

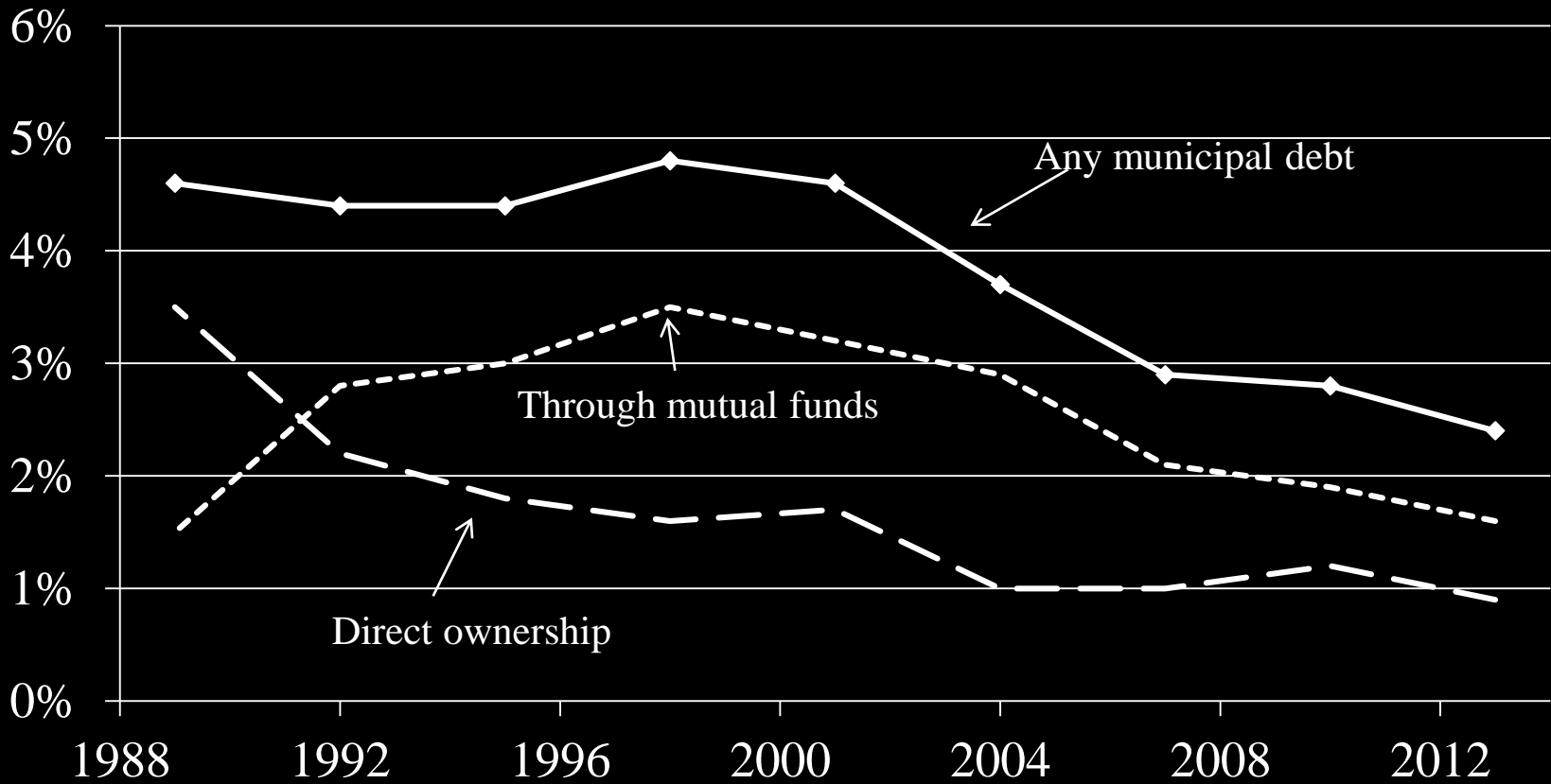
Changing patterns in household ownership of municipal debt

