Measuring Income and Wealth at the Top Using Administrative and Survey Data

Jesse Bricker

Alice Henriques

Jacob Krimmel

John Sabelhaus

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Motivation

- Top income and wealth shares: high and rising
- Both normative and policy concerns
  - Is the world becoming less fair? If so, why?
  - Has inequality contributed to macro instability and/or slowed economic growth?
- Not just academic debates, bestsellers!
  - Rajan (2010), Stiglitz (2012), Piketty (2014)

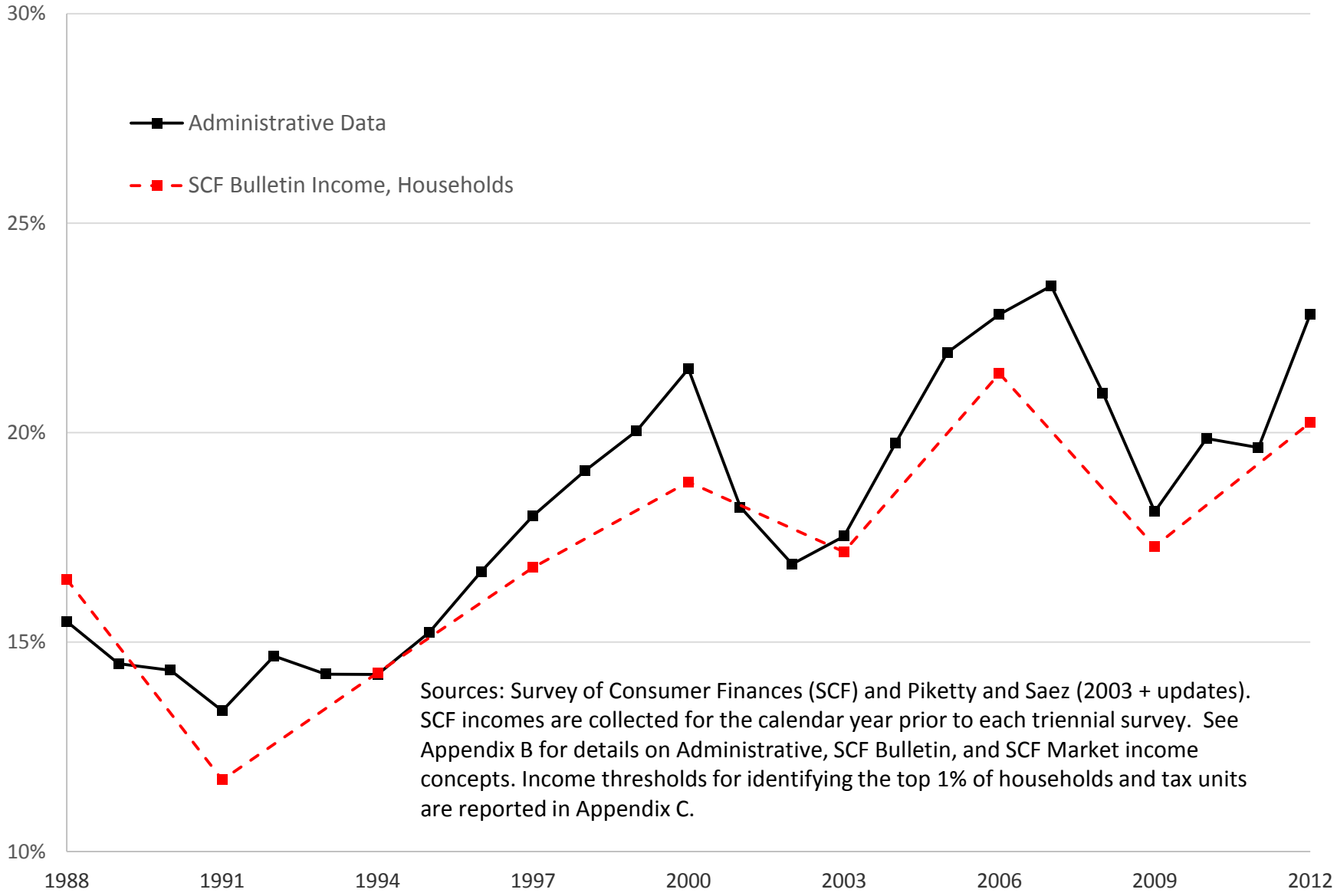
Goals for this Paper

- U.S. top income and wealth shares are high and rising, but how high, and how fast?
- Widely-cited top shares estimates based on administrative income tax data diverge from Survey of Consumer Finances (SCF)
  - Piketty and Saez (2003, updated)
  - Saez and Zucman (2014)
- Primary goal is to understand *why* the two approaches diverge, and solve for biases

Why Might Different Approach Matter?

- SCF samples the population and validates representativeness with same administrative data
  - SCF top shares lower/growing more slowly
  - Does this mean SCF *not* capturing top shares?
- Could also be problems with tax-based estimates
  - Unit of observation is not households
  - Income and wealth concepts limited by tax system
    - *Unmeasured* incomes and wealth are not distributed the same as measured components
  - Aggregate benchmarks matter, especially for wealth
  - Transitory income fluctuations distort very top shares

SCF and Administrative Data: Top 1% Income Shares



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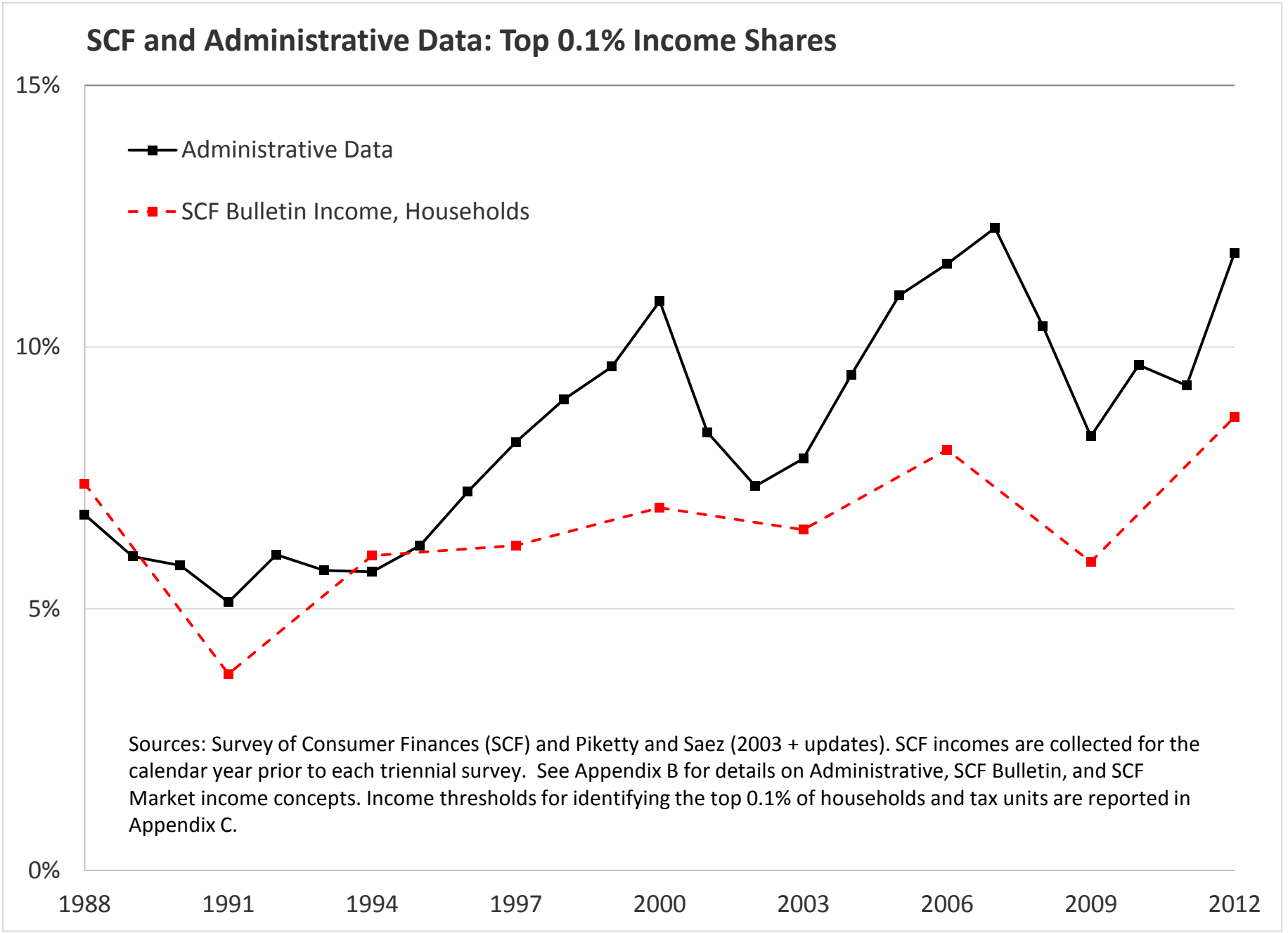
SCF and Administrative Data: Top 0.1% Income Shares
15%
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Administrative Data
SCF Bulletin Income, Households
1988
1991
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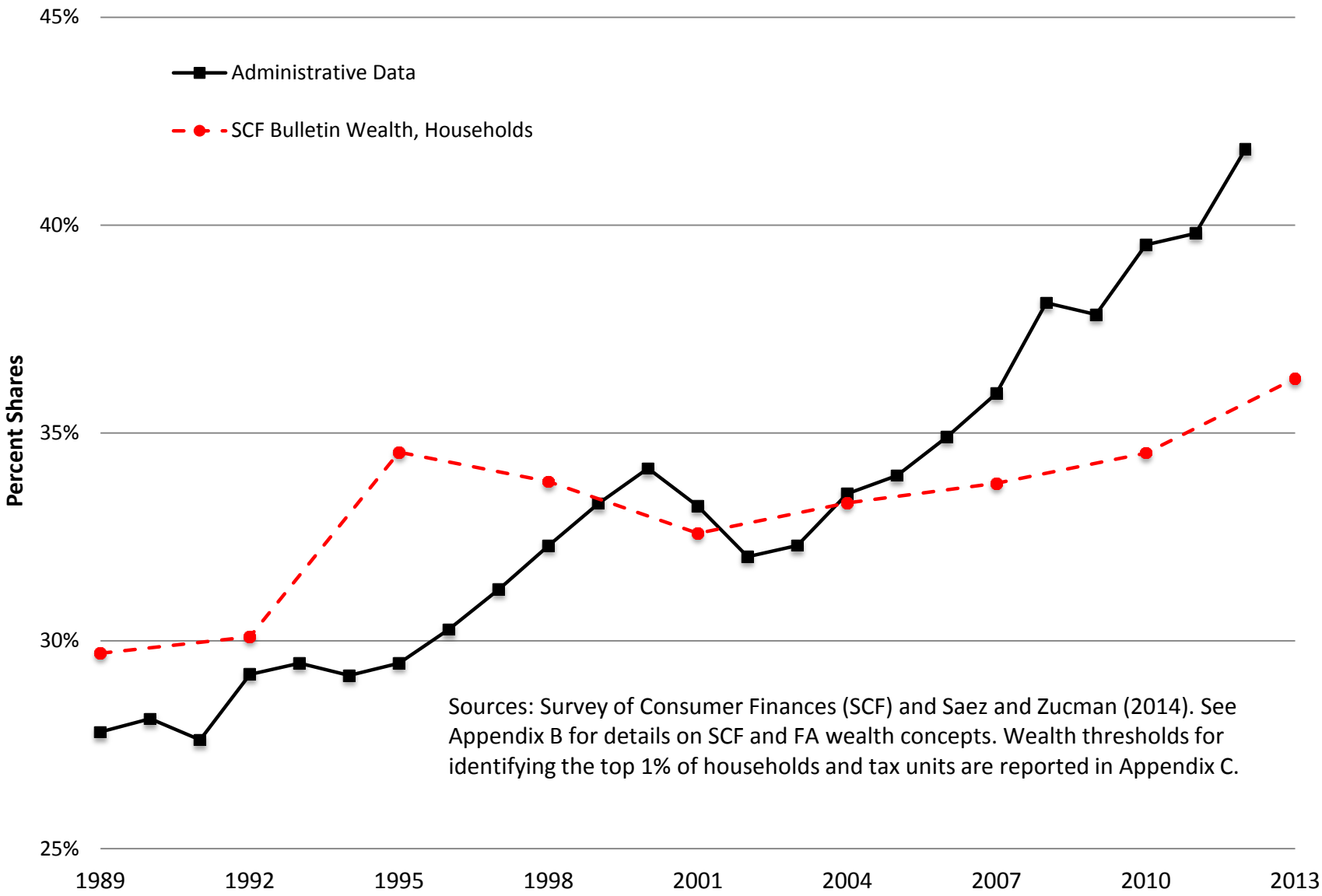
SCF and Administrative Data Top 1% Wealth Shares



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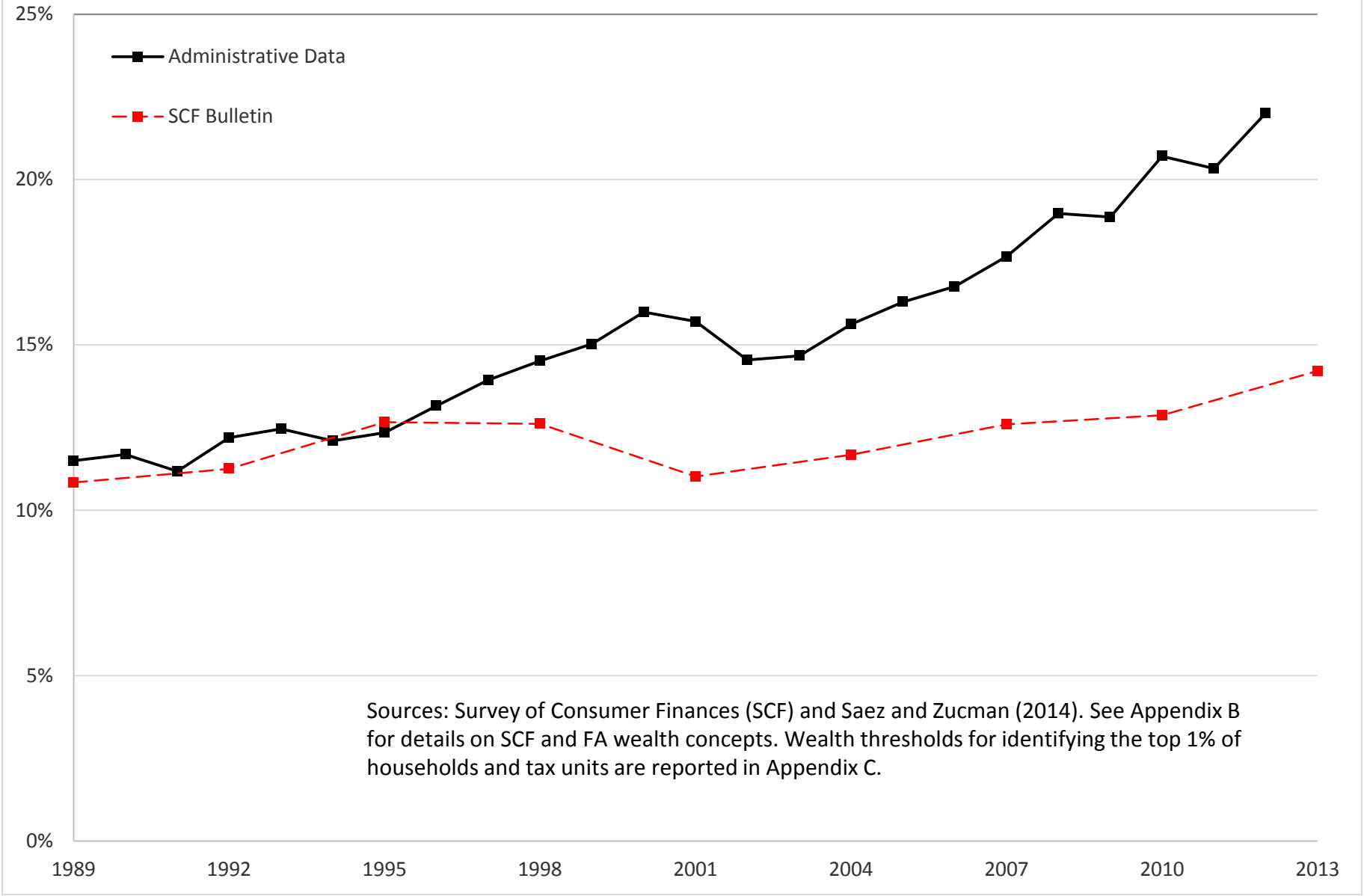
SCF and Administrative Data: Top 0.1% Wealth Shares



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Road Map for Paper

I. Introduce SCF sampling and validation
   - Participants and non-participants look the same

II. Reconcile top 1%, 0.1% income shares
   - Tax units vs households, income concepts

III. Reconcile top 1%, 0.1% wealth shares
   - Tax units vs households, wealth concepts
   - Benchmarking to wealth aggregates, Forbes 400

IV. Show how SCF sampling goal of finding *permanently* wealthy affects very top shares

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III. Wealth Reconciliation

- Why do SCF and tax-based "Gross Capitalization" top wealth share estimates diverge?
  - Capitalized approach uses taxable SOI incomes for income-generating assets, imputations for rest
  - Capitalized calibrated to Financial Accounts (FA)
  - SCF and FA balance sheet *concepts* diverge
  - SCF and FA estimated *aggregates* diverge
  - Some implied capitalization factors problematic
- 160 million tax units versus 120 million families
- SCF (by rule) does not survey Forbes 400

Gross Capitalization (GC) Approach

- Given taxable capital income type *k*=1,…9 along with estimates of wealth that do not generate taxable income, for family *i*

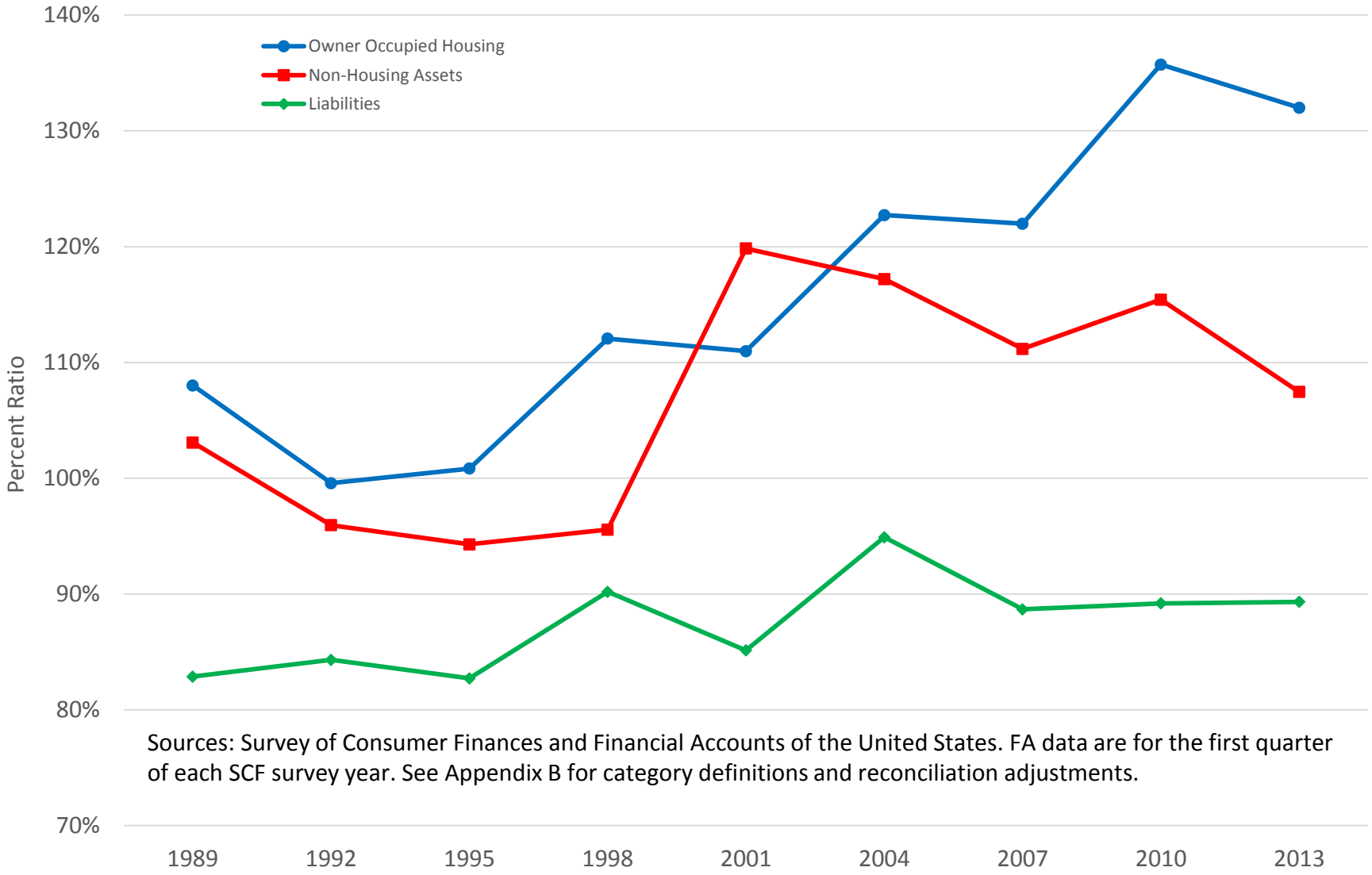
$$\widehat{wealth}_i^{GC} = \sum_{\forall k} \frac{SOI\ income_i^k}{ror^k} + nonfinancial_i$$

