Lecture 3 - Consumption

UCLA - Econ 221 - Fall 2018

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Outline

Understanding Consumption and Saving

- Steps:
  1. Keynesian Consumption function.
  2. Friedman's Permanent Income Hypothesis. Followed by Hall, Modigliani, modelling in macro models, etc.
  3. Evidence is more messy.
- One thing keeps coming up: it is really hard to understand is why the rich save (and work) so much, at least given neoclassical assumptions.

> *F. S. Fitzgerald: The rich are different from you and me.*
> *E. Hemingway: Yes, they have more money.*

Why do the rich save so much?

- Lee Iacocca, former CEO from Chrysler (Iacocca (1988)):

  Once you reach a certain level in a material way, what more can you do? You can't eat more than three meals a day; you'll kill yourself. You can't wear two suits one over the other. You might now have three cars in your garage-but six! Oh, you can indulge yourself, but only to a point.

- Adam Smith, *The Theory of Moral Sentiments (Smith (1759)):*

  To what purpose is all the toil and bustle of the world? ... It is our vanity which urges us on... It is not wealth that men desire, but the consideration and good opinion that wait upon riches.

- Weber (1905)'s "Capitalist Spirit": the accumulation of wealth for itself?

Why do the rich save so much?

Cole et al. (1992) take the example of Donald Trump (!) to show that often, the consumption motive fails to explain why such already rich individuals work so much, and propose the rat race explanation:

> *But think for a moment about an already very rich agent such as Donald Trump. Why does he continue to work long days, endure substantial amounts of stress, and take enormous risks?* ***Surely it cannot be that he is savoring the prospect of going to the grocery store with a looser budget constraint next year****. He seems to have more money than he could spend in several lifetimes. Even if we are wrong about Trump's net worth, there clearly seem to be wealthy individuals that continue to work very hard and take large risks to increase their net worth. It is hard to reconcile such behavior with the underlying decision making in traditional growth models.We propose that people like Trump continue to care about increasing their net worth because their utility depends not only on the absolute level of their wealth but also on their wealth relative to that of other very rich people.*

1. Keynes (1936) consumption function, Friedman (1957) PIH
2. Poterba and Summers (1987) Paper
3. Campbell and Deaton (1989) Paper
4. Parker (1999) Paper
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6. Carroll (2000) Paper
7. Johnson et al. (2006) Paper
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Keynes (1919), *Economic Consequences of the Peace*

Europe was so organised socially and economically as to secure the ***maximum accumulation of capital****. While there was some continuous improvement in the daily conditions of life of the mass of the population, society was so framed as to* ***throw a great part of the increased income into the control of the class least likely to consume it****. The new rich of the nineteenth century were not brought up to large expenditures, and preferred the power which investment gave them to the pleasures of immediate consumption.* ***In fact, it was precisely the inequality of the distribution of wealth which made possible those vast accumulations of fixed wealth and of capital improvements which distinguished that age from all others. Herein lay, in fact, the main justification of the capitalist system. If the rich had spent their new wealth on their own enjoyments, the world would long ago have found such a régime intolerable.*** *But like bees they saved and accumulated.*

Keynes (1919), *Economic Consequences of the Peace*

The ***immense accumulations of fixed capital which, to the great benefit of mankind, were built up during the half century before the war, could never have come about in a society where wealth was divided equitably.*** *The railways of the world, which that age built as a monument to posterity, were, not less than the pyramids of Egypt, the work of labour which was not free to consume in immediate enjoyment the full equivalent of its efforts. (...)* ***The duty of 'saving' became nine-tenths of virtue and the growth of the cake the object of true religion.*** *There grew round the non-consumption of the cake all those instincts of puritanism which in other ages has withdrawn itself from the world and has neglected the arts of production as well as those of enjoyment.* ***And so the cake increased; but to what end was not clearly contemplated.*** *Individuals would be exhorted not so much to abstain as to defer, and to cultivate the pleasures of security and anticipation.* ***Saving was for old age or for your children; but this was only in theory -- the virtue of the cake was that it was never to be consumed, neither by you nor by your children after you.***

Keynes (1936)

An act of individual saving means—so to speak—a decision ***not to have dinner to-day****. But it does not necessitate a decision to have dinner or to buy a pair of boots a week hence or a year hence or to consume any specified thing at any specified date. Thus it depresses the business of preparing today's dinner without stimulating the business of making ready for some future act of consumption. It is not a substitution of future consumption-demand for present consumption-demand,—it is a net diminution of such demand. Moreover, the expectation of future consumption is so largely based on current experience of present consumption that a reduction in the latter is likely to depress the former, with the result that the act of saving will not merely depress the price of consumption-goods and leave the marginal efficiency of existing capital unaffected, but may actually tend to depress the latter also. In this event it may reduce present investment-demand as well as present consumption- demand.*

Keynes (1936)

The trouble arises, therefore, because the act of saving implies, not a substitution for present consumption of some specific additional consumption which requires for its preparation just as much immediate economic activity as would have been required by present consumption equal in value to the sum saved, ***but a desire for 'wealth' as such, that is for a potentiality of consuming an unspecified article at an unspecified time****.* ***The absurd****, though almost universal,* ***idea that an act of individual saving is just as good for effective demand as an act of individual consumption****, has been fostered by the fallacy, much more specious than the conclusion derived from it, that an increased desire to hold wealth, being much the same thing as an increased desire to hold investments, must, by increasing the demand for investments, provide a stimulus to their production; so that current investment is promoted by individual saving to the same extent as present consumption is diminished.*

Keynes (1936)

Keynes (1936), in Chapter 14 (the classical theory of interest):

> *Certainly the ordinary man—banker, civil servant or politician—brought up on the traditional theory, and the trained economist also, has carried away with him the idea that whenever an individual performs an act of saving he has done something which automatically brings down the rate of interest, that this automatically stimulates the output of capital, and that the fall in the rate of interest is just so much as is necessary to stimulate the output of capital to an extent which is equal to the increment of saving. (...)*
>
> *A decreased readiness to spend will be looked on in quite a different light If, instead of being regarded as a factor which will, cet. par., increase investment, it is seen as a factor which will, cet. par., diminish employment.*

Permanent Income Hypothesis

- Basic observation: it is true that in the cross-section, consumption is lower.
- Keynes (1936):

> *"The fundamental psychological law, upon which we are entitled to depend with great confidence both a priori from our knowledge of human nature and from the detailed facts of experience, is that men are disposed, as a rule and on the average, to increase their consumption as their income increases but not by as much as the increase in the income."*

- Argument of Friedman (1957): yes in the cross-section, but not in the time-series. He attributed this to transitory versus persistent shocks to income.

Overview

- Clear evidence of a **decline in national saving** in the face of increased federal deficits.
- Direct evidence that preannounced tax policies affect consumption spending when they are implemented.
- Large real appreciation in the dollar and the associated trade deficit provide further support for the traditional view of the economic effects of the deficits.
- "The observation that real interest rates frequently fail to rise during wars, when nearly all theories predict they should, suggests that these findings may tell us more about our ignorance concerning interest rate determination than about the **consumption effects of debt policies**."

Overview

- Changes in tax policy as a natural experiment.
- In the face of exceptionally large peace-time government deficits during the 1980s, **private saving has not increased and may well have declined**.
- This clearly violates Ricardian equivalence, or rather Ricardian non-equivalence (Barro (1974); O'Driscoll (1977)).
- This is a macro identification strategy, using an event study. However, this holds true more generally:
  - confirms microeconomic evidence that people do consume when face with lower taxes (even the non hand to mouth).
  - is confirmed by more extensive macroeconomic evidence.

Effects of deficit policies

Table 1

Effects of deficit policies in lifecycle model.[a]

Parameter values	Debt concept held constant	Fraction of debt that is net wealth	Δconsumption/Δdeficit	
			1-year deficit	5-year deficit
$r = 0.01$, $n = 0.01$, $\theta = 0.01$	Real	0.850	0.067	0.246
	Real per capita	1.000	0.071	0.262
$r = 0.01$, $n = 0.01$, $\theta = 0.03$	Real	0.850	0.060	0.212
	Real per capita	1.000	0.063	0.222
$r = 0.03$, $n = 0.01$, $\theta = 0.01$	Real	0.651	0.068	0.248
	Real per capita	0.767	0.072	0.266
$r = 0.03$, $n = 0.01$, $\theta = 0.03$	Real	0.651	0.061	0.217
	Real per capita	0.767	0.065	0.229
$r = 0.03$, $n = 0.02$, $\theta = 0.01$	Real	0.665	0.058	0.223
	Real per capita	0.888	0.066	0.256
$r = 0.03$, $n = 0.02$, $\theta = 0.03$,	Real	0.665	0.051	0.190
	Real per capita	0.888	0.057	0.213
$r = 0.05$, $n = 0.01$ $\theta = 0.01$	Real	0.531	0.068	0.247
	Real per capita	0.625	0.073	0.268
$r = 0.05$, $n = 0.01$, $\theta = 0.03$	Real	0.531	0.063	0.221
	Real per capita	0.625	0.066	0.235
$r = 0.05$, $n = 0.02$, $\theta = 0.01$	Real	0.546	0.059	0.227
	Real per capita	0.727	0.068	0.263
$r = 0.05$, $n = 0.02$, $\theta = 0.03$	Real	0.546	0.053	0.197
	Real per capita	0.727	0.060	0.223

[a]All calculations assume that each household lives for 55 periods and works for the first 45 periods. Deficits are financed using lump-sum taxes on all working individuals. Parameter are: r, the real interest rate, n, the population growth rate, and θ, the consumption growth rate. The third column indicates the fraction of debt incurred during a one-year deficit program that is net wealth. The last two columns indicate the consumption response, in dollars, to a temporary one-dollar per-person per-year tax cut.

Federal Government Spending, taxes and transfers

Table 2

Federal government spending, taxes, and transfers; 1960–86.[a]

Year	Federal spending and revenue as a percentage of full-employment GNP		
	Purchases of goods and services plus intergovernmental grants	Net interest payments	Taxes net of transfers and subsidies to government enterprises
1960	10.76	1.20	12.51
1961	11.12	1.07	11.53
1962	11.76	1.10	12.17
1963	11.63	1.14	12.82
1964	11.44	1.19	12.14
1965	11.23	1.18	12.47
1966	12.47	1.21	13.43
1967	13.43	1.21	13.02
1968	13.46	1.28	14.06
1969	12.46	1.32	14.66
1970	11.67	1.34	11.83
1971	11.16	1.20	10.45
1972	11.49	1.15	11.26
1973	10.73	1.31	11.63
1974	10.37	1.34	10.99
1975	10.52	1.32	7.86
1976	10.34	1.40	8.94
1977	10.45	1.39	9.64
1978	10.36	1.52	10.60
1979	9.96	1.64	10.98
1980	10.17	1.83	9.90
1981	10.04	2.20	10.30
1982	9.95	2.36	8.24
1983	9.74	2.48	7.60
1984	10.08	2.88	8.72
1985	10.73	3.09	9.13
1986	10.67	3.07	9.14
Averages:			
1961–65	11.44	1.14	12.23
1966–70	12.70	1.27	13.40
1971–75	10.85	1.26	10.44
1976–80	10.26	1.56	10.01
1981–85	10.20	2.68	8.86

[a] National Income and Product Accounts, table 3.2. Full-employment GNP data were provided courtesy of Data Resources, Inc.

US Saving rate

Table 3

Five-year averages of various measures of U.S. saving rate.[a]

Saving concept	Time period					
	1955–60	1961–65	1966–70	1971–75	1976–80	1981–86
Net national saving/GNP	7.29	7.88	7.67	7.31	6.67	3.12
Net private saving/GNP	7.28	8.25	8.23	9.10	8.55	7.47
Inflation-adjusted net private saving/GNP	6.08	7.59	7.10	7.72	6.97	6.39
Flow of funds net national saving/GNP	6.96	7.26	6.58	6.39	6.93	3.52
Change in real household net worth/GNP	10.15	12.50	4.98	1.51	13.33	4.82
Consumption/GNP	63.78	63.05	62.09	62.47	62.96	64.72
Non-durable and service consumption/GNP	55.20	54.60	53.29	53.66	54.11	56.17

[a]Each entry is measured as a percentage of GNP. Net private saving in rows 2 and 3 includes saving by state and local governments. The change in household net worth measure, row 5, is net of the increase in the publicly-held federal debt.

Post-1981 changes in saving after adjustment

Table 4

Post-1981 changes in saving after adjustment for economic conditions.[a]

Saving concept	Control variables for economic conditions: Lagged GNP growth	Lagged GNP growth and stock market returns	Lagged GNP growth and unemployment rate	Lagged GNP growth and inflation rates
Net national saving/GNP	−4.22 (0.55)	−4.40 (0.86)	−3.25 (0.55)	−4.05 (0.80)
Net national saving (flow of funds)/GNP	−3.45 (0.55)	−4.68 (0.79)	−3.25 (0.64)	−2.24 (0.84)
Consumption/GNP	2.71 (0.38)	2.87 (0.59)	1.92 (0.35)	2.20 (0.54)
Consumption of non-durables and services/GNP	2.71 (0.50)	2.42 (0.79)	1.59 (0.42)	2.51 (0.75)

[a] Each entry corresponds to the reported coefficient on a dummy variable equal to 1 beginning in 1981 in the equation:

$$SAVE_t = \alpha_0 + \alpha_1 TIME_t + \alpha_2 DUM81_t + \beta(L) X_{t-1} + \epsilon_t,$$

where X_t denotes four lagged values of the series indicated at the column head. These equations are estimated using annual data for the 1954–86 sample period. The coefficient's standard error is reported in parentheses.

Pre-announced tax changes

Table 5

Consumption responses to pre-announced tax changes.[a]

Consumption measure	Tax measure	Constant	C_{-1}	Tax reform episode				$D.W.$	R^2
				1964	1968	1975	1981		
Non-durables	Withholding	10.61 (15.43)	0.998 (0.005)	0.217 (0.070)	0.073 (0.119)	0.162 (0.099)	0.044 (0.021)	1.78	0.997
Non-durables	Total personal taxes	10.96 (15.38)	0.998 (0.005)	0.259 (0.079)	0.066 (0.091)	0.162 (0.098)	0.035 (0.016)	1.79	0.997
Services	Withholding	2.55 (5.36)	1.005 (0.002)	0.091 (0.047)	0.107 (0.080)	0.113 (0.064)	0.010 (0.017)	1.91	0.999
Services	Total personal taxes	2.63 (5.37)	1.005 (0.002)	0.106 (0.053)	0.074 (0.061)	0.113 (0.064)	0.008 (0.013)	1.91	0.999
All consumption	Withholding	12.03 (21.32)	1.002 (0.003)	0.402 (0.161)	0.150 (0.272)	0.349 (0.218)	0.134 (0.051)	1.79	0.999
All consumption	Total personal taxes	12.78 (21.31)	1.002 (0.003)	0.462 (0.183)	0.121 (0.209)	0.351 (0.217)	0.108 (0.040)	1.80	0.999
All consumption $+0.229*G$	Total personal taxes	23.11 (22.20)	1.000 (0.003)	0.410 (0.162)	−0.048 (0.275)	0.338 (0.220)	0.154 (0.052)	1.85	0.999
All consumption $+0.229*G$	Withholding	23.96 (22.19)	1.000 (0.003)	0.469 (0.185)	−0.046 (0.211)	0.339 (0.219)	0.123 (0.041)	1.85	0.999

[a] Each row reports estimates of the consumption Euler equation,

$$c_t = a + \beta * c_{t-1} + \gamma_1 * \Delta tax64_t + \gamma_2 * \Delta tax68_t + \gamma_3 * \Delta tax75_t + \gamma_4 * \Delta tax81_t + \epsilon_t.$$

Values in parentheses are standard errors. All equations are estimated using seasonally adjusted, quarterly, per capita consumption data for the period 1947:1–1986:3. The government spending series used in the last two rows is the sum of federal, state, and local spending.

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Overview

- Why is consumption so smooth?
- Friedman (1957): consumption is smooth because permanent income is smoother than measured income.
- Campbell and Deaton (1989) show that permament income is in fact less smooth than measured income.
- Simple explanation: consumption is smooth because it responds with a lag to changes in income.

TABLE I

Means, actual and predicted standard deviations

Variable	Mean (% per annum)	Standard deviation (% p.a.)	Scale factor λ
$\Delta \log z_t$	2·155	3·293	
$\Delta \log y_t$	1·805	3·516	
$\sum \rho^i \Delta E_t \Delta \log y_t$	0·000	5·587	
	Total consumption		
$\Delta \log c_t$	2·204	3·141	
$\Delta c_t / y_{t-1}$	2·307	3·272	
$\Delta \eta_t$	−2·155	3·574	
	Scaled consumption of non-durables and services		
$\Delta \log c_{nt}$	1·991	1·950	—
$\lambda \Delta c_{nt} / y_{t-1}$	2·073	2·019	1·274
$\Delta \eta_t$	−1·923	2·469	1·274
$\lambda \Delta c_{nt} / y_{t-1}$	2·433	2·370	1·495
$\Delta \eta_t$	−1·194	2·488	1·495

Notes. z_t is total real disposable income *per capita* and y_t is real disposable labour income *per capita*, as constructed by Blinder and Deaton (1985). In constructing the parameter ρ, we assume a constant discount rate of 6% per annum. The calculations in the third line assume that $\Delta \log y_t$ follows an AR (1) process with coefficient $\phi = 0{\cdot}443$. $\Delta \eta_t$ is shorthand for $(s_t / y_t) - \Delta \log y_t - \rho^{-1}(s_{t-1} / y_{t-1})$. The data run from 1953(1) to 1985(4).

TABLE II

Bivariate representations of income growth and savings

	(1)		(2)		(3)	
			VAR parameters			
a_{11}, a_{12}	0·443	−0·177	0·454	−0·067	0·458	−0·066
	(0·08)	(0·06)	(0·08)	(0·03)	(0·08)	(0·03)
a_{21}, a_{22}	0·072	0·803	0·212	0·972	0·266	0·956
	(0·07)	(0·05)	(0·07)	(0·03)	(0·08)	(0·03)
			ARMA parameters and AR roots			
ϕ_1, ϕ_2 (AR)	1·247	−0·369	1·425	−0·455	1·414	−0·455
	(0·09)	(0·07)	(0·08)	(0·08)	(0·08)	(0·03)
θ_1 (MA)	−0·799	(0·05)	−0·954	(0·02)	−0·952	(0·02)
r_1, r_2 (roots)	0·763	0·483	0·943	0·482	0·918	0·496

Notes. (1) refers to calculations in which consumption is taken to be total consumption, including purchases of durables. Panel (2) uses only nondurables and services consumption inflated by a factor of 1·274. Panel (3) is the same as panel (2) but with an inflation factor of 1·495.

TABLE III

Tests for excess smoothness and excess sensitivity

	Wald test (p-value)	Predicted innovation standard deviation	Actual innovation standard deviation	Ratio (s.e.)
		Total consumption		
VAR-1	19·6 ($5{\cdot}4\times10^{-5}$)	5·044	3·309	0·656 (0·10)
VAR-5	45·9 ($1{\cdot}5\times10^{-6}$)	4·768	3·017	0·633 (0·15)
		Non-durables and services consumption ×1·274		
VAR-1	18·4 ($1{\cdot}0\times10^{-4}$)	3·864	2·290	0·593 (0·21)
VAR-5	31·4 ($5{\cdot}0\times10^{-4}$)	4·686	2·135	0·456 (0·20)
		Non-durables and services consumption ×1·495		
VAR-1	10.0 (0·0066)	3·188	2·382	0·747 (0·16)
VAR-5	18·2 (0·0509)	4·022	2·257	0·561 (0·13)

Notes. The Wald test is the test of the estimated parameters in the VAR for conformity with the restrictions (21a). The predicted innovation is the standard deviation of the last term in (20), i.e. the square root of the quadratic form $e_1'(I-\rho A)^{-1}\Omega(I-\rho A')^{-1}e_1$ where Ω and A are estimated from the unrestricted VAR. The actual innovation is the standard deviation of $u_{2t}-u_{1t}$, or the square root of $(e_2'-e_1')\Omega(e_2-e_1)$. The standard error of the ratio of these quantities is computed as $\sqrt{(D'\theta D)}$ where D is the vector of derivatives of the standard deviation ratio with respect to the VAR parameters, and θ is the variance-covariance matrix of the parameters. D was computed numerically. All calculations use a ρ of 0·9895, which corresponds to a real interest rate of 6% per annum.

TABLE IV

Non-parametric estimates of persistence

Labour income, $\Delta \log y_t$

Autocorrelations at lag:

1	2	3	4	5	6	7	8	9	10
0·446	0·193	0·156	0·056	−0·152	−0·017	−0·010	−0·070	−0·024	0·123

Persistence estimates:

Window size	$\hat{V}^k$	s.e. $(\hat{V}^k)$	$\tilde{V}^k$
10	2·212	0·755	2·401
20	2·334	1·100	2·132
30	2·523	1·445	2·883
40	2·443	1·609	0·827
50	1·986	1·459	−0·530
60	1·424	1·144	−2·302

Total income, $\Delta \log z_t$

Autocorrelations at lag:

1	2	3	4	5	6	7	8	9	10
0·373	0·124	0·103	−0·039	−0·206	−0·074	−0·068	−0·120	−0·031	0·141

Persistence estimates:

Window size	$\hat{V}^k$	s.e. $(\hat{V}^k)$	$\tilde{V}^k$
10	1·589	0·542	1·406
20	1·518	0·716	0·906
30	1·529	0·871	1·291
40	1·438	0·947	−0·068
50	1·088	0·800	−0·642
60	0·793	0·637	−1·039

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- The Reaction of Household Consumption to Predictable Changes in Social Security Taxes
- Consumer Expenditure Survey (CEX)
- Individuals with wage and salary income earned in the US are subject to Social Security tax withholding of around 7% of their gross pay up to an annual maximum income level.
- Two sources of identification:
  1. a series of preannounced tax rate increases occurred in the 1980's. Since the share of after-tax labor income in total income differs across households and since some individuals are not subject to Social Security tax withholding, these changes produce different percentage changes in income for different households.
  2. when an individual's income earned in a calendar year **reaches the maximum taxable amount**, that individual's take-home pay increases because Social Security taxes are no longer withheld from his or her paycheck. **In January of the following year, when withholding begins again, take-home pay falls again**.

Taxes

TABLE 1—THE SOCIAL SECURITY TAX STRUCTURE, 1980–1993

Year	Individual tax rate (percent)	Maximum annual contribution per earner	Maximum annual taxable earnings per earner
1980	6.13	1,588	25,900
1981	6.65	1,975	29,700
1982	6.70	2,171	32,400
1983	6.70	2,392	35,700
1984[a]	6.70	2,533	37,800
1985	7.05	2,792	39,600
1986	7.15	3,003	42,000
1987	7.15	3,132	43,800
1988	7.51	3,380	45,000
1989	7.51	3,605	48,000
1990	7.65	3,924	51,300
1991			
OASDI:	6.20	3,311	53,400
HI:	1.45	1,812	125,000
1992			
OASDI:	6.20	3,441	55,500
HI:	1.45	1,888	130,200
1993			
OASDI:	6.20	3,571	57,600
HI:	1.45	1,958	135,000

Sources: Social Security Administration (1990) Tables 2.A3, 2.A4, and 2.A5 and the *Social Security Bulletin* (January 1993). Data refer to both Old Age Survivor and Disability Insurance (OASDI) and to Health Insurance (HI), except where noted.

[a] The tax rate in 1984 includes the tax credit.