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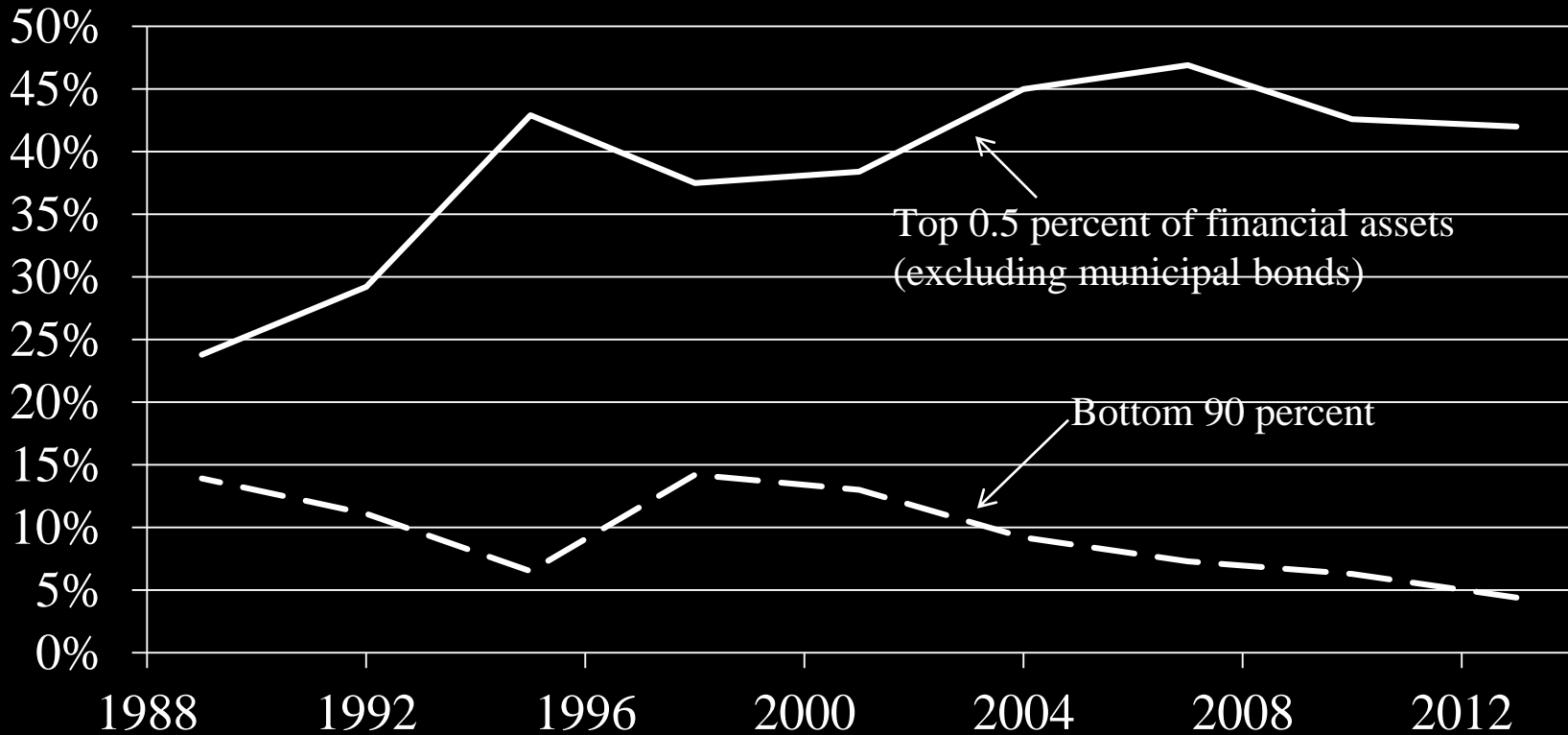
Punchline

Share of Households Owning Municipal Bonds, 1989-2013



Punchline

Share of Municipal Bonds Held by Wealth Group, 1989-2013



Municipal bond market

- Sovereign repayment can be a mysterious thing (Bulow and Rogoff, 1989). Guembel and Sussman (2009) propose model where debt is held by voters of borrowing country.
- Incidence of tax exemption is complicated (Galper et al (2014), but perceptions about who benefits are important.

