Do the rich save more?

Evidence from Japanese Micro Data for the 2000s

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Preliminary

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.

If, for some reasons, 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 on aggregate consumption of those policy shocks.

it is necessary to take measures to mitigate the regressive nature of consumption taxes when considering a higher tax rate.

measures to utilize the large amount of savings held by older households might help to revitalize Japan's economy.

1. Introduction (cont.)

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. Despite the important implications of the question, it has since received little attention.

Representative agent models used in macroeconomics *assume* that saving rates do not change in response to changes in total wealth.

1. Introduction (cont.)

Using microdata and econometric techniques not available to earlier generations of researchers, Dynan, Skinner, and Zeldes (2004) revisit the old question to find that higher-lifetime income households in the US save a larger fraction of their income.

Studies for other countries following in their footsteps (Bozio et al., 2011, for the UK; 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.

1. Introduction (cont.)

While household saving rates in Japan used to be the highest in the world (Hayashi, 1986; Horioka, 1990), they have been declining since the 1990s, in line with the lifecycle model, 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.

2. Data Sources

To address these issues, we utilize two micro dataset on Japanese households.

* *Family and Lifestyle Survey* (FLS)

A registered consumer tester-based repeat survey (conducted in 2011 and 2012) designed (by our research group) to collect information on the economic activities of households and households' basic attributes. The sample consists of about 3,000 testers.

* *Family Income and Expenditure Survey* (FIES)

A nationally representative monthly survey (based on the Statistics Act) that aims at providing comprehensive data on income and expenditure of households in Japan.

The survey covers about 9,000 households in each month, and each household is surveyed for six months; one-sixth of the households are replaced by new households every month.

2. Data Sources (cont.)

Family and Lifestyle Survey (FLS)

While the survey design is not necessarily nationally representative, the FLS questionnaire covers a wide range of household attributes (in addition to household annual income and expenditures) that are vital to answering the question: do the rich save more?

E.g.: family structure, educational background, jobs held in the past, household assets and liabilities, inheritances, etc.

Among other things, the FLS asks survey households about their expected lifetime/permanent income, i.e., their *subjective lifetime income*.

2. Data Sources (cont.)

Family and Lifestyle Survey (FLS) (cont.)

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.

2. Data Sources (cont.)

Family and Lifestyle Survey (FLS) (cont.)

Answers to this coarse question may appear unreliable. However, a simple regression to relate the *subjective lifetime income* and a variety of household attributes indicates that the answers are quite reasonable.

Subjective lifetime income is larger for

a) households that are currently well-to-do

b) households with a highly educated head/spouse

c) households whose head is/was a full-time employee at a large firm/full-time civil servant

d) ……

The estimated relationships indicate that the answer to the lifetime income question is basically determined by factors that are generally fixed over the life cycle, while it is also influenced by current economic conditions.

2. Data Sources (cont.)

Family and Lifestyle Survey (FLS) (cont.)

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/Househusband)						
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)
Number of obs.	2,672			2,986		
Adj. R-squared	0.433			0.297		
Root MSE	0.422			0.481		

2. Data Sources (cont.)

Family Income and Expenditure Survey (FIES)

While the FIES is nationally representative, it does not necessarily provide the kind of information we need.

E.g., it does not provide information on households' educational background.

However, it does provide detailed information on household income, expenditure, assets, and family structure for a larger sample than the FLS.

As the data are compiled from diaries collected twice a month, the information can be assumed to be accurate and credible.

2. Data Sources (cont.)

Family Income and Expenditure Survey (FIES) (cont.)

Among the information available from the FIES microdata, we use the information on the prices of goods that households purchased.

If we assume that households that purchase expensive items in a particular category of goods are rich, 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 constructed a predictor (of households' lifetime income) as their weighted average.

2. Data Sources (cont.)

Summary statistics for the two datasets:

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

	Family and Lifestyle Survey, 2010, 2011				*Family Income and Expenditure Survey*, 2002-2012			
	Obs.	Median	Mean	Std. Dev.	Obs.	Median	Mean	Std. Dev.
Saving ratio	1,870	0.143	0.119	0.462	101,349	0.173	-0.115	20.294
Disposable income	1,870	476	520	323	101,349	470	525	292
Consumption	1,870	360	392	179	101,349	396	440	210
Net assets	1,798	1,460	2,493	3,895	101,349	2,133	2,925	3,282
Financial assets	1,852	500	1,237	1,933	101,349	920	1,569	1,986
Real assets	1,820	1,355	1,952	3,008	101,349	1,454	1,792	2,052
Debts	1,847	0	704	1,549	101,349	0	436	945
Lifecycle income	1,768	18,000	18,687	7,784				
Lifecycle income - male	1,707	5,000	6,819	5,593				
Lifecycle income - female	1,867	22,667	23,931	10,264				
Household head age	1,870	50.00	51.50	14.03	101,349	55.00	54.64	15.01
Number of family members	1,870	2.00	2.46	1.17	101,349	3.00	3.09	1.13

Despite differences in the survey design and sample size, the basic statistics look quite similar for the two surveys.