- In practice, Saez and Zucman (2014) compute *ror* for each asset *k* to calibrate to FA aggregates

$$ror^k = \frac{\sum_{\forall i} SOI\ income_i^k}{FA\ asset^k}$$

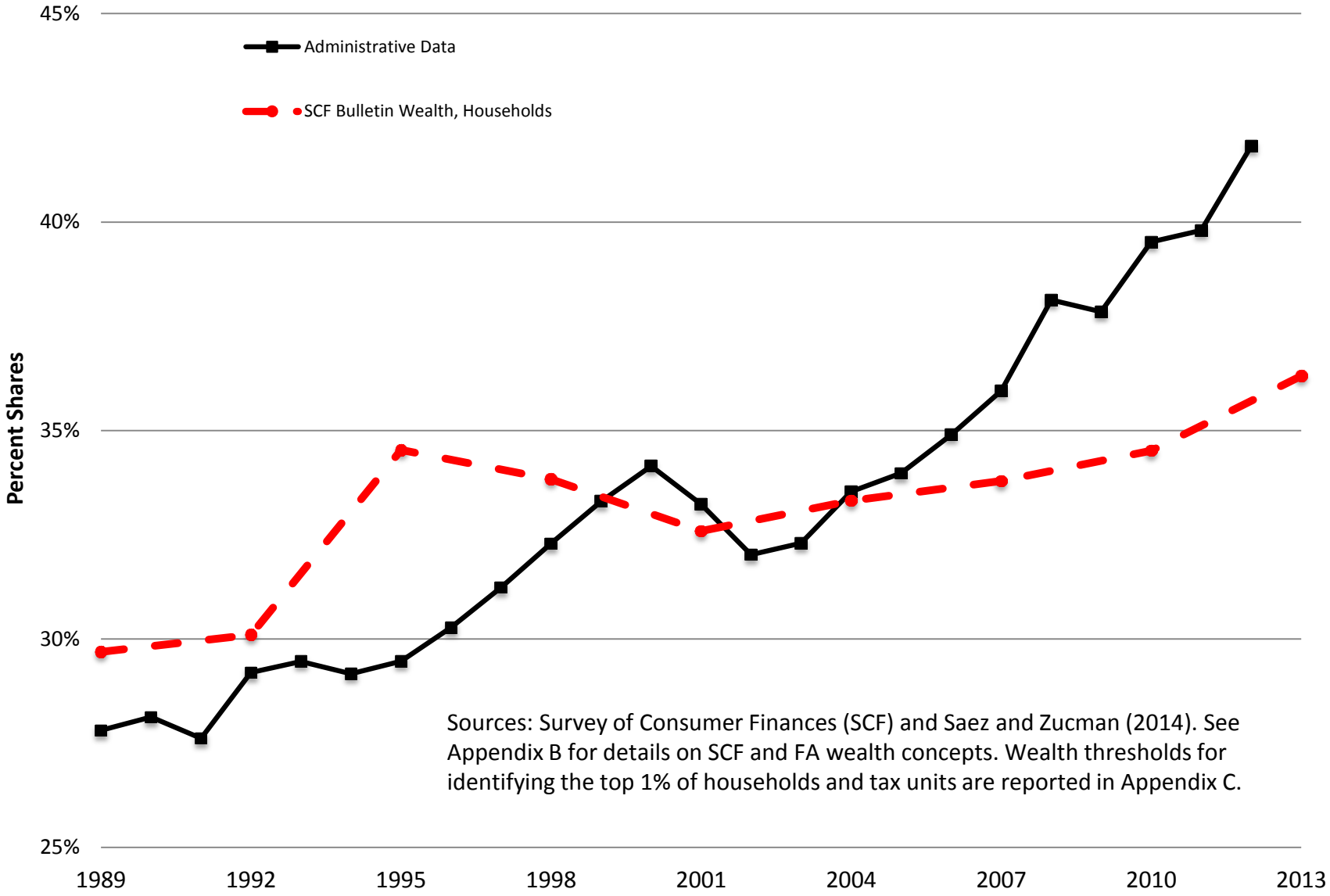
Table B.1. Reconciling SCF and FA Aggregates			
	2013Q1 ($ Trillions)		
	SCF	FA	Gap
Published Household Net Worth	65.5	72.3	-6.8
- Less Identifiable Nonprofit Net Worth		2.1	
- Less Security Credit, miscellaneous assets and liabilities	1.0	1.1	
- Less Life Insurance	0.8	1.2	
+ Plus DB Pensions	10.9		
- Less Durables	2.4	4.9	
- Less Forbes400 Net Worth		2.0	
= Conceptually Equivalent Net Worth	72.2	61.0	11.2

Ratio of SCF Balance Sheet Categories to Comparable FA Aggregates



Sources: Survey of Consumer Finances and Financial Accounts of the United States. FA data are for the first quarter of each SCF survey year. See Appendix B for category definitions and reconciliation adjustments.

Reconciling Survey of Consumer Finances (SCF) and Administrative Data
Top 1% Wealth Shares



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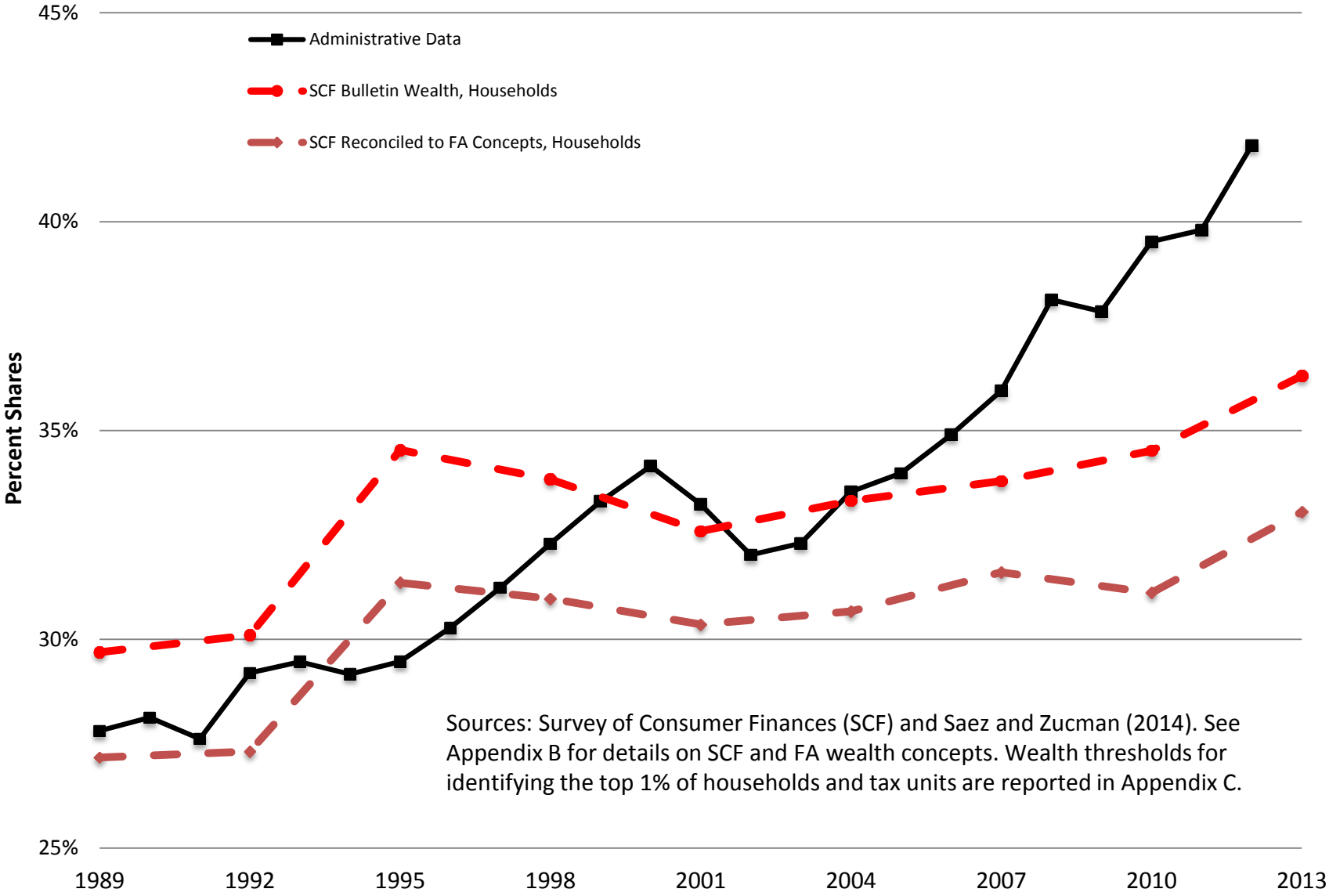

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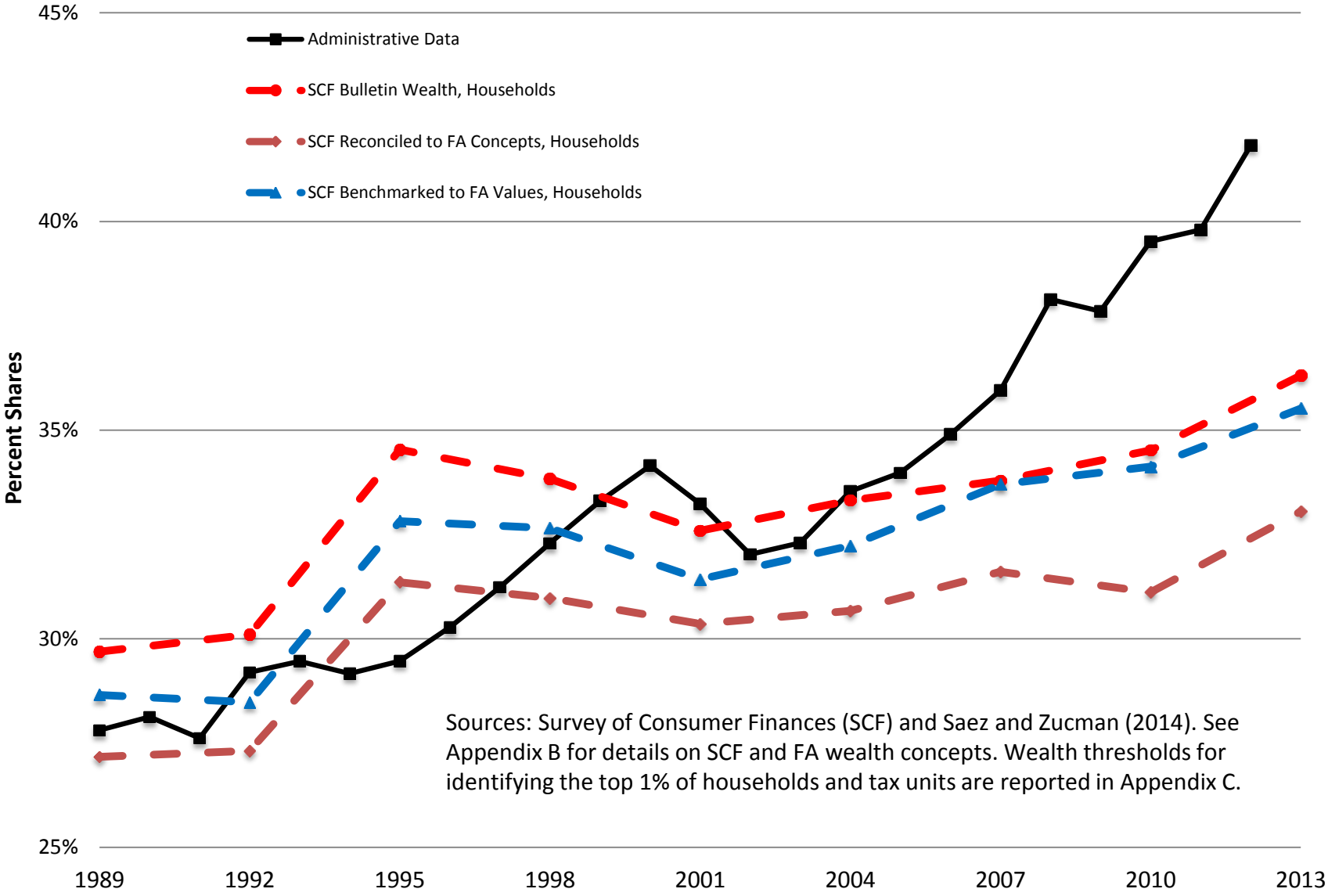

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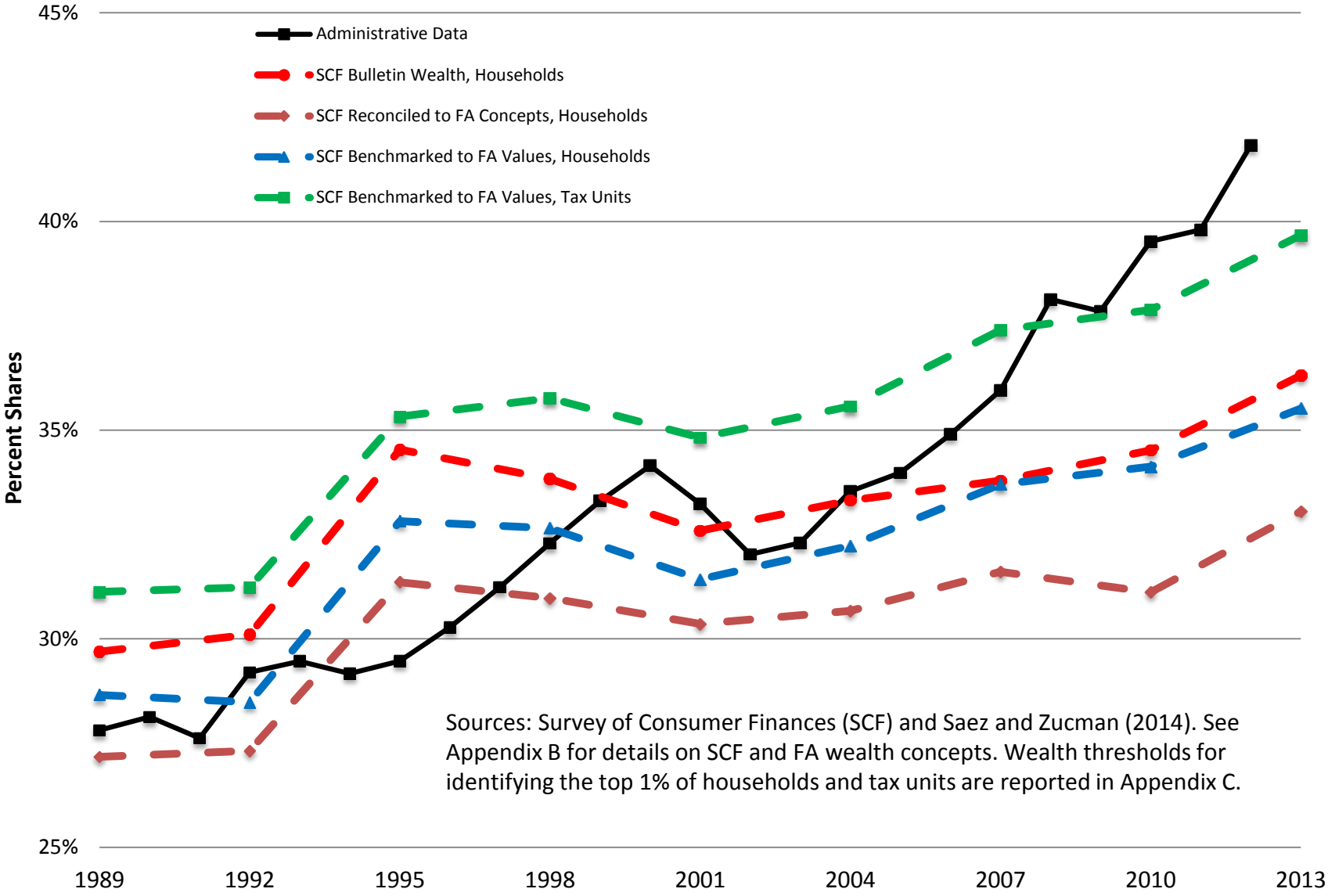

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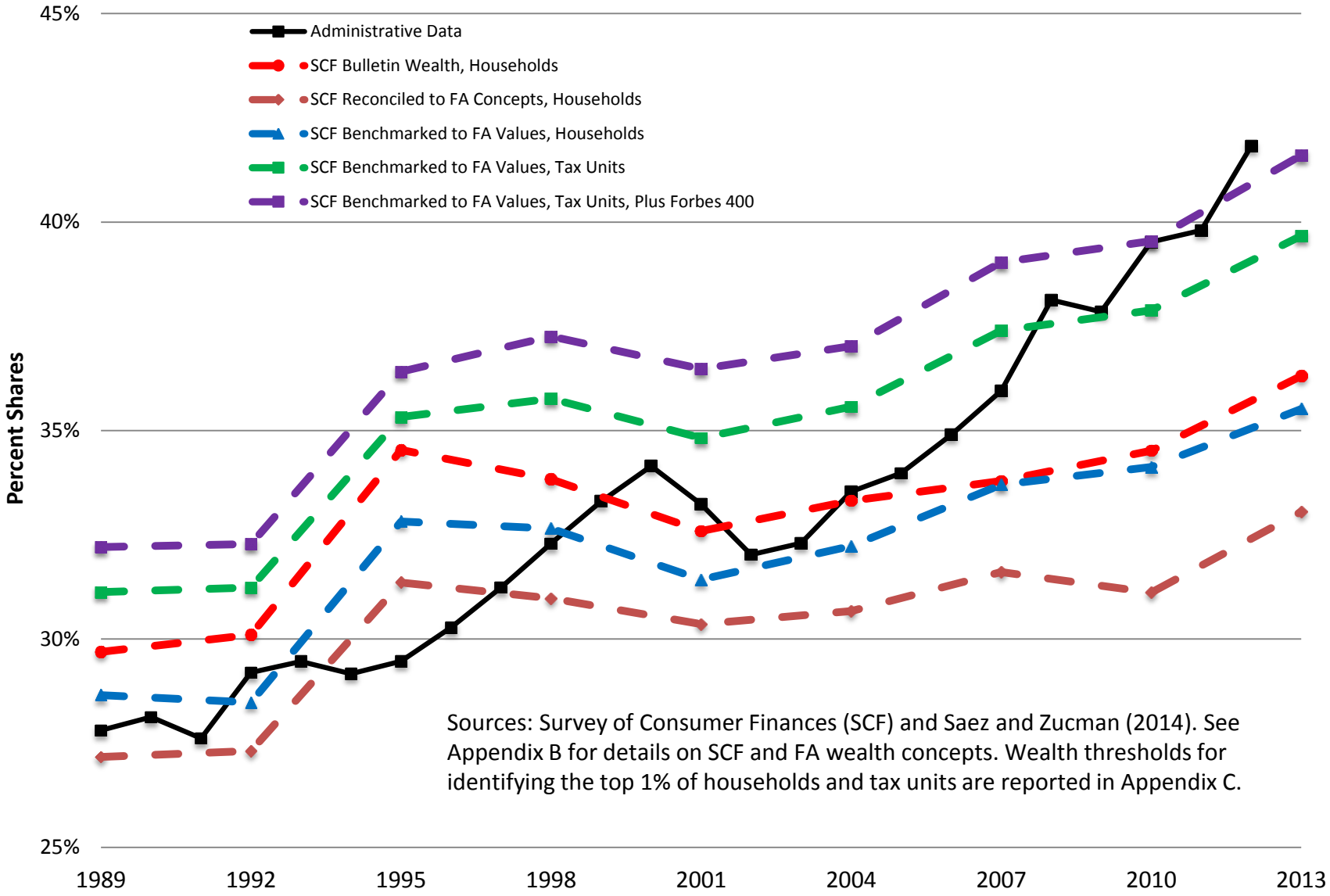