Municipal bond market

- Political economy matters for repayment of municipal debt and for continued existence of tax exemption.
- Municipal bonds are disproportionately a retail-held investment. Household ownership of municipals is very direct.

Flow of Funds data

- Munis: \$3.65 trillion in total assets
 - \$1.54 trillion held by household sector
 - \$0.28 trillion by 2a-7 funds
 - \$0.65 trillion by other mutual funds
- Treasuries: \$13.00 trillion in assets
 - \$0.71 trillion held by households
 - \$0.41 trillion by 2a-7 funds
 - \$0.73 trillion by other mutual funds

Flow of Funds vs. SCF

- Both conducted by Federal Reserve Board
- Flow of Funds approach: count assets held by different reporting sectors (mutual funds, insurers) – households are a residual. Hedge funds turn out to be included with households
- Survey of Consumer Finances – direct survey of a sample of households

Survey of Consumer Finances

- Repeated cross section of a large number of households. Conducted by Federal Reserve Board and NORC.
- Split-sample design with area-probability sample and list sample. Oversampling of households likely to be wealthy.

Survey of Consumer Finances

- Survey repeated (with very stable set of questions) triennially since 1989. Most recent survey is 2013.
- High response rates (Kennickell, 1999): 66 percent for area-probability sample in 1995; 13-44 percent for list sample (lower for higher wealth strata)

Survey of Consumer Finances

- Response rates to individual questions is very high, although response rates to questions about municipal bonds are somewhat lower than some other questions.
- Survey question non-response handled through multiple imputation.

Survey of Consumer Finances

- 1989: 3,143 households surveyed
- 2013: 6,015 households surveyed
- Average financial assets: ~ \$225k
- Average financial assets of bottom 50% ~ 0
- Average financial assets of top 0.5% ~ \$13M

Average holdings

- Next slide shows average holdings, by year.
- Average (inflation adjusted) is in neighborhood of \$10k per household per year.
- Average holdings in top 0.5 percent double between 1989 and 2013

Table 4. Household holdings of municipal bonds (direct and indirect), 1989-2013 Surveys of Consumer Finances

Tables based on 1989 through 2013 Surveys of Consumer Finances, conducted by Federal Reserve Board. Measure of financial assets used to group households includes all financial assets, including retirement accounts, but does not include municipal bonds. Municipal bond values in this table include both bonds held directly and bonds held indirectly through mutual funds. Dollar values are in 2013-equivalent dollars, calculated using CPI-U

Panel A: Average holdings of municipal bonds (direct and indirect), by percentiles of financial assets (2013-equivalent dollars, in thousands)

Financial asset percentile	2013	2010	2007	2004	2001	1998	1995	1992	1989
0-50	-	-	-	0.3	-	0.1	0.1	0.1	-
50-75	0.9	0.7	0.8	0.3	0.8	1.4	0.6	1.5	1.0
76-90	1.4	4.2	4.9	5.6	9.1	5.0	2.4	3.3	6.8
90-95	18.1	15.9	12.5	15.0	22.5	23.5	13.0	22.1	16.7
95-99	76.4	107.0	96.4	66.9	75.7	43.7	47.9	72.6	76.8
99-99.5	294.8	304.7	294.3	357.1	329.1	187.2	321.6	195.6	364.2
99.5-100	859.7	1,105.0	1,216.3	1,025.6	921.3	600.6	706.3	491.7	436.6
All	10.2	12.9	13.0	11.4	12.0	8.0	8.2	8.3	9.2

Shares held by groups

- Next slide shows shares held by different wealth groups, by year
- Share held by top 0.5 percent rises from 23.8 percent in 1989 to 42.0 percent in 2013.

