	(0.0149)	0.0426 *	(0.0250)	0.1500 ***	(0.0171)	0.0292	(0.0293)
Quintile 4	0.1714 ***	(0.0166)	0.0961 **	(0.0407)	0.1518 ***	(0.0229)	0.0653 **	(0.0315)
Quintile 5	0.2500 *** †††	(0.0184)	0.1933 *** ††	(0.0328)	0.2500 ***	(0.0200)	0.1942 *** †††	(0.0304)
Sample size	1268		602		1268		602	
Pseudo R2	0.0763		0.0367		0.0714		0.0346	
Coefficient on income	0.00035 ***	(0.00002)	0.00031 ***	(0.00004)	0.1910 ***	(0.00000)	0.1420 ***	(0.00000)
Family Income and Expenditure Survey								
Inst2: Lagged Income								
Quintile 1	0.1405 ***	(0.0052)	0.0001	(0.0097)				
Quintile 2	0.2376 *** †††	(0.0047)	0.0175 * ††	(0.0094)				
Quintile 3	0.2875 *** †††	(0.0042)	0.0432 *** †††	(0.0101)				
Quintile 4	0.3231 *** †††	(0.0044)	0.0701 *** †††	(0.0112)				
Quintile 5	0.3767 *** †††	(0.0048)	0.1432 *** †††	(0.0114)				
Sample size	62,392		38,957					
Pseudo R2	0.0220		0.0046					
Coefficient on income	0.00096 ***	(0.00002)	0.00101 ***	(0.00006)				

Notes: See notes for Table 3.

Table 5(c). Median Instrumental Variable Regressions of Saving Rate on Income Quintiles

	Current Income		Subjective Lifetime Income	
	Households with head aged 20 to 60	Households with head aged over 60	Households with head aged 20 to 60	Households with head aged over 60
Family and Lifestyle Survey				
Inst3: Consumption				
Quintile 1	0.1860 *** (0.0213)	0.0991 *** (0.0377)	0.1633 *** (0.0222)	0.0824 ** (0.0355)
Quintile 2	0.1500 *** (0.0221)	0.1000 *** (0.0341)	0.1500 *** (0.0179)	0.0391 (0.0322)
Quintile 3	0.1377 *** (0.0141)	0.1033 *** (0.0363)	0.1389 *** (0.0221)	0.1109 *** † (0.0295)
Quintile 4	0.0833 *** ††† (0.0206)	0.0533 ** (0.0244)	0.1031 *** † (0.0227)	0.0889 *** (0.0346)
Quintile 5	0.0862 *** (0.0192)	0.0833 *** (0.0220)	0.1000 *** (0.0200)	0.0724 *** (0.0215)
Sample size	1268	602	1268	602
Pseudo R2	0.0203	0.0034	0.0100	0.0055
Coefficient on income	-0.00015 *** (0.00004)	-0.00002 (0.00007)	-0.0373 ** (0.0182)	0.0007 (0.0187)
Family Income and Expenditure Survey				
Inst3: Nondurable consumption				
Quintile 1	0.3457 *** (0.0051)	0.2343 *** (0.0094)		
Quintile 2	0.3352 *** †† (0.0039)	0.1332 *** ††† (0.0089)		
Quintile 3	0.3049 *** ††† (0.0039)	0.0569 *** ††† (0.0089)		
Quintile 4	0.2729 *** ††† (0.0037)	-0.0268 *** ††† (0.0090)		
Quintile 5	0.1896 *** ††† (0.0044)	-0.2580 *** ††† (0.0114)		
Sample size	62,392	38957		
Pseudo R2	0.0148	0.0281		
Coefficient on income	-0.00047 *** (0.00001)	-0.00210 *** (0.00000)		

Notes: See notes for Table 3.

Table 5(d). Median Instrumental Variable Regressions of Saving Rate on Income Quintiles

	Current Income		Subjective Lifetime Income	
	Households with head aged 20 to 60	Households with head aged over 60	Households with head aged 20 to 60	Households with head aged over 60
Family and Lifestyle Survey				
Inst4: Lagged consumption				
Quintile 1	0.0222 (0.0271)	-0.0054 (0.0403)	0.0278 (0.0217)	0.0000 (0.0365)
Quintile 2	0.1351 *** ††† (0.0189)	0.0589 * (0.0346)	0.1425 *** ††† (0.0207)	0.0292 (0.0353)
Quintile 3	0.1429 *** (0.0183)	0.0700 ** (0.0343)	0.1429 *** (0.0195)	0.0500 (0.0304)
Quintile 4	0.1389 *** (0.0230)	0.0839 *** (0.0288)	0.1429 *** (0.0199)	0.0889 *** (0.0262)
Quintile 5	0.1779 *** † (0.0171)	0.1200 *** (0.0292)	0.1825 *** † (0.0177)	0.1417 *** (0.0282)
Sample size	1268	620	1268	602
Pseudo R2	0.0208	0.0118	0.0237	0.0164
Coefficient on income	0.00021 *** (0.00004)	0.00022 *** (0.00008)	0.0839 *** (0.0192)	0.0683 * (0.0382)
Family Income and Expenditure Survey				
Inst5: Purchase prices and assets				
Quintile 1	0.2638 *** (0.0052)	0.1170 *** (0.0098)		
Quintile 2	0.2817 *** ††† (0.0056)	0.0875 *** ††† (0.0093)		
Quintile 3	0.2916 *** ††† (0.0051)	0.0575 *** ††† (0.0089)		
Quintile 4	0.2953 *** (0.0057)	0.0045 ††† (0.0087)		
Quintile 5	0.2942 *** (0.0056)	-0.0706 *** ††† (0.0111)		
Sample size	62,392	38,957		
Pseudo R2	0.0067	0.0068		
Coefficient on income	0.00011 *** (0.00001)	-0.0012 *** (0.00005)		

Notes: See notes for Table 3.