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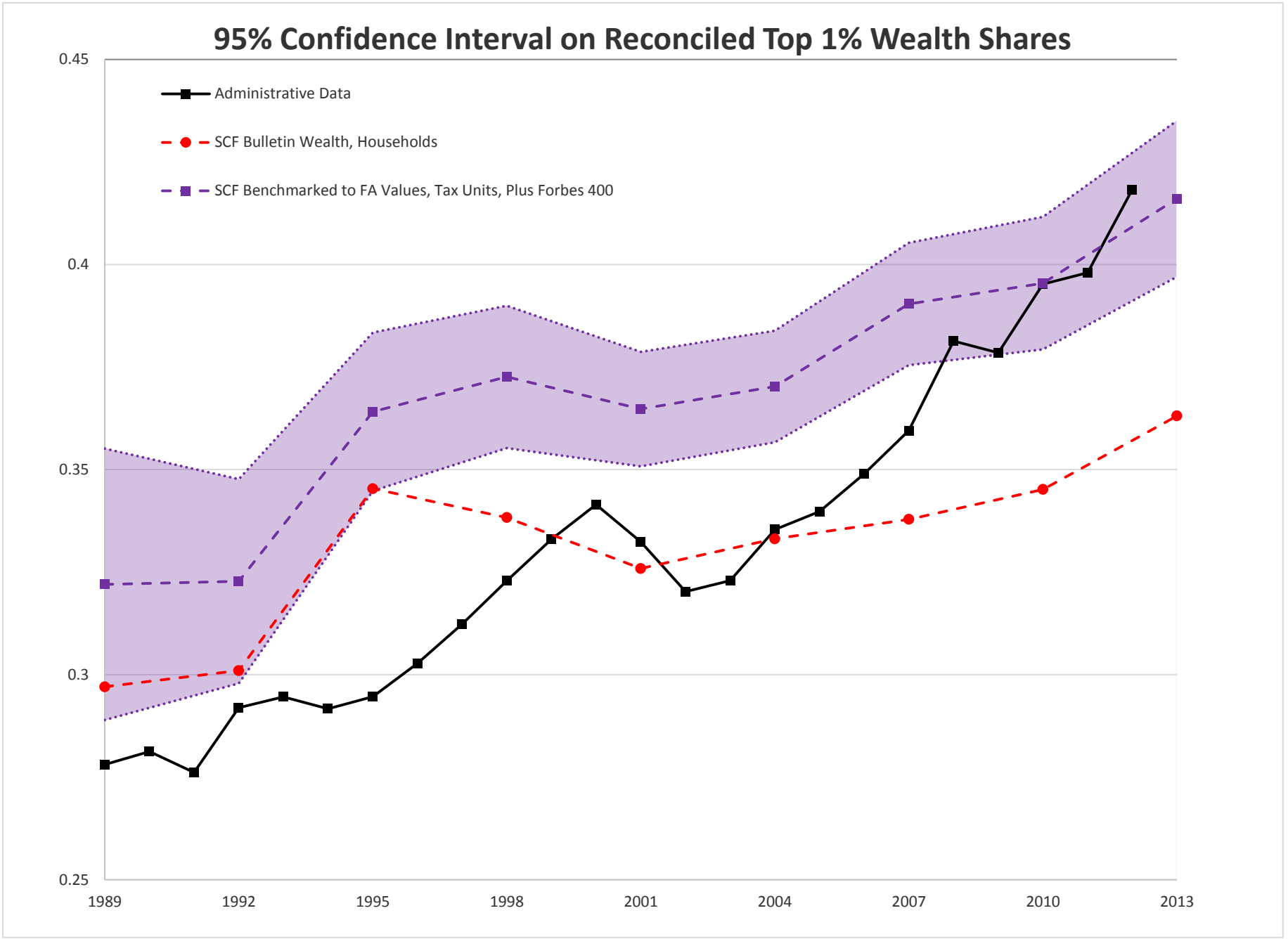
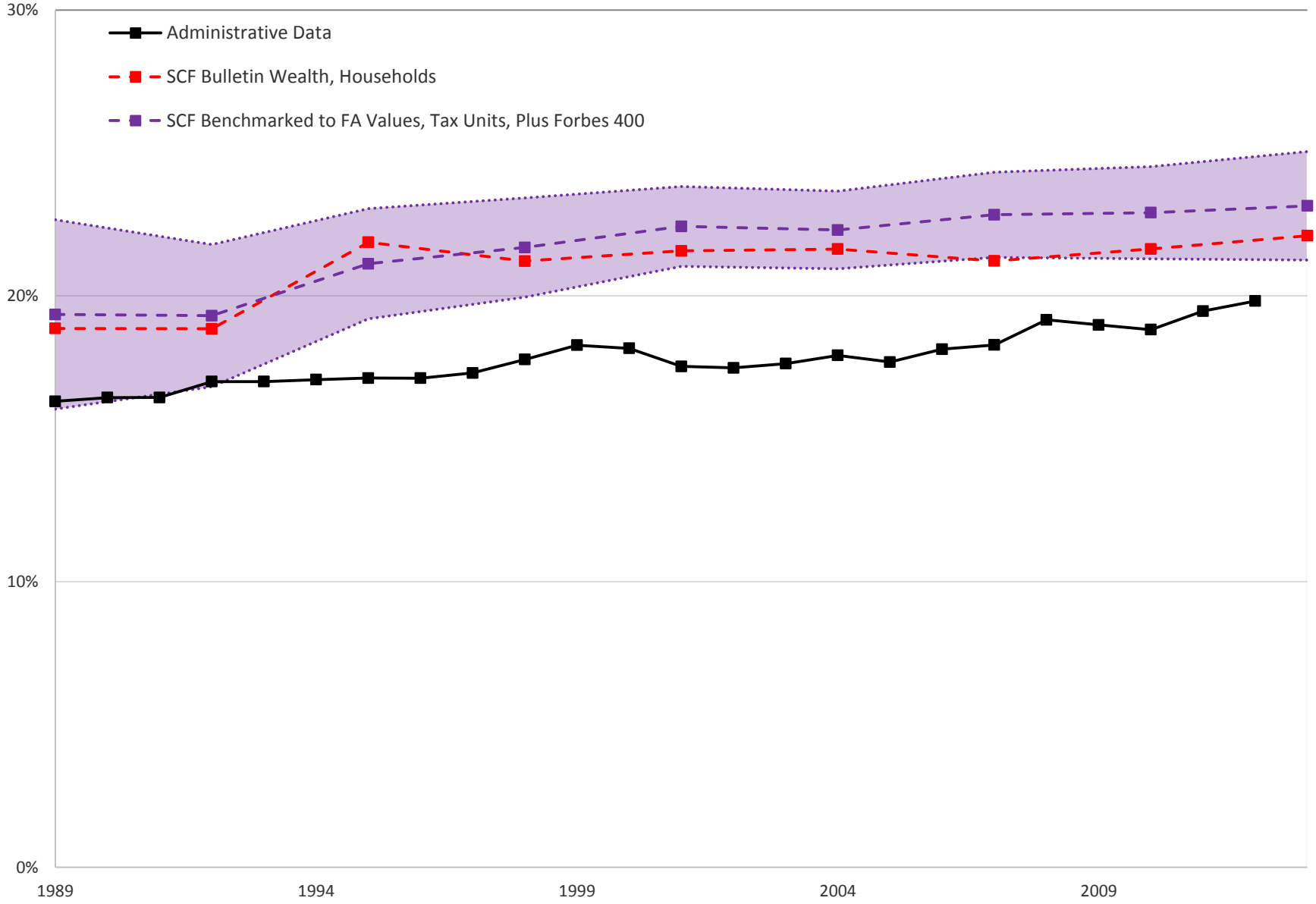
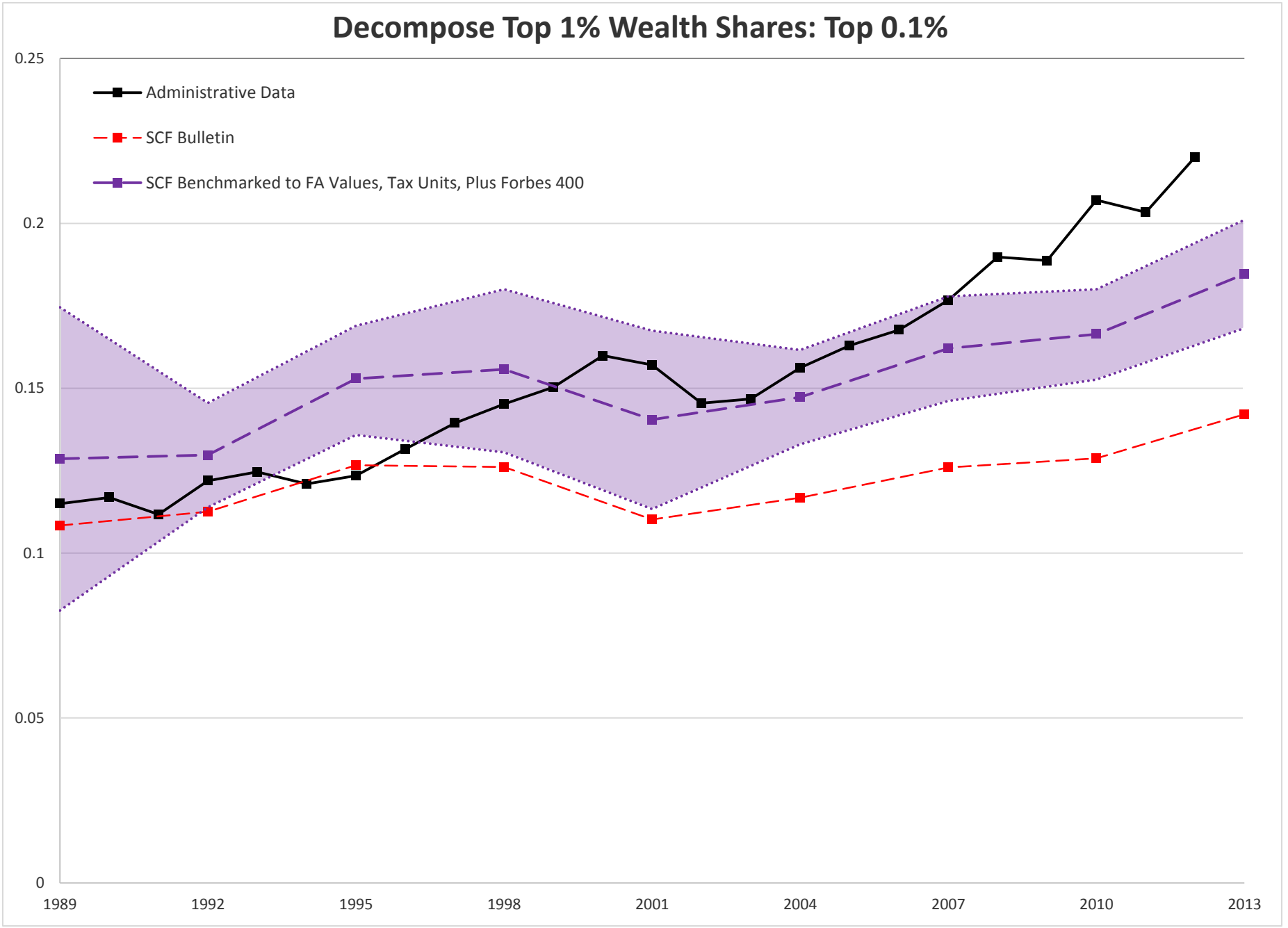

95% Confidence Interval on Reconciled Top 1% Wealth Shares
0.45
0.4
0.35
0.3
0.25
Administrative Data
SCF Bulletin Wealth, Households
SCF Benchmarked to FA Values, Tax Units, Plus Forbes 400
1989
1992
1995
1998
2001
2004
2007
2010
2013

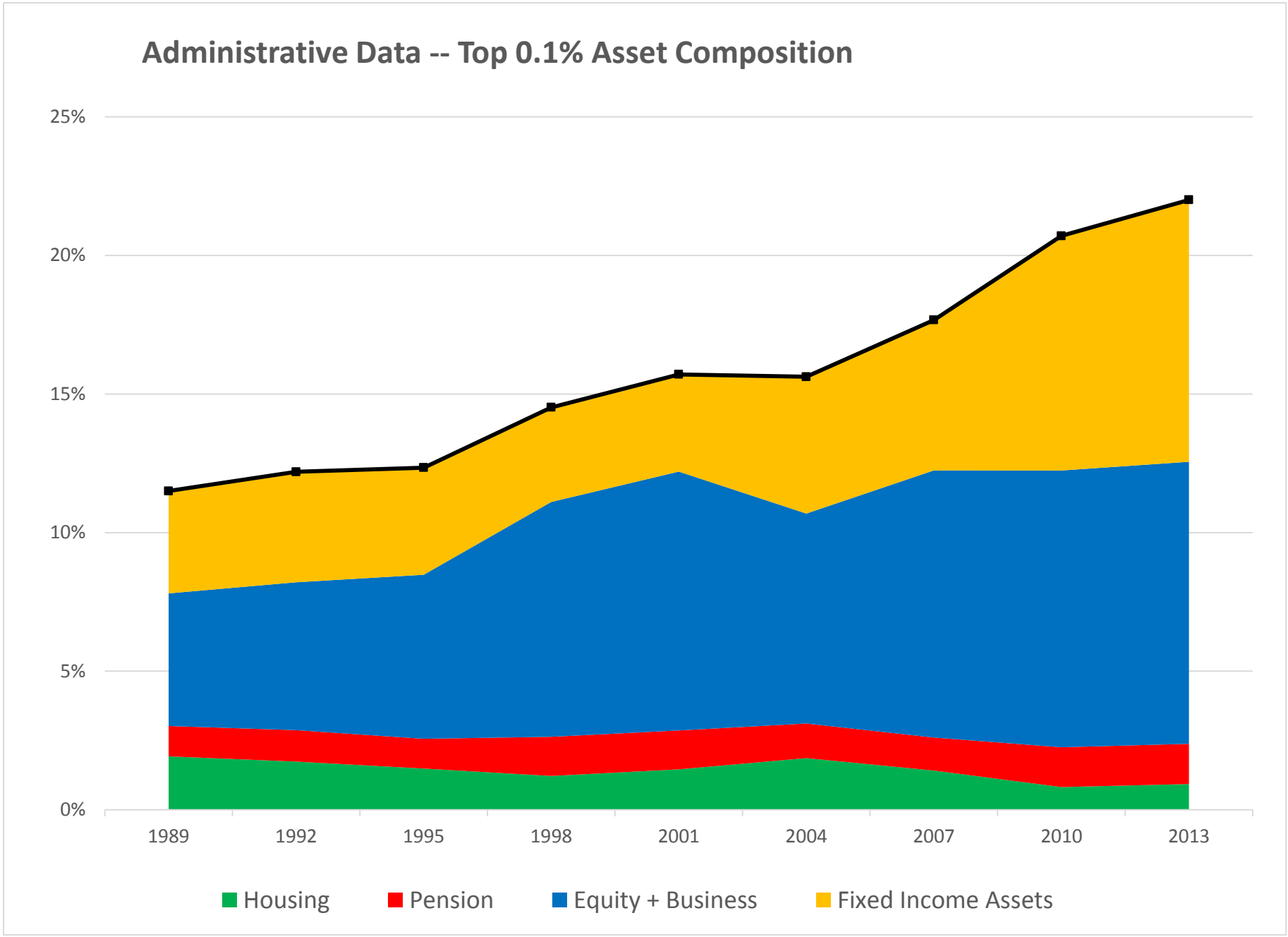
Decompose Top 1% Wealth Shares: Top 1-0.1 % (99-99.9th percentile)

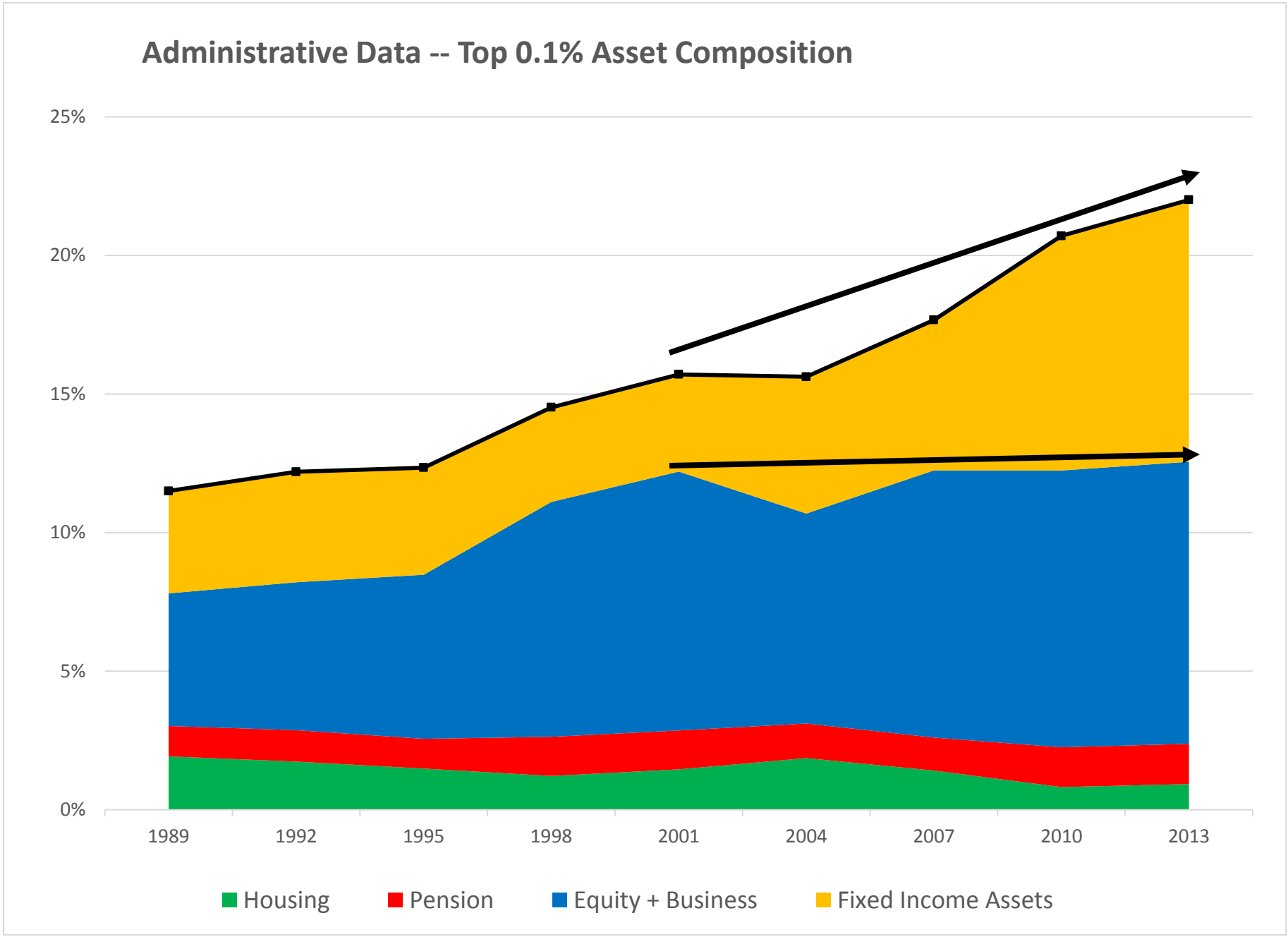



Decompose Top 1% Wealth Shares: Top 0.1%
Administrative Data
SCF Bulletin
SCF Benchmarked to FA Values, Tax Units, Plus Forbes 400
0.25
0.2
0.15
0.1
0.05
0
1989
1992
1995
1998
2001
2004
2007
2010
2013