3. Empirical Methodology

In our analysis, we basically follow Dynan et al. (2004). The final goal is to estimate the relationship between saving rates and permanent/lifetime income, i.e.:

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

where Y^* is permanent/lifetime income and X is a set of other determinants of saving behavior (including age).

To allow for nonlinearities in the relationship, we parameterize *f()* using a set of five dummies capturing the quintiles of lifetime income to which each household belongs.

3. Empirical Methodology (cont.)

The key problem we face is that we cannot observe true lifetime income (Y^*).

If we use current income as a proxy, there is an upward bias 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 employed a two stage estimation procedure using instruments correlated with lifetime income but uncorrelated with measurement errors and/or temporary income shocks.

We basically follow the same estimation strategy.

3. Empirical Methodology (cont.)

Specifically, we first regress income measures (age adjusted current income/subjective lifetime 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 regression.

3. Empirical Methodology (cont.)

The key to our empirical strategy is obviously the choice of instruments for lifetime income.

Instruments must be correlated with true lifetime income, but not with the temporary components/measurement error of current income.

Considering data availability from the two datasets, we consider the following five instruments:

1) educational background and the longest job held (FLS)
   or current job/occupation (FIES)
2) lagged income (FLS & FIES)
3) (nondurable) consumption (FLS & FIES)
4) lagged consumption (FLS)
5) information on the prices households paid when purchasing certain goods as well as on asset holdings of individual households (FIES)

3. Empirical Methodology (cont.)

1) Educational background, longest job held

These instruments are fixed over the lifecycle and are therefore correlated with lifetime income and uncorrelated with transitory shocks or measurement errors. However, they may also be correlated with unobserved taste variables that influence savings.

2) Lagged income

Lagged income can mitigate the problems caused by transitory income and measurement errors, although the transitory component of earnings may show some persistence.

3) (Nondurable) consumption

Transitory consumption will bias the estimated relationship between saving rates and permanent income towards negative values.

4) Lagged consumption

Lagged consumption can mitigate the problem above.

5) Purchase price information, asset holding information

Original instruments. Asset holdings may be a good proxy especially in the case of older households.

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.

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 can observe a similar positive correlation for the older households.

4. Results (cont.)

4.1 Saving Rates and Current Income

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.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.

4. Results (cont.)

4.2 Saving Rates and Subjective Lifetime Income

Replacing current income with our subjective lifetime income measure does not change the basic findings, although use of the latter measure appears to make the slopes less steep.

Coefficients from the linear regressions indicate that saving rates rise roughly by 5 percentage points when the lifetime income of a household increase by 100 million yen (a million dollars).

However, the correlation may still be biased upwards, because the subjective measure might also depend on the current situation.

4. Results (cont.)

4.2 Saving Rates and Subjective Lifetime Income

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.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.

4. Results (cont.)

4.3 Results Based on a Variety of Instruments

Earlier studies for other countries suggest that the estimated relationship between saving rates and long-run income is sensitive to the choice of instruments to proxy lifetime income. Broadly speaking,

- researchers found a strong positive relationship between saving rates and long-run income when using education as an instrument.

- in contrast, when researchers use household expenditure-related variables as instruments, they found a less positive/fairly flat relationship.

4. Results (cont.)

4.3 Results Based on a Variety of Instruments

Instrument 1: Education and the longest job held

We use a combination of educational attainment and the longest job held as our instruments for the FLS regressions.

Since the FIES does not provide information on educational attainment or previous jobs, we limit our sample to worker households and use current job types as our instrument.

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, the positive correlation for the older households largely disappears in the regressions using education & jobs as instruments.

4. Results (cont.)

4.3 Results Based on a Variety of Instruments (cont.)

Table 5-1. 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)				

4. Results (cont.)

4.3 Results Based on a Variety of Instruments (cont.)

Instrument 2: Lagged income

When we use lagged income as our instrument, 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 significantly higher for households with higher lagged income.

4. Results (cont.)

4.3 Results Based on a Variety of Instruments (cont.)

Table 5-2. 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)				

4. Results (cont.)

4.3 Results Based on a Variety of Instruments (cont.)

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 instruments, 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.

Regardless of the dataset used, we obtained a negative correlation between saving rates and consumption.

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.

4. Results (cont.)

4.3 Results Based on a Variety of Instruments (cont.)

Table 5-3. 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)				

4. Results (cont.)

4.3 Results Based on a Variety of Instruments (cont.)

Instrument 4: (Lagged) consumption for the FLS data, and

Instrument 5: Price and asset data information for the FIES data

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 5-3 are the result of the negative bias associated with transitory consumption.

Finally, if we use the instrument constructed from information on households' purchase prices and asset holdings, the saving rates increase marginally against a rise in lifetime income for working age households.

However, 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.

4. Results (cont.)

4.3 Results Based on a Variety of Instruments (cont.)

Table 5-4. 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)				

5. Summary and Implications

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 measures, the patterns observed for working age households in Japan are generally consistent with those reported for Western countries:

- when we use education and the type of occupation as our instruments, which are generally constant over the lifecycle, we find significant positive correlations;

- when we use consumption measures as an alternative instrument, the positive correlations disappear.