Summary Statistics

TABLE 2—SAMPLE STATISTICS

Monthly rates	Mean	Standard deviation	Percent of total consumption
Panel A: Full sample, 133,820 observations			
Total expenditures	1,449	960	100
Nondurable consumption	823	545	57
Expenditures excluding gifts to people outside the household:			
Total	1,414	934	98
Nondurable	797	523	55
Food and alcohol	325	191	22
Apparel and services	84	96	6
Entertainment and personal care	136	149	9
Family size	2.65	1.54	
Age	46.7	17.7	
Before-tax family income	2,241	1,812	155
After-tax family income	2,022	1,607	140
Head labor income	1,271	1,403	88
Fifth-interview Δy^{sst}	0.000	0.005	
Second-interview Δy^{sst}	0.000	0.006	
Growth in nondurable consumption excluding gifts to people outside the household	−0.004	0.380	
Panel B: Sample of households hitting cap, 11,828 observations			
Nondurable consumption excluding gifts to people outside the household	1,438	661	
Before-tax family income	4,922	2,183	
Head labor income	3,939	1,680	
Months Social Security covers head	9.8	2.2	
Fifth-interview Δy^{sst}	0.000	0.017	
Second-interview Δy^{sst}	0.000	0.017	
Growth in nondurable consumption excluding gifts to people outside the household	−0.002	0.366	

Notes: Based on samples for regressions on nondurable consumption excluding gifts to people outside the household. Total consumption excludes expenditures on mortgages, health care, pensions, education, and cash contributions. See the Appendix and text for additional definitions. Averages are across observations. All variables are current dollars.

Results

TABLE 3—THE REACTION OF NONDURABLE CONSUMPTION TO PREDICTABLE CHANGES IN INCOME

	Measure of income growth due to Social Security		
	Fifth-interview $\Delta y^{ss\tau}_{t+1}$ OLS regression	Second-interview $\Delta y^{ss\tau}_{t+1}$ OLS regression	Fifth-interview $\Delta y^{ss\tau}_{t+1}$ TSLS regression
Panel A: Full sample, 133,820 observations			
Coefficient:	0.538	0.617	0.661
Standard error:	(0.197)	(0.202)	(0.220)
Panel B: Sample with high consumption, 13,895 observations			
Coefficient:	0.615	0.718	0.784
Standard error:	(0.344)	(0.351)	(0.380)
Panel C: Sample of households hitting cap, 11,828 observations			
Coefficient:	0.446	0.563	0.608
Standard error:	(0.272)	(0.279)	(0.313)

Notes: The dependent variable is the change in the log of nondurable consumption excluding gifts to those outside the household. In addition to the measure of the change in income caused by the Social Security tax, all regressions also include a fourth-order polynomial in age, a second-order polynomial in family size in the second interview and in the last interview, and complete sets (less one) of month and year dummies. The instrument set includes all these additional regressors and both measures of the income change due to the Social Security tax calculated from second-interview information, and dummy variables for whether the changes thus calculated are strictly positive for that observation and dummy variables for whether the changes are strictly negative.

Results

TABLE 4—THE RELATIVE REACTION OF NONDURABLE CONSUMPTION FOR THE TREATMENT GROUP

	Panel A: Full sample, 133,820 observations		Panel B: Sample of households hitting cap, 10,361 observations	
Δy^{ss} Measures employed:	Second-interview	Fifth-interview	Second-interview	Fifth-interview
Method of estimation:	OLS regression	TSLS regression	OLS regression	TSLS regression
Treatment group coefficient ($\widehat{\alpha_2}$):	1.009	1.043	1.213	1.265
Standard error:	(0.637)	(0.676)	(0.694)	(0.742)
Neither group coefficient ($\widehat{\alpha_3}$):	0.295	0.288	0.711	0.779
Standard error:	(0.828)	(0.941)	(0.902)	(1.045)
Everyone group coefficient ($\widehat{\alpha_4}$):	−0.394	−0.385	−0.705	−0.710
Standard error:	(0.606)	(0.643)	(0.686)	(0.736)
Percent of individuals in				
Treatment group:	70	70	75	75
Control group:	5	5	8	8

Notes: The dependent variable is the change in the log of nondurable consumption excluding gifts to those outside the household. In addition to the measure of the change in income caused by the Social Security tax, all regressions also include a constant, fourth-order polynomial in age, a second-order polynomial in family size in the second interview and in the last interview, and complete sets (less one) of month and year dummies. The instrument set includes all these additional regressors and both measures of the income change due to the Social Security tax calculated from second-interview information, and dummy variables for whether the changes thus calculated are strictly positive for that observation and dummy variables for whether the changes are strictly negative. The percentages reported are the number of heads or spouses with positive earnings in each group divided by the total number of heads and spouses with positive earnings.

Results

TABLE 5—THE REACTION OF NONDURABLE CONSUMPTION BY AGE-GROUP AND ASSET LEVEL

	Low asset ratio	High asset ratio	Young age	High age
	Panel A: Full sample			
Coefficient:	0.513	0.828	0.693	0.466
Standard error:	(0.638)	(0.349)	(0.299)	(0.320)
Number of observations:	33,795	29,460	67,276	49,626
	Panel B: Sample of households hitting cap			
Coefficient:	1.727	0.570	0.614	0.570
Standard error:	(1.099)	(0.488)	(0.428)	(0.452)
Number of observations:	1,284	4,358	6,938	4,867

Notes: The dependent variable is the change in the log of nondurable consumption excluding gifts to those outside the household. High age is 44 to 70; low age is 43 or younger. High asset ratio is more than enough assets to finance six months of nondurable consumption; low asset ratio is less than enough assets to finance one month of nondurable consumption; the remaining households are dropped. All regressions employ TSLS on the fifth-interview $\Delta y^{ss\tau}$. In addition to the fifth-interview measure of the change in income caused by the Social Security tax all regressions also include a constant, a fourth-order polynomial in age, a second-order polynomial in family size in the second interview and in the last interview, and complete sets (less one) of month and year dummies. The instrument set replaces the Social Security variable with the following variables: both measures of the income change due to the Social Security tax calculated from second-interview information, and dummy variables for whether the changes thus calculated are strictly positive for that observation and dummy variables for whether the changes are strictly negative.

Results

TABLE 6—THE REACTION OF DIFFERENT CATEGORIES OF CONSUMPTION

Dependent variable consumption category:	Total	Food and alcohol	Entertainment and personal care	Apparel and services
Panel A: Full sample				
Coefficient:	0.564	0.133	0.835	2.145
Standard error:	(0.241)	(0.206)	(0.407)	(0.515)
Number of observations:	128,437	131,076	128,709	103,799
Panel B: Sample of households hitting cap				
Coefficient:	0.631	0.192	−0.281	1.010
Standard error:	(0.347)	(0.285)	(0.574)	(0.714)
Number of observations:	11,089	11,745	11,784	10,671

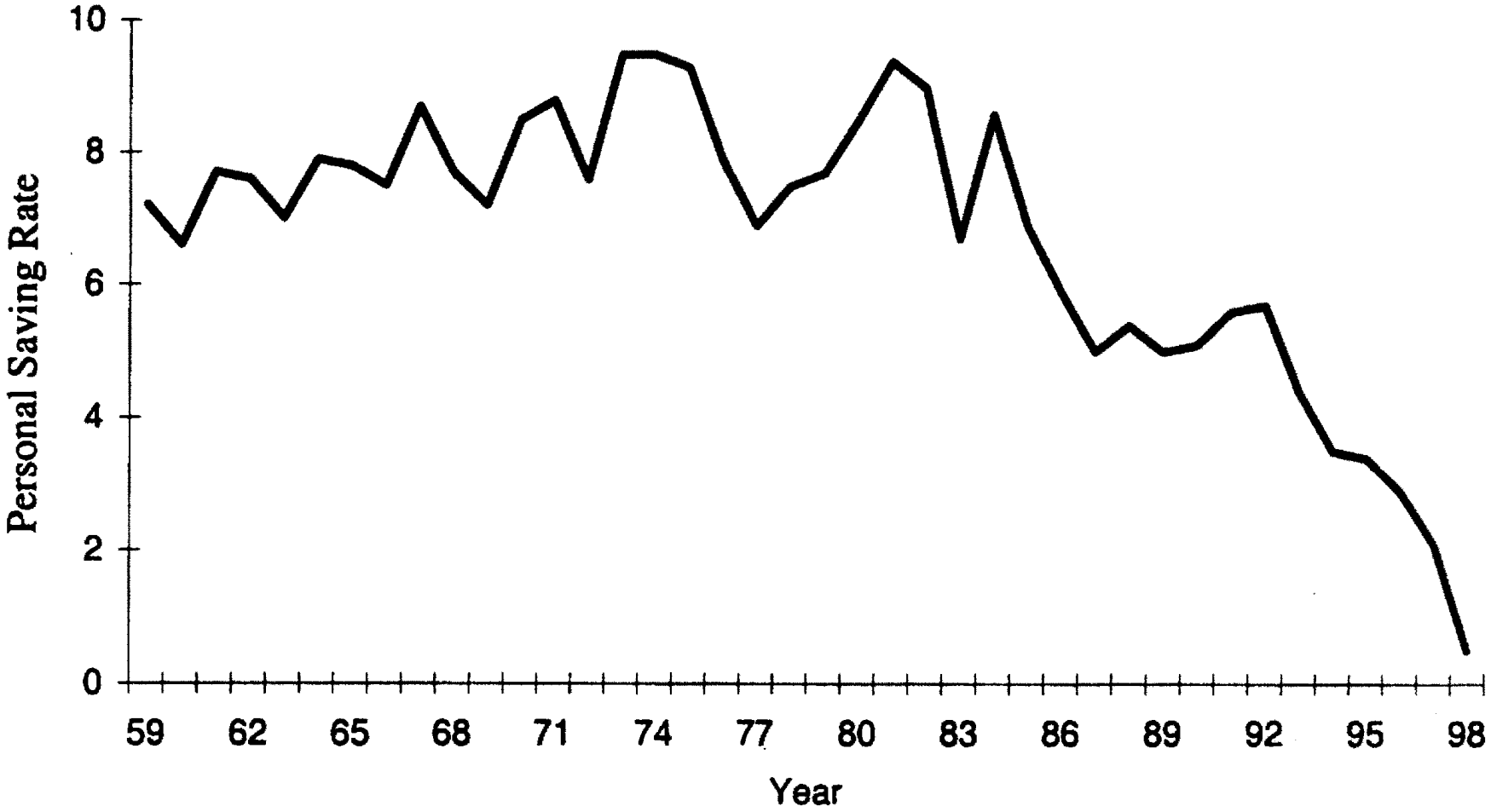
Notes: In regressions on total and food consumption observations are discarded if consumption changes more than 100 percent between quarters. For the other categories, the cutoff is 200 percent. These cutoffs are all around two standard deviations. See the Appendix for exact definitions of the categories. All regressions employ TSLS on the fifth-interview $\Delta y^{ss\tau}$. In addition to the fifth-interview measure of the change in income caused by the Social Security tax all regressions also include a constant, a fourth-order polynomial in age, a second-order polynomial in family size in the second interview and in the last interview, and complete sets (less one) of month and year dummies. The instrument set replaces the Social Security variable with the following variables: both measures of the income change due to the Social Security tax calculated from second-interview information, and dummy variables for whether the changes thus calculated are strictly positive for that observation and dummy variables for whether the changes are strictly negative.

1. Keynes (1936) consumption function, Friedman (1957) PIH
2. Poterba and Summers (1987) Paper
3. Campbell and Deaton (1989) Paper
4. Parker (1999) Paper
5. **Parker (2000) Paper**
6. Carroll (2000) Paper
7. Johnson et al. (2006) Paper
8. Jappelli and Pistaferri (2014) Paper
9. Kaplan et al. (2014) Paper
10. Saez and Zucman (2016) Paper
11. Parker (2017) Paper
12. Wong (2016) Paper

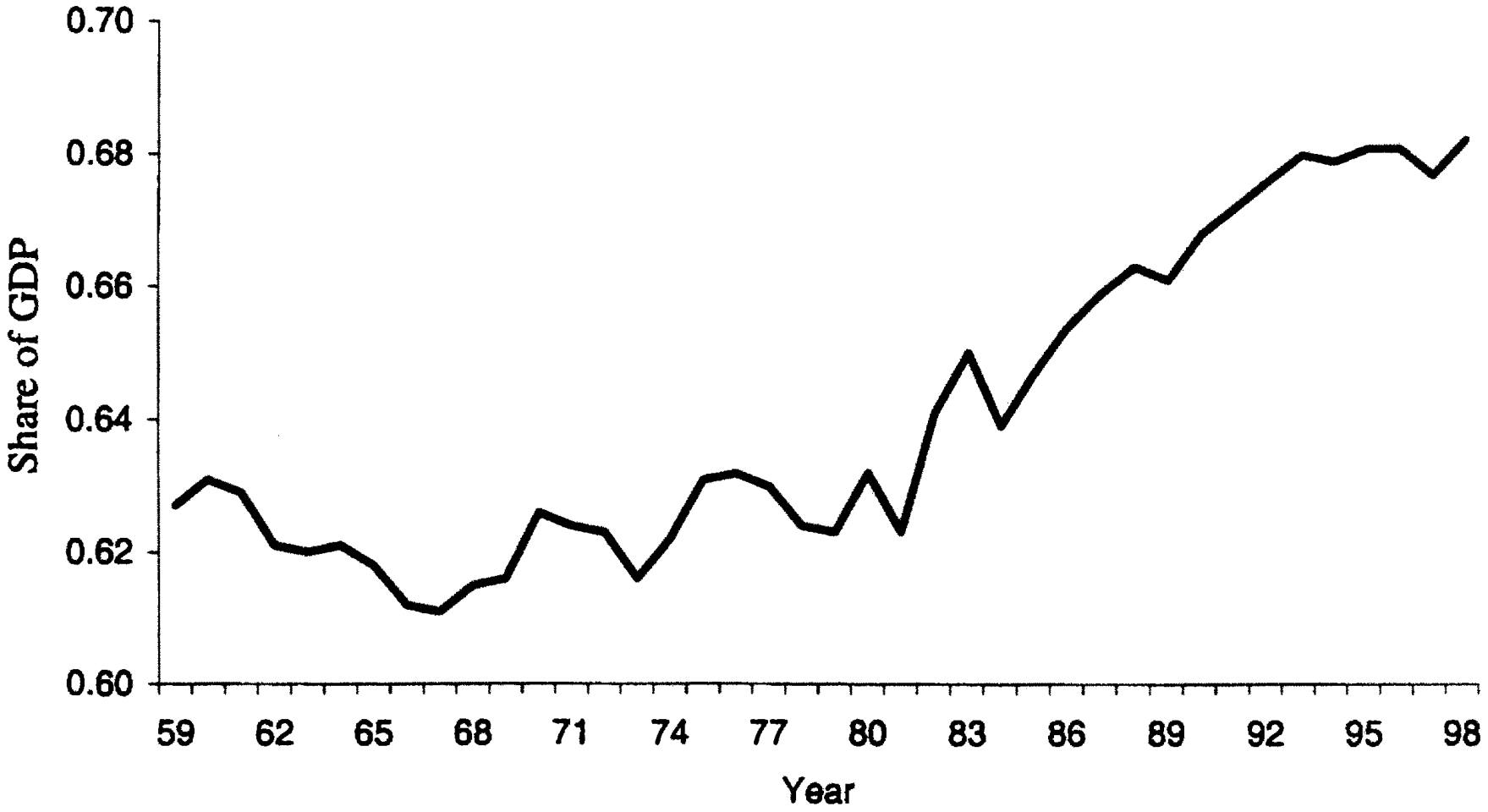
Overview

- Typical and steady level of around 8% during the 60s and 70s.
- Has declined to below 2% in 1997.
- Preliminary estimates put the rate at 0.5% in 1998.

Personal Saving Rate



Consumption



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11. Parker (2017) Paper
12. Wong (2016) Paper

Why do the rich save so much?

- The rich save really a lot, and we do not quite understand why they do save so much.
- In the 1992 SCF, only 2% of the wealthy households, indicated that **providing an inheritance** was the most important reason to save. In fact, even the elderly save.
- Moreover, Kotlikoff and Summers (1981) have shown that a small fraction of aggregate wealth is actually due to life-cycle saving.
- "Another obvious test of the model is to see whether the childless elderly tend to dissave more than those with children. This hypothesis has been tested using population-representative data; Hurd (1986) found that in the population as a whole, there is no tendency for elderly with children to decumulate faster than those without."

Why do the rich save so much?

	Most Important Reason	One of the 5 Most Important Reasons	Number of Observations
Entire Sample	.03	.05	3254
Richest 1 Percent	.02	.04	652

Table 1: Percent Saying Inheritance is Important Reason to Save

1. Keynes (1936) consumption function, Friedman (1957) PIH
2. Poterba and Summers (1987) Paper
3. Campbell and Deaton (1989) Paper
4. Parker (1999) Paper
5. Parker (2000) Paper
6. Carroll (2000) Paper
7. Johnson et al. (2006) Paper
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11. Parker (2017) Paper
12. Wong (2016) Paper

Abstract

Using questions expressly added to the Consumer Expenditure Survey, we estimate the change in consumption expenditures caused by the **2001 federal income tax rebates** and **test the permanent income hypothesis**. We exploit the unique, r**andomized timing of rebate receipt across households**. Households **spent 20 to 40 percent of their rebates on nondurable goods during the three-month period in which their rebates arrived, and roughly two-thirds of their rebates cumulatively during this period and the subsequent three-month period**. The implied effects on aggregate consumption demand are substantial. Consistent with liquidity constraints, responses are larger for households with low liquid wealth or low income.

TABLE 1—SUMMARY STATISTICS

Panel A. Sample statistics (N = 13,066 observations)

Variable	Mean	Standard deviation
Expenditures on		
Food	1,482	1,115
Strictly nondurables	3,168	3,984
Nondurables	4,149	4,481
Change in expenditures on		
Food	0	936
Strictly nondurables	30	1,684
Nondurables	62	2,052
Change in		
Number of adults	0	0.3
Number of children	0	0.2
Age	50.2	16.6
Rebate	86.8	199.0
Rebate|*Rebate* $>$ 0 (N = 2,364)	480.0	173.8
$I(Rebate > 0)$	0.181	0.385
Income (N = 9,443)	47,021	36,805
Liquid assets (N = 6,060)	7,877	16,661

Panel B. Distribution of positive rebate values (N = 2,364)

Rebate value	Number of observations	Percent of positive rebates
$0 < Rebate < 300$	171	7.2
$Rebate = 300$	638	27.0
$300 < Rebate < 600$	233	9.9
$Rebate = 600$	1,275	53.9
$Rebate > 600$	47	2.0

Panel C. Means of rebate variables by interview period (N = 2,364)

Three-month period	*Rebate*	*I*(*Rebate*)	*Rebate*|*Rebate* $>$ 0	Number of positive rebates
May–July 2001	30.6	0.07	444.7	58
June–Aug 2001	152.5	0.33	467.7	442
July–Sept 2001	279.6	0.57	489.5	742
Aug–Oct 2001	254.7	0.52	487.8	649
Sept–Nov 2001	167.1	0.36	470.3	473

Note: These results are based on the sample for the baseline regression using nondurable goods, in panel A of Table 2.

TABLE 2—THE CONTEMPORANEOUS RESPONSE OF EXPENDITURES TO THE TAX REBATE

	Panel A. Dependent variable: dollar change in expenditures on:					
	Food	Strictly nondurable goods	Nondurable goods	Food	Strictly nondurable goods	Nondurable goods
Estimation method	OLS	OLS	OLS	OLS	OLS	OLS
Rebate	0.109	0.239	0.373			
	(0.056)	(0.115)	(0.135)			
I(*Rebate* > 0)				51.5	96.2	178.8
				(27.6)	(53.6)	(65.0)
Age	0.570	0.449	1.165	0.552	0.391	1.106
	(0.320)	(0.550)	(0.673)	(0.318)	(0.548)	(0.670)
Change in adults	130.3	285.8	415.8	131.1	287.7	418.6
	(57.8)	(90.0)	(102.8)	(57.8)	(90.2)	(102.9)
Change in children	73.7	98.3	178.4	74.0	98.7	179.2
	(45.3)	(82.4)	(98.3)	(45.3)	(82.5)	(98.3)
RMSE	934	1680	2047	934	1680	2047
R^2 (percent)	0.6	0.6	0.6	0.6	0.6	0.6

	Panel B. Percent change in:			*Panel C. Dollar change in:*		
	Food	Strictly nondurable goods	Nondurable goods	Food	Strictly nondurable goods	Nondurable goods
Estimation method	OLS	OLS	OLS	2SLS	2SLS	2SLS
Rebate				0.108	0.202	0.375
				(0.058)	(0.112)	(0.136)
I(*Rebate* > 0)	2.72	1.76	3.16			
	(1.36)	(1.05)	(1.02)			
Age	0.035	0.005	0.023	0.569	0.424	1.166
	(0.020)	(0.016)	(0.015)	(0.320)	(0.549)	(0.671)
Change in adults	6.16	6.22	7.55	130.3	286.2	415.7
	(2.08)	(1.58)	(1.50)	(57.7)	(90.0)	(102.7)
Change in children	3.99	3.73	4.59	73.7	98.3	178.4
	(2.36)	(1.66)	(1.66)	(45.3)	(82.5)	(98.3)
RMSE	0.50	0.37	0.36	934	1680	2047
R^2 (percent)	0.4	0.8	0.8	0.6	0.6	0.6

Notes: All regressions include a full set of month dummies, following equation (1). Reported standard errors are adjusted for arbitrary within-household correlations and heteroskedasticity. The coefficients in panel B are multiplied by 100 so as to report a percent change. Panel C reports results from 2SLS regressions where *I*(*Rebate* > 0) with the other regressors are used as instruments for *Rebate*. All regressions have $N = 13{,}066$, except percent change in food expenditures which has $N = 13{,}007$.

TABLE 3—THE CONTEMPORANEOUS RESPONSE OF EXPENDITURES: EXTENSIONS

	Dollar change in:		*Percent change in:*		*Dollar change in:*	
	Strictly nondurable goods	Nondurable goods	Strictly nondurable goods	Nondurable goods	Strictly nondurable goods	Nondurable goods
	Panel A. All households (N = 13,066), controlling for rebate receipt					
Estimation method	OLS	OLS	OLS	OLS	2SLS	2SLS
Rebate	0.294	0.438			0.262	0.462
	(0.136)	(0.161)			(0.141)	(0.173)
I(*Rebate* > 0)			2.07	3.73		
			(1.37)	(1.33)		
I(*Total Rebates* > 0)	−39.9	−46.8	−0.37	−0.70	−34.8	−50.6
	(30.0)	(36.3)	(0.70)	(0.68)	(31.8)	(38.6)
	Panel B. Only households receiving rebates (N = 4,739)					
Estimation method	OLS	OLS	OLS	OLS	2SLS	2SLS
Rebate	0.152	0.247			0.079	0.190
	(0.183)	(0.213)			(0.225)	(0.264)
I(*Rebate* > 0)			1.35	1.94		
			(2.18)	(2.11)		

Notes: All regressions also include the change in the number of adults, the change in the number of children, the age of the household, and a full set of month dummies. Reported standard errors are adjusted for arbitrary within-household correlations and heteroskedasticity. The coefficients in the second pair of columns are multiplied by 100 so as to report a percent change. The final pair of columns report results from 2SLS regressions where *I*(*Rebate* > 0) with the other regressors are used as instruments for *Rebate*. *I*(*Total Rebates* > 0) is an indicator for households that received a rebate in some reference quarter, whereas *I*(*Rebate* > 0) indicates receipt in the contemporaneous quarter ($t + 1$) in particular. The regression R^2's range from 0.6 percent to 0.9 percent and the RMSE are similar or slightly smaller than those reported in Table 2.