Wealth Reconciliation at the Very Top

- Still, top 0.1 wealth share is greater in capitalized administrative tax data
- Look closer at asset composition and RoR
  - Fixed-income assets were 25%, now 45% of assets


Administrative Data -- Top 0.1% Asset Composition
25%
20%
15%
10%
5%
0%
1989
1992
1995
1998
2001
2004
2007
2010
2013
Housing
Pension
Equity + Business
Fixed Income Assets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1995
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2001
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2007
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Housing
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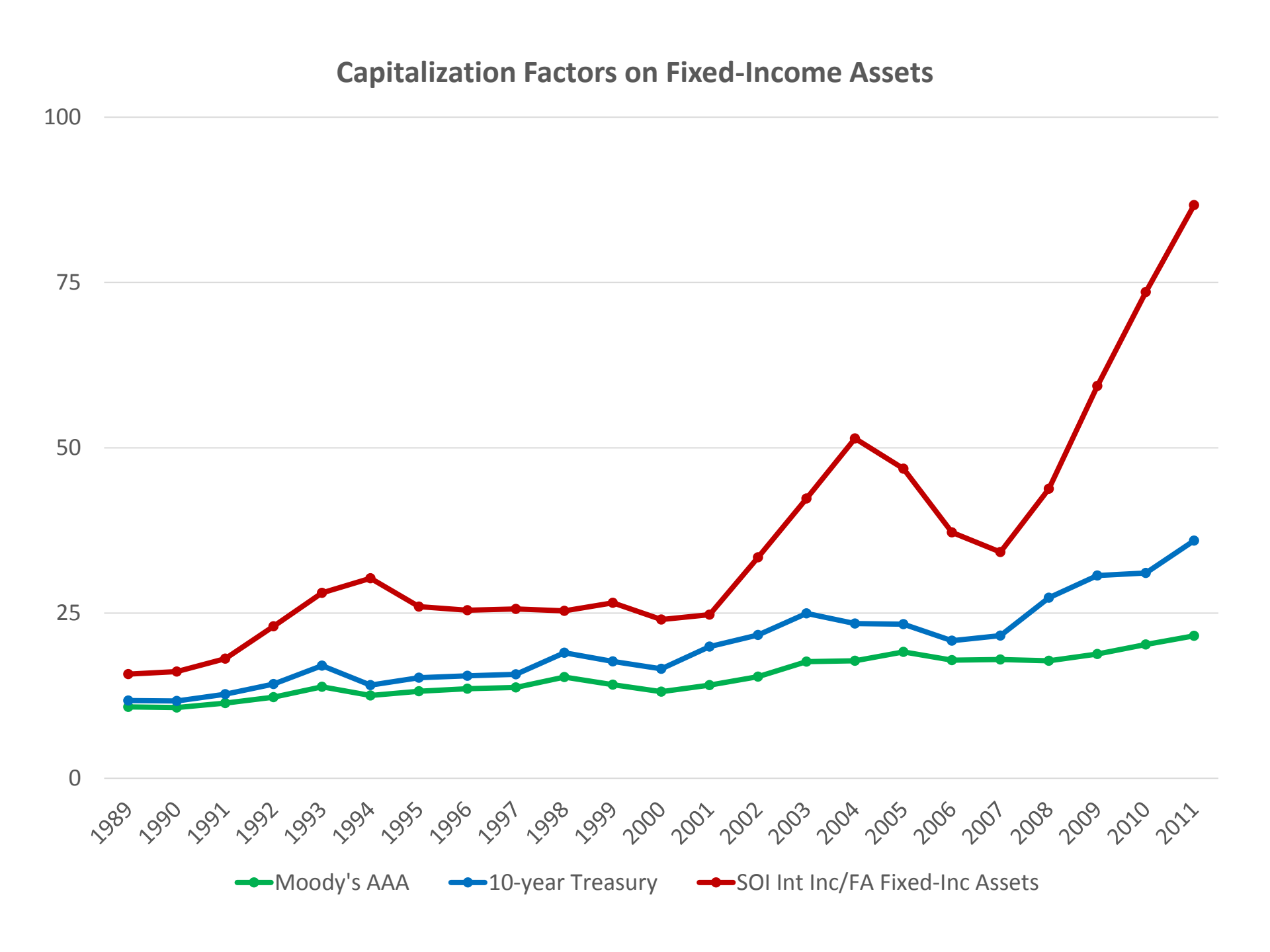
Fixed Income Assets

Wealth Reconciliation at the Very Top

- Still, top 0.1 wealth share is greater in capitalized administrative tax data
- Look closer at asset composition and RoR
  - Fixed-income assets were 25%, now 45% of assets
  - Bonds ≈ 1/3rd, deposit accounts are the other 2/3^{rds}.
  - Do the top 0.1 really hold savings deposit accounts?
- Rate of return on fixed-income = 1 pct. (for all)
  - → capitalization factor of 100x for interest income
  - Compare to market rates of return


Capitalization Factors on Fixed-Income Assets
100
75
50
25
0
1989
1990
1991
1992
1993
1994
1995
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1997
1998
1999
2000
2001
2002
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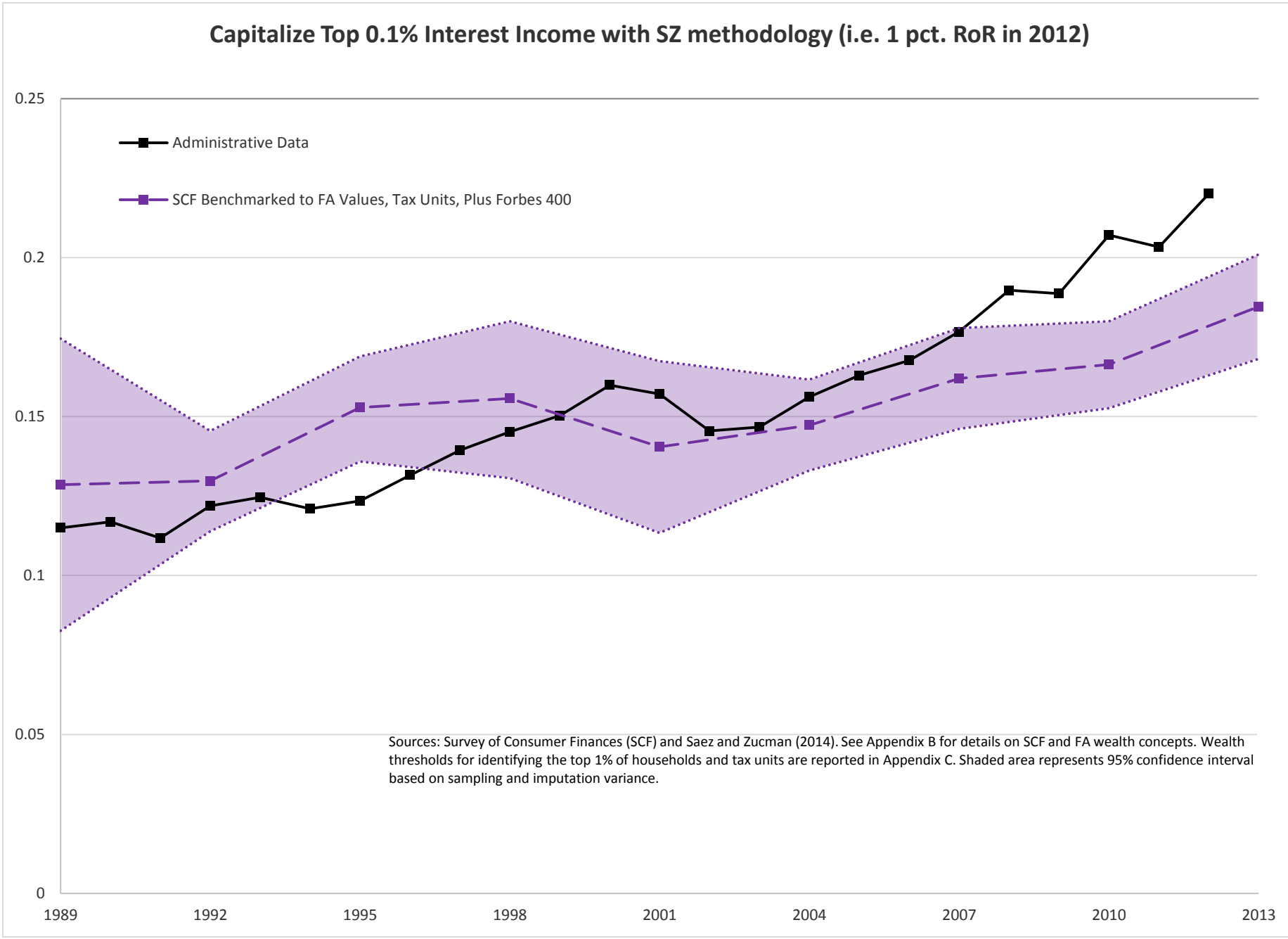
2004
2005
2006
2007
2008
2009
2010
2011
Moody's AAA
10-year Treasury
SOI Int Inc/FA Fixed-Inc Assets


Capitalize Top 0.1% Interest Income with SZ methodology (i.e. 1 pct. RoR in 2012)
0.25
0.2
0.15
0.1
0.05
0
Administrative Data
SCF Benchmarked to FA Values, Tax Units, Plus Forbes 400
1989
1992
1995
1998
2001
2004
2007
2010
2013
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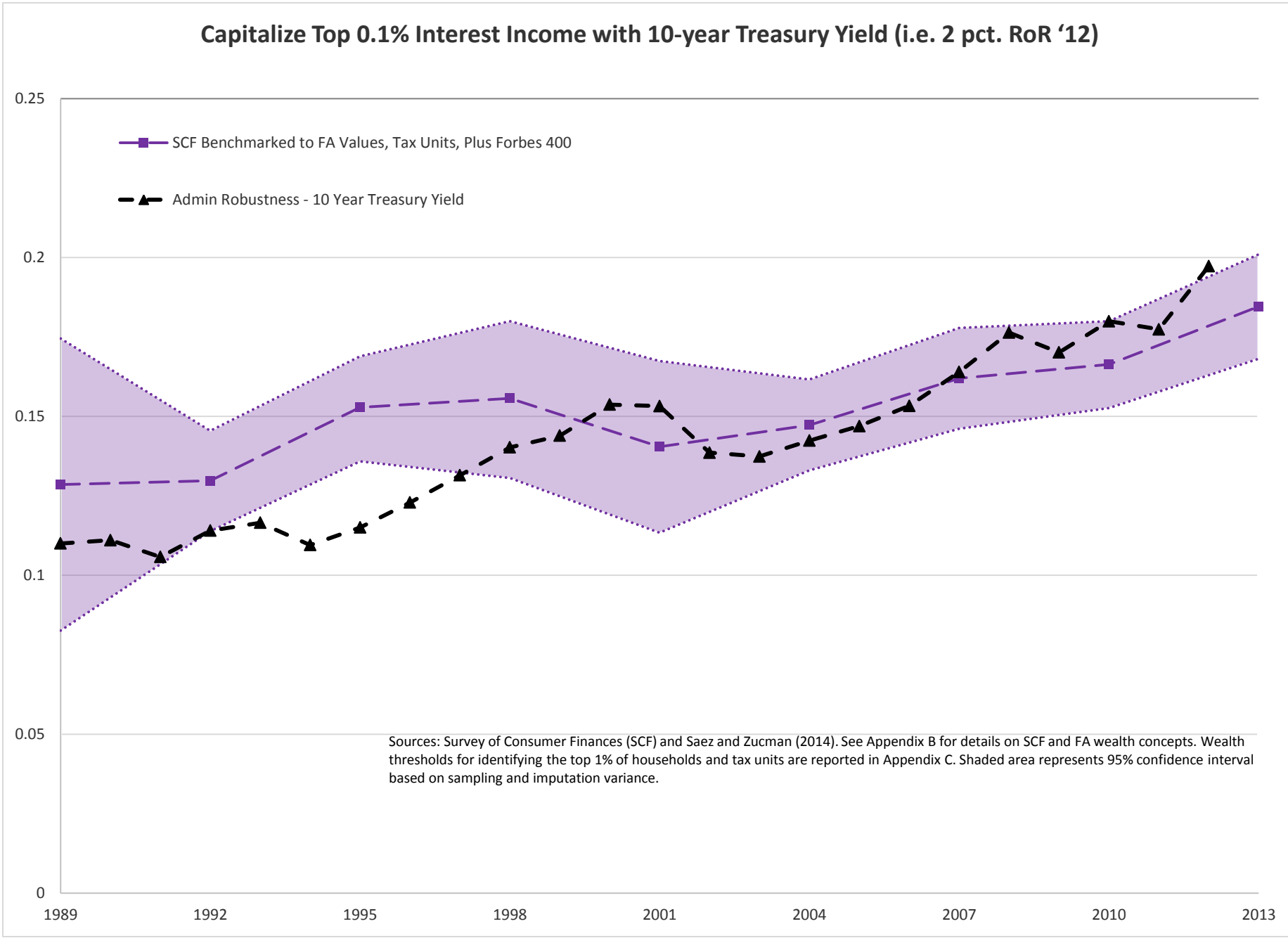
Capitalize Top 0.1% Interest Income with 10-year Treasury Yield (i.e. 2 pct. RoR '12)
SCF Benchmarked to FA Values, Tax Units, Plus Forbes 400
Admin Robustness - 10 Year Treasury Yield
0.25
0.2
0.15
0.1
0.05
0
1989
1992
1995
1998
2001
2004
2007
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2013
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Wealth Reconciliation Takeaways

- As with income, top 1% levels in 2013 similar, but SCF trends generally flatter
  - All the difference is due to top 0.1 percent
- The ***same slower*** top 0.1 wealth shares, growth
  - When assume reasonable capitalization factor for interest income
  - Why? Allocate FA fixed-income assets to those that realize interest income
  - Small balance deposits growing; 1099-INT if ≥ $10
  - Further, the SZ bond series is pre-FA revision!

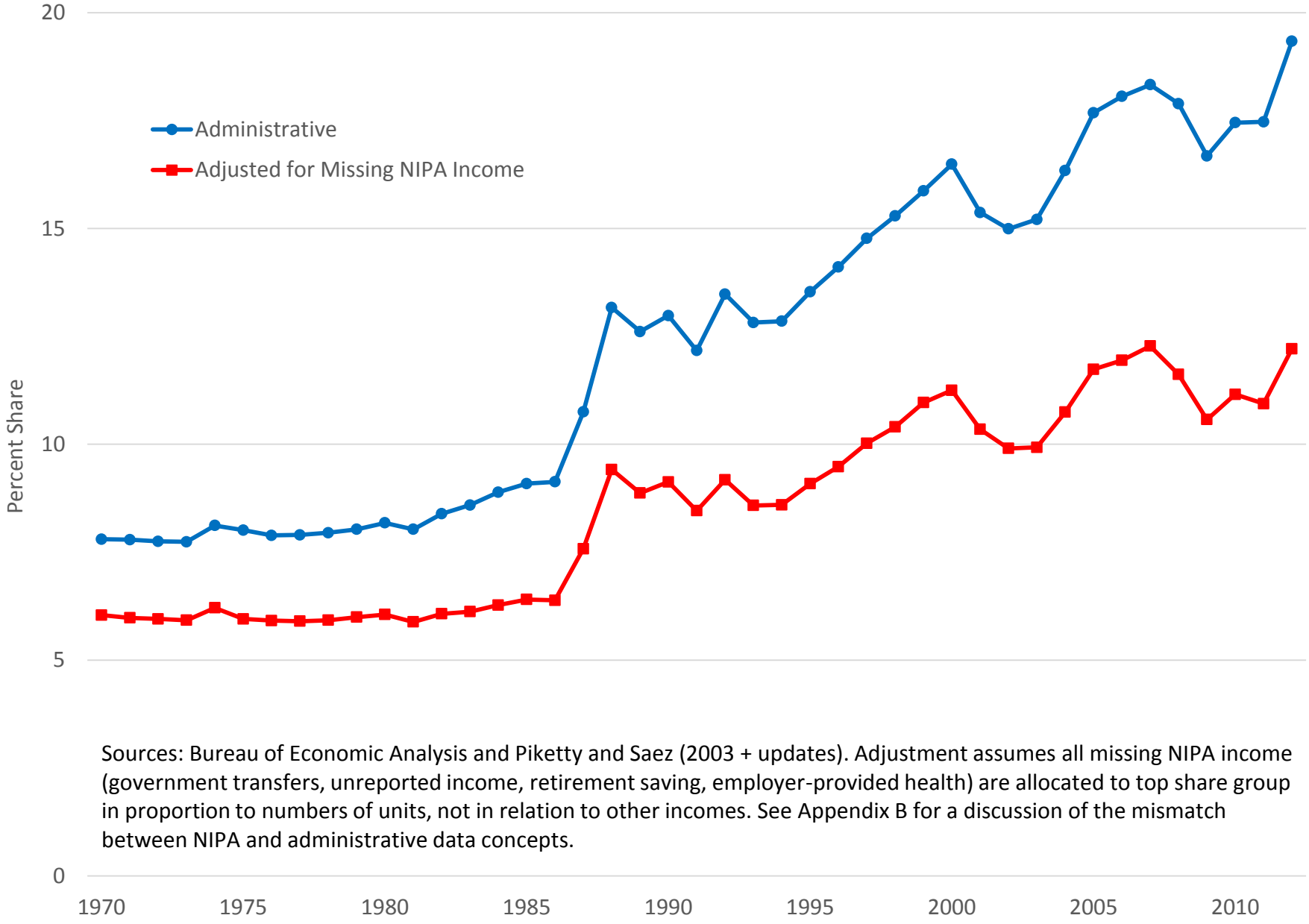
Conclusions

- Estimates of top income and wealth shares from SCF can be reconciled with estimates derived directly from administrative tax data
- SCF suggests that administrative-based top share estimates too high and rising too fast
- Reconciliations offer direction for future work, as broader income and wealth measures are likely to further reduce estimated top shares

If Time: Expanded Income Concept

- Cannot distribute all of NIPA personal income, but can at least bracket top income shares
- Assume that missing income in every year, starting in 1970, is allocated per tax unit
  - Top 1 percent gets only 1% of the missing income
- Top 1% income levels and growth much more muted, and tax unit adjustment would add
- Extreme assumption, but brackets truth: missing incomes are transfers, non-wage compensation, retirement saving

Figure 10. Effect of Allocating Missing Personal Income on Top 1% Income Shares



Sources: Bureau of Economic Analysis and Piketty and Saez (2003 + updates). Adjustment assumes all missing NIPA income (government transfers, unreported income, retirement saving, employer-provided health) are allocated to top share group in proportion to numbers of units, not in relation to other incomes. See Appendix B for a discussion of the mismatch between NIPA and administrative data concepts.