Table 4. Household holdings of municipal bonds (direct and indirect), 1989-2013 Surveys of Consumer Finances

Tables based on 1989 through 2013 Surveys of Consumer Finances, conducted by Federal Reserve Board. Measure of financial assets used to group households includes all financial assets, including retirement accounts, but does not include municipal bonds. Municipal bond values in this table include both bonds held directly and bonds held indirectly through mutual funds. Dollar values are in 2013-equivalent dollars, calculated using CPI-U

Panel B: Share held by group (divided by financial asset levels) as percent of total household holdings

Financial asset percentile	2013	2010	2007	2004	2001	1998	1995	1992	1989
0-50	0.1%	0.2%	0.1%	1.1%	0.1%	0.5%	0.4%	0.5%	0.1%
50-75	2.3%	1.3%	1.6%	0.7%	1.6%	4.4%	1.8%	4.6%	2.7%
76-90	2.0%	4.8%	5.6%	7.4%	11.3%	9.3%	4.3%	6.0%	11.1%
90-95	8.9%	6.1%	4.9%	6.6%	9.4%	14.6%	7.9%	13.2%	9.1%
95-99	30.1%	33.1%	29.6%	23.5%	25.3%	21.9%	23.2%	34.8%	33.4%
99-100	14.6%	11.8%	11.3%	15.7%	13.8%	11.7%	19.5%	11.8%	19.8%
99.5-100	42.0%	42.6%	46.9%	45.0%	38.4%	37.5%	42.9%	29.2%	23.8%
all	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Shares held by groups

- Can compare municipal concentration to other assets (wealth groups based on total financial assets). Top 0.5 share:
- Municipals: 1989 – 45.4%; 2013 – 58.5%
- Total Fin Assets: 1989 – 25.5%; 2013 – 28.7%
- Stocks (outside TDA): 1989 – 38.9%; 2013 41.9%
- All stocks: 1989 – 33.3%; 2013 – 30.8%

Share with positive holdings

- Next slide shows shares with positive holdings, by year
- Share holding munis falls from 4.6% in 1989 to 2.4% in 2013.

Table 5. Household holdings of municipal bonds (direct and indirect), 1989-2013 Surveys of Consumer Finances

Tables based on 1989 through 2013 Surveys of Consumer Finances, conducted by Federal Reserve Board. Measure of financial assets used to group households includes all financial assets, including retirement accounts, but does not include municipal bonds. Municipal bond values in this table include both bonds held directly and bonds held indirectly through mutual funds. Dollar values are in 2013-equivalent dollars, calculated using CPI-U

Panel A: Percent of households reporting positive holdings of municipal debt (direct and indirect)

Financial asset percentile	2013	2010	2007	2004	2001	1998	1995	1992	1989
0-50	0.1%	0.2%	0.3%	0.4%	0.5%	0.6%	0.2%	0.1%	0.1%
50-75	0.9%	0.7%	1.2%	2.3%	2.8%	3.8%	1.8%	2.2%	2.4%
75-90	2.6%	2.6%	3.5%	5.9%	8.9%	9.6%	7.5%	6.7%	7.0%
90-95	7.3%	14.6%	9.5%	12.5%	16.1%	12.9%	18.3%	19.4%	17.1%
95-99	21.4%	24.1%	23.1%	24.4%	27.4%	25.8%	31.3%	32.2%	35.9%
99-100	46.4%	38.4%	55.4%	47.3%	37.8%	41.1%	47.3%	47.0%	64.6%
99.5-100	46.6%	56.4%	58.0%	41.3%	51.9%	51.8%	55.0%	61.7%	55.2%
all	2.4%	2.8%	2.9%	3.7%	4.6%	4.8%	4.4%	4.4%	4.6%

Comparing munis to other assets

- Next slide shows change in ownership rates for a variety of different assets
- Share holding other bonds (outside of TDAs) is falling dramatically, but offset by share holding fixed income assets inside of retirement accounts.