TABLE 4—THE DYNAMIC RESPONSE OF EXPENDITURES TO THE TAX REBATE

	Dollar change in:		*Percent change in:*		*Dollar change in:*	
	Strictly nondurable goods	Nondurable goods	Strictly nondurable goods	Nondurable goods	Strictly nondurable goods	Nondurable goods
	Panel A. Lagged rebate and baseline sample (N = 12,730)					
Estimation method	OLS	OLS	OLS	OLS	2SLS	2SLS
$Rebate_{t+1}$ or	0.248	0.386	1.86	3.29	0.208	0.386
$I(Rebate_{t+1} > 0)$	(0.114)	(0.135)	(1.05)	(1.01)	(0.111)	(0.135)
$Rebate_t$ or	−0.156	−0.082	−1.89	−1.44	−0.190	−0.113
$I(Rebate_t > 0)$	(0.099)	(0.115)	(1.06)	(1.02)	(0.101)	(0.118)
	Implied cumulative fraction of rebate spent over both three-month periods					
	0.340	0.691	NA	NA	0.227	0.659
	(0.218)	(0.260)			(0.212)	(0.262)
	Panel B. Two lags of rebate and extended sample (N = 15,022)					
Estimation method	OLS	OLS	OLS	OLS	2SLS	2SLS
$Rebate_{t+1}$ or	0.247	0.386	1.85	3.29	0.208	0.386
$I(Rebate_{t+1} > 0)$	(0.114)	(0.135)	(1.04)	(1.01)	(0.111)	(0.135)
$Rebate_t$ or	−0.172	−0.099	−2.17	−1.72	−0.212	−0.139
$I(Rebate_t > 0)$	(0.097)	(0.113)	(1.05)	(1.01)	(0.099)	(0.115)
$Rebate_{t-1}$ or	−0.034	−0.123	−0.32	−1.67	−0.055	−0.191
$I(Rebate_{t-1} > 0)$	(0.121)	(0.141)	(1.23)	(1.21)	(0.122)	(0.142)
	Implied cumulative fraction of rebate spent over all three three-month periods					
	0.362	0.838	NA	NA	0.145	0.690
	(0.322)	(0.392)			(0.315)	(0.396)

Notes: All regressions also include the change in the number of adults, the change in the number of children, the age of the household, and a full set of month dummies. Standard errors are adjusted for arbitrary within-household correlations and heteroskedasticity. The coefficients in the second pair of columns are multiplied by 100 so as to report a percent change. The final pair of columns report results from 2SLS regressions where $I(Rebate > 0)$ and its lags, along with the other regressors, are used as instruments for *Rebate* and its lags. The regression R^2's range from 0.7 percent to 0.9 percent and the RMSE are similar or slightly smaller than those reported in Table 2.

TABLE 5—THE PROPENSITY TO SPEND ACROSS DIFFERENT HOUSEHOLDS

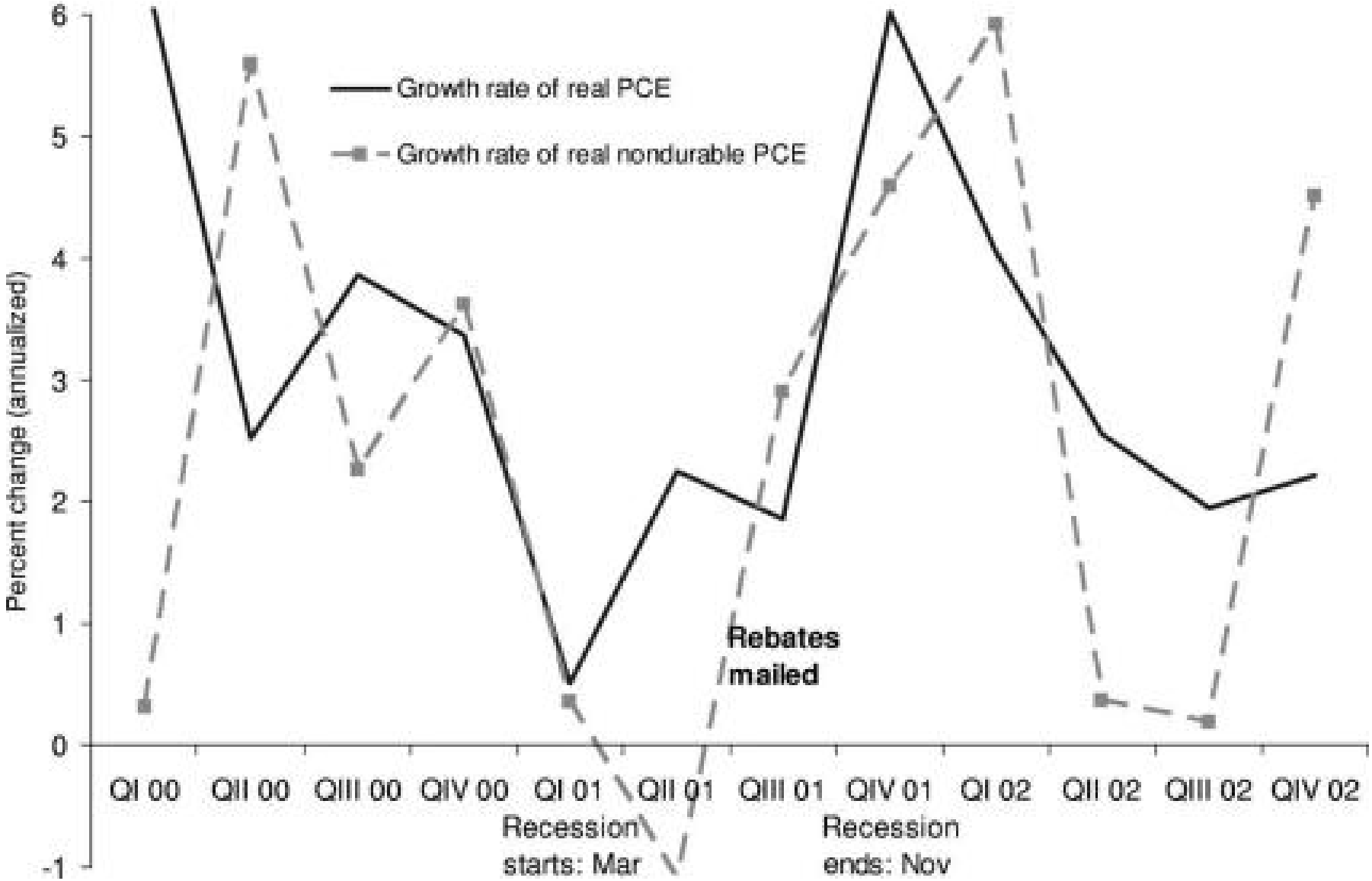
	Dollar change in:		*Percent change in:*		*Dollar change in:*	
	Strictly nondurable goods	Nondurable goods	Strictly nondurable goods	Nondurable goods	Strictly nondurable goods	Nondurable goods
	Interaction: Age		*Interaction: Income*		*Interaction: Liquid Assets*	
	Low: age ≤ 39 High: age ≥ 56		Low: ≤34,298 High: >69,000		Low: ≤1,000 High: >8,000	
$Rebate_{t+1}$	0.249	0.363	0.050	0.129	−0.284	−0.243
	(0.177)	(0.209)	(0.163)	(0.184)	(0.177)	(0.217)
$Rebate_{t+1} * Low$	−0.063	0.033	0.319	0.627	0.569	0.876
(Low group diff)	(0.210)	(0.238)	(0.224)	(0.266)	(0.239)	(0.284)
$Rebate_{t+1} * High$	−0.095	0.034	0.275	0.256	0.312	0.404
(High group diff)	(0.264)	(0.304)	(0.251)	(0.291)	(0.299)	(0.364)
$Rebate_t$	−0.266	−0.250	−0.080	−0.064	0.201	0.283
	(0.142)	(0.167)	(0.148)	(0.172)	(0.226)	(0.261)
$Rebate_t * Low$	0.271	0.425	−0.053	−0.067	−0.290	−0.292
(Low group diff)	(0.190)	(0.223)	(0.198)	(0.248)	(0.253)	(0.302)
$Rebate_t * High$	−0.042	0.010	−0.310	−0.246	−0.659	−0.670
(High group diff)	(0.228)	(0.270)	(0.235)	(0.275)	(0.298)	(0.358)
N	12,730	12,730	9,233	9,233	5,951	5,951
	Implied cumulative fraction spent over both three-month periods for each group					
Baseline group	0.232	0.476	0.020	0.194	−0.367	−0.203
	(0.359)	(0.431)	(0.363)	(0.410)	(0.405)	(0.501)
Low group	0.377	0.967	0.604	1.380	0.481	1.256
	(0.323)	(0.370)	(0.347)	(0.428)	(0.364)	(0.425)
High group	−0.001	0.554	0.259	0.461	−0.403	−0.065
	(0.395)	(0.476)	(0.421)	(0.507)	(0.569)	(0.704)

Notes: All regressions also include separate intercepts for the high and low groups, the change in the number of adults, the change in the number of children, the age of the household, and a full set of month dummies. All results are from 2SLS regressions where $I(Rebate > 0)$ and its lag and interactions, along with the other regressors, are used as instruments for *Rebate* and its lag and interactions. Reported standard errors are adjusted for arbitrary within-household correlations and heteroskedasticity. All sample splits are chosen to include about one-third of rebate recipients in each grouping. The R^2's range from 0.7 percent to 1.5 percent, with the highest fits for the splits using liquid assets; the RMSE are somewhat smaller than those reported in Table 2, smallest for the splits using liquid assets.

TABLE 6—THE PROPENSITY TO SPEND ON DIFFERENT CATEGORIES OF GOODS

	Panel A. Food			*Panel B. Additional strictly nondurable goods*				*Panel C. Additional nondurable goods*		
	Food at home	Food away from home	Alcoholic beverages	Utilities, household operations	Personal care, misc.	Gas, motor fuel, public transportation	Tobacco products	Apparel	Health	Reading
Avg. share of nondurables:	0.27	0.08	0.02	0.24	0.04	0.10	0.02	0.08	0.14	0.01
$Rebate_{t+1}$	0.054	0.045	0.004	0.036	0.067	0.002	0.000	0.074	0.098	0.005
	(0.038)	(0.038)	(0.011)	(0.027)	(0.058)	(0.044)	(0.007)	(0.044)	(0.040)	(0.004)
$Rebate_t$	0.005	−0.039	0.003	−0.005	−0.070	−0.079	−0.004	0.085	−0.009	0.000
	(0.038)	(0.046)	(0.011)	(0.025)	(0.052)	(0.040)	(0.008)	(0.033)	(0.040)	(0.005)
	Implied cumulative fraction spent over both three month periods on each category of expenditure									
	0.114	0.051	0.010	0.067	0.064	−0.074	−0.005	0.234	0.187	0.011
	(0.085)	(0.079)	(0.022)	(0.056)	(0.107)	(0.083)	(0.015)	(0.090)	(0.082)	(0.008)
RMSE	624	635	173	697	833	668	136	715	698	73
R^2 (percent)	0.3	0.6	0.2	0.6	0.2	0.8	0.2	1.5	0.2	0.5

Notes: $N = 12{,}730$ for all regressions. All regressions also include the change in the number of adults, the change in the number of children, the age of the household, and a full set of month dummies. Reported standard errors are adjusted for arbitrary within-household correlations and heteroskedasticity. All results are from 2SLS regressions where $I(Rebate)$ and its lag, along with the other regressors, are used as instruments for *Rebate* and its lag.


Growth rate of real PCE
Growth rate of real nondurable PCE
Percent change (annualized)
6
5
4
3
2
1
0
-1
QI 00
QII 00
QIII 00
QIV 00
QI 01
QII 01
QIII 01
QIV 01
QI 02
QII 02
QIII 02
QIV 02
Rebates mailed
Recession starts: Mar
Recession ends: Nov

1. Keynes (1936) consumption function, Friedman (1957) PIH
2. Poterba and Summers (1987) Paper
3. Campbell and Deaton (1989) Paper
4. Parker (1999) Paper
5. Parker (2000) Paper
6. Carroll (2000) Paper
7. Johnson et al. (2006) Paper
8. **Jappelli and Pistaferri (2014) Paper**
9. Kaplan et al. (2014) Paper
10. Saez and Zucman (2016) Paper
11. Parker (2017) Paper
12. Wong (2016) Paper

Abstract

We use responses to survey questions in the 2010 Italian Survey of Household Income and Wealth that ask consumers how much of an unexpected transitory income change they would consume. The **marginal propensity to consume (MPC) is 48 percent on average**. We also find substantial heterogeneity in the distribution, as households with low cash-on-hand exhibit a much higher MPC than affluent households, which is in agreement with models with precautionary savings, where income risk plays an important role. The results have important implications for predicting household responses to tax reforms and redistributive policies. Imagine you unexpectedly receive a reimbursement equal to the amount your household earns in a month. How much of it would you save and how much would you spend? Please give the percentage you would save and the percentage you would spend.

Empirical Strategy

- Not based on actual behavior, but based on a **survey**.
- Of course, some economists would always be skeptical (especially if the results do not conform to their priors) of that type of evidence.
- Personally, I think that this at least informs on people's views of what their own preferences look like.
- The main question is as follows: "Imagine you unexpectedly receive a reimbursement equal to the amount your household earns in a month. How much of it would you save and how much would you spend? Please give the percentage you would save and the percentage you would spend."