Thanks!

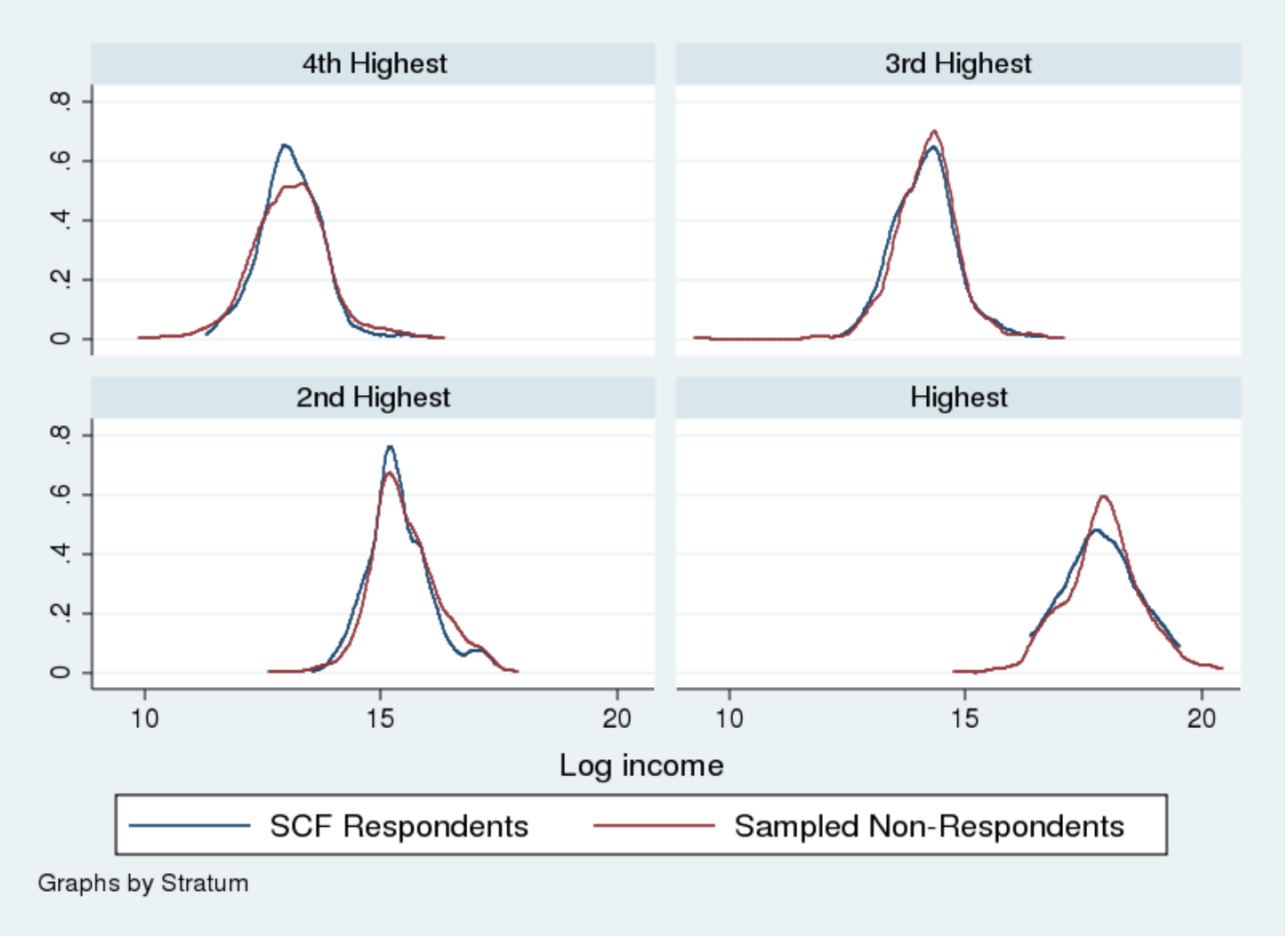
jesse.bricker@frb.gov
alice.henriques@frb.gov
jake.krimmel@frb.gov
john.sabelhaus@frb.gov

Additional Slides

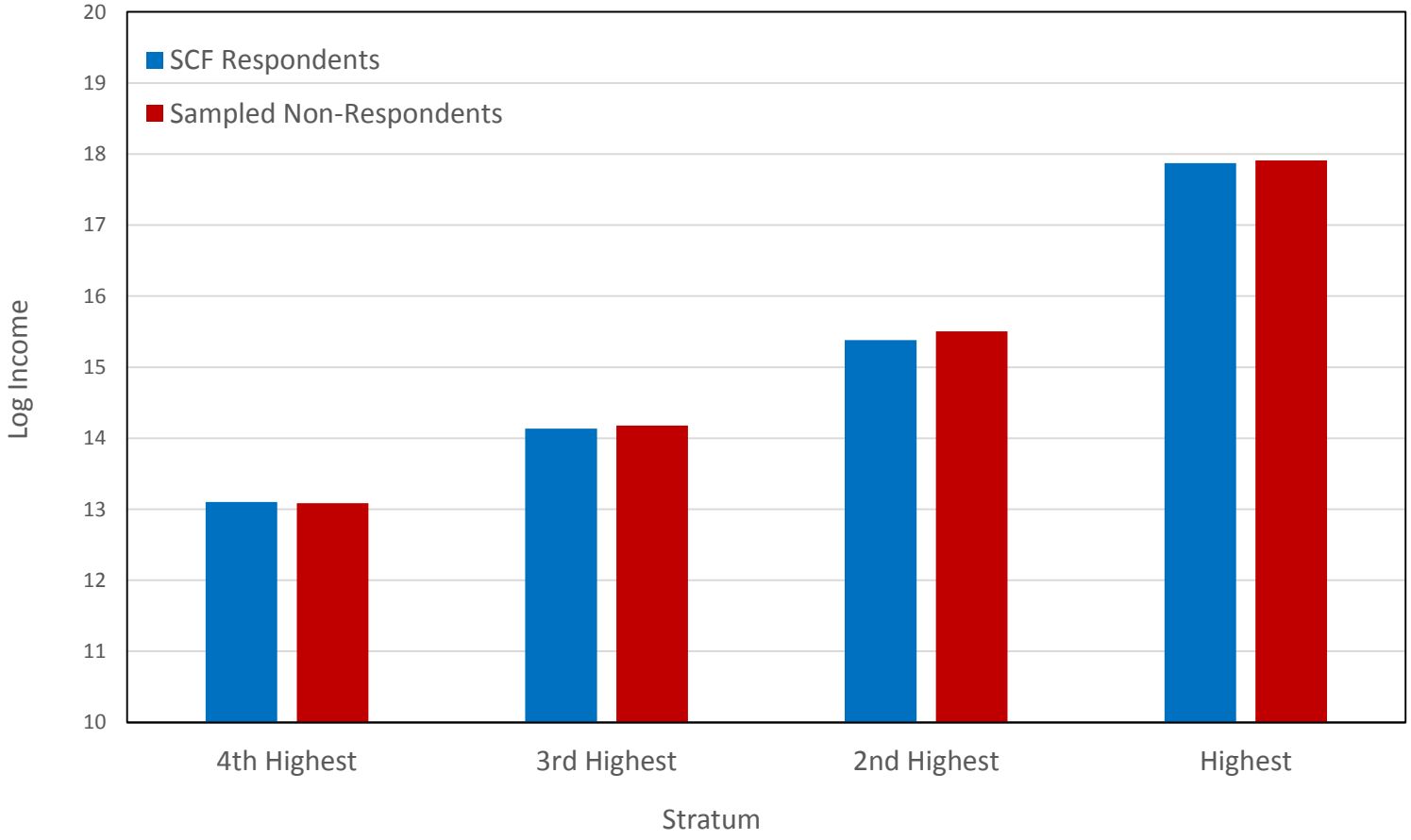
I. SCF Sampling and Representativeness

- Non-participation among wealthy families in traditional household surveys is a problem
  - Indirect evidence: don't see large incomes, wealth
  - Direct evidence: Sabelhaus et al. (2015)
- SCF solves this by *targeting* a certain number of cases from very thin strata near the top
  - Accept low response rates, weight accordingly
- Things can go wrong: participants within a given stratum don't look like non-participants

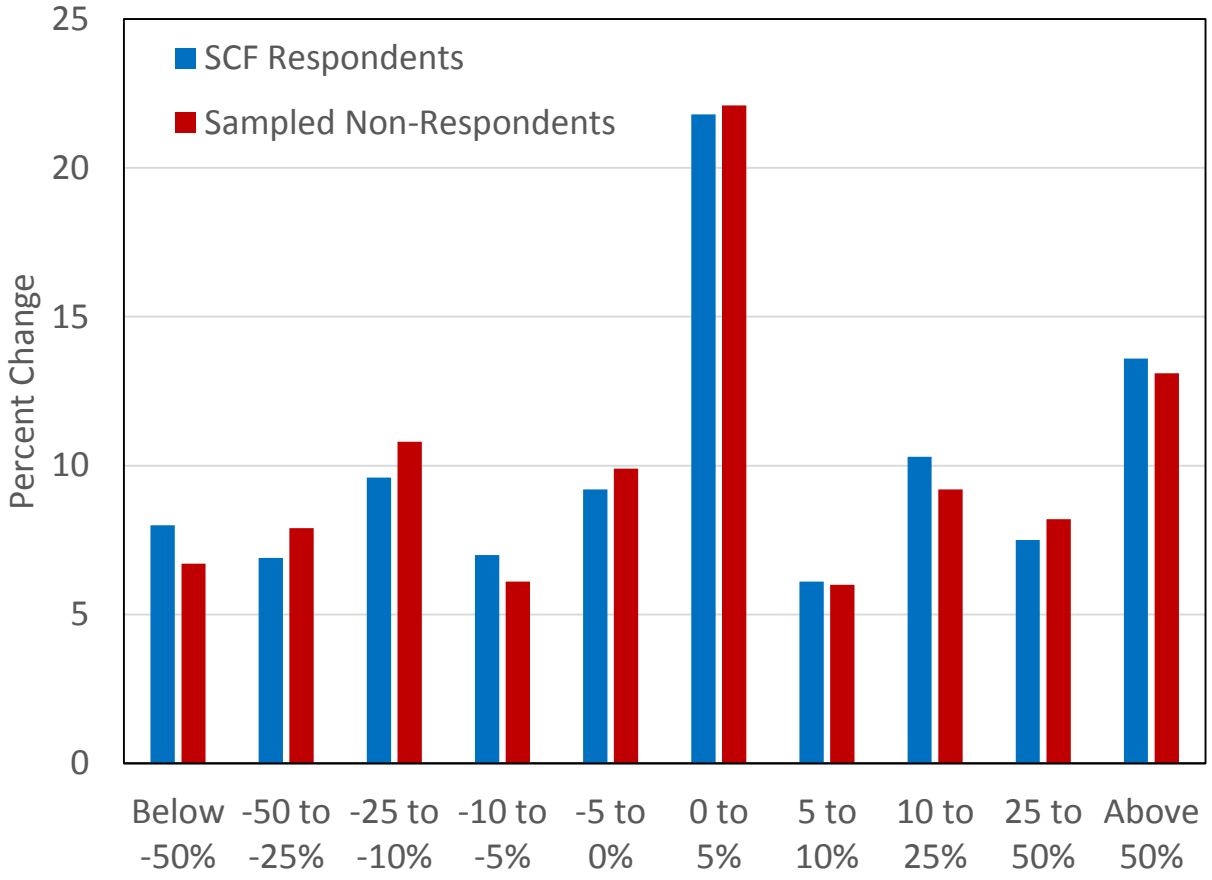
SCF Respondents are Similar to Non-Respondents by Income Within Top Share Strata



Mean Incomes within Top Share Strata are Similar for Respondents and Non-Respondents



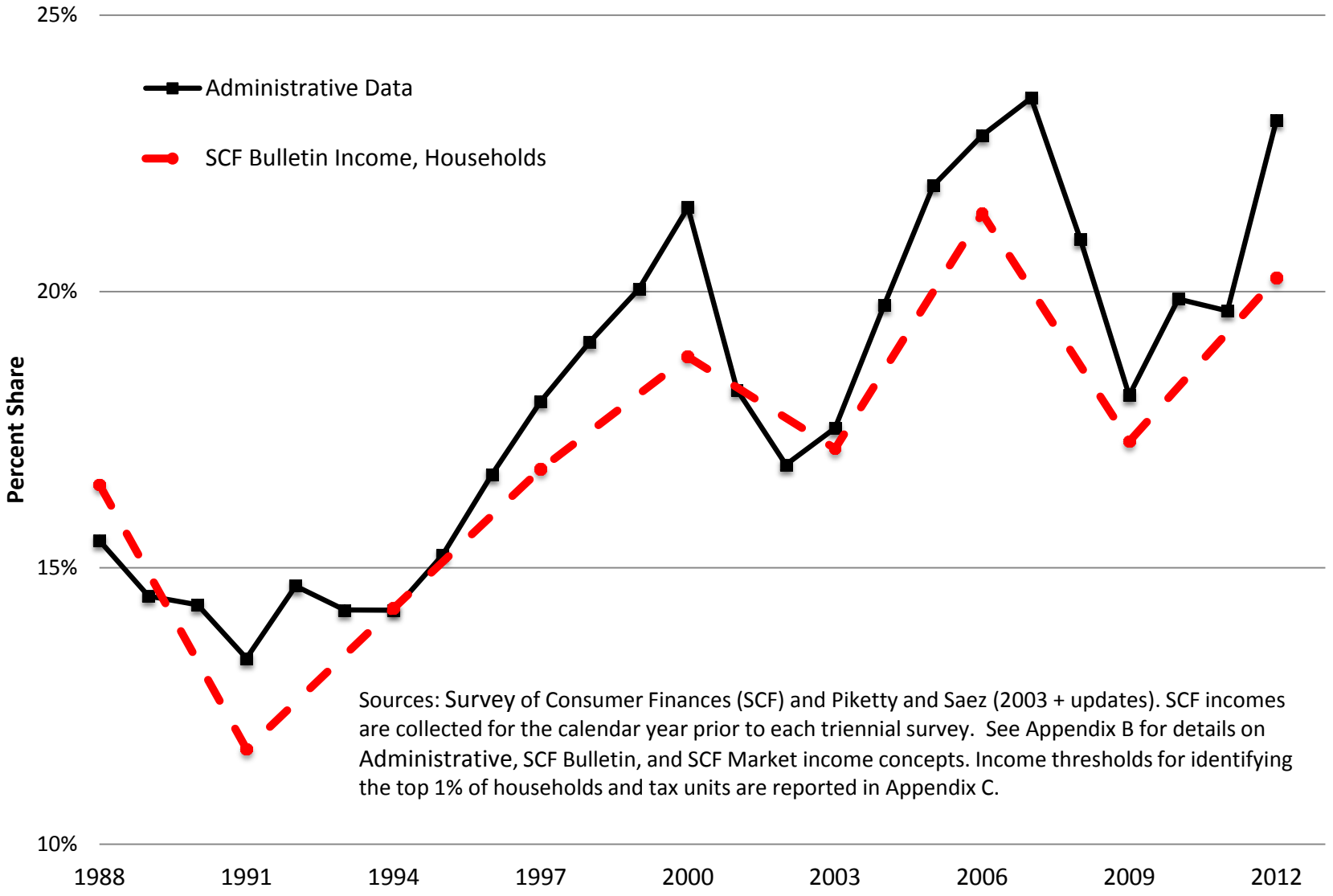
Pre-Survey Income Volatility is Similar for Respondents and Non-Respondents



II. Income Reconciliation

- Comparisons between Piketty-Saez and SCF income shares is “apples-to-oranges”
- First, adjust income concept
  - Strip out “non-market” incomes from SCF
- Second, adjust for tax units vs households
  - In 2013, 160 mill tax units, 120 mill households
  - In adjusted 1% series, just count 1.6 mill from top

Reconciling Survey of Consumer Finances (SCF) and Administrative Data
Top 1% Total Income Shares



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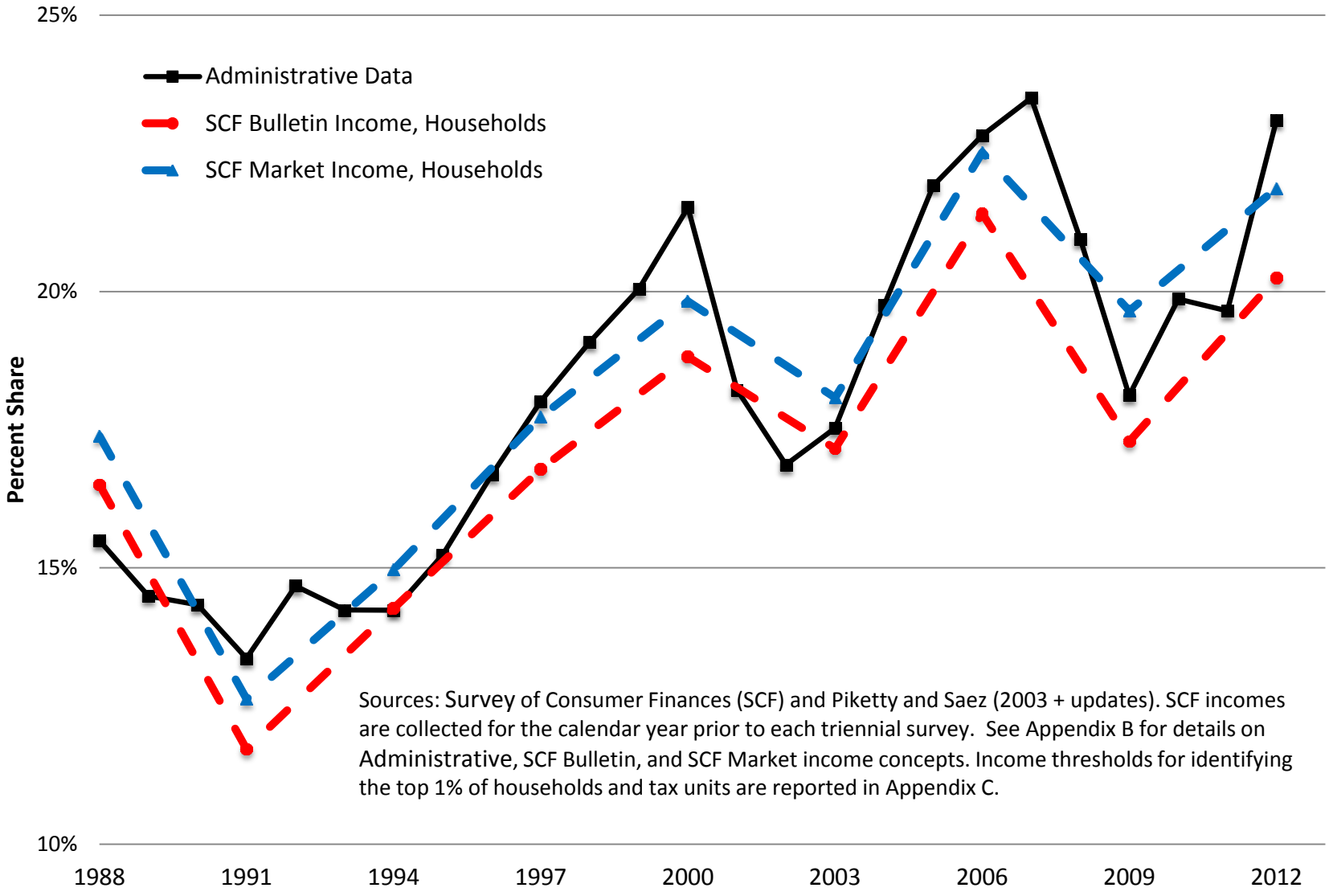