5. Summary and Implications (cont.)

The first finding may result from the fact that there is an unobserved household characteristic, such as individuals' "patience," which affects both saving rates and lifetime income.

The second finding probably results from 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 support, albeit marginally, that there is a positive relationship between saving rates and lifetime income.

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.

5. Summary and Implications (cont.)

To sum up, in the case of Japan, it appears to be correct to say that the working age rich save more.

On the other hand, 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 saving.)

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 today, the fact that the rich save more appears to have important implications for tax and macroeconomic policies, as mentioned in the introduction of this presentation, whatever the reasons.

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Reply: Some thoughts about why question.

As an economist, it is legitimate to ask "why" question, i.e. why do the rich save more?

We agree with the comment that our ultimate goal is to construct a model that delivers behavior consistent with empirical findings.

However, is structural model a necessary condition to draw any policy implications?

Whatever the reasons are, isn't consumption tax regressive if rich leave larger bequests?

Reply (cont.)

To shed some light on the issue, we asked a following question in the FLS.

Some informal evidence from the *Family and Lifestyle Survey* Questionnaire

Q. This is a question about the size of the inheritance you are going to leave to your children and that you have received (or expect to receive) fromyour parents.
Which of the following describes the difference in size? (Circle one)

1. Planning to leave more money to my children than I inherited from my parents.
2. Planning to leave about the same amount to my children as I inherited.
3. Planning to leave less money to my children than I inherited.

Table. Shares of the responses by lifestage and by lifetime income quintile

	All	Subjective Lifetime Income (Edu. & Job inst.) Quintile				
		Q1 Bottom 20%	Q2	Q3	Q4	Q5 Top 20%
All Sample Households						
Planning to leave						
more to children than I inherited	26	21	28	28	29	27
about the same amount to children as I inherited	44	45	40	43	40	47
less to children than I inherited	30	33	32	28	32	27
Working-age Households (20-60)						
more to children than I inherited	19	15	17	20	20	22
about the same amount to children as I inherited	51	50	55	51	47	52
less to children than I inherited	30	35	28	29	33	26
Old Households (over 60)						
more to children than I inherited	42	43	36	44	43	39
about the same amount to children as I inherited	29	27	27	31	26	32
less to children than I inherited	29	30	36	24	30	29

Reply (cont.)

Roughly 40-50 percent of households answered that they are planning to leave about the same amount to their children as they inherited from their parents. This means they consume all lifetime income.

However, the estimated pattern differs depending the generation of individual households. Older generation households tend to answer that they leave more.

As for the working generation households, the rich are more likely to answer they leave more, albeit marginally, though the pattern results from reverse causality.

Reply (cont.)

As for the suggested interpretations/explanations,

- we speculate that the rich are more patient (in general) than the poor.

- we do not think explanations based on bequest motives are promising.

  <= No evidence that households with children save more than those without (not only for the US but also for Japan.)

  <=The share of households that cited inheritance as a motivation for their savings is relatively low in the FLS.

Some informal evidence from the *Family and Lifestyle Survey* Questionnaire

Q. What is the purpose of the net assets that you plan to accumulate (or accumulated) until retirement?
Please choose up to 3 of the choices below.

1. Basic post-retirement living expenses.
2. For post-retirement leisure, travel, etc.
3. Provisions for an emergency.

Table. Shares of the households by lifestage and by lifetime income quintile

	All	Subjective Lifetime Income (Edu. & Job inst.) Quintile				
		Q1 Bottom 20%	Q2	Q3	Q4	Q5 Top 20%
All Sample Households						
Accumulate the assets until retirement for						
basic post-retirement living expenses	77	70	53	71	82	81
post-retirement leisure, travel, etc.	26	19	13	21	26	36
provisions for an emergency	70	63	50	66	71	74
buying or repairing/maintaining home	24	19	16	23	26	27
an inheritance for children	12	9	8	10	15	14
Working-age Households (20-60)						
basic post-retirement living expenses	80	72	66	74	83	85
post-retirement leisure, travel, etc.	25	21	25	19	23	35
provisions for an emergency	68	62	65	66	66	73
buying or repairing/maintaining home	23	18	14	23	25	27
an inheritance for children	14	8	8	13	18	14
Old Households (over 60)						
basic post-retirement living expenses	74	68	53	69	81	74
post-retirement leisure, travel, etc.	29	19	13	24	31	38
provisions for an emergency	73	63	55	69	78	74
buying or repairing/maintaining home	26	20	20	25	27	25
an inheritance for children	9	11	6	6	9	13

Reply (cont.)

As for the suggested interpretations/explanations (cont.),

- we agree with Professor Hansen's view about the precautionary savings motive to cover large medical expenses.

- however, the LTC based accounting for saving behaviors of old might be promising.

Long-term care insurance system was introduced in Japan in 2000. Horioka (2009) argues that the introduction of the LTC insurance may explain the drop of Japanese saving rates in recent years, though Suzuki et al. (2008) appears to have a different view.