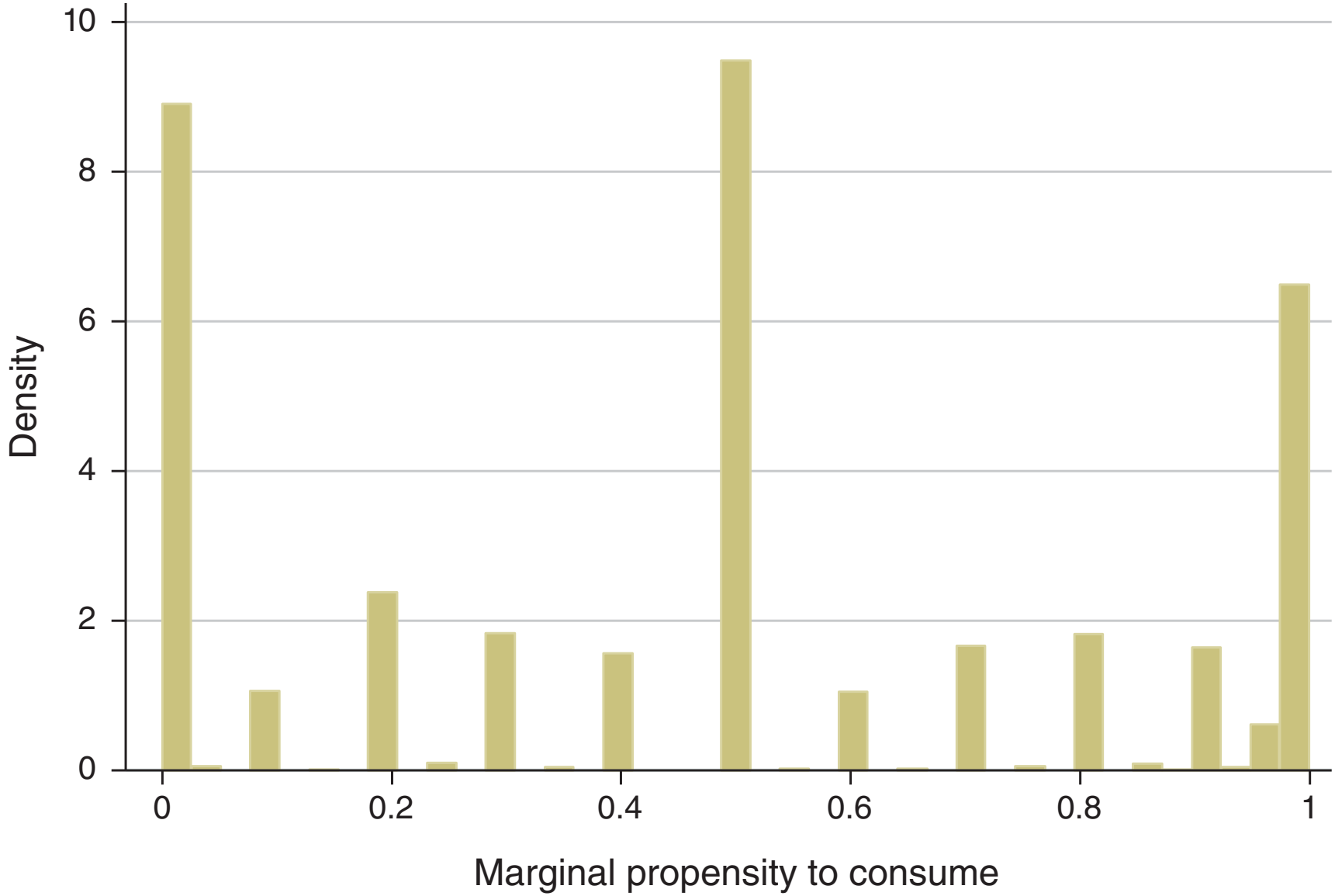


FIGURE 1. SELF-REPORTED MPC FROM TRANSITORY INCOME SHOCK

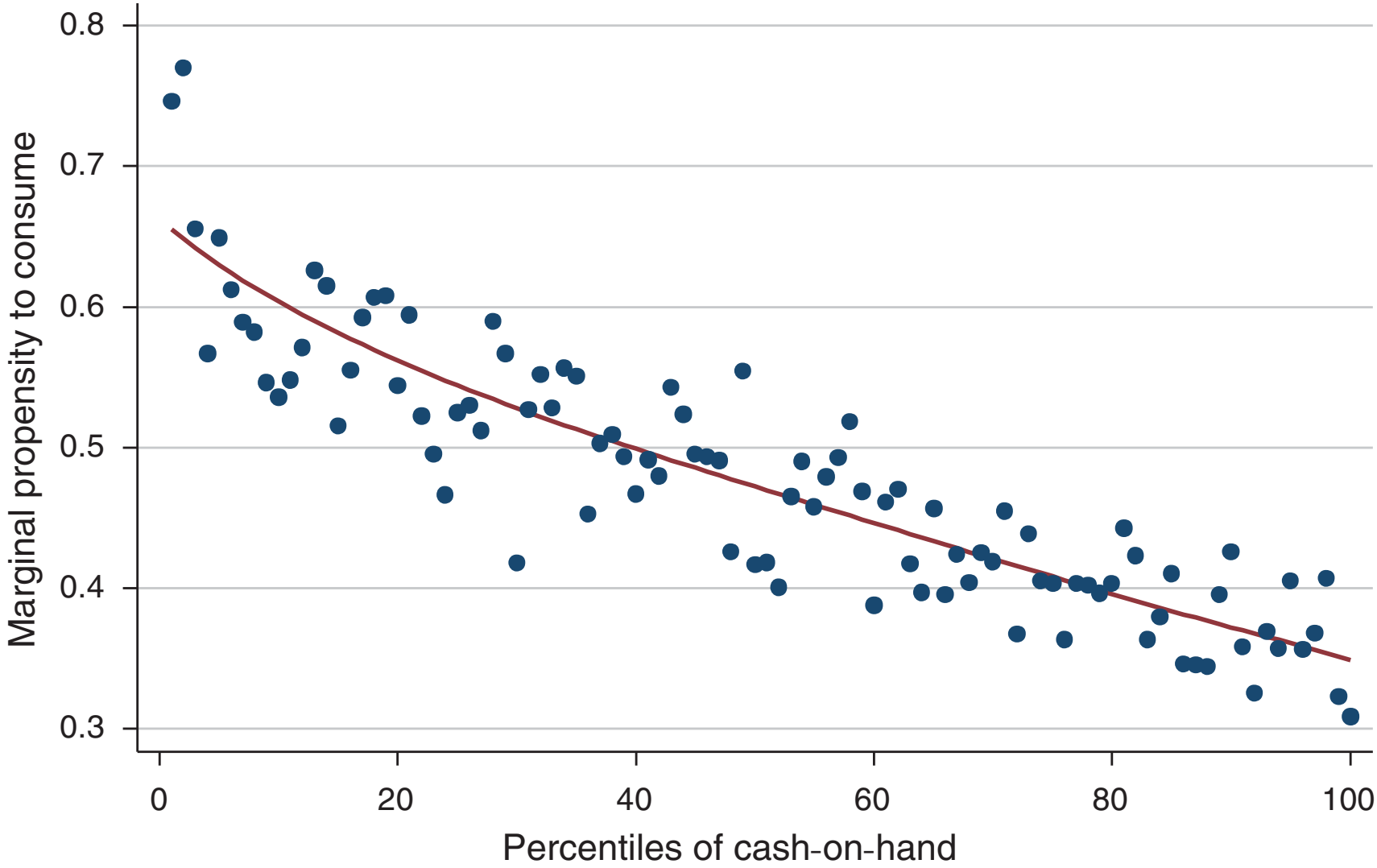


FIGURE 2. AVERAGE MPC BY CASH-ON-HAND PERCENTILES

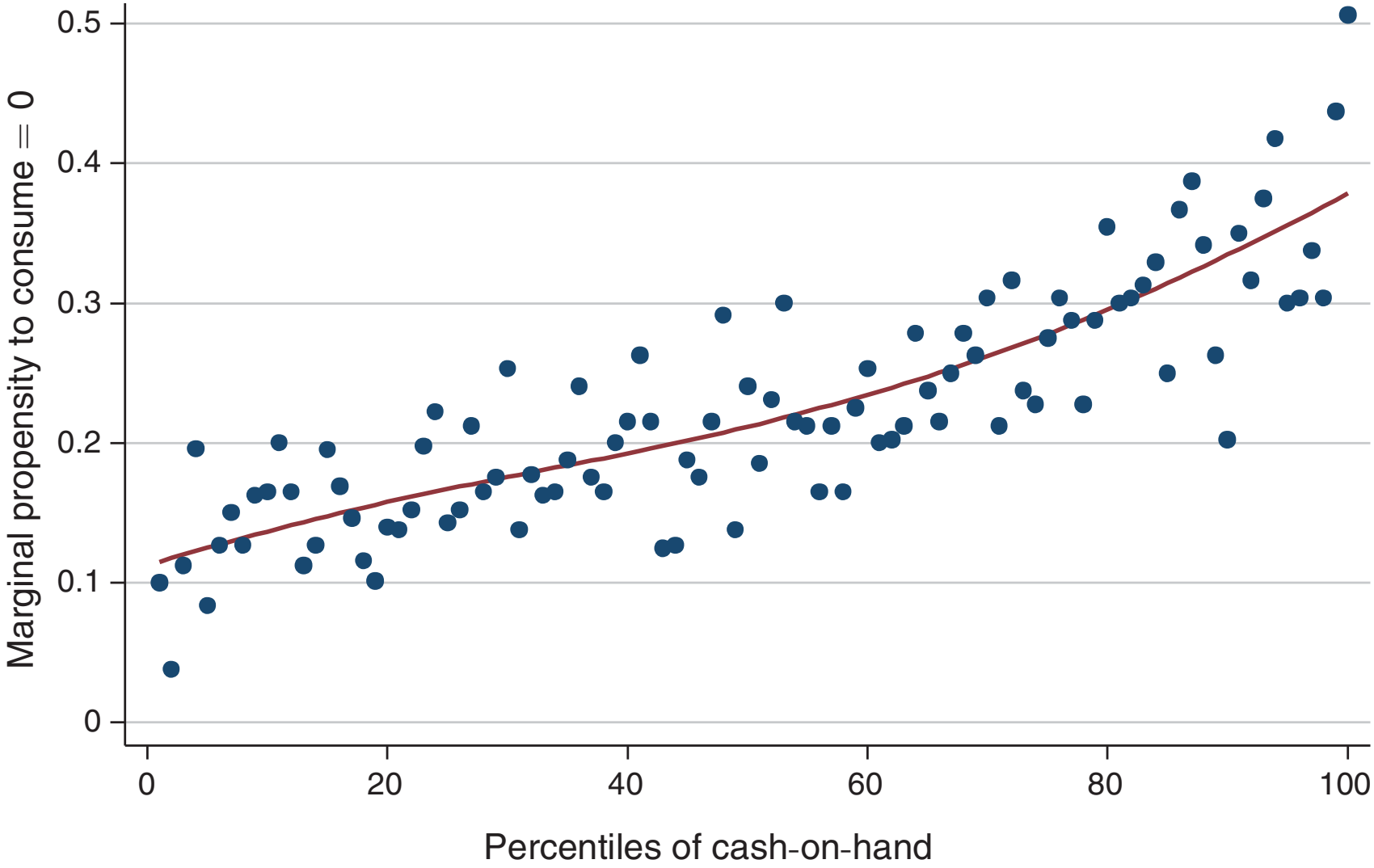


FIGURE 3. FRACTION WITH MPC $= 0$ BY CASH-ON-HAND PERCENTILES

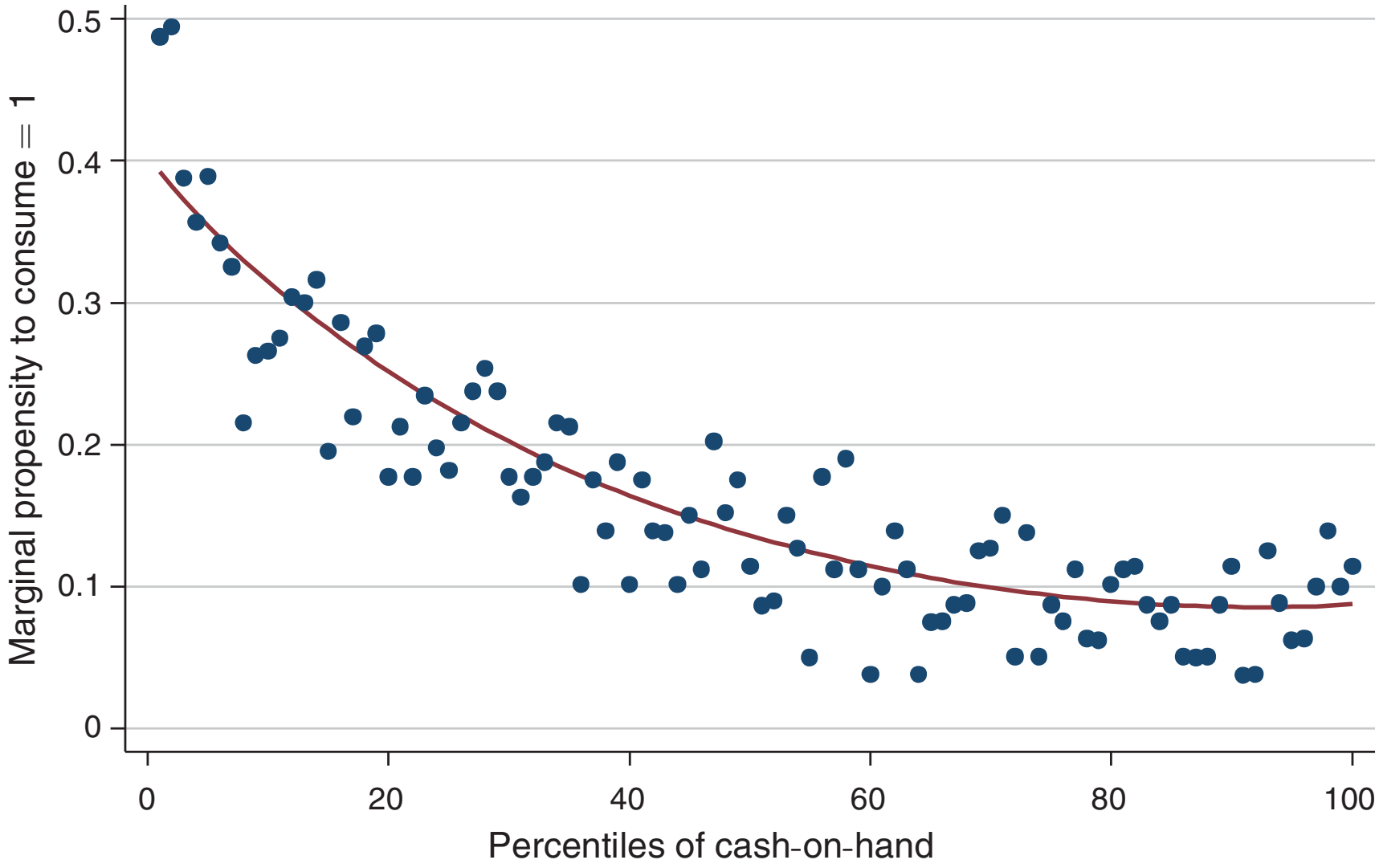


FIGURE 4. FRACTION WITH MPC = 1 BY CASH-ON-HAND PERCENTILES

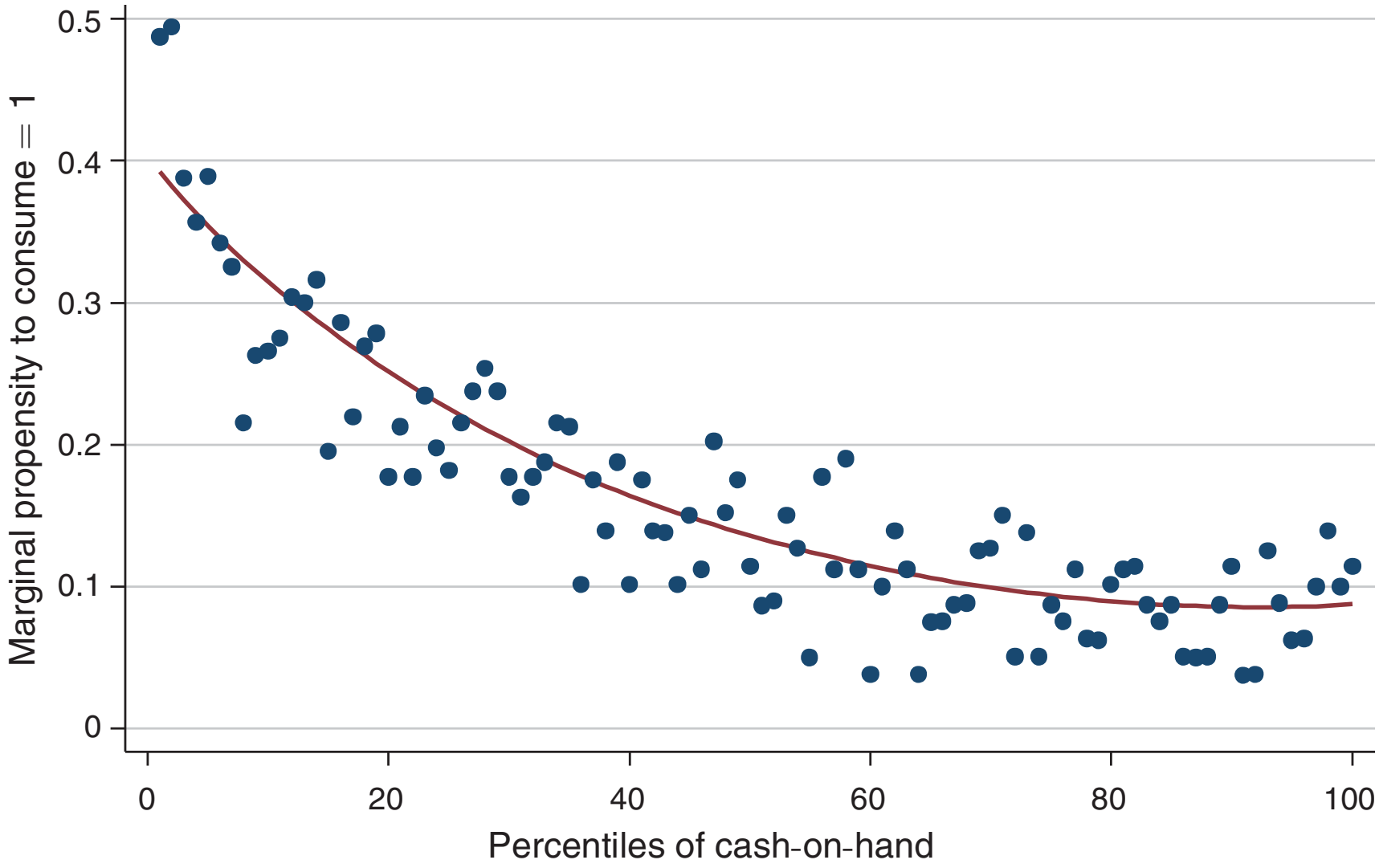


FIGURE 4. FRACTION WITH MPC = 1 BY CASH-ON-HAND PERCENTILES

TABLE 1—DESCRIPTIVE STATISTICS

	Mean	Standard deviation	Minimum	Maximum
Marginal propensity to consume (MPC)	0.476	0.357	0.000	1.000
Age	58.374	15.761	18.000	99.000
Male	0.545	0.498	0.000	1.000
Married	0.623	0.485	0.000	1.000
Years of education	9.576	4.595	0.000	20.000
Resident in the South	0.324	0.468	0.000	1.000
Family size	2.495	1.257	1.000	12.000
City size less than 20,000	0.256	0.437	0.000	1.000
City size 20,000–40,000	0.182	0.386	0.000	1.000
City size 40,000–500,000	0.470	0.499	0.000	1.000
City size over 500,000	0.091	0.288	0.000	1.000
Cash ('000 euro)	62.482	111.871	0.000	4,381.469
Disposable income ('000 euro)	33.089	24.530	0.000	587.784
Financial wealth ('000 euro)	29.393	98.324	0.000	4,154.771
Unemployed	0.035	0.185	0.000	1.000
Liquidity constrained	0.047	0.212	0.000	1.000
Overdraft	0.269	0.444	0.000	1.000
Credit card	0.320	0.467	0.000	1.000
Late payment	0.010	0.102	0.000	1.000

Notes: Data are drawn from the 2010 SHIW. Total number of observations is 7,950.

Table 2—Baseline Estimates

	(1)	(2)	(3)
Age 18–30	0.111	0.023	0.017
	(0.034)***	(0.035)	(0.035)
Age 31–45	0.106	0.042	0.040
	(0.018)***	(0.019)**	(0.019)**
Age 46–60	0.076	0.051	0.048
	(0.016)***	(0.016)***	(0.016)***
Male	−0.028	−0.016	−0.017
	(0.013)**	(0.013)	(0.013)
Married	−0.041	−0.013	−0.012
	(0.016)**	(0.016)	(0.016)
Years of education	−0.005	0.005	0.005
	(0.001)***	(0.002)***	(0.002)***
Family size	0.009	0.023	0.022
	(0.007)	(0.007)***	(0.007)***
Resident in the South	0.339	0.276	0.276
	(0.013)***	(0.014)***	(0.014)***
City size less than 20,000	−0.208	−0.193	−0.193
	(0.023)***	(0.023)***	(0.023)***
City size 20,000–40,000	−0.185	−0.174	−0.174
	(0.024)***	(0.024)***	(0.024)***
City size 40,000–500,000	−0.125	−0.120	−0.120
	(0.022)***	(0.021)***	(0.021)***
I cash-on-hand quintile		0.293	0.287
		(0.024)***	(0.024)***
II cash-on-hand quintile		0.186	0.184
		(0.021)***	(0.021)***
III cash-on-hand quintile		0.133	0.132
		(0.020)***	(0.020)***
IV cash-on-hand quintile		0.063	0.062
		(0.019)***	(0.019)***
Unemployed			0.070
			(0.034)**
Observations	7,950	7,950	7,950

Notes: Estimation performed using Tobit. Standard errors are reported in parentheses.
***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

TABLE 3—DETERMINANTS OF MPC: AGE LESS THAN 60

	(1)	(2)	(3)
Age 18–30	0.036	−0.033	−0.035
	(0.034)	(0.034)	(0.034)
Age 31–45	0.032	−0.008	−0.008
	(0.017)*	(0.017)	(0.017)
Male	−0.045	−0.032	−0.032
	(0.016)***	(0.016)**	(0.016)**
Married	−0.050	−0.020	−0.018
	(0.022)**	(0.022)	(0.022)
Years of education	−0.010	0.001	0.001
	(0.002)***	(0.002)	(0.002)
Family size	0.005	0.019	0.019
	(0.008)	(0.008)**	(0.008)**
Resident in the South	0.338	0.269	0.269
	(0.018)***	(0.019)***	(0.019)***
City size less than 20,000	−0.176	−0.158	−0.158
	(0.030)***	(0.030)***	(0.030)***
City size 20,000–40,000	−0.178	−0.166	−0.166
	(0.031)***	(0.031)***	(0.031)***
City size 40,000–500,000	−0.099	−0.095	−0.095
	(0.028)***	(0.027)***	(0.027)***
I cash-on-hand quintile		0.321	0.315
		(0.031)***	(0.031)***
II cash-on-hand quintile		0.199	0.197
		(0.028)***	(0.028)***
III cash-on-hand quintile		0.123	0.122
		(0.026)***	(0.026)***
IV cash-on-hand quintile		0.070	0.070
		(0.025)***	(0.025)***
Unemployed			0.039
			(0.034)
Observations	4,315	4,315	4,315

Notes: Estimation performed using Tobit. Standard errors are reported in parentheses.
***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

TABLE 4—DETERMINANTS OF MPC:
THE ROLE OF DISPOSABLE INCOME, FINANCIAL ASSETS, AND DEBT

	(1)	(2)	(3)
Age 18–30	0.038	0.033	0.088
	(0.035)	(0.035)	(0.041)**
Age 31–45	0.057	0.055	0.090
	(0.019)***	(0.019)***	(0.023)***
Age 46–60	0.060	0.058	0.074
	(0.016)***	(0.016)***	(0.018)***
Male	−0.013	−0.013	−0.027
	(0.013)	(0.013)	(0.015)*
Married	−0.012	−0.011	−0.005
	(0.016)	(0.016)	(0.018)
Years of education	0.006	0.006	0.007
	(0.002)***	(0.002)***	(0.002)***
Family size	0.022	0.021	0.021
	(0.007)***	(0.007)***	(0.008)**
I income quintile	0.115	0.110	0.123
	(0.028)***	(0.028)***	(0.032)***
II income quintile	0.058	0.055	0.094
	(0.024)**	(0.024)**	(0.027)***
III income quintile	0.057	0.055	0.073
	(0.021)***	(0.021)**	(0.025)***
IV income quintile	0.032	0.031	0.056
	(0.020)	(0.020)	(0.023)**
I financial asset quintile	0.258	0.257	0.242
	(0.024)***	(0.024)***	(0.027)***
II financial asset quintile	0.146	0.146	0.144
	(0.022)***	(0.022)***	(0.024)***
III financial asset quintile	0.098	0.098	0.112
	(0.020)***	(0.020)***	(0.023)***
IV financial asset quintile	0.045	0.046	0.043
	(0.020)**	(0.020)**	(0.022)*
Homeowner	−0.003	−0.003	−0.002
	(0.015)	(0.015)	(0.017)
Positive debt	−0.090	−0.090	
	(0.015)***	(0.015)***	
Unemployed		0.056	0.017
		(0.034)*	(0.040)
Observations	7,950	7,950	5,967

Notes: Regressions include dummies for South and city size (less than 20,000 inhabitants, 20–40,000, and 40,000–500,000). Estimation performed using Tobit. Standard errors are reported in parentheses.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

TABLE 5—DETERMINANTS OF MPC: THE ROLE OF LIQUIDITY CONSTRAINTS

	(1)	(2)	(3)	(4)
Age 18–30	0.023	0.024	−0.033	−0.033
	(0.035)	(0.035)	(0.034)	(0.034)
Age 31–45	0.047	0.048	−0.003	−0.003
	(0.019)**	(0.019)**	(0.017)	(0.017)
Age 46–60	0.052	0.053		
	(0.016)***	(0.016)***		
Male	−0.015	−0.015	−0.030	−0.030
	(0.013)	(0.013)	(0.016)*	(0.016)*
Married	−0.014	−0.014	−0.023	−0.022
	(0.016)	(0.016)	(0.022)	(0.022)
Years of education	0.005	0.005	0.000	0.001
	(0.002)***	(0.002)***	(0.002)	(0.002)
Family size	0.022	0.022	0.019	0.019
	(0.007)***	(0.007)***	(0.008)**	(0.008)**
I cash-on-hand quintile	0.293	0.292	0.326	0.322
	(0.024)***	(0.025)***	(0.031)***	(0.033)***
II cash-on-hand quintile	0.185	0.184	0.200	0.198
	(0.021)***	(0.022)***	(0.028)***	(0.029)***
III cash-on-hand quintile	0.133	0.132	0.125	0.123
	(0.020)***	(0.021)***	(0.026)***	(0.027)***
IV cash-on-hand quintile	0.062	0.062	0.070	0.069
	(0.019)***	(0.019)***	(0.025)***	(0.025)***
Unemployed	0.075	0.075	0.044	0.044
	(0.034)**	(0.034)**	(0.034)	(0.034)
Turned down for credit or discouraged	−0.125	−0.126	−0.176	−0.176
	(0.029)***	(0.029)***	(0.032)***	(0.032)***
Overdraft		0.013		0.000
		(0.014)		(0.018)
Credit card		−0.011		−0.007
		(0.015)		(0.019)
Observations	7,950	7,950	4,315	4,315

Notes: Regressions include dummies for South and city size (less than 20,000 inhabitants, 20–40,000, and 40,000–500,000). Estimation performed using Tobit. Standard errors are reported in parentheses.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

TABLE 6—DETERMINANTS OF MPC: MEASUREMENT ERROR

	Total sample (1)	Excluding financial literacy < 2 (2)	Excluding quality of interview less than 8 (3)
Age 18–30	0.029	−0.006	−0.008
	(0.035)	(0.042)	(0.043)
Age 31–45	0.055	0.036	0.038
	(0.019)***	(0.022)	(0.023)*
Age 46–60	0.059	0.034	0.047
	(0.016)***	(0.019)*	(0.020)**
Male	−0.012	−0.027	−0.020
	(0.013)	(0.015)*	(0.016)
Married	−0.010	0.004	−0.018
	(0.016)	(0.020)	(0.021)
Years of education	0.007	0.002	0.005
	(0.002)***	(0.002)	(0.002)**
Family size	0.021	0.010	0.011
	(0.007)***	(0.008)	(0.008)
I cash-on-hand quintile	0.258	0.296	0.307
	(0.024)***	(0.030)***	(0.031)***
II cash-on-hand quintile	0.165	0.143	0.167
	(0.021)***	(0.025)***	(0.026)***
III cash-on-hand quintile	0.120	0.121	0.119
	(0.020)***	(0.023)***	(0.023)***
IV cash-on-hand quintile	0.054	0.047	0.056
	(0.019)***	(0.021)**	(0.022)**
Unemployed	0.075	0.066	0.093
	(0.033)**	(0.040)*	(0.047)**
Credit constrained	−0.131	−0.067	−0.145
	(0.029)***	(0.036)*	(0.038)***
Financial literacy	−0.009		
	(0.006)		
Responder's level of understanding	−0.024		
	(0.004)***		
Observations	7,950	5,292	5,479

Notes: Regressions include dummies for South and city size (less than 20,000 inhabitants, 20–40,000, and 40,000–500,000). Estimation performed using Tobit. Standard errors are reported in parentheses.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

TABLE 7—EFFECT OF TRANSFER POLICY FINANCED BY DEBT

Policy: Transfer equivalent to 1 percent of national disposable income	$MPC = \Delta C/\Delta Y$ (1)	Aggregate consumption growth (2)
Homogeneous MPC		
(a) Transfer to bottom income decile	0.48	0.62%
Heterogeneous MPC		
(b) Transfer to bottom income decile	0.62	0.82%
(c) Transfer to top income decile	0.36	0.47%
(d) Transfer to unemployed	0.58	0.76%

Notes: In column 1, we report the aggregate MPC, computed as: $\frac{\sum_i \beta_i \tau_i(k)}{G}$, where β_i is the individual MPC, $\tau_i(k)$ is the transfer received by household i in policy experiment k, and G are total government revenues raised. In column 2, we report aggregate consumption growth, defined as $\frac{\sum_i \beta_i \tau_i(k)}{\sum_i c_i}$, where c_i denotes household consumption. In experiments (a) and (b), transfers are distributed equally among members of the first decile of the cash-on-hand distribution; in experiment (c), transfers are distributed equally among members of the top decile of the cash-on-hand distribution; finally, in experiment (d) transfers are distributed equally among households with at least one unemployed member. See Appendix C for more details.