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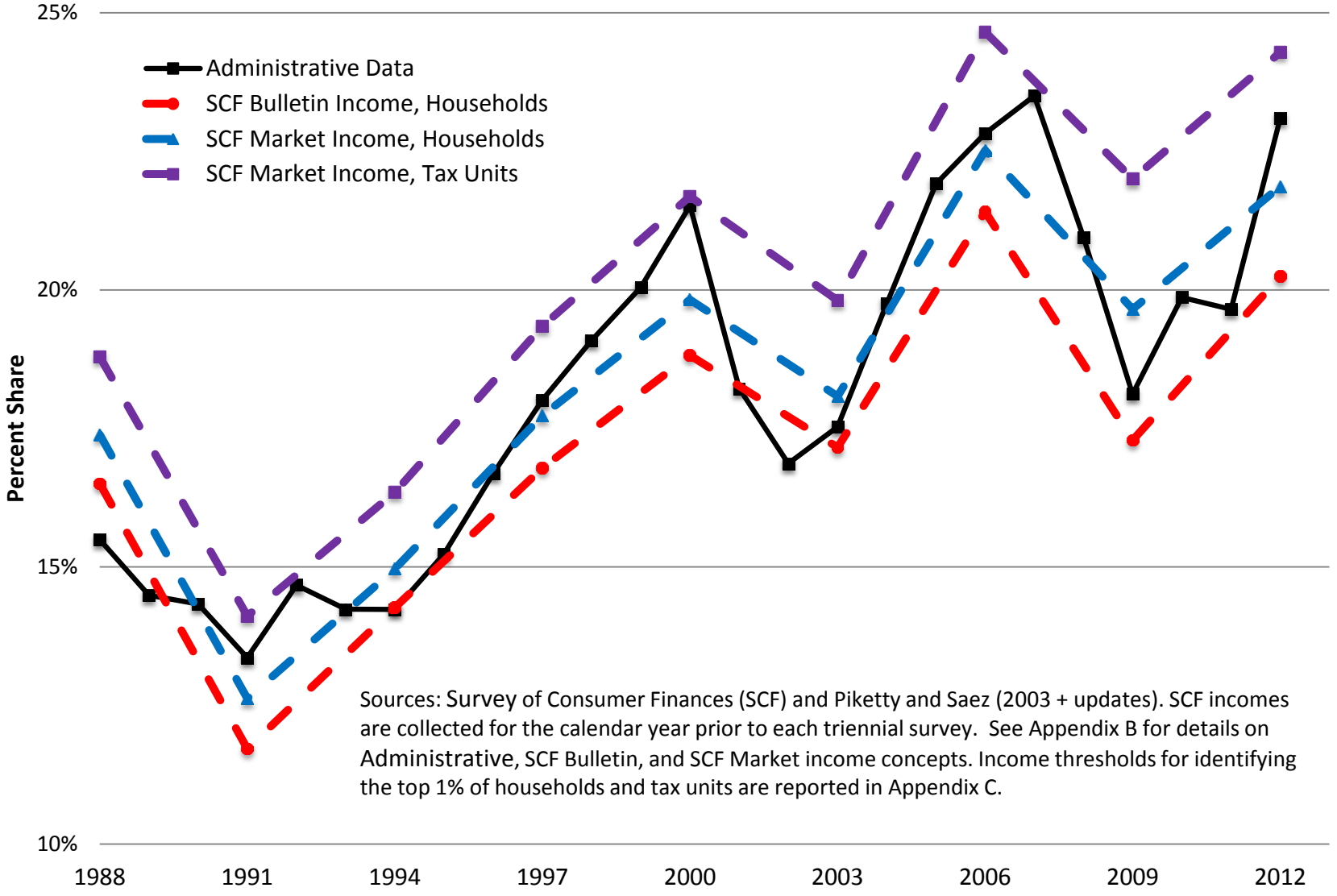

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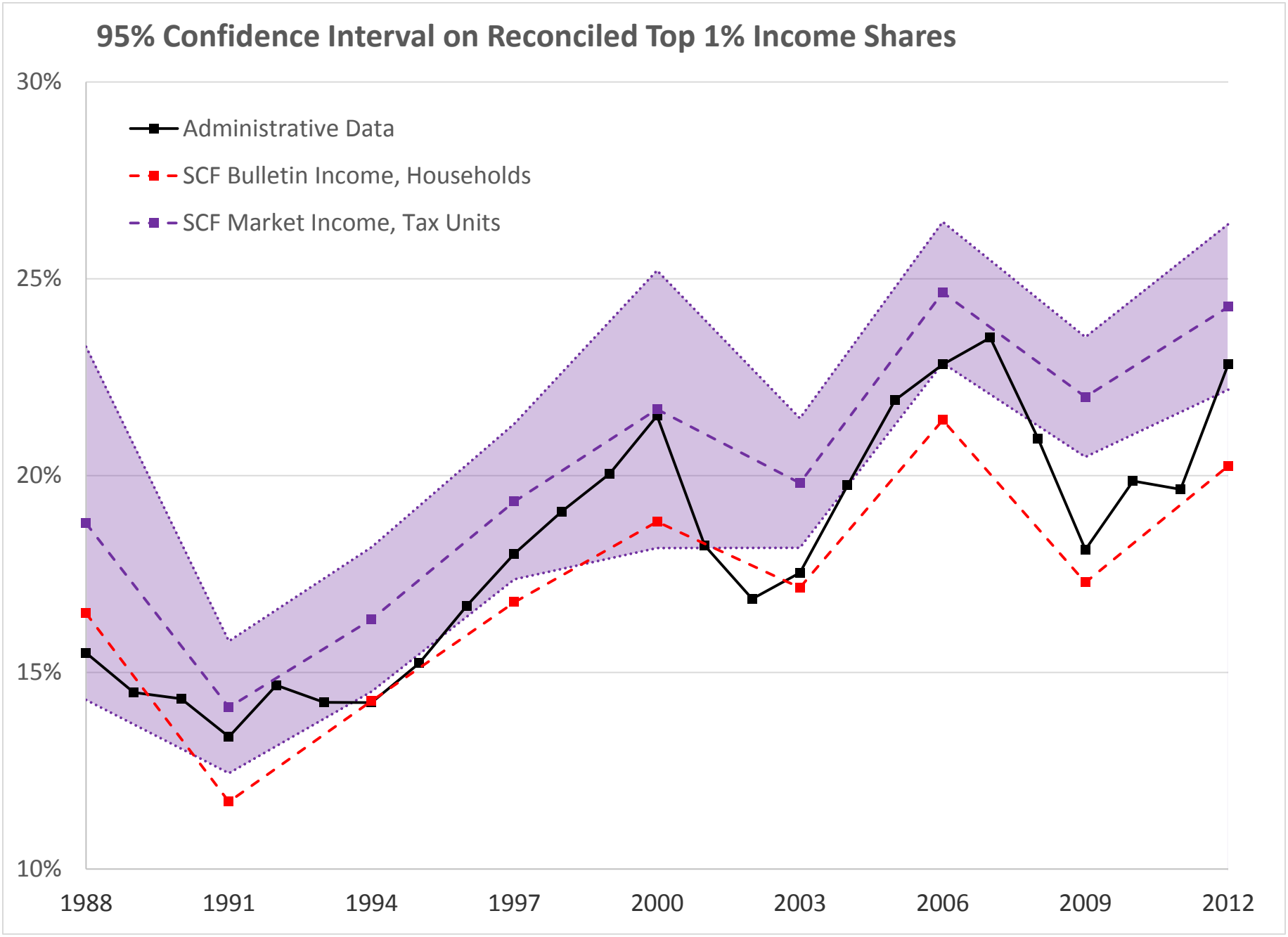
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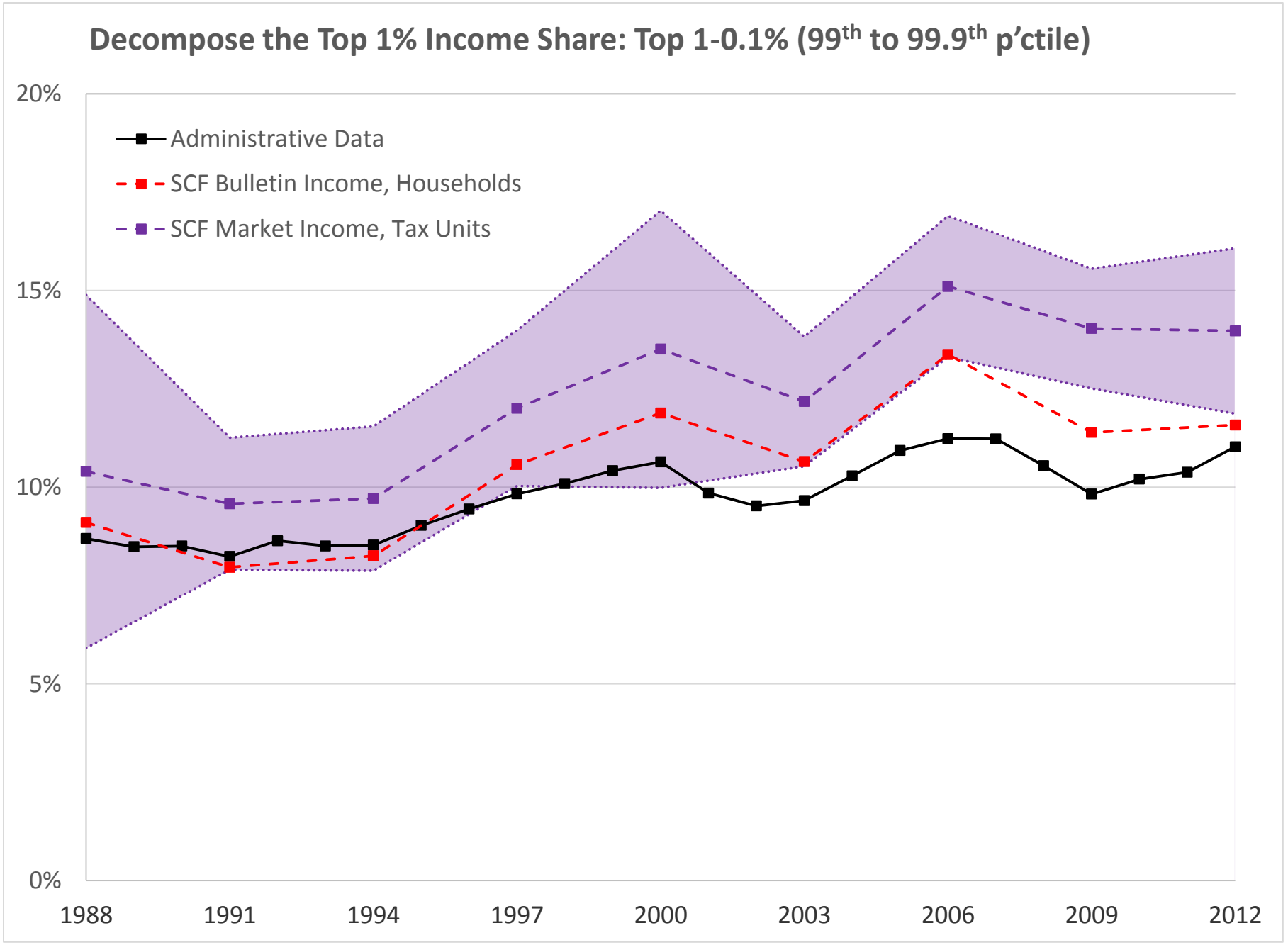
Decompose the Top 1% Income Share: Top 1-0.1% (99th to 99.9th p'ctile)
20%
15%
10%
5%
0%
Administrative Data
SCF Bulletin Income, Households
SCF Market Income, Tax Units
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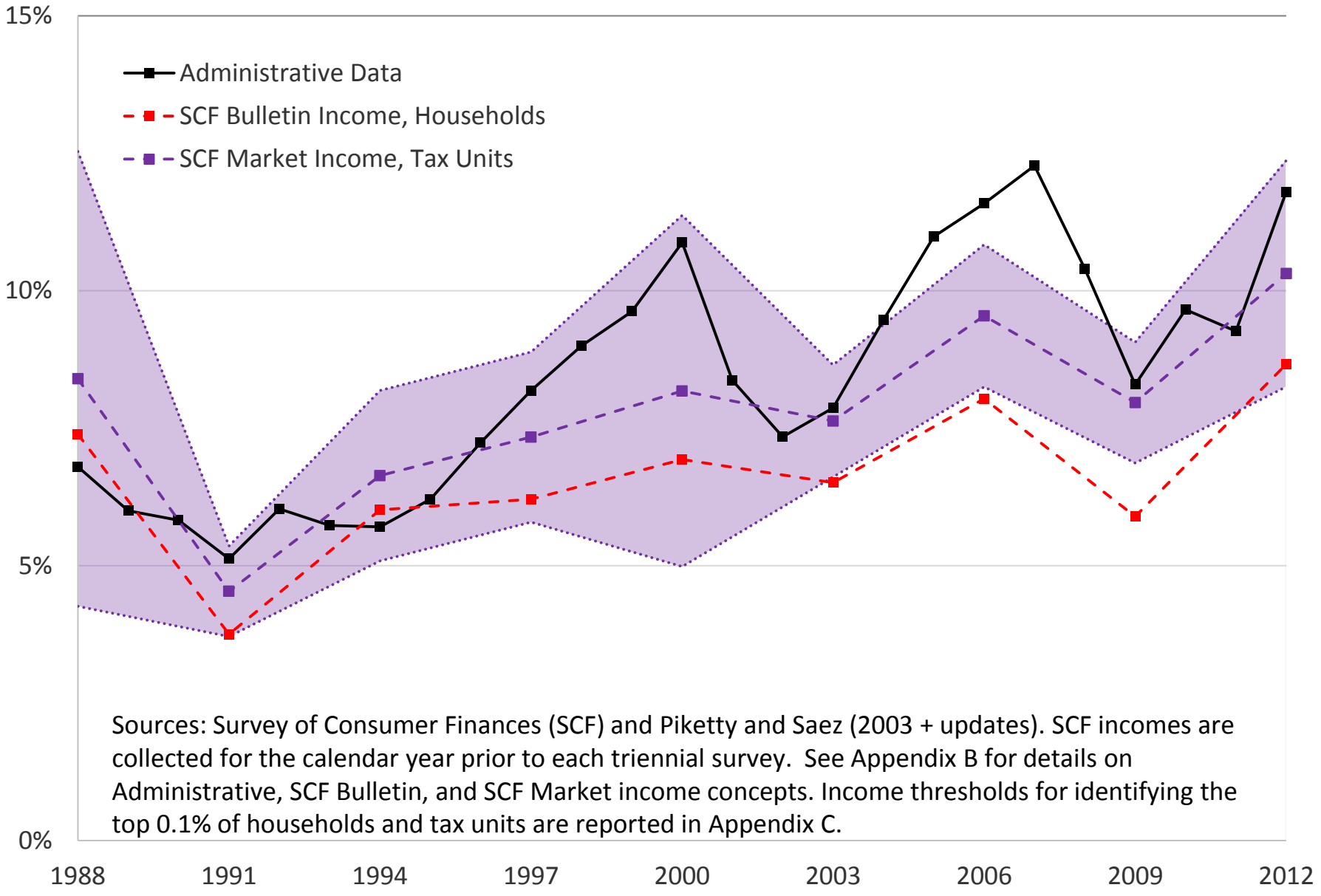
2009
2012