Direct holdings only

- Direct holding category includes municipal bonds held through SMAs. Excludes bonds held through mutual funds.
- Share holding munis falls from 3.5 percent to 0.9 percent.

Indirect holdings only

- Indirect holding category includes only munis held through mutual funds.
- Share holding munis rises from 1.5 percent to over 3 percent, then falls back to 1.6 percent.

Age of muni owners

- Next slide compares age of muni owners to non-owning households.
- Muni owners are older, but average age is rising more slowly than general population.

Table 10. Age distribution of households, by municipal bond ownership status (both direct and indirect holdings), 1989-2013 Surveys of Consumer Finances

Tables based on 1989 through 2013 Surveys of Consumer Finances, conducted by Federal Reserve Board. Municipal bond values in this table include both bonds held directly and bonds held through mutual funds.

Panel A: Age distribution among households that own municipal bonds.

	2013	2010	2007	2004	2001	1998	1995	1992	1989
5th	35	39	33	36	32	32	31	36	35
10th	42	42	38	41	36	36	36	41	38
25th	52	52	47	49	47	47	46	51	51
50th	62	62	59	60	58	61	57	60	62
75th	71	73	70	72	71	72	70	72	69
90th	79	83	82	81	79	80	77	78	76
95th	85	87	87	84	82	84	81	81	79
Mean	61	62	59	60	58	59	58	60	59

Panel B: Age distribution among households that do not own municipal bonds.

	2013	2010	2007	2004	2001	1998	1995	1992	1989
5th	24	24	24	24	24	24	24	24	24
10th	28	28	28	27	27	27	27	27	26
25th	37	37	36	36	35	35	34	34	33
50th	50	49	48	47	46	45	45	45	44
75th	63	62	61	61	61	60	62	62	61
90th	75	75	75	75	74	74	74	74	73
95th	81	80	81	80	79	80	79	79	79
Mean	51	50	50	49	49	48	48	48	47

MTR of muni owners

- Next slide compares marginal tax rates of municipal owners to other households.
- MTRs of municipal-owning households are much higher than non-owning households. Median dollar held by household with 28% MTR.

Table 11. Marginal Tax Rate (MTR) distribution of households, by municipal bond ownership status (both direct and indirect holdings), 1989-2013 Surveys of Consumer Finances

Tables based on 1989 through 2013 Surveys of Consumer Finances, conducted by Federal Reserve Board. Municipal bond values in this table include both bonds held directly and bonds held through mutual funds. Marginal Tax Rate (MTR) constructed based on households' SCF data through merge to National Bureau of Economic Research TAXSIM calculation engine.

Panel A: MTR distribution among households that own municipal bonds.

	2013	2010	2007	2004	2001	1998	1995	1992	1989
5th	0	-6	0	-8	0	0	-8	0	0
10th	0	0	0	0	0	0	0	0	0
25th	0	0	5	0	15	15	15	15	15
50th	25	25	25	19	28	23	28	28	28
75th	28	33	33	28	31	28	29	29	28
90th	35	35	36	35	40	37	36	32	33
95th	35	35	36	36	41	40	41	35	33
Mean	18	18	20	17	22	20	22	19	20

Panel B: MTR distribution among households that do not own municipal bonds.

	2013	2010	2007	2004	2001	1998	1995	1992	1989
5th	-34	-40	-34	-8	-34	-40	-30	-17	-14
10th	-8	-14	-8	-8	-8	-8	-26	-17	0
25th	0	0	0	0	0	0	0	0	0
50th	15	15	15	15	15	15	15	15	15
75th	25	25	25	25	28	28	28	23	28
90th	28	28	28	28	31	28	28	28	28
95th	31	31	31	31	36	32	31	28	28
Mean	10	9	12	12	14	10	9	9	13

Table 12. Distribution of Marginal Tax Rates (MTR), weighted by municipal bond holdings. Holdings based on both indirect and direct holdings. 1989-2013 Surveys of Consumer Finances (with link to NBER TAXSIM for estimated marginal tax rates).