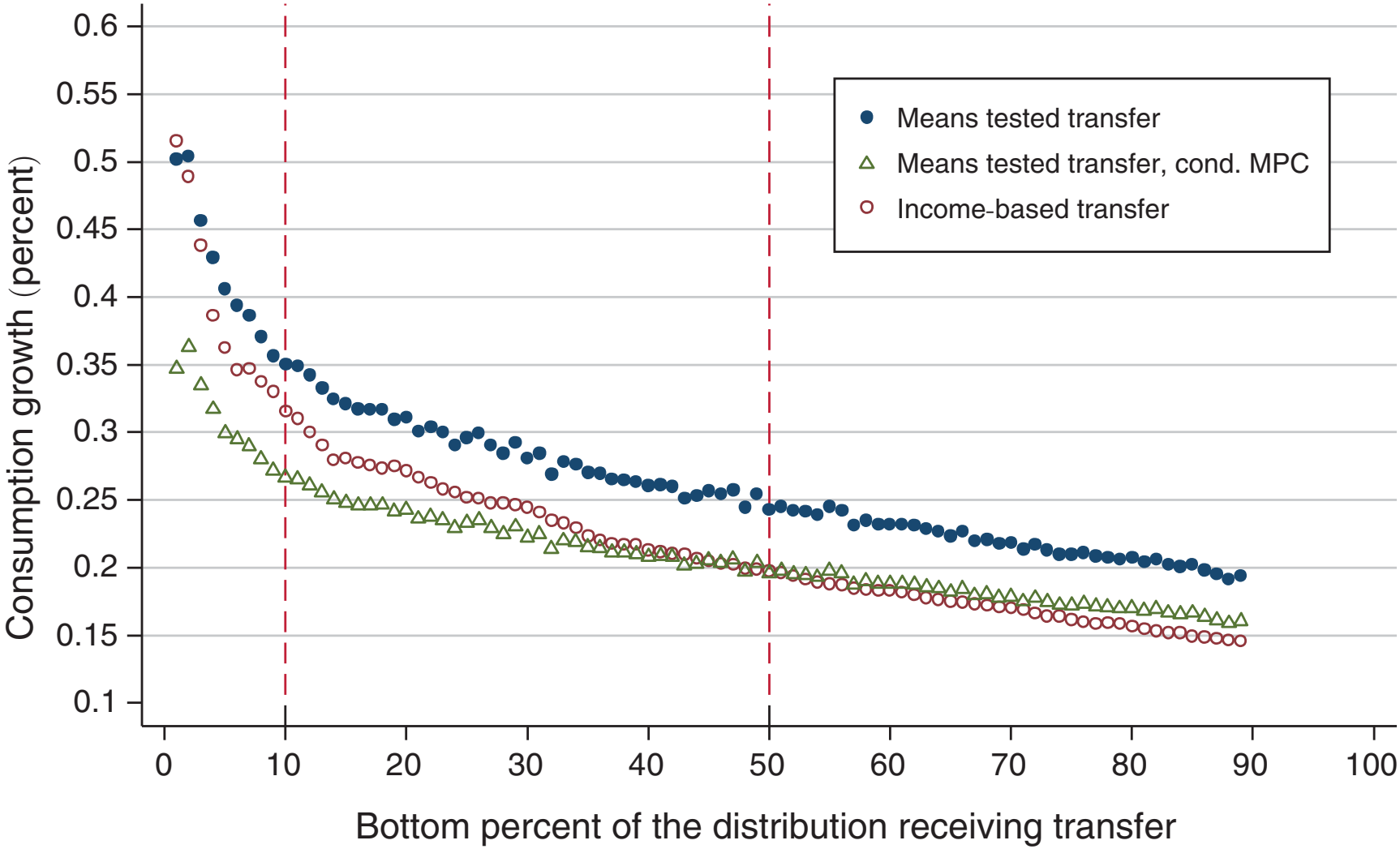


FIGURE 5. THE EFFECT OF A REDISTRIBUTIVE TRANSFER PROGRAM

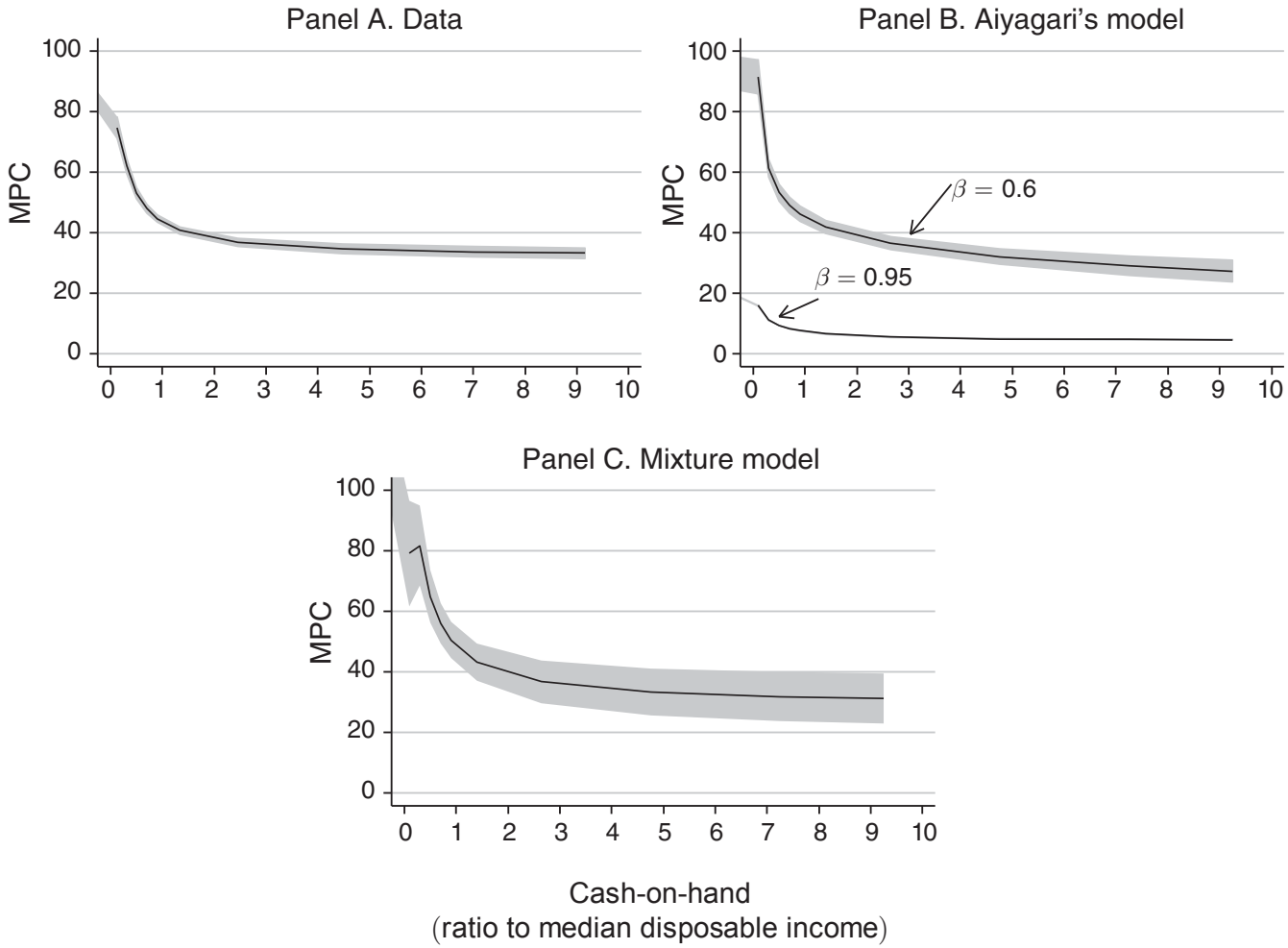


FIGURE B1. MPC HETEROGENEITY IN THE DATA AND IN TWO CONSUMPTION MODELS

Notes: Each graph plots average MPC for households in 10 bins of the distribution of cash-on-hand (relative to median disposable income): (0–0.2), (0.2–0.4), (0.4–0.6), (0.6–0.8), (0.8–1), (1–1.8), (1.8–3.5), (3.5–6), (6–8.5), (8.5–10). The continuous lines are fractional polynomial fits, the shaded areas are 95 percent confidence intervals. In panel B, we solve Aiyagari's model for two values of β (0.95 and 0.6). In panel C, we assume $\beta = 0.95$ and that the fraction of rule-of-thumb consumers is 75 percent in bins 1–3, 40 percent in bins 4–7, and 30 percent in bins 8–10.

"Wealthy" hand to mouth

- Way to "save" the Permanent Income Hypothesis, and to think about Keynesian multipliers.
- David H. Romer, in the discussion:
  - Way to save intertemporal optimization.
  - However, this is not how people behave.
  - People follow "rules of thumb."
- Also, asks Alan Blinder: is housing that much of a stellar investment?

Table 1. Summary Information on the Survey Data Used, Sample Countries

	United States	*Canada*[a]	*Australia*	*United Kingdom*	*Germany*	*France*	*Italy*	*Spain*
Survey years	*SCF 1989–2010*	*SFS 2005*	*HILDA 2010*	*WAS 2008–10*	*HFCS 2008–10*	*HFCS 2008–10*	*HFCS 2008–10*	*HFCS 2008–10*
Initial sample size	35,513	5,267	7,317	18,510	3,565	15,006	7,951	6,197
Exclusions								
Not age 22–79	2,098	373	782	1,655	246	1,428	846	559
Negative income	9	10	0	0	0	0	0	0
All income from self-employment	4,334	—	202	334	228	890	721	658
Final sample size	29,072	4,884	6,333	18,176	3,091	12,688	6,384	4,980

Source: Data from national and euro area survey series. See text for full description.
a. Self-employment income is not provided in the SFS for Canada.

Table 2. Household Income, Liquid and Illiquid Wealth Holdings, and Portfolio Composition, Sample Countries[a]

	United States[b]		*Canada*[c]		*Australia*		*United Kingdom*	
	Median	*Fraction positive*	*Median*	*Fraction positive*	*Median*	*Fraction positive*	*Median*	*Fraction positive*
Income (age 22–59)	47,040	0.984	49,905	1.000	79,555	0.993	29,340	0.979
Net worth	56,721	0.883	112,418	0.877	380,889	0.984	187,157	0.880
Net liquid wealth	1,714	0.750	2,643	0.716	12,139	0.880	2,111	0.632
Cash, checking, saving, MM accounts	2,640	0.923	2,873	0.864	8,709	0.978	2,639	0.766
Directly held stocks	0	0.142	0	0.109	0	0.351	0	0.160
Directly held bonds	0	0.014	0	0.106	0	0.015	0	0.154
Revolving credit card debt	0	0.382	0	0.412	0	0.296	0	0.405
Net illiquid wealth	52,000	0.761	100,713	0.752	347,500	0.939	17,4999	0.843
Housing net of mortgages	29,000	0.629	64,238	0.648	250,000	0.714	81,400	0.677
Retirement accounts	1,508	0.526	871	0.518	61,000	0.863	58,560	0.766
Life insurance	0	0.186	0	0.033	0	0.064	0	0.110

	Germany		*France*		*Italy*		*Spain*	
	Median	*Fraction positive*	*Median*	*Fraction positive*	*Median*	*Fraction positive*	*Median*	*Fraction positive*
Income (age 22–59)	35,444	0.994	31,518	0.999	26,116	0.987	26,961	0.991
Net worth	46,798	0.949	108,976	0.966	165,420	0.919	178,925	0.967
Net liquid wealth	1,319	0.853	1,453	0.925	5,226	0.769	2,685	0.890
Cash, checking, saving, MM accounts	1,154	0.876	1,255	0.953	4,181	0.769	2,261	0.908
Directly held stocks	0	0.110	0	0.151	0	0.043	0	0.106
Directly held bonds	0	0.050	0	0.015	0	0.146	0	0.014
Revolving credit card debt	0	0.225	0	0.076	0	0.049	0	0.086
Net illiquid wealth	39,306	0.876	104,214	0.922	148,524	0.803	171,161	0.885
Housing net of mortgages	0	0.476	86,372	0.607	148,524	0.716	162,491	0.847
Retirement accounts	0	0.245	0	0.039	0	0.088	0	0.037
Life insurance	0	0.493	0	0.378	0	0.193	0	0.245

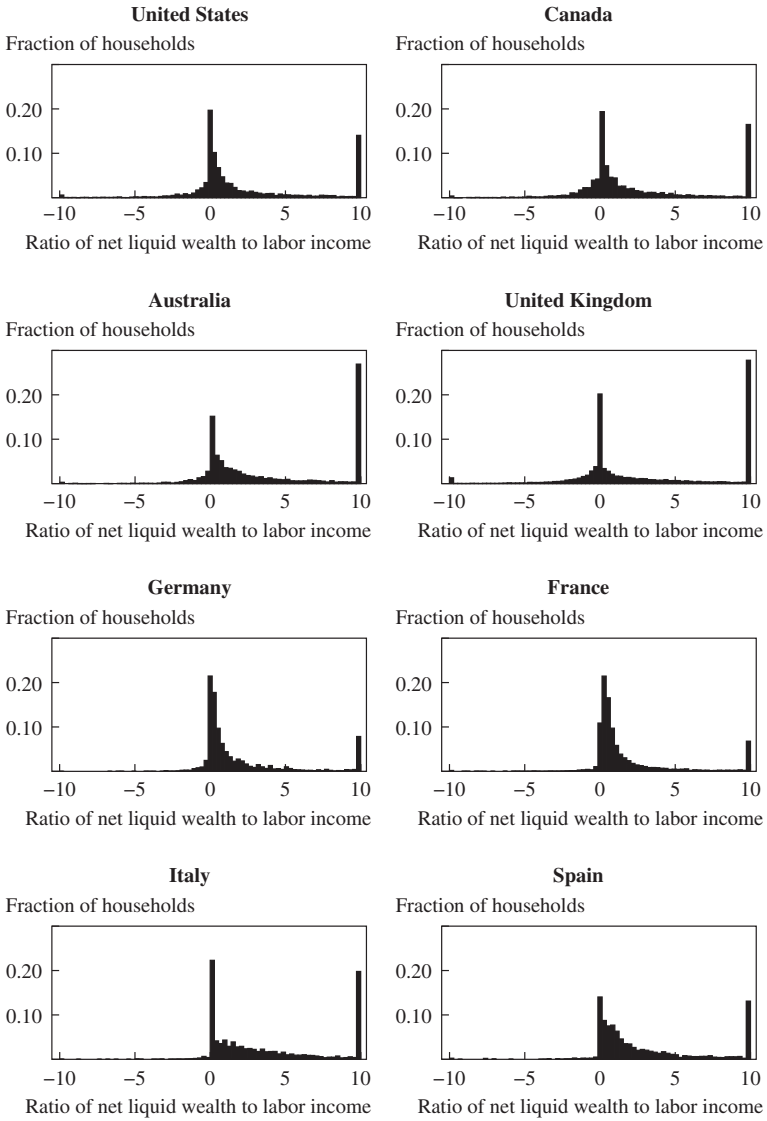
Source: Data from national and euro area survey series. See text for full description.

a. All figures are in local currency units. From the Federal Reserve Board's G.5 release, the average exchange rates in the survey years are 1.2 CA$, 1.1 AU$, 0.6 British pounds, and 0.7 euros per U.S. dollar.

b. Data for the United States are from the 2010 survey only.

c. Data for Canada are adjusted to 2010 Canadian dollars using the Canadian CPI.

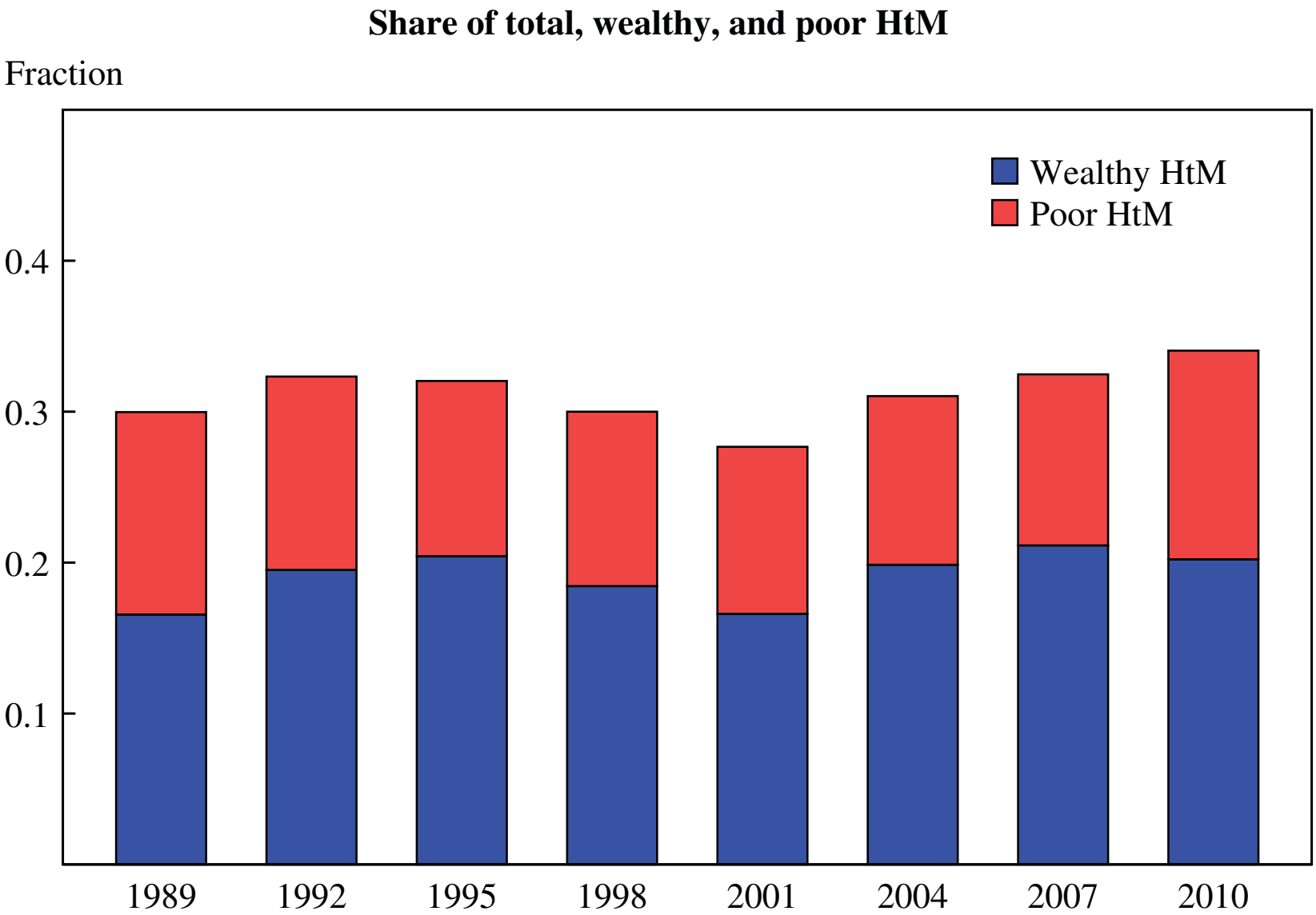
Figure 2. Distribution of Liquid Wealth to Monthly Income Ratios, Sample Countries[a]



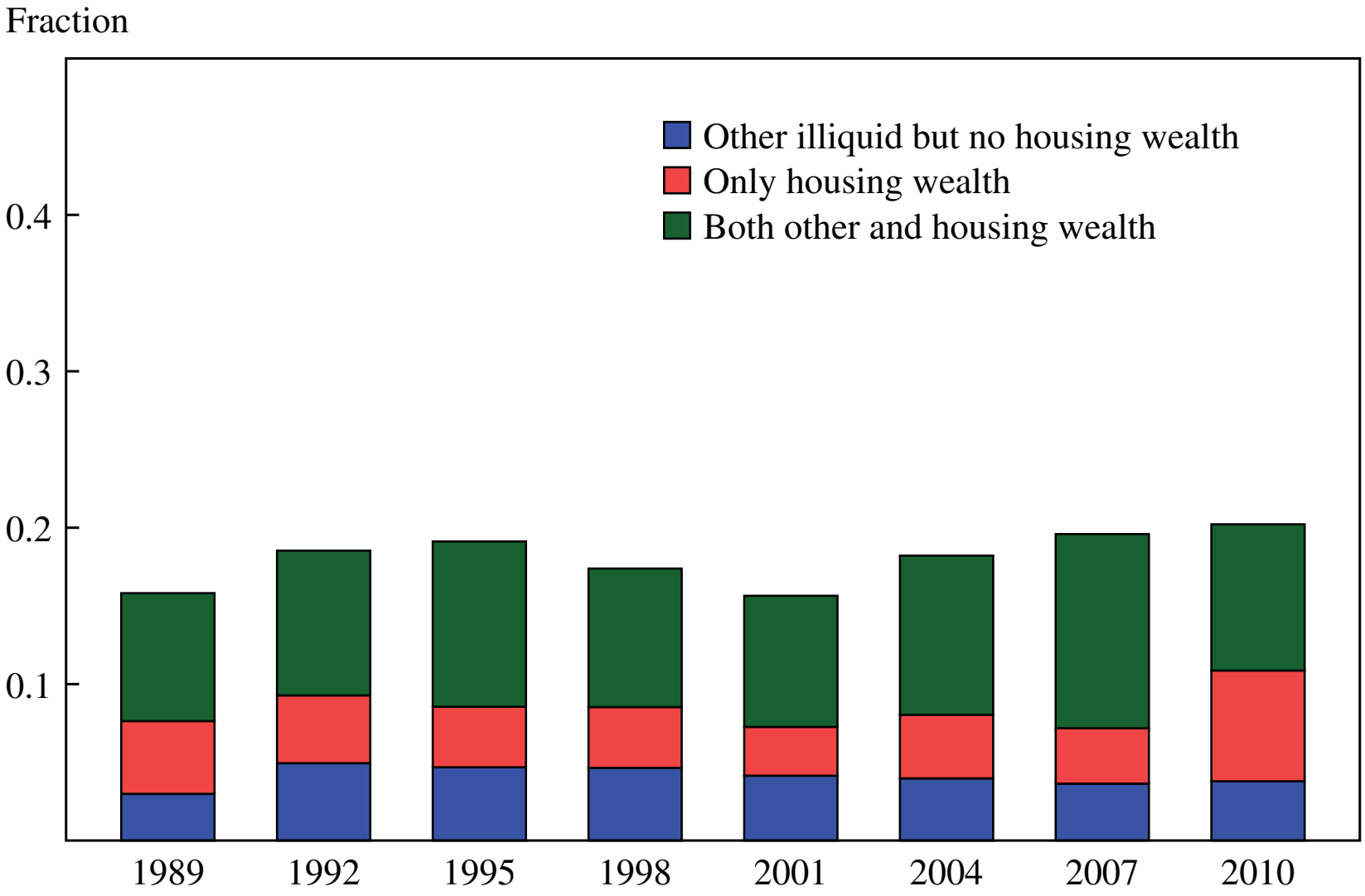
Source: Data from national and euro area survey series. See text for full description of the data.

a. Data for the United States are from the 2010 SCF; for Canada from the 2005 SFS; for Australia from the 2010 HILDA; for the United Kingdom from the 2010 WAS; and for euro area countries from the 2008–10 HFCS. See text for more details.

Figure 3. Fraction of HtM Households, United States, 1989–2010

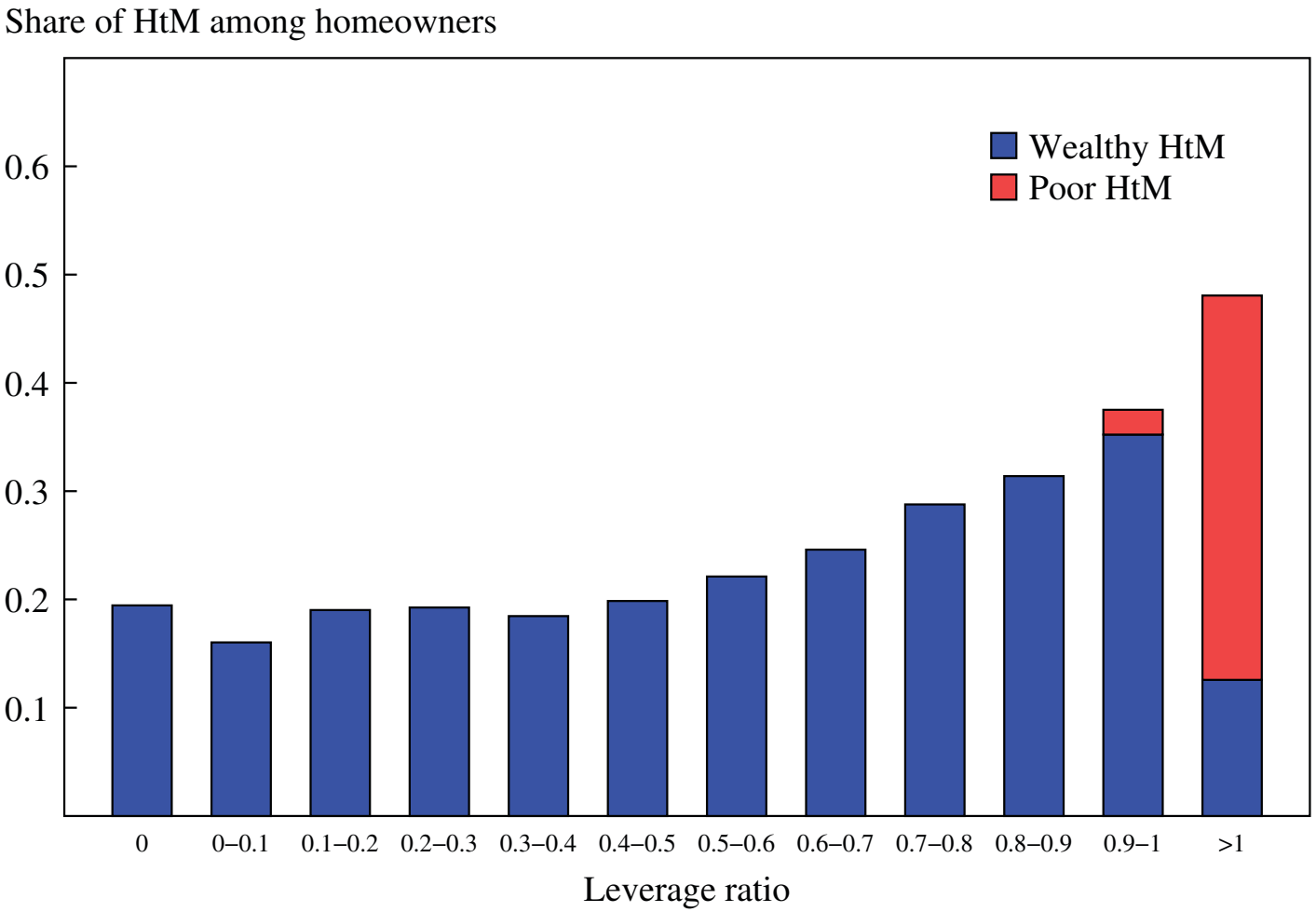


Wealthy HtM by portfolio composition



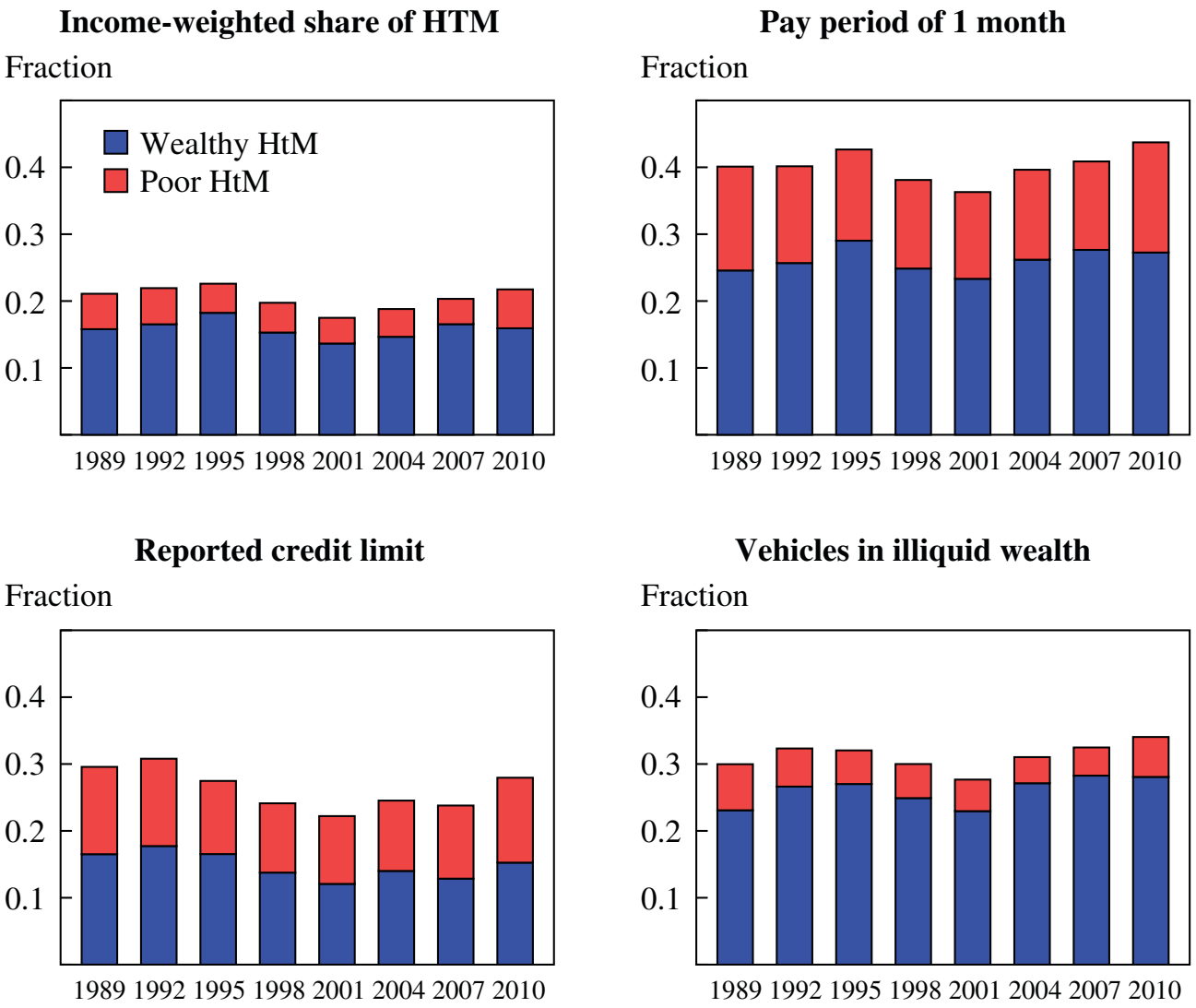
Source: Authors' calculations, based on the U.S. SCF. See text for full description.

Figure 4. Share of HtM Households among Homeowners by Leverage Ratio, United States, SCF, 1989–2010[a]



Source: Authors' calculations, based on the U.S. SCF. See text for full description.
a. Intervals include observations at the upper boundary point, but not at the lower boundary point.

Figure 5. Fraction of HtM Households, United States, Alternate Definitions, 1989–2010

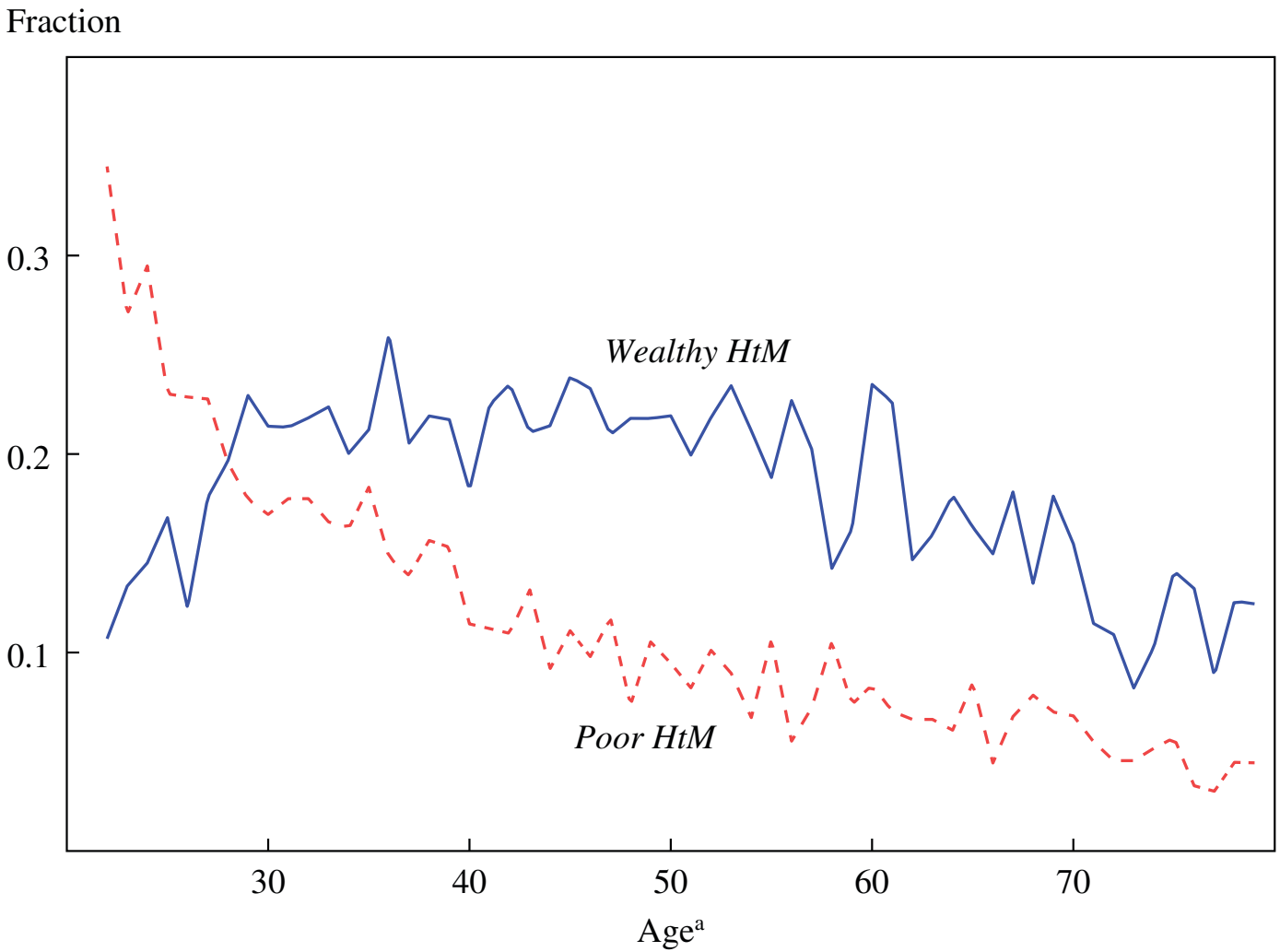


Source: Authors' calculations, based on the U.S. SCF. See text for full description.

Table 3. Robustness Results for Fraction HtM in Each HtM Category, United States, SCF, Pooled 1989–2010

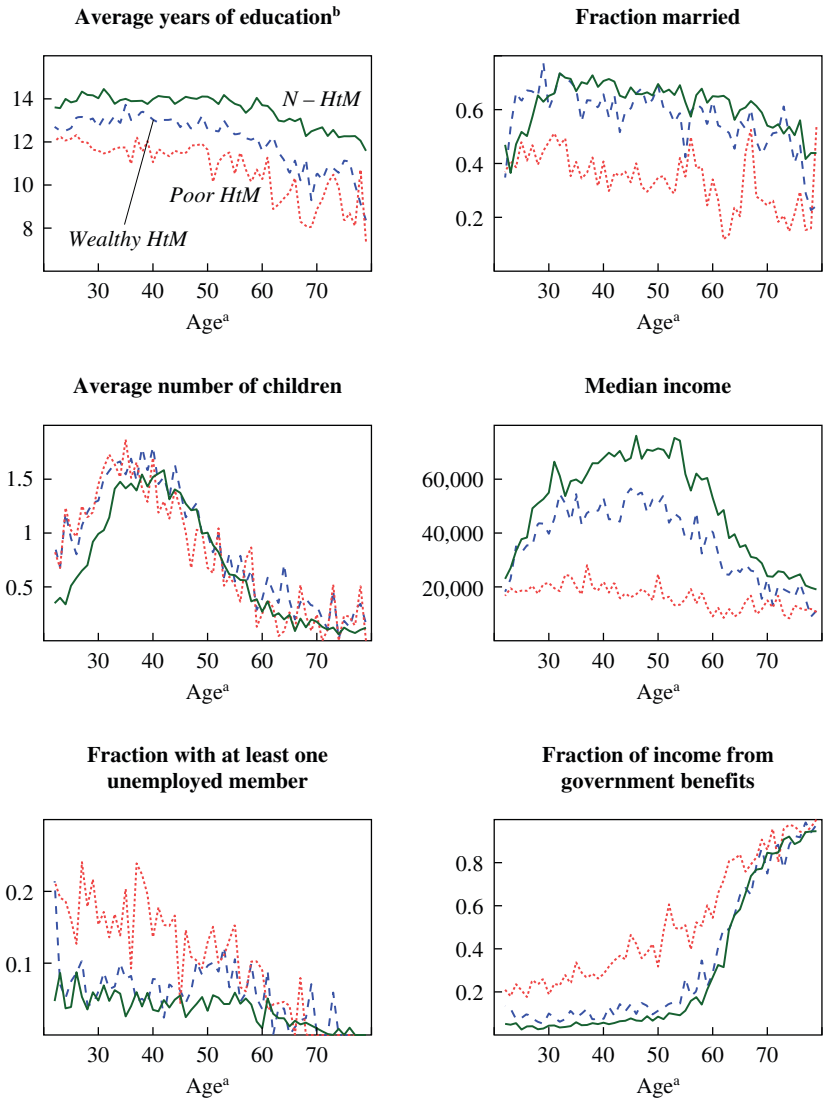
	P-HtM[i]	*W-HtM*[i]	*N-HtM*[i]	*HtM*[i]	*HtM-NW*[i]
Baseline	0.121	0.192	0.688	0.312	0.137
In past year, $c > y$	0.130	0.309	0.561	0.439	—
Usually, $c > y$	0.089	0.156	0.756	0.244	—
Financially fragile households[a]	0.173	0.331	0.497	0.503	0.209
Reported credit limit	0.114	0.147	0.738	0.262	0.126
1-year income credit limit	0.102	0.118	0.780	0.220	0.108
Weekly pay period	0.106	0.150	0.744	0.256	0.119
Monthly pay period	0.141	0.261	0.598	0.402	0.164
Higher illiquid wealth cutoff[b]	0.131	0.181	0.688	0.312	0.137
Retirement account as liquid for 60+[c]	0.121	0.183	0.696	0.304	0.137
Businesses as illiquid assets[d]	0.114	0.193	0.693	0.307	0.129
Direct as illiquid assets[e]	0.120	0.217	0.663	0.337	0.137
Other valuables as illiquid assets	0.117	0.196	0.688	0.312	0.132
Excludes cc puzzle households	0.163	0.183	0.654	0.346	0.177
HELOCs as liquid debt	0.120	0.181	0.699	0.301	0.135
Usual income	0.119	0.198	0.683	0.317	0.137

Figure 6. Age Profile of Fraction of HtM Households, United States, Pooled 1989–2010



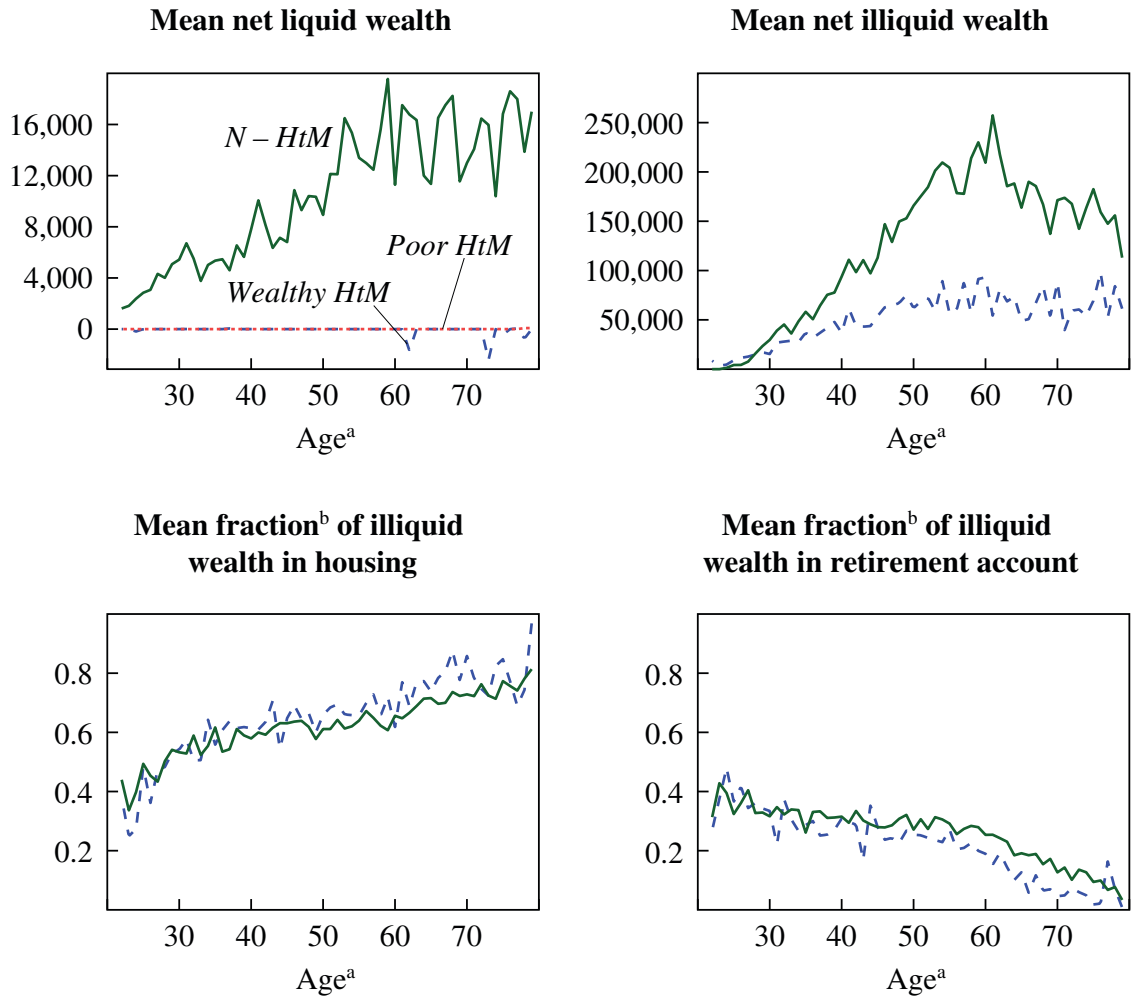
Source: Authors' calculations, based on the U.S. SCF. See text for full description.
a. Age refers to that of the head of the household.

Figure 7. Age Profile of the HtM, United States, by Demographic Characteristics, Pooled 1989–2010



Source: Authors' calculations, based on the U.S. SCF. See text for full description.
a. Age refers to that of the head of the household.
b. Average years of education refer to that of the head of the household.

Figure 8. Age Profile of the Portfolio Composition of the HtM, United States, Pooled 1989–2010



Source: Authors' calculations, based on the United States SCF. See text for full description.
a. Age refers to that of the head of household.
b. To reduce the sensitivity to outliers, means are computed after trimming the overall top and bottom 0.1 percent of the statistic's distribution.

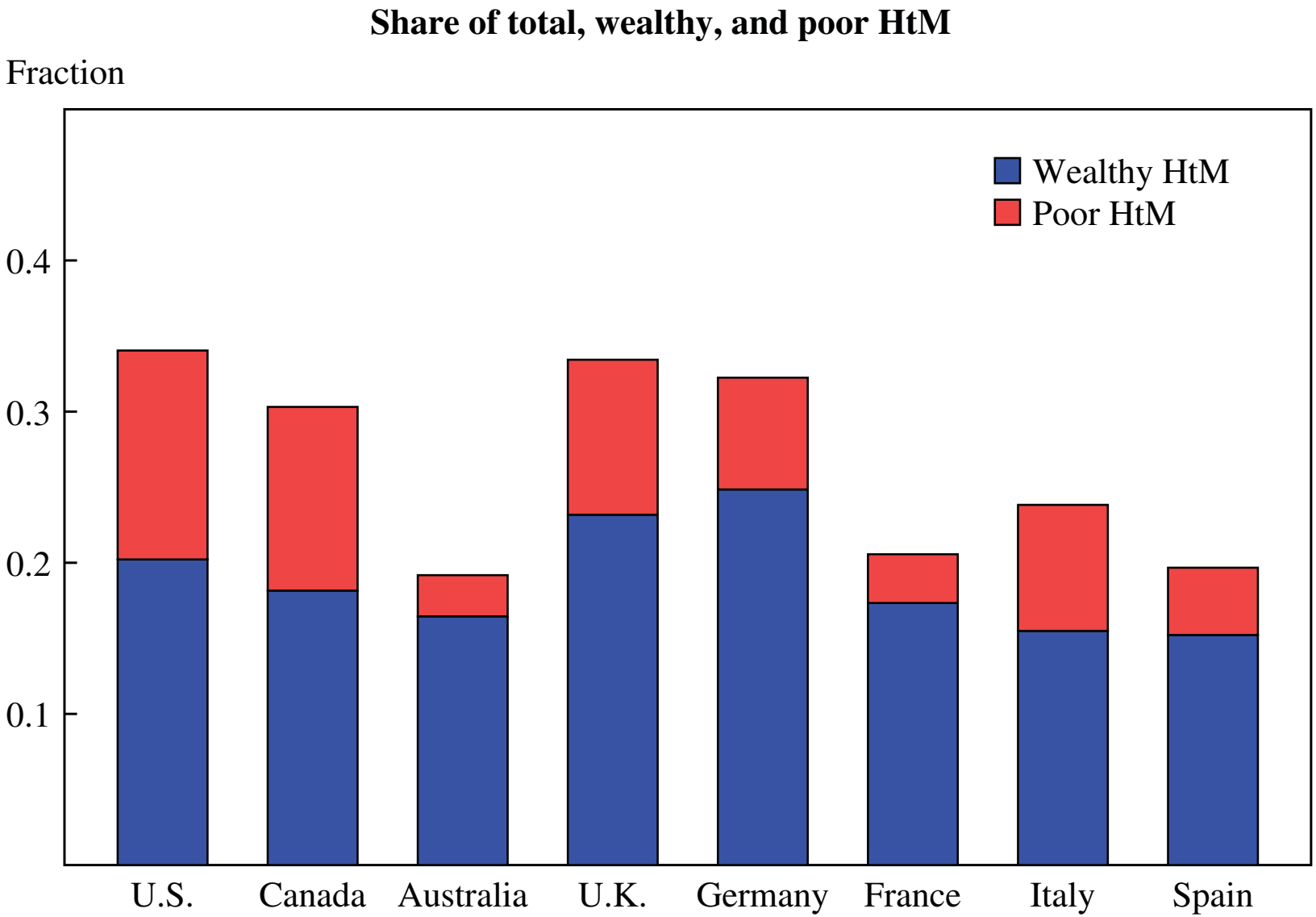
Table 4. Transition Matrix for the 2007–09 Panel of the SCF (United States)

07 → 09	*P*	*W*	*N*
P	0.548	0.127	0.326
W	0.101	0.455	0.444
N	0.055	0.129	0.816
Ergodic	0.126	0.191	0.683

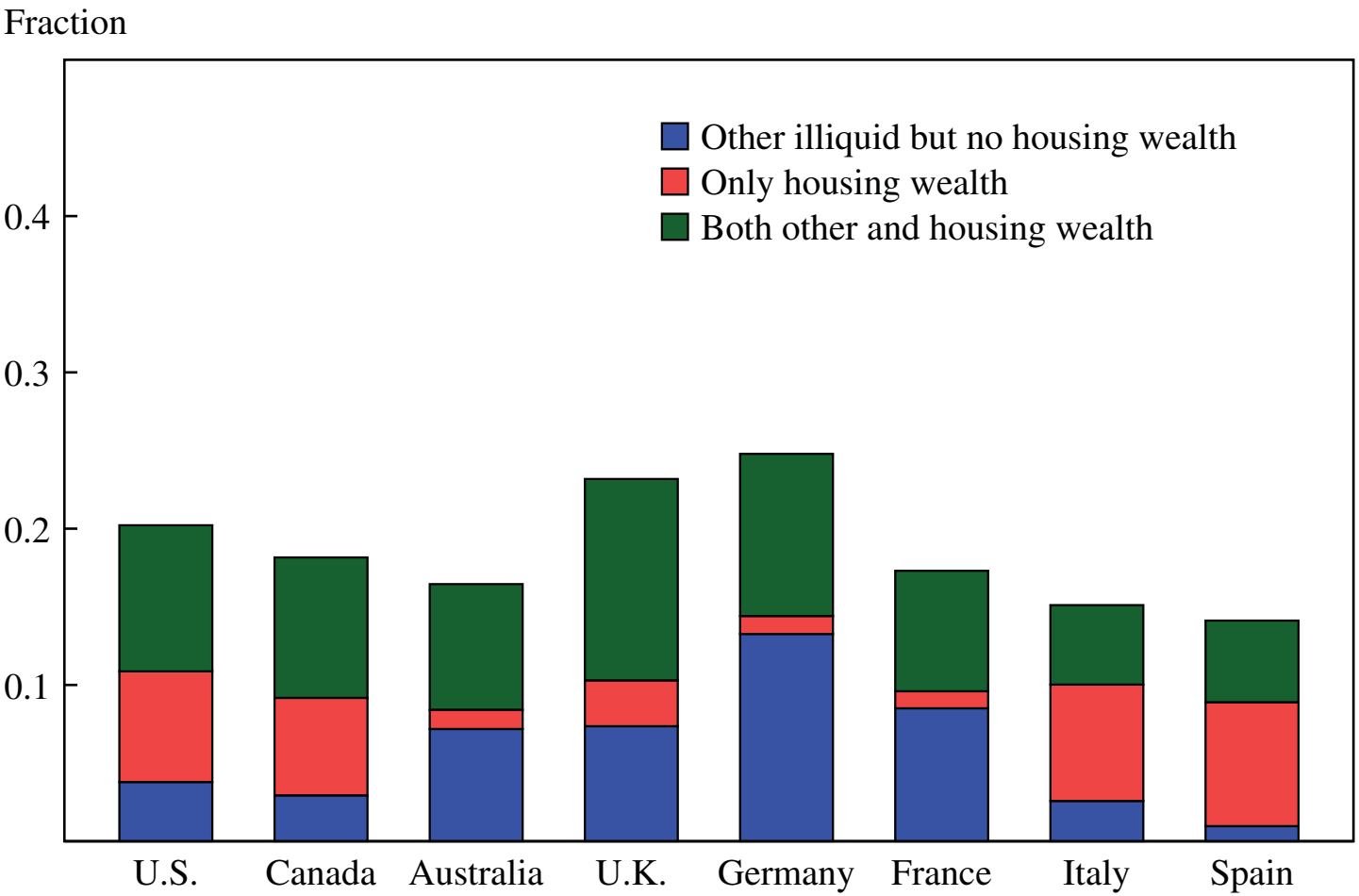
Source: Authors' calculations, based on U.S. SCF. See text for full description.

Note: Fraction of households with the row HtM status in 2007 and the column HtM status in 2009. The last row reports the implied ergodic distribution.

Figure 9. Fraction of Poor and Wealthy HtM Households, Sample Countries[a]



Wealthy HtM by portfolio composition



Source: Authors' calculations based on data from national and euro area survey series. See text for full description.

a. Data for the United States are from the 2010 SCF; for Canada from the 2005 SFS; for Australia from the 2010 HILDA; for the United Kingdom from the 2010 WAS; and for euro area countries from the 2008–10 HFCS. See text for more details.

Figure 10. Age Profile of Fraction of HtM Households, Sample Countries[a]

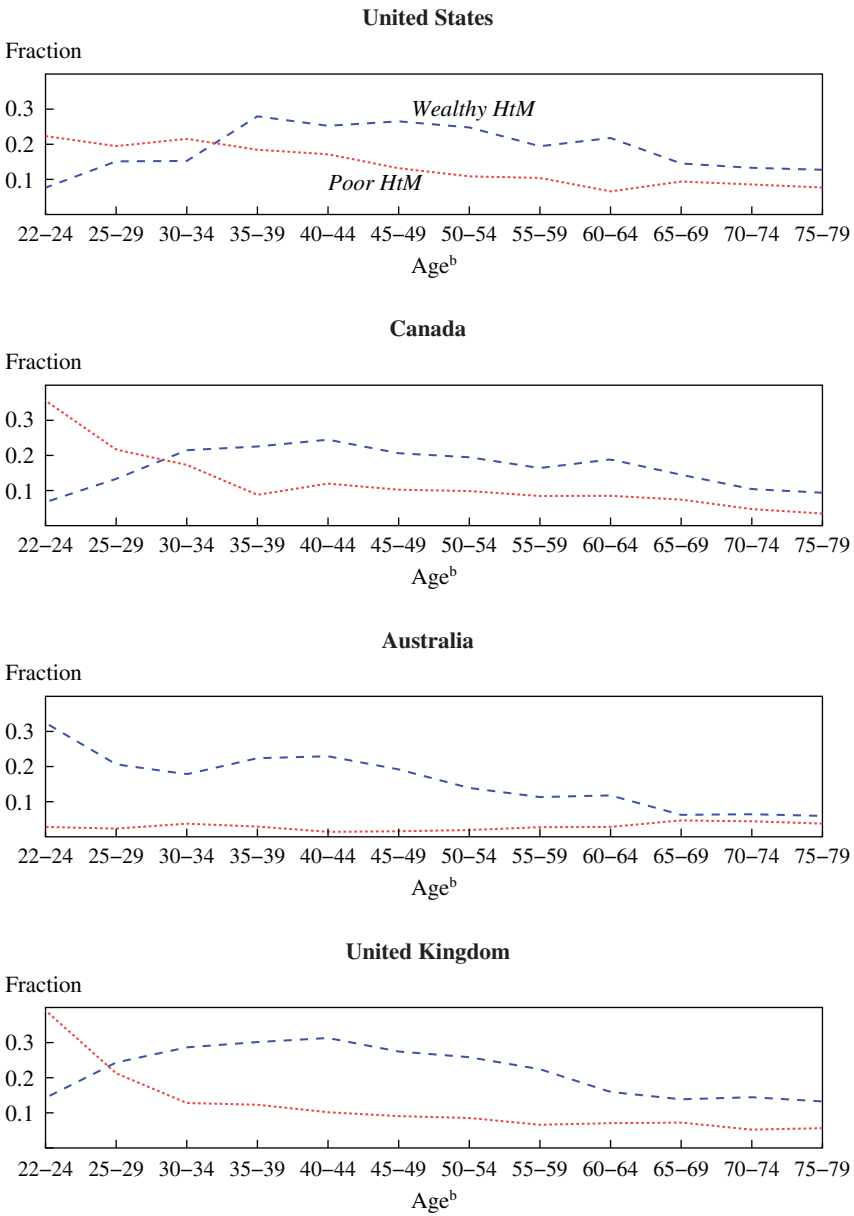
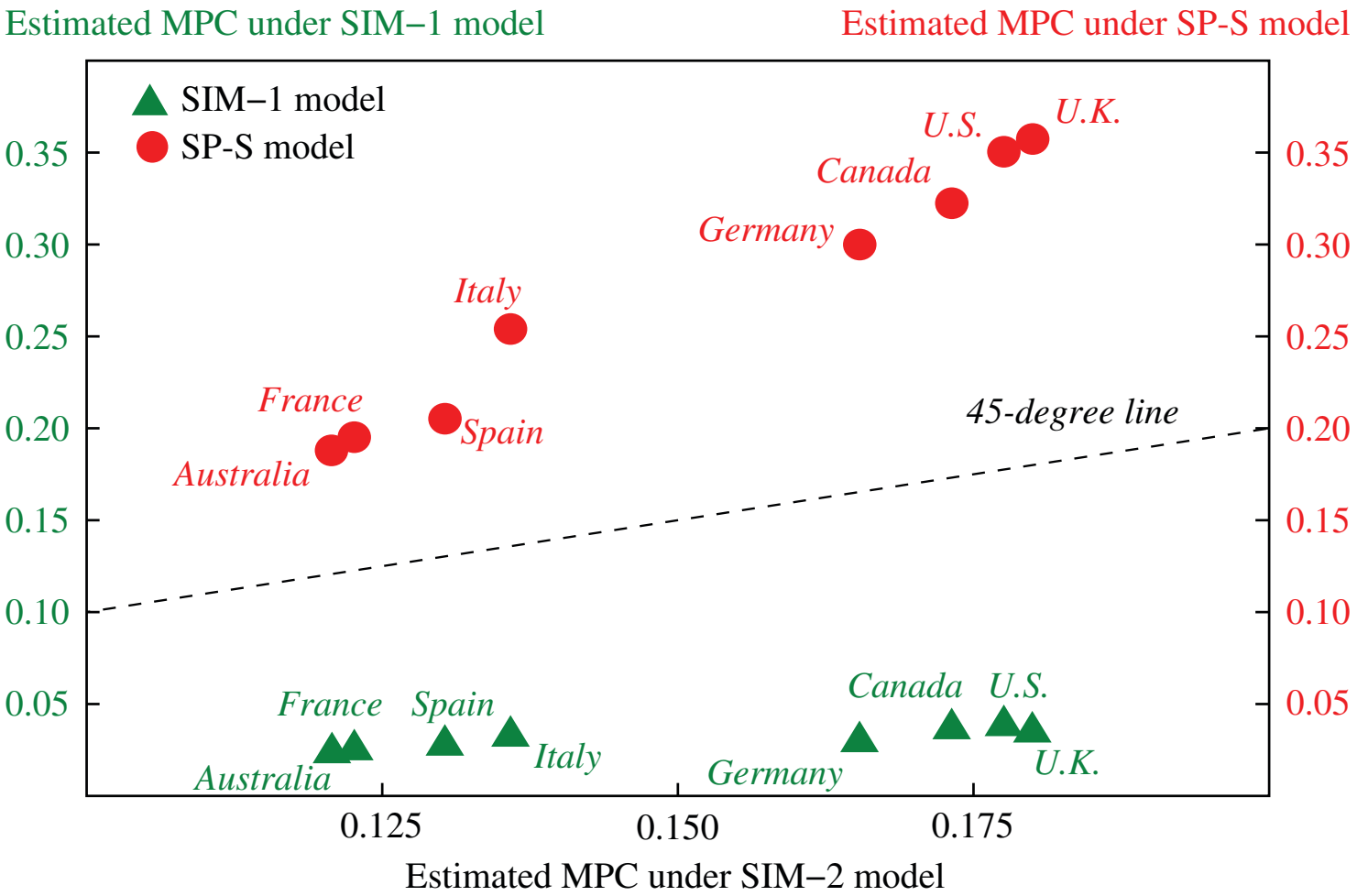


Figure 11. Estimated Aggregate Consumption Response, Sample Countries, under Three Models



Source: Authors' calculations. Population shares from national and euro area surveys. See text for full description.

Table 6. Marginal Propensity to Consume out of Transitory Income Shocks for Different Types of HtM Households, United States[a]

	P-HtM	*W-HtM*	*N-HtM*	*HtM-NW*	*N-HtM-NW*
Baseline	0.243***	0.301***	0.127***	0.229***	0.201***
	(0.065)	(0.048)	(0.036)	(0.054)	(0.030)
Pre-tax earnings[b]	0.131***	0.223***	0.122***	0.143***	0.164***
	(0.043)	(0.035)	(0.027)	(0.036)	(0.023)
Include food stamps[c]	0.217***	0.264***	0.105***	0.203***	0.171***
	(0.059)	(0.045)	(0.035)	(0.050)	(0.029)
Continuously married households[d]	0.095	0.193**	0.079*	–0.048	0.157***
	(0.194)	(0.079)	(0.043)	(0.129)	(0.042)
Stable marital status[e]	0.239***	0.282***	0.110***	0.190***	0.195***
	(0.085)	(0.054)	(0.038)	(0.070)	(0.033)
Households with male heads[f]	0.186**	0.193***	0.073*	0.150**	0.129***
	(0.080)	(0.058)	(0.040)	(0.064)	(0.035)
Monthly income[g]	0.229***	0.288***	0.159***	0.236***	0.199***
	(0.068)	(0.053)	(0.034)	(0.057)	(0.030)

Source: Authors' calculations, based on United States PSID. See text for full description.

a. Boot-strapped standard errors based on 250 replications in parentheses. Statistical significance indicated at the ***1 percent; **5 percent; and *10 percent levels.

b. Transfers are excluded.

c. Food stamps are included among transfers.

d. Restricted to continuously married households.

e. Restricted to households with no change in marital status.

f. Households with female heads (mostly single) are excluded.

g. Pay period is set to one month instead of two weeks.

Table 7. Quarterly Marginal Propensity to Consume out of an Unexpected Transfer for the Aggregate Economy, Following Three Models, United States[a]

	SIM-2[b]			*SIM-1*[c]		*SP-S*[d]	
	P-HtM	*W-HtM*	*N-HtM*	*HtM*	*N-HtM*	*HtM*	*N-HtM*
Average	0.35	0.44	0.06	0.14	0.02	1.00	0.02
Low income	0.34	0.37	0.16	0.15	0.04	1.00	0.04
Middle income	0.38	0.44	0.09	0.11	0.02	1.00	0.02
High income	0.31	0.52	–0.02	0.12	0.01	1.00	0.01
Age ≤40	0.38	0.42	0.08	0.16	0.02	1.00	0.02
Age 40–60	0.30	0.42	0.01	0.11	0.01	1.00	0.01
Age >60	0.39	0.51	0.13	0.04	0.04	1.00	0.04

Source: Authors' calculations. Population shares from national and euro area survey series. See text for full description.

a. Quarterly marginal propensity to consume out of an unexpected $500 transfer for the aggregate economy, and for various subgroups of the population, using group composition from the 2010 SCF.

b. SIM-2 = Two-asset, life-cycle, incomplete-market model.

c. SIM-1 = One-asset, life-cycle, incomplete-market model.

d. SP-S = Spender-saver model.

Table 8. Quarterly Aggregate Consumption Responses under Three Models, United States[a]

	Model[b]		
	SIM-2	*SIM-1*	*SP-S*
$500 transfer	0.18	0.04	0.35
Size asymmetry			
$50 transfer	0.29	0.05	0.35
$2,000 transfer	0.05	0.03	0.35
Sign asymmetry			
$500 tax	0.42	0.14	0.36
Income targeting			
$500 transfer, bottom tercile	0.26	0.07	0.50
$500 transfer, top tercile	0.20	0.03	0.34

Source: Authors' calculations. Population shares from United States 2010 SCF. See text for full description.

a. Quarterly aggregate consumption responses for the United States using group composition from the 2010 SCF. All taxes and transfers are lump-sum, one-time, and unexpected.

b. See notes to table 7 for model definitions.

Lifecycle, Bequests?

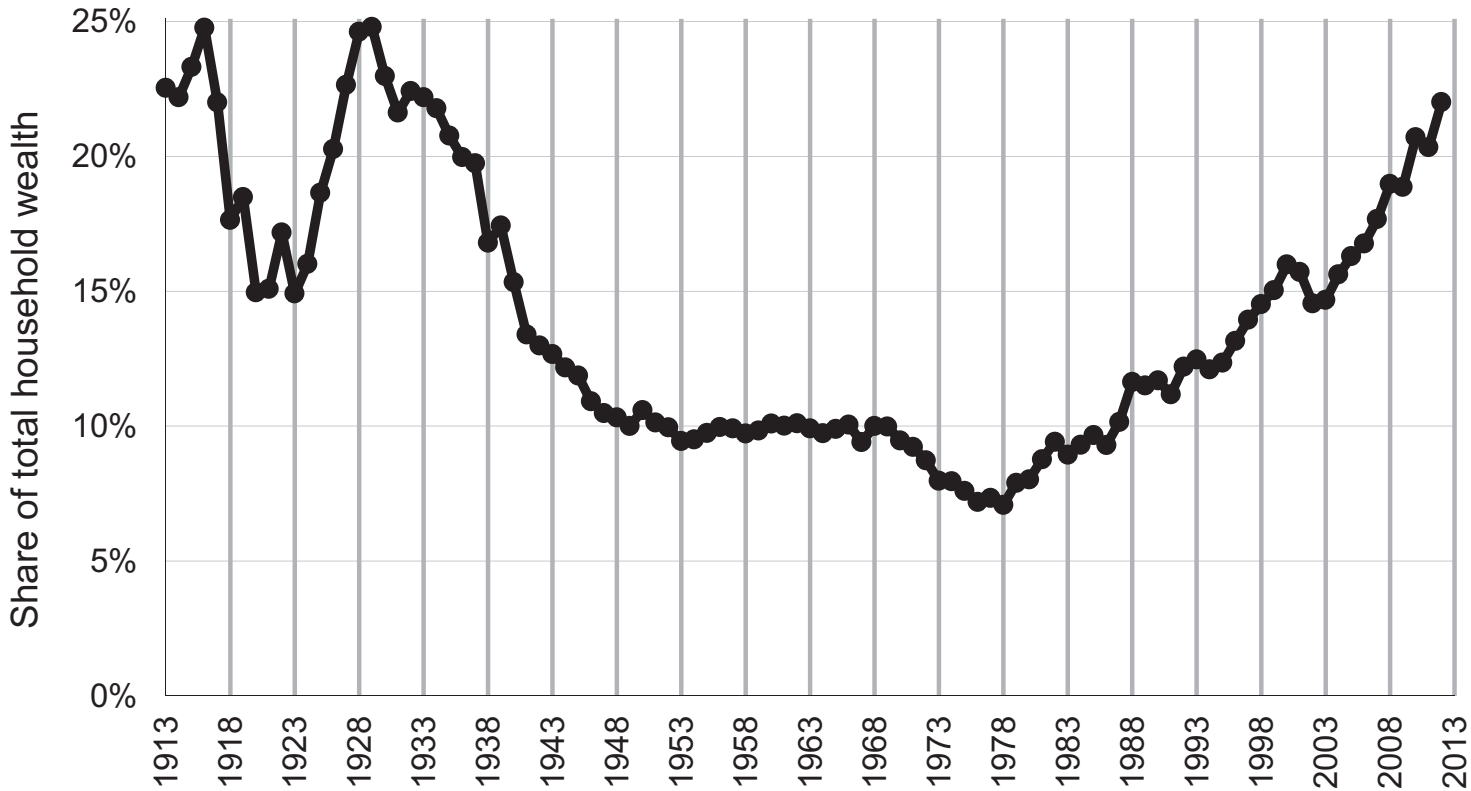
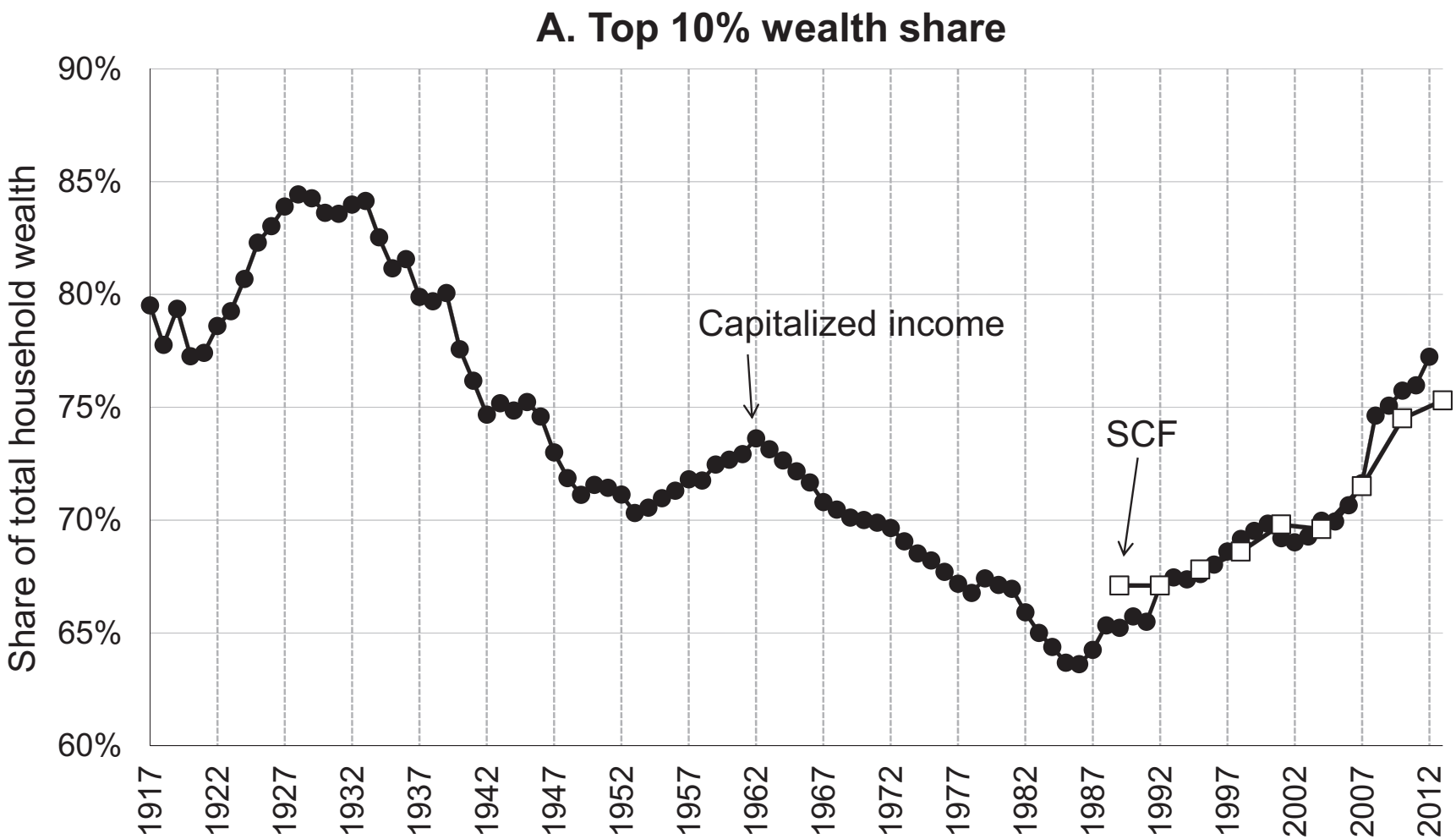


FIGURE I

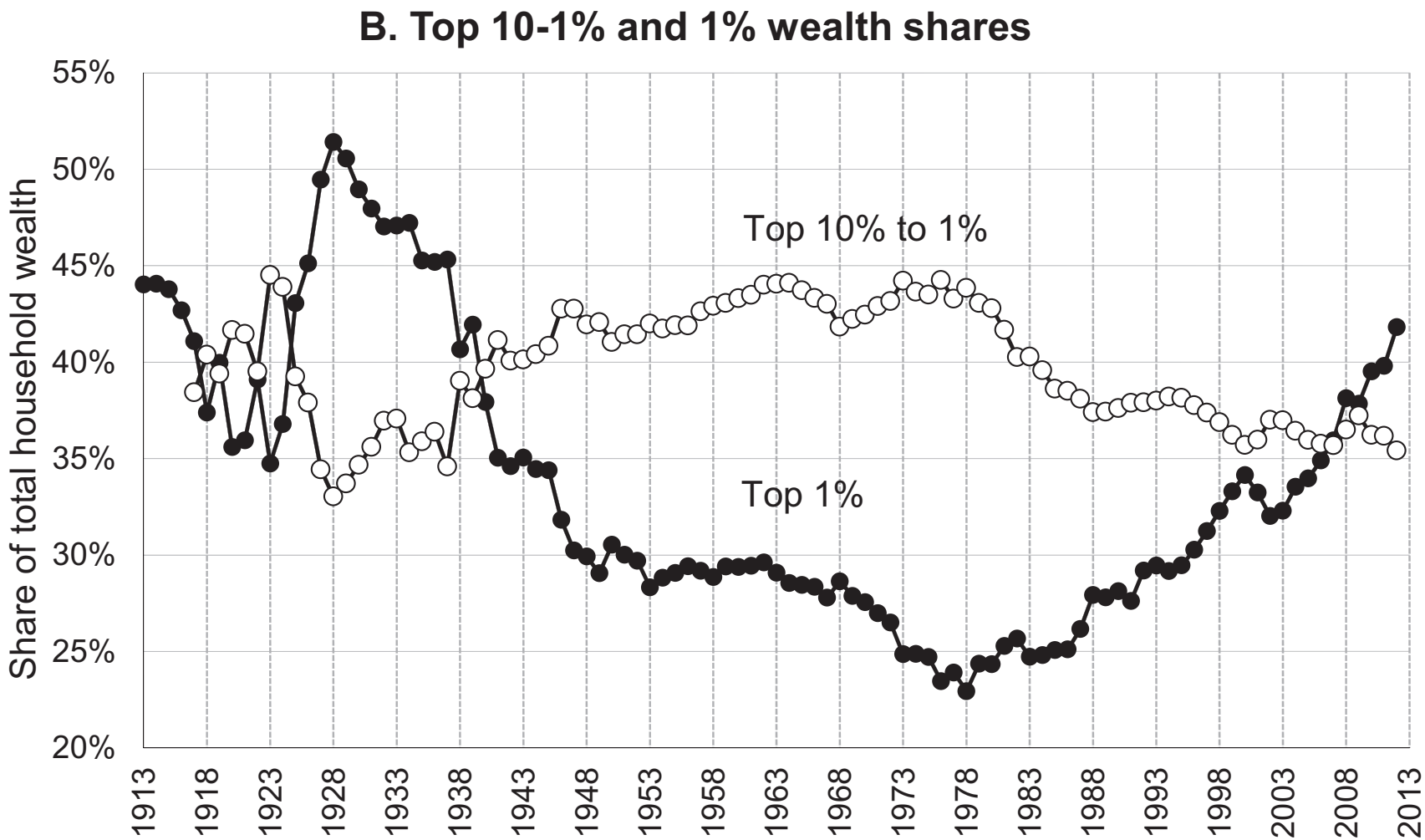
Top 0.1% Wealth Share in the United States, 1913–2012

The figure plots the share of total household wealth owned by the richest .1% of families in the United States from 1913 to 2012. The unit is the family (either a single person aged 20 or above or a married couple, in both cases with children dependents if any). The top .1% is defined relative to the total number of families in the population. In 2012, the top .1% included about 160,000 families with a net wealth above $20.6 million. Source: Online Appendix Table B1.

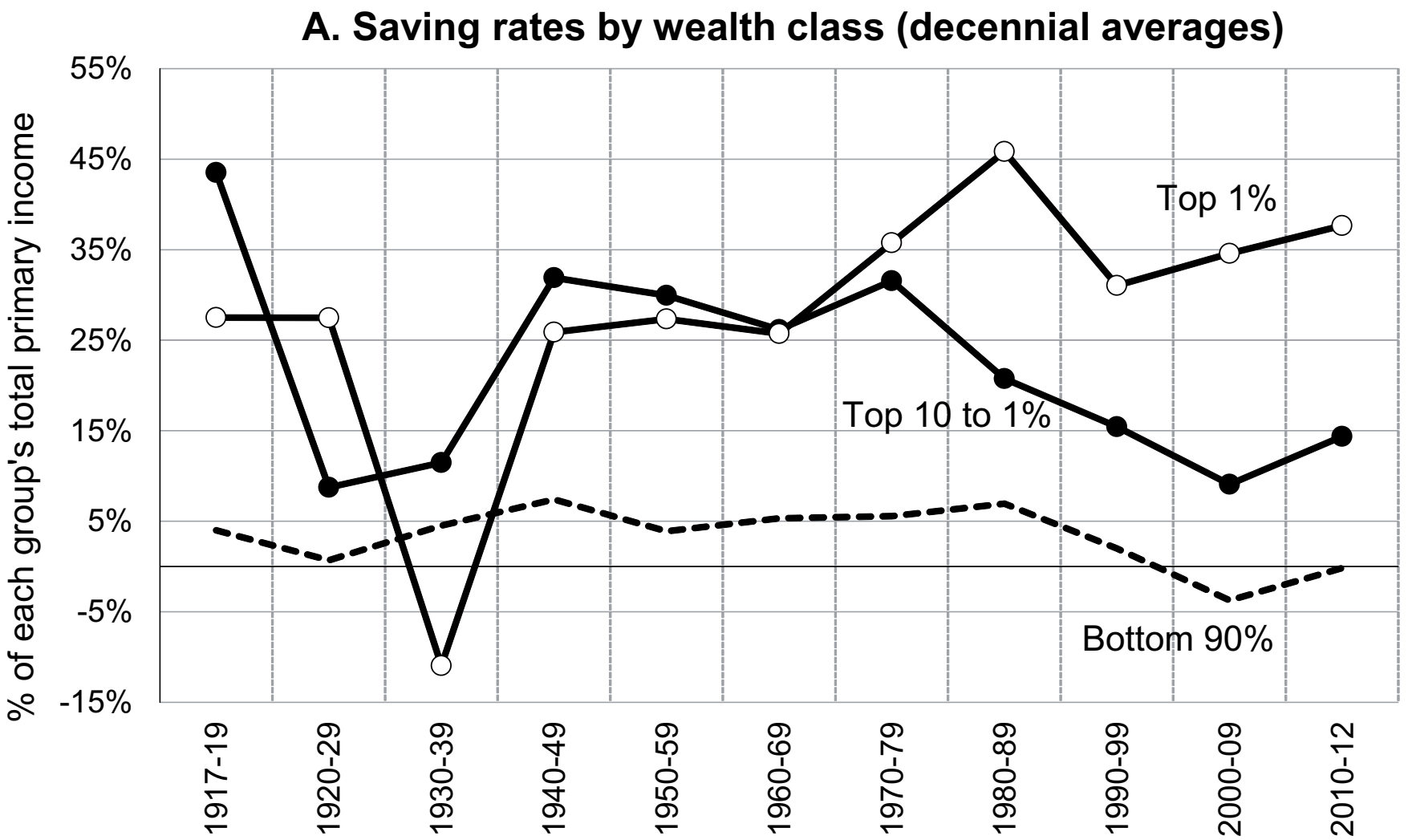
Mostly Top 10%



Top 1% higher than Top 10-1%



The poor can't afford to save...



Abstract

This paper evaluates theoretical explanations for the propensity of households to increase spending in response to the arrival of predictable, lump-sum payments, using households in the Nielsen Consumer Panel who received $25 million in randomly distributed stimulus payments. The pattern of spending is inconsistent with models in which identical households cycle rapidly through high and low- response states as they manage liquidity, but is instead highly predictable by income years before the payment. **Spending responses** are unrelated to expectation errors, almost unrelated to crude measures of procrastination and self-control, **significantly related to sophistication and planning**, and highly related to impatience.

Timing of Stimulus Payments

TABLE 1—THE TIMING OF THE ECONOMIC STIMULUS PAYMENTS

Panel A. Payments by transfer of electronic funds		*Panel B. Payments by paper check*	
Last two digits of taxpayer SSN	Date by which payment funds are deposited	Last two digits of taxpayer SSN	Date by which payment check is in mail
00–20	May 2	00–09	May 16
21–75	May 9	10–18	May 23
76–99	May 16	19–25	May 30
		26–38	June 6
		39–51	June 13
		52–63	June 20
		64–75	June 27
		76–87	July 4
		88–99	July 11

Source: Internal Revenue Service (2008)

TABLE 2—SPENDING PROPENSITIES FOR ALL HOUSEHOLDS AND BY LIQUIDITY

	Using all variation in time of receipt			Using only variation in timing within each method of receipt		
	All households	At least two months available income in liquid wealth?		All households	At least two months available income in liquid wealth?	
		Yes	No		Yes	No
Contemporaneous week	1.49	0.63	2.78	1.45	0.66	2.53
	(0.25)	(0.29)	(0.39)	(0.29)	(0.30)	(0.42)
t-stat of "Yes" equals "No"		4.47			3.64	
Four-week cumulative increase	3.70	2.04	6.57	3.31	2.08	4.87
	(0.70)	(0.74)	(1.01)	(0.46)	(1.03)	(1.36)
t-stat of "Yes" equals "No"		3.63			1.64	
Number of households	21,386	13,685	7,656	21,320	13,654	7,621

Notes: Standard errors are in parentheses. The table reports the propensity to consume NCP goods out of a payment in percent. The regressions in the first triplet of columns include fixed effects for each week in the sample, and the second triplet of columns include fixed effects for each week for each means of receipt. All regressions include household fixed effects and are weighted by the NCP projection factor for 2008. Each sample includes only households that report receipt during the period of the experimental variation, sufficient ESP information for that specification, and meet the standard NCP static reporting requirement for the year.

Source: Calculated based on data from The Nielsen Company (US) LLC and provided by the Marketing Data Center at the University of Chicago Booth School of Business

TABLE 3—SPENDING RESPONSES BY INCOME GROWTH AND INCOME GROUP

	Using all variation in time of receipt			Using only variation in timing within each method of receipt		
	To lower category	Same category	To higher category	To lower category	Same category	To higher category
Panel A. Income growth 2007 to 2008						
Contemporaneous week	1.35	0.99	1.70	0.85	0.90	1.29
	(0.57)	(0.39)	(0.61)	(0.64)	(0.42)	(0.67)
Four-week cumulative increase	4.18	2.45	4.57	1.35	1.84	1.80
	(1.55)	(1.05)	(1.61)	(2.06)	(1.46)	(2.11)
Number of households	3,416	7,719	3,051	3,405	7,696	3,042
Panel B. Income growth 2006 to 2007						
Contemporaneous week	1.19	1.28	1.94	0.88	1.10	1.89
	(0.65)	(0.32)	(0.61)	(0.64)	(0.35)	(0.65)
Four-week cumulative increase	2.20	4.01	5.19	0.12	3.28	4.23
	(1.61)	(0.86)	(1.57)	(2.08)	(1.19)	(2.26)
Number of households	3,142	10,051	4,055	3,133	10,023	4,042

	Income < $35,000	$35,000 ≤ income < $70,000	$70,000 ≤ income	Income < $35,000	$35,000 ≤ income < $70,000	$70,000 ≤ income
Panel C. 2008 income						
Contemporaneous week	2.46	1.40	0.21	2.06	0.87	0.39
	(0.58)	(0.45)	(0.49)	(0.64)	(0.49)	(0.50)
Four-week cumulative increase	3.78	4.01	2.20	2.68	1.07	1.98
	(1.64)	(1.16)	(1.33)	(2.02)	(1.46)	(1.95)
Number of households	5,057	5,303	3,826	5,035	5,289	3,819
Panel D. 2007 income						
Contemporaneous times	2.56	1.44	0.71	2.39	1.11	0.65
	(0.55)	(0.40)	(0.44)	(0.57)	(0.44)	(0.46)
Four-week cumulative increase	5.35	3.97	3.17	4.85	3.02	1.73
	(1.44)	(1.05)	(1.19)	(1.81)	(1.44)	(1.71)
Number of households	6,067	6,398	4,783	6,049	6,377	4,772
Panel E. 2006 income						
Contemporaneous week	3.13	1.41	0.56	3.09	1.15	0.59
	(0.57)	(0.34)	(0.37)	(0.59)	(0.37)	(0.39)
Four-week cumulative increase	6.99	3.44	1.99	8.13	2.16	1.10
	(1.33)	(0.90)	(1.02)	(1.73)	(1.20)	(1.42)
Number of households	7,495	7,783	6,063	7,466	7,761	6,048

Notes: Standard errors are in parentheses. The table reports the propensity to consume NCP goods out of a payment in percent. The regressions in the first triplet of columns include fixed effects for each week in the sample and the second triplet of columns include fixed effects for each week for each means of receipt. All regressions include household fixed effects and are weighted by the NCP projection factor for 2008. Each sample includes only households that report receipt during the period of the experimental variation, sufficient ESP information for that specification, and meet the standard NCP static reporting requirement for the year.

Source: Calculated based on data from The Nielsen Company (US) LLC and provided by the Marketing Data Center at the University of Chicago Booth School of Business

TABLE 4—SPENDING RESPONSES BY LIQUIDITY AND INCOME LEVEL

	Using all variation in time of receipt			Using only variation in timing within each method of receipt		
	Income < $35,000	$35,000 ≤ income < $70,000	$70,000 ≤ income	Income < $35,000	$35,000 ≤ income < $70,000	$70,000 ≤ income
Panel A. Households with sufficient liquid wealth, by 2008 income						
Contemporaneous	0.91	0.62	−0.06	1.08	−0.03	0.17
week	(0.76)	(0.50)	(0.55)	(0.82)	(0.53)	(0.56)
Four-week	−0.17	3.55	0.41	0.18	0.89	0.66
cumulative increase	1.92	(1.44)	(1.51)	(2.51)	(1.76)	(2.26)
Number of households	3,068	3,762	2,964	3,055	3,754	2,962
Panel B. Households with low liquid wealth, by 2008 income						
Contemporaneous	4.23	2.61	1.21	3.26	2.23	1.20
week	(0.90)	(0.84)	(1.03)	(1.01)	(0.95)	(1.08)
Four-week	8.41	4.74	8.31	5.77	1.10	6.44
cumulative increase	(2.76)	(1.99)	(2.86)	(3.29)	(2.56)	(3.66)
Number of households	1,989	1,541	862	1,980	1,535	857
Panel C. Households with sufficient liquid wealth, by 2006 income						
Contemporaneous	2.33	0.44	0.06	2.46	0.24	0.21
week	(0.85)	(0.41)	(0.42)	(0.85)	(0.43)	(0.43)
Four-week	3.79	2.27	1.04	5.45	1.97	0.79
cumulative increase	(1.70)	(1.16)	(1.19)	(2.33)	(1.61)	(1.60)
Number of households	4,147	5,047	4,491	4,134	5,036	4,484
Panel D. Households with low liquid wealth, by 2006 income						
Contemporaneous	3.79	2.60	1.81	3.69	2.23	1.52
week	(0.76)	(0.56)	(0.75)	(0.81)	(0.61)	(0.81)
Four-week	9.91	5.02	4.45	10.40	2.22	1.53
cumulative increase	(2.01)	(1.40)	(2.01)	(2.53)	(1.79)	(3.06)
Number of households	3,348	2,736	1,572	3,332	2,725	1,564

Notes: Standard errors are in parentheses. The table reports the propensity to consume NCP goods out of an ESP in percent. The regressions in the first triplet of columns include fixed effects for each week in the sample and the second triplet of columns include fixed effects for each week for each means of receipt. All regressions include household fixed effects and are weighted by the NCP projection factor for 2008. Each sample includes only households that report receipt during the period of the experimental variation, sufficient ESP information for that specification, and meet the standard NCP static reporting requirement for the year.

Source: Calculated based on data from The Nielsen Company (US) LLC and provided by the Marketing Data Center at the University of Chicago Booth School of Business

TABLE 5—SPENDING RESPONSES BY HOUSEHOLD EXPECTATIONS AND LIQUIDITY

	Using all variation in time of receipt			Using only variation in timing within each method of receipt		
Was this about the amount your household was expecting?:	Yes, known since February, March, or April	Learned more recently or positively surprised	No, less than expecting	Yes, known since February, March, or April	Learned more recently or positively surprised	No, less than expecting
Panel A. All households						
Contemporaneous week	1.19	2.37	2.80	1.30	1.68	2.00
	(0.25)	(0.83)	(0.73)	(0.27)	(0.81)	(0.81)
Four-week cumulative	3.31	5.13	6.69	3.42	1.91	4.52
	(0.67)	(1.74)	(2.20)	(0.93)	(2.03)	(3.10)
Number of households	15,991	2,525	2,693	15,956	2,505	2,685
Panel B. Households with sufficient liquid wealth						
Contemporaneous week	0.39	1.07	2.08	0.59	0.43	1.35
	(0.29)	(1.18)	(1.13)	(0.31)	(1.15)	(1.24)
Four-week cumulative	1.69	2.61	4.68	2.56	−0.58	1.99
	(0.82)	(2.08)	(3.00)	(1.13)	(2.58)	(4.94)
Number of households	10,603	1,658	1,317	10,586	1,649	1,314
Panel C. Households with low liquid wealth						
Contemporaneous week	2.41	4.26	3.41	2.39	3.47	2.55
	(0.46)	(1.06)	(0.96)	(0.50)	(1.09)	(1.07)
Four-week cumulative	5.89	8.89	8.74	4.51	5.58	6.89
	(1.12)	(3.03)	(3.15)	(1.58)	(3.32)	(3.99)
Number of households	5,388	867	1,376	5,370	856	1,371

Notes: Standard errors are in parentheses. The table reports the propensity to consume NCP goods out of an ESP in percent. The regressions in the first triplet of columns include fixed effects for each week in the sample and the second triplet include fixed effects for each week for each means of receipt. All regressions include household fixed effects and are weighted by the NCP projection factor for 2008. Each sample includes only households that report receipt during the period of the experimental variation, sufficient ESP information for that specification, and meet the standard NCP static reporting requirement for the year.

Source: Calculated based on data from The Nielsen Company (US) LLC and provided by the Marketing Data Center at the University of Chicago Booth School of Business

Table 11—Summary of Findings and Conjectures on Implications

	Correlated with a higher propensity to spend?	Correlation with low liquidity	If correlated with low liquidity: Explanation under textbook buffer-stock theory	If correlated with low liquidity: Alternative explanation of spending response	Independent channel: Is there correlation conditional on liquidity?
Factor					
Decrease in income (poorly measured)	No				
Less than median income (2006)	Yes	0.13	Means-testing or impatience	Ability to earn and smooth	Yes, channel-like sophistication, ability
Positive news on arrival	No	−0.01			No
Unexpected or less than expected	Yes, insignif.	0.08			Possibly, channel-like sophistication
Lack of financial planning	Yes	0.31	Low wealth implies little need to plan	Planning causes saving, smoothing	Yes, but not statistically strong
Little/no vacation planning	Weak, week of arrival only	−0.01			
Low use of specials, deals	Yes, week of arrival only	0.13	Poor have little time	Optimization over goods and time	Yes, only week of arrival, low liquidity
Spender household	Yes	0.31	Impatience causes low liquidity	Some households are hand-to-mouth	Yes, only week of arrival, low liquidity
Often regret purchases	Yes, insignificant	0.06			5 percent of households lack self-control
Procrastination of survey	No	−0.03			

Notes: Each variable is defined as a binary variable so that correlations are comparable. Low income is defined as less than the median income. "Yes, insignificant" indicates effects that are behaviorally important but statistically insignificant.

1. Keynes (1936) consumption function, Friedman (1957) PIH
2. Poterba and Summers (1987) Paper
3. Campbell and Deaton (1989) Paper
4. Parker (1999) Paper
5. Parker (2000) Paper
6. Carroll (2000) Paper
7. Johnson et al. (2006) Paper
8. Jappelli and Pistaferri (2014) Paper
9. Kaplan et al. (2014) Paper
10. Saez and Zucman (2016) Paper
11. Parker (2017) Paper
12. Wong (2016) Paper

Abstract

This paper assesses the effects of demographic changes on the transmission of monetary policy to consumption. First, I empirically estimate age-specific consumption responses to rate shocks. **Consumption of younger people is more responsive and explains most of the aggregate response**. The response is **driven by homeowners who refinance or enter new loans**, which is **concentrated among younger people**. Second, I develop a life-cycle model **with fixed rate mortgages that explains these facts**. The mortgage channel accounts for a sizable share of the young-old difference in response. Under an older demographic structure, aggregate consumption is less responsive to monetary policy shocks.

Table 1: Consumption Response to a Monetary Policy Shock

	Expansionary		**Contractionary**	
	First year	Second year	First year	Second year
Total	1.92	4.31	3.77	10.77
	[0.25, 3.59]	[0.4, 8.22]	[8.35, -0.8]	[23.31, -1.76]
Non-durables	1.06	1.43	0.20	-4.58
	[0, 2.13]	[-1.07, 3.935]	[-2.62, 3.03]	[-12.32, 3.15]

Notes: This table shows the annual elasticities of consumption to 1 standard deviation expansionary and contractionary monetary policy shocks. 80 percent confidence intervals are depicted in parentheses. The elasticities are estimated using the CEX data.

Table 2: Consumption Elasticities by Age

	Young		**Middle**		**Old**
	25-34		35-64		65+
CEX data					
Total	4.59		0.79		-1.15
	[2.01 , 7.17]		[-1.44 , 3.02]		[-4.8 , 2.5]
Non-durables	2.24		0.47		0.12
	[0.67 , 3.82]		[-0.7 , 1.65]		[-1.83 , 2.07]
			Age groups		
	25-34	35-44	45-54	55-65	65+
Nielsen data					
Non-durables (food)	0.79	0.50	0.60	0.38	0.03
	[0.28, 1.31]	[0.21, 0.78]	[0.36, 0.83]	[0.14, 0.63]	[-0.23, 0.28]

Notes: This table shows the annual elasticities of consumption to a 1 standard deviation expansionary monetary policy shock, based on Equation 5. 80 percent confidence intervals are depicted in parentheses. The elasticities are estimated using the CEX data and the Nielsen Homescan data.

Table 3: Contribution by Age-group to Aggregate Consumption Elasticity

	Annual response	Share of consumption	Contribution to total elasticity in ppt	Contribution to total elasticity % of total
Current population				
Young	2.24	32%	0.72%	72%
Middle	0.47	57%	0.27%	27%
Old	0.12	11%	0.01%	1%
Average	**1.00**	**100%**	**1.00%**	**100%**
Population of 2060				
Young	2.24	24%	0.54%	66%
Middle	0.47	53%	0.25%	31%
Old	0.12	23%	0.03%	3%
Average	**0.82**	**100%**	**0.82%**	**100%**

Notes: This table shows the annual elasticities of consumption by age group in column (I). The elasticities are obtained by estimating Equation 5 separately for each consumption category using the CEX data. Column (II) shows each age group's the share of overall consumption within the consumption category. Column (III) and (IV) give the contribution of each age group to the total elasticity in percentage points and percent of total, respectively. Column (III) is computed based on the product of (I) and (II). (IV) is computed based on (III) divided by the total elasticity within each consumption category. The bottom panel shows a simple exercise that shifts the population to the U.N. projected 2060 population structure, holding all other factors constant (i.e. elasticities, the consumption per capita for each age group). See text for more detail.

Table 2: Consumption Elasticities by Age

	Young		**Middle**		**Old**
	25-34		35-64		65+
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	[0.67 , 3.82]		[-0.7 , 1.65]		[-1.83 , 2.07]
			Age groups		
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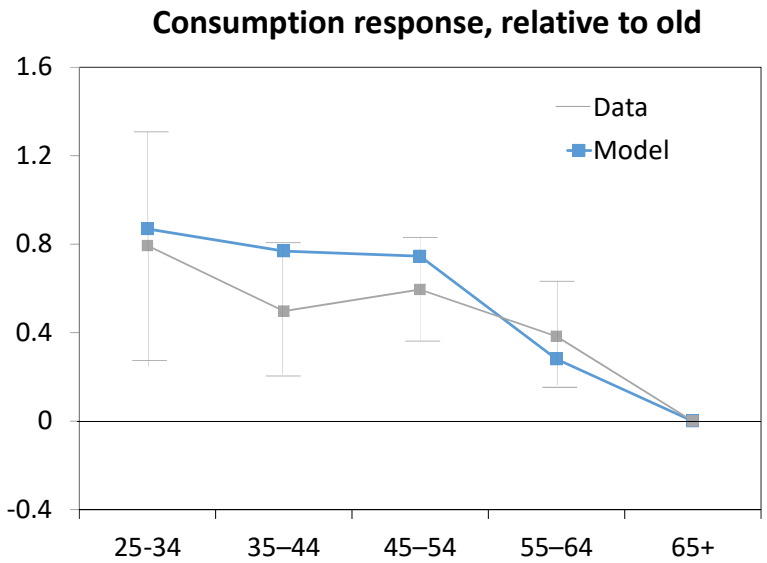
Non-durables (food)	0.79	0.50	0.60	0.38	0.03
	[0.28, 1.31]	[0.21, 0.78]	[0.36, 0.83]	[0.14, 0.63]	[-0.23, 0.28]

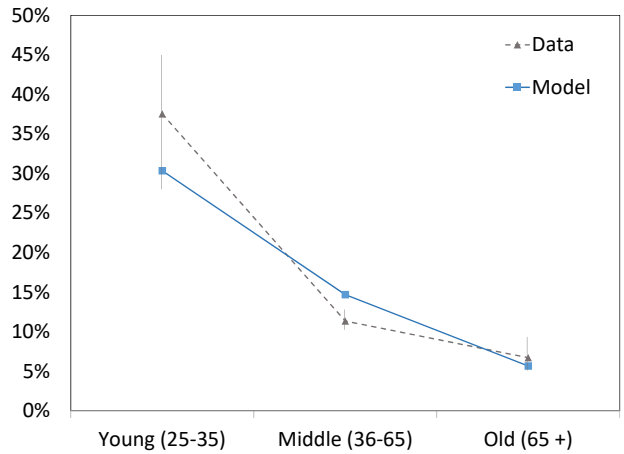
Notes: This table shows the annual elasticities of consumption to a 1 standard deviation expansionary monetary policy shock, based on Equation 5. 80 percent confidence intervals are depicted in parentheses. The elasticities are estimated using the CEX data and the Nielsen Homescan data.

Figure 4: Age-specific Consumption Response to a Monetary Policy Shock



Notes: This figure depicts the model implied impulse response function of non-durable consumption by age group to a 1 standard deviation shock to monetary policy.

Figure 5: Age-specific Loan Adjustments to a Monetary Policy Shock



Notes: This figure depicts the fraction of loans refinanced and change in the homeownership rate by age group following a 1 standard deviation shock to monetary policy.

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