Decompose the Top 1% Income Share: Top 0.1 percent



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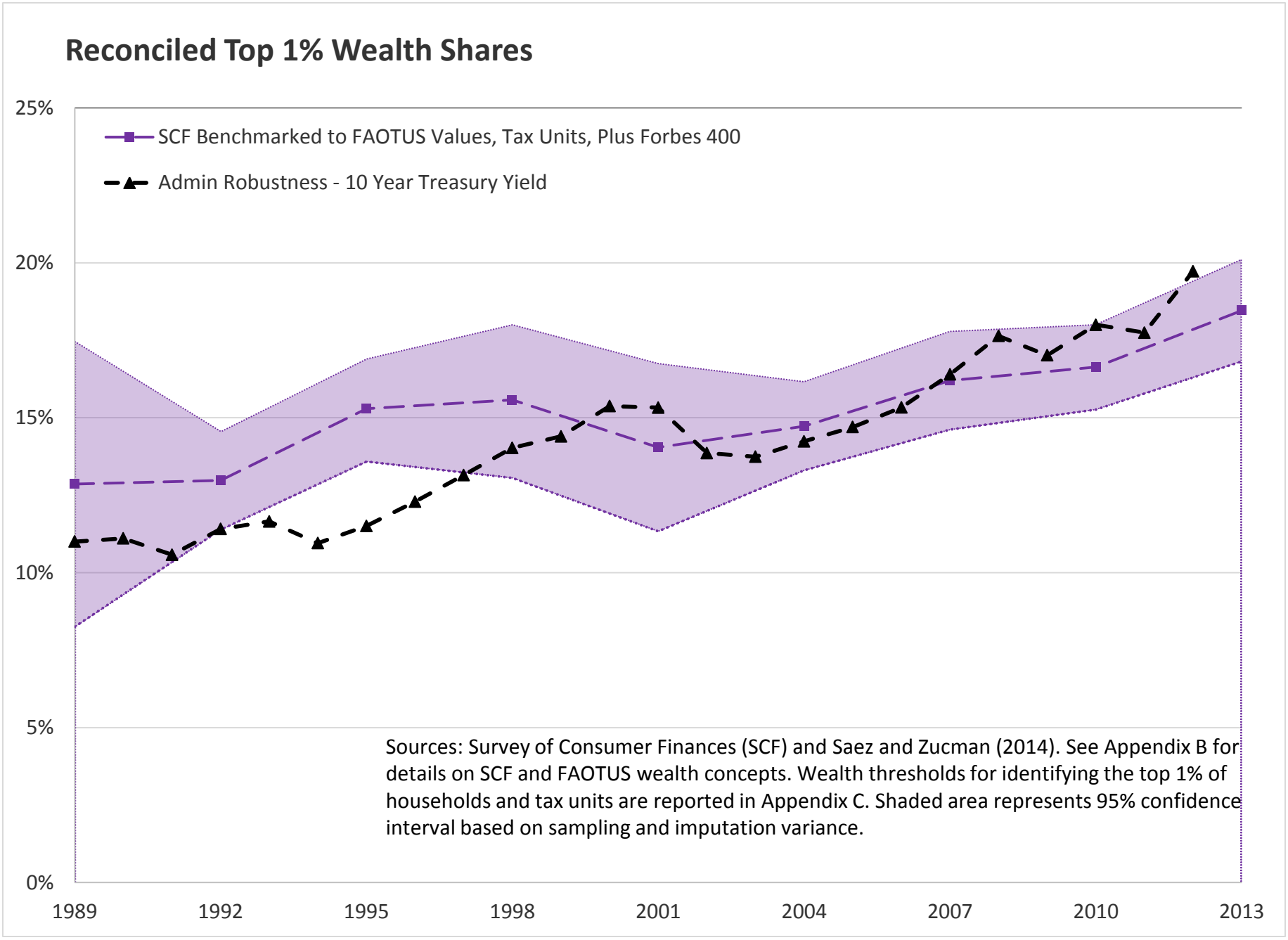
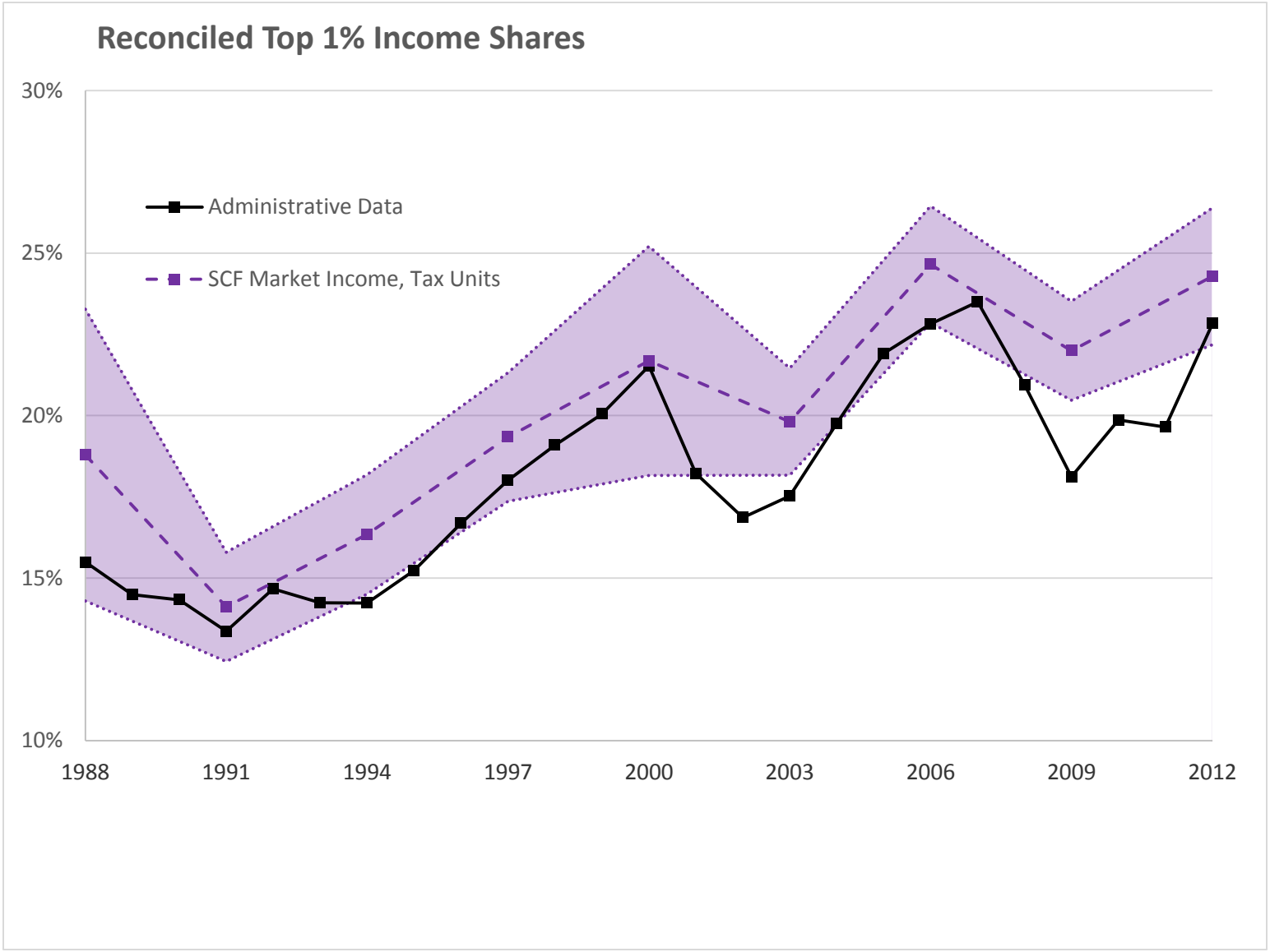
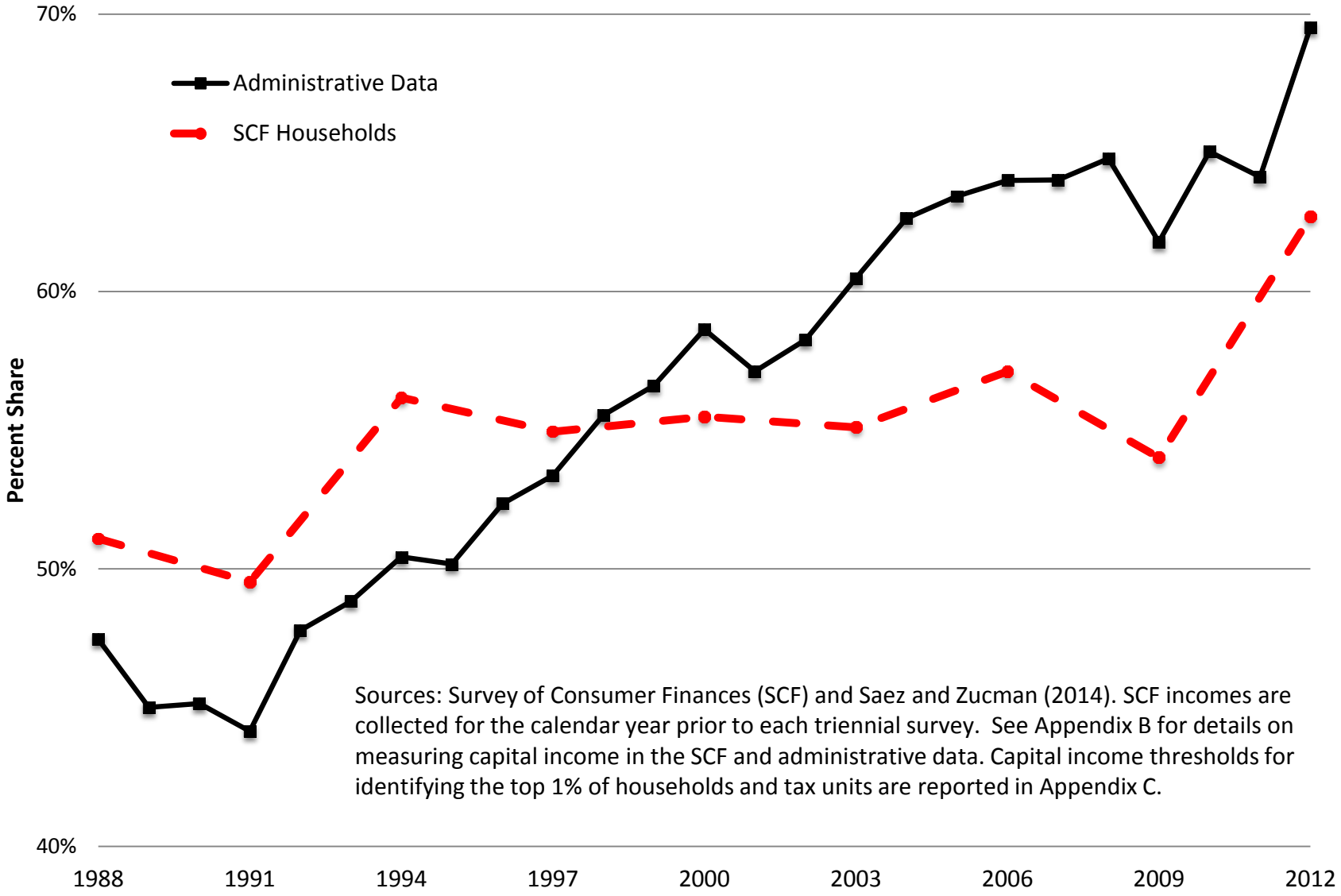
Income Reconciliation Takeaways

- Income concepts and tax unit adjustments reconcile top 1% share, levels and trends
- Top 0.1%, Top 1-0.1%: growth is the same in recent years
  - SCF does not “spike” as much for top 0.1%
- Levels: Top 0.1% slightly higher, Top 1-0.1% slightly lower in level in recent years


Reconciled Top 1% Wealth Shares
25%
20%
15%
10%
5%
0%
SCF Benchmarked to FAOTUS Values, Tax Units, Plus Forbes 400
Admin Robustness - 10 Year Treasury Yield
1989
1992
1995
1998
2001
2004
2007
2010
2013
Sources: Survey of Consumer Finances (SCF) and Saez and Zucman (2014). See Appendix B for details on SCF and FAOTUS wealth concepts. Wealth thresholds for identifying the top 1% of households and tax units are reported in Appendix C. Shaded area represents 95% confidence interval based on sampling and imputation variance.

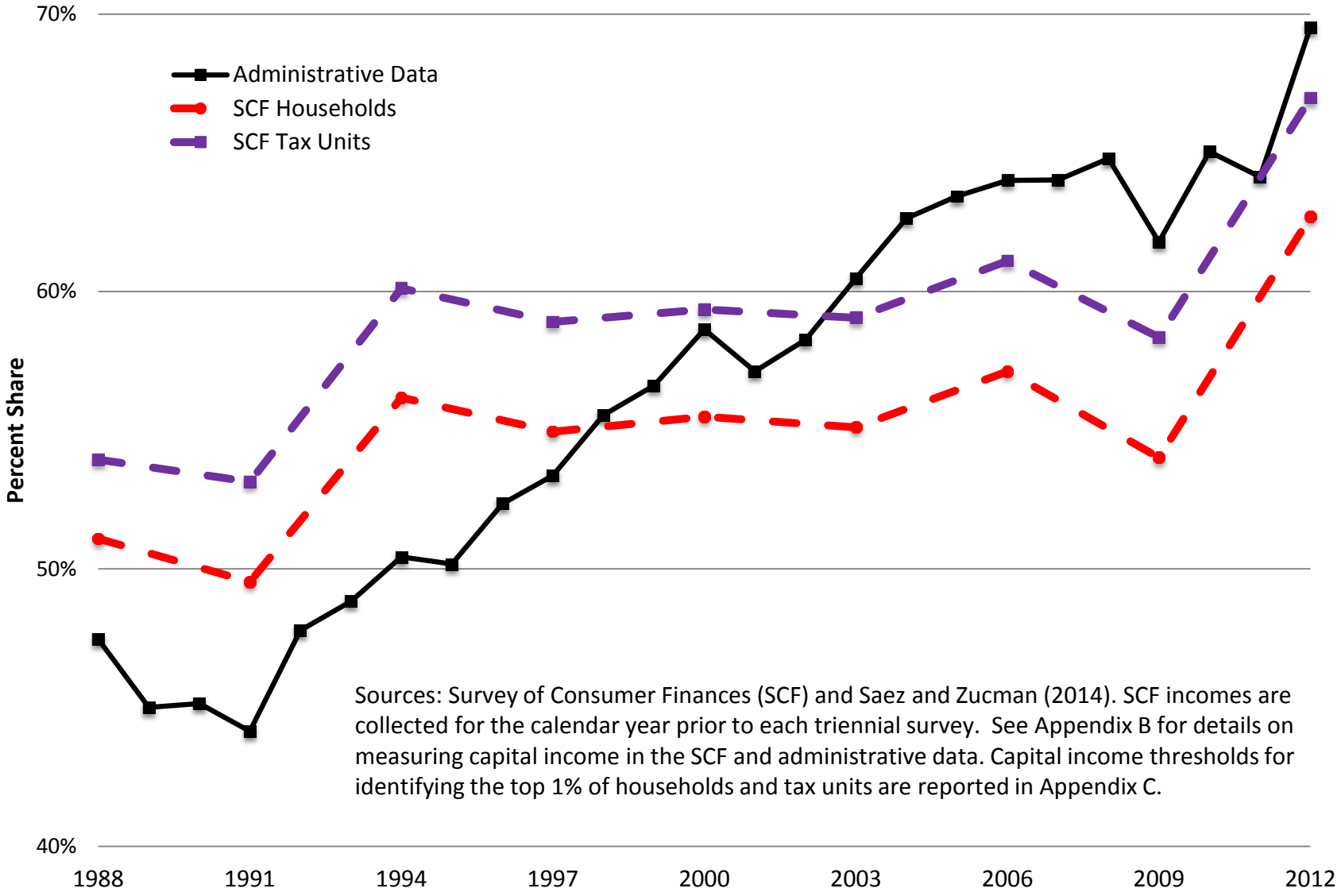

Reconciled Top 1% Income Shares
30%
25%
20%
15%
10%
Administrative Data
SCF Market Income, Tax Units
1988
1991
1994
1997
2000
2003
2006
2009
2012

Reconciling Survey of Consumer Finances (SCF) and Administrative Data
Top 1% Capital Income Shares

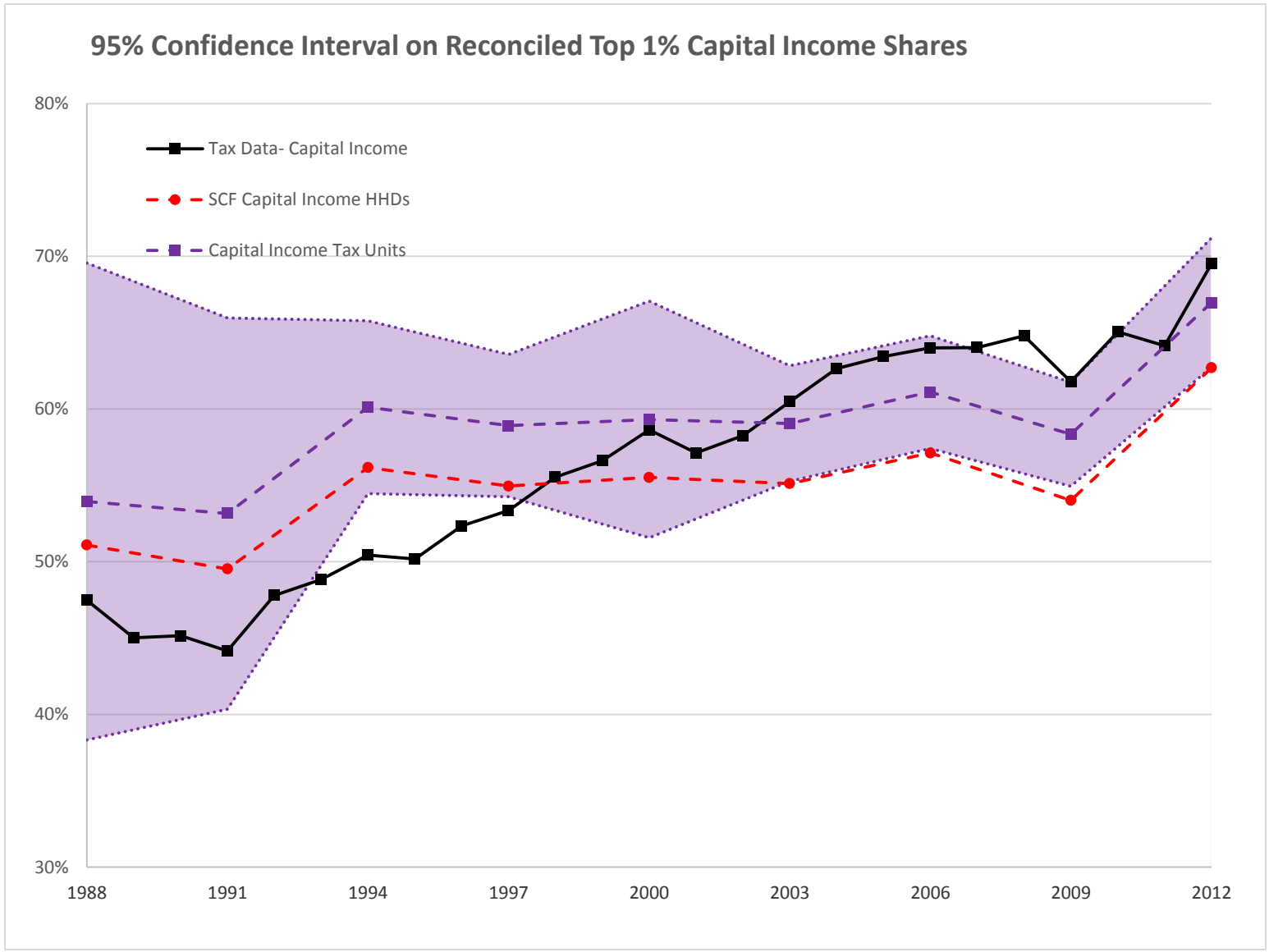


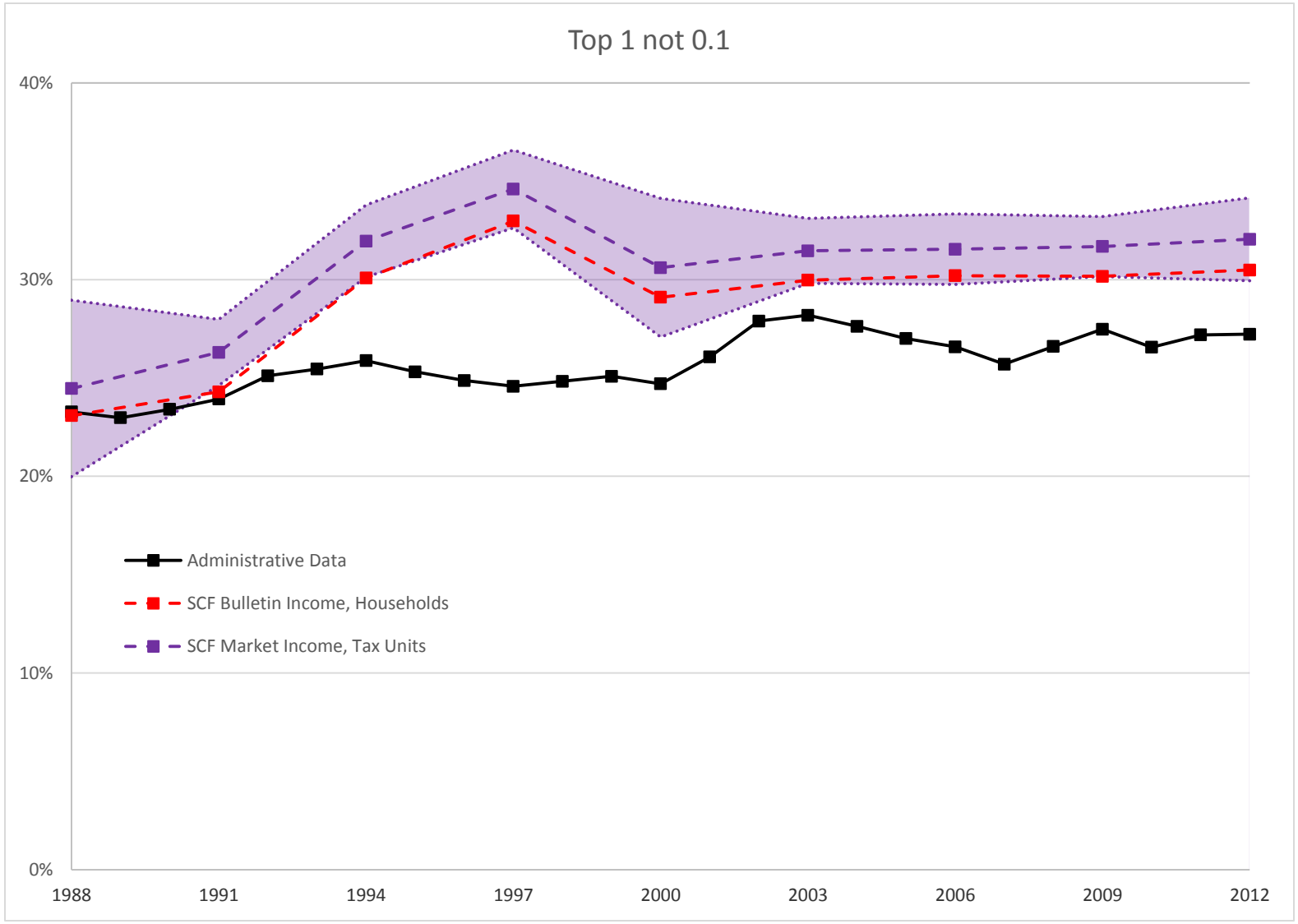
Sources: Survey of Consumer Finances (SCF) and Saez and Zucman (2014). SCF incomes are collected for the calendar year prior to each triennial survey. See Appendix B for details on measuring capital income in the SCF and administrative data. Capital income thresholds for identifying the top 1% of households and tax units are reported in Appendix C.

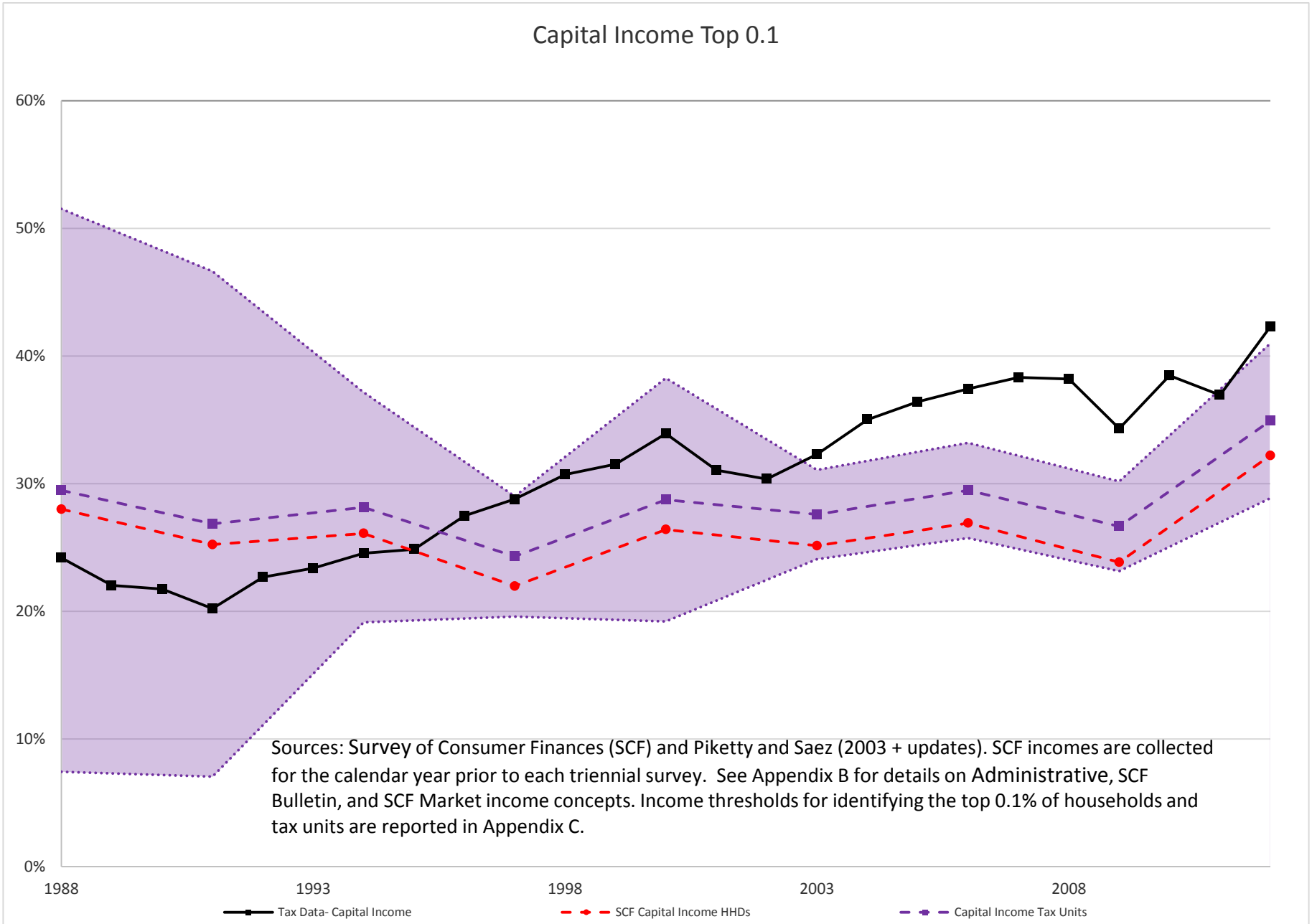
Reconciling Survey of Consumer Finances (SCF) and Administrative Data
Top 1% Capital Income Shares



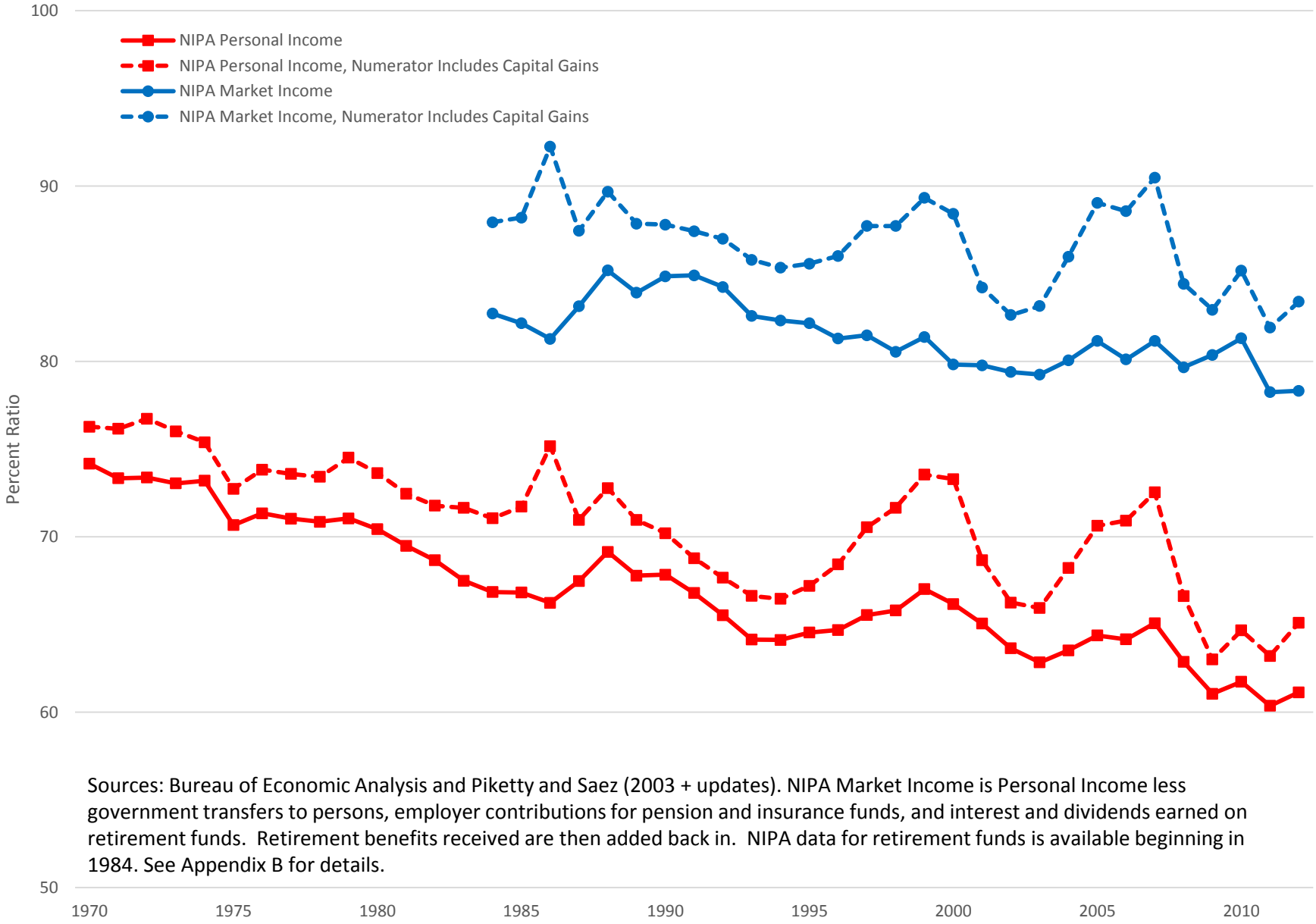
Sources: Survey of Consumer Finances (SCF) and Saez and Zucman (2014). SCF incomes are collected for the calendar year prior to each triennial survey. See Appendix B for details on measuring capital income in the SCF and administrative data. Capital income thresholds for identifying the top 1% of households and tax units are reported in Appendix C.


95% Confidence Interval on Reconciled Top 1% Capital Income Shares
80%
70%
60%
50%
40%
30%
Tax Data- Capital Income
SCF Capital Income HHDs
Capital Income Tax Units
1988
1991
1994
1997
2000
2003
2006
2009
2012

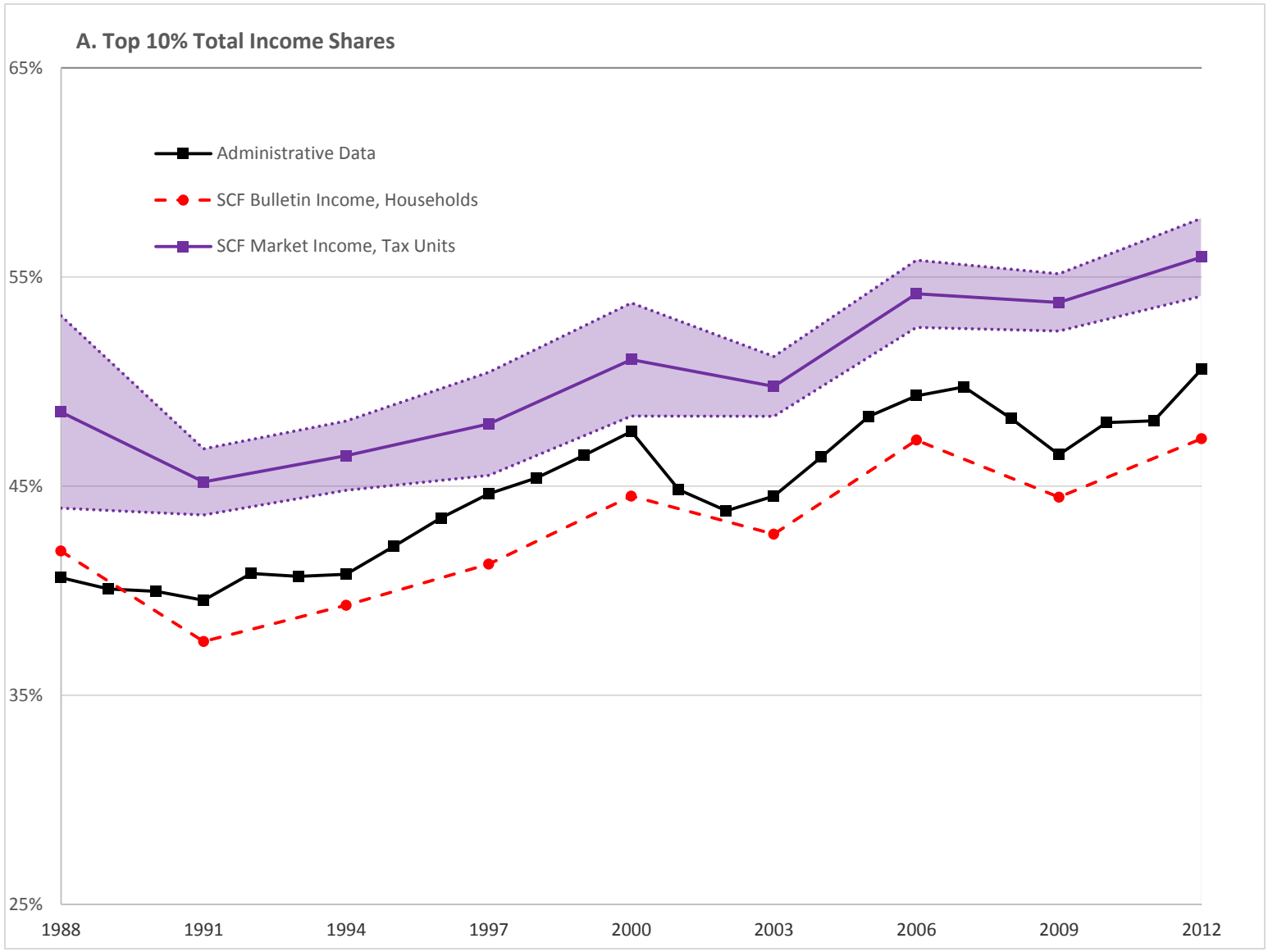

Top 1 not 0.1
40%
30%
20%
10%
0%
1988
1991
1994
1997
2000
2003
2006
2009
2012
Administrative Data
SCF Bulletin Income, Households
SCF Market Income, Tax Units


Capital Income Top 0.1
60%
50%
40%
30%
20%
10%
0%
1988
1993
1998
2003
2008
Tax Data- Capital Income
SCF Capital Income HHDs
Capital Income Tax Units
Sources: Survey of Consumer Finances (SCF) and Piketty and Saez (2003 + updates). SCF incomes are collected for the calendar year prior to each triennial survey. See Appendix B for details on Administrative, SCF Bulletin, and SCF Market income concepts. Income thresholds for identifying the top 0.1% of households and tax units are reported in Appendix C.

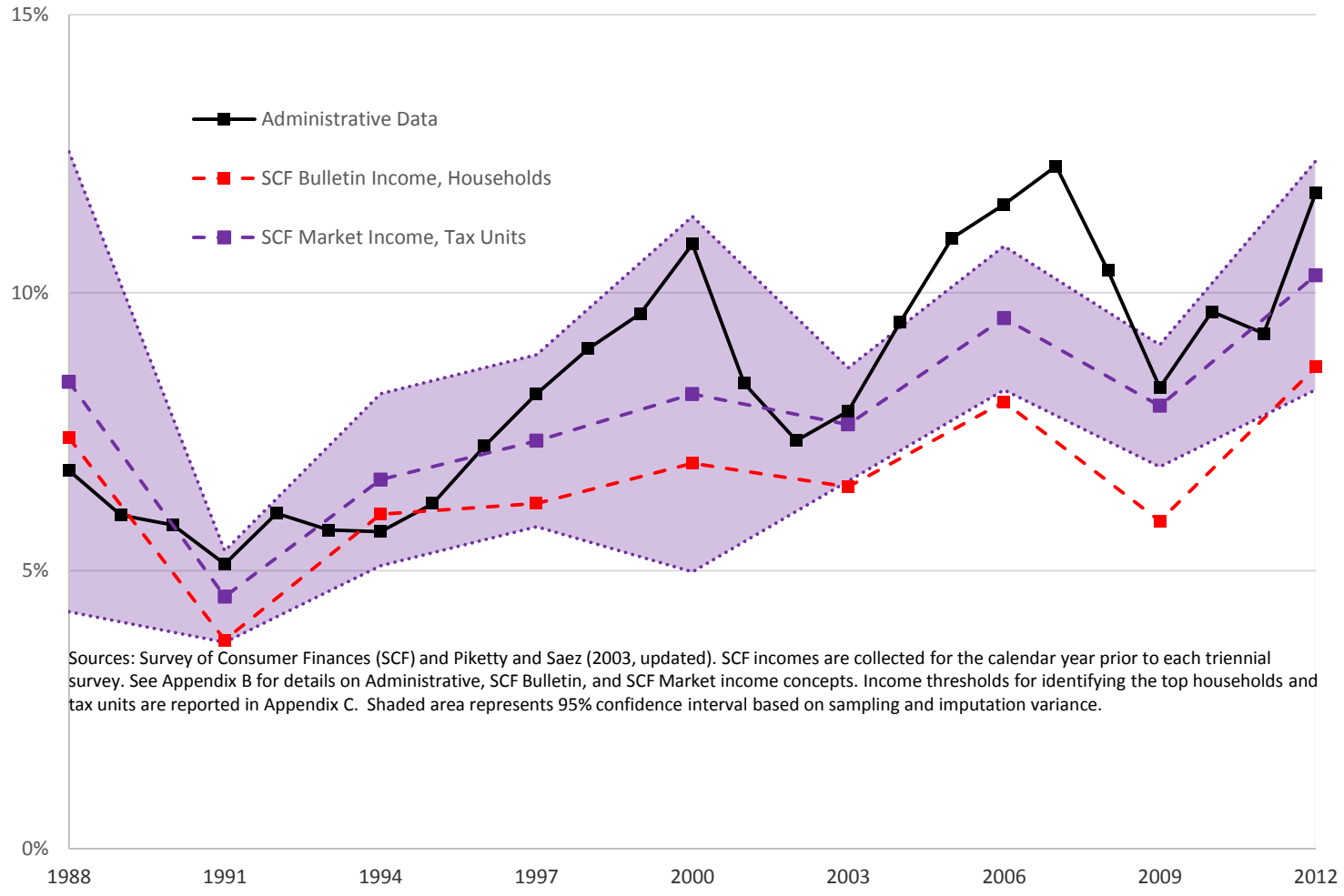
Ratio of Administrative Data Aggregate Incomes to Alternative NIPA Concepts



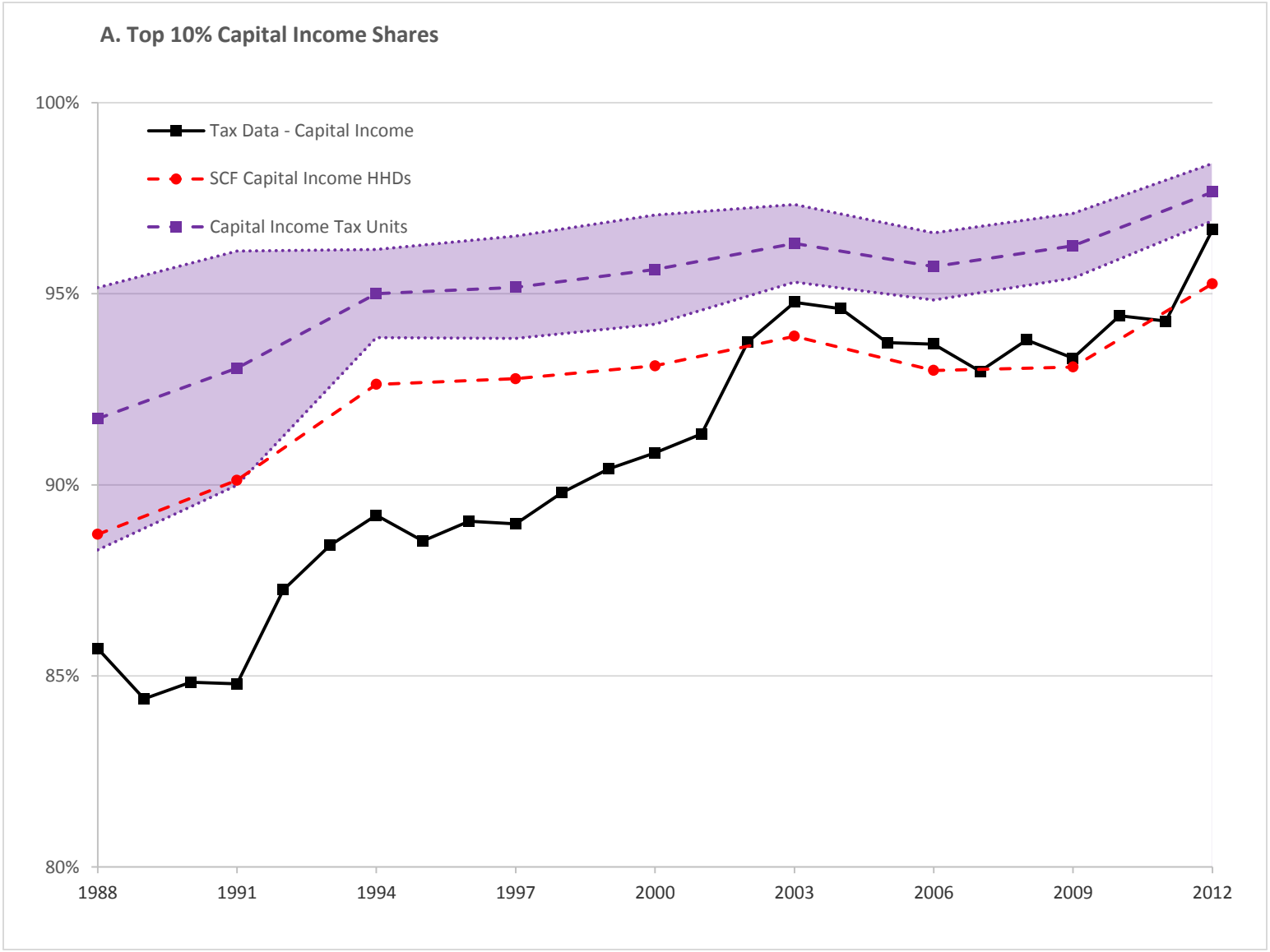
Sources: Bureau of