Tables based on 1989 through 2013 Surveys of Consumer Finances, conducted by Federal Reserve Board. Municipal bond values in this table include both bonds held directly and bonds held through mutual funds. Marginal Tax Rate (MTR) constructed based on households' SCF data through merge to National Bureau of Economic Research TAXSIM calculation engine.

	2013	2010	2007	2004	2001	1998	1995	1992	1989
Bottom	-45.0	-51.2	-40.0	-40.0	-40.0	-40.0	-30.0	-17.0	-14.0
5th	0.0	-6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10th	0.0	0.0	0.0	7.5	0.0	0.0	15.0	0.0	0.0
15th	0.0	0.0	10.0	10.0	10.0	15.0	15.0	0.0	15.0
20th	0.0	15.0	20.0	15.0	15.0	15.0	15.0	15.0	15.0
25th	15.0	18.5	25.0	18.5	15.0	15.0	15.0	15.0	22.5
30th	15.0	18.8	25.9	25.0	22.5	22.5	27.8	22.5	28.0
35th	15.0	25.3	26.0	25.0	25.0	25.0	28.0	22.5	28.0
40th	25.0	27.0	28.0	25.0	28.0	28.0	28.0	28.0	28.0
45th	26.0	27.8	29.1	25.6	28.0	28.0	28.0	28.0	28.0
50th	28.0	28.8	32.5	27.8	28.0	28.0	28.0	28.0	28.0
55th	28.0	30.0	35.0	28.0	31.9	28.0	31.0	28.0	28.0
60th	30.0	33.0	35.0	28.0	32.5	31.0	31.0	31.0	28.0
65th	30.0	34.9	35.0	32.5	36.0	31.9	36.0	31.0	28.0
70th	35.0	35.0	35.0	34.0	37.6	36.0	37.1	31.0	28.0
75th	35.0	35.0	35.0	35.0	39.6	37.5	39.6	31.0	33.0
80th	35.0	35.0	35.7	35.0	39.6	39.1	39.6	31.0	33.0
85th	35.0	35.0	35.7	35.4	39.6	39.6	39.6	31.1	33.0
90th	35.0	35.4	35.7	36.4	39.6	39.6	39.6	31.9	33.0
95th	35.0	41.0	36.0	46.3	51.8	39.6	40.8	35.1	42.0
Top	61.1	64.8	66.1	65.9	73.3	68.0	78.8	55.9	49.5

Predicting muni ownership

- We ran a probit model predicting municipal ownership in each year.
- Share of assets held through TDA is important predictor (controlling for wealth and income) of whether household holds municipal bonds.

Table 14. Determinants of municipal bond holding status. 1989-2013 Surveys of Consumer Finances.

Figure shows results of probit regressions. Dependent variable is set to one for households that have municipal bonds, either held directly or held indirectly through a mutual fund. Independent variable 'TDA share' is share of financial assets held in tax-deferred accounts. Statistical significance indicated with stars: *** for significant at 1% confidence level, ** for 5%, * for 10%. Statistical confidence calculated using bootstrapping approach described in text.

Variable	2013	2010	2007	2004	2001	1998	1995	1992	1989
Marginal									
Tax Rate	0.277	0.293	0.568 *	0.366	0.846 ***	0.948 ***	0.776 ***	1.093 ***	0.691 **
Family income percentile (0-50th omitted)									
50-75	-0.289 **	0.239 *	-0.081	0.197	0.163	0.326 ***	0.257 *	0.390 **	0.390 **
75-90	-0.255 **	0.253 *	0.104	0.251 *	0.232	0.234	0.564 ***	0.517 ***	0.488 **
90-95	-0.181	0.191	0.254	0.437 **	0.441 **	0.509 ***	0.557 **	0.626 ***	0.695 ***
95-99	-0.110	0.296 *	0.390 *	0.322 *	0.367 **	0.476 ***	0.608 ***	0.881 ***	0.975 ***
99-99.5	-0.042	0.383 **	0.669 ***	0.422 *	0.521 ***	0.848 ***	0.661 ***	1.041 ***	1.278 ***
99.5-100	0.029	0.300 *	0.821 ***	0.629 ***	0.661 ***	0.976 ***	0.844 ***	1.063 ***	1.285 ***
Net worth percentile (0-50th omitted)									
50-75	1.868	0.396 **	0.767	0.408 **	0.299 **	0.486 ***	0.323 *	0.682	0.436
75-90	2.385	1.043 ***	1.325	0.836 ***	0.789 ***	0.929 ***	0.691 ***	1.099 ***	0.949
90-95	2.841	1.626 ***	1.520	1.102 ***	1.158 ***	1.050 ***	1.080 ***	1.339 ***	1.321
95-99	3.220	2.019 ***	2.001 **	1.606 ***	1.301 ***	1.328 ***	1.304 ***	1.642 ***	1.411
99-99.5	3.187	2.368 ***	1.986 **	1.712 ***	1.252 ***	1.412 ***	1.346 ***	1.640 ***	1.605
99.5-100	3.501	2.471 ***	1.960 **	1.590 ***	1.320 ***	1.356 ***	1.386 ***	1.615 ***	1.273
TDA shr	-0.986 ***	-1.139 ***	-0.909 ***	-1.000 ***	-1.018 ***	-0.808 ***	-0.947 ***	-1.089 ***	-0.626 ***
Education (No HS omitted)									
HS	0.122	0.026	-0.212	-0.004	0.261	0.057	0.545 ***	0.216	0.322 **
Some col	0.009	0.201	0.017	0.306	0.406 *	0.193	0.674 ***	0.282 **	0.449 ***
College	0.315 *	0.493 **	0.183	0.326 *	0.456 **	0.164	0.878 ***	0.356 ***	0.795 ***
Postgrad	0.500 ***	0.503 **	0.338 *	0.417 **	0.572 **	0.344 **	1.053 ***	0.505 ***	0.678 ***
Age category (<35 omitted)									
35-44	-0.057	0.364 *	-0.055	0.158	-0.047	-0.103	0.044	0.079	-0.037
45-64	0.145	0.400 **	-0.049	0.405	0.276	-0.098	0.132	0.307 **	0.264 **
65+	0.209	0.576 ***	0.211	0.534 ***	0.413 **	0.386 ***	0.599 ***	0.710 ***	0.639 ***
Married	0.191 *	-0.102	0.119	0.092	-0.048	-0.130	0.035	-0.237 **	-0.211 *
Female	0.223	-0.002	0.316	0.145	0.083	0.245 **	0.333 **	-0.069	0.138
Risk tolerance group (Low tolerance omitted)									
Highest	-0.402 ***	-0.328 **	-0.386 **	-0.085	-0.133	-0.029	-0.107	-0.296 **	-0.430 **
High	0.160	0.079	-0.129	0.085	0.112	0.129	0.483 ***	0.206 *	0.237 **
Average	0.278 ***	0.190 **	-0.015	0.191 **	0.219 **	0.288 ***	0.378 ***	0.432 ***	0.317 ***
Constant	-4.444 ***	-3.457 ***	-3.066 ***	-3.180 ***	-3.011 ***	-2.807 ***	-3.724 ***	-3.560 ***	-3.570 ***
PseudoR2	0.409	0.462	0.392	0.362	0.331	0.334	0.381	0.391	0.374
Mean									
TDA shr	32.6%	33.9%	34.0%	31.8%	28.8%	27.4%	25.6%	21.7%	19.4%

Summary

- Static overall household ownership of municipal bonds masks an important trend: ownership concentrated in a smaller number of hands.
- This matters due to political economy of market.
- Explanation: Tax-deferred investing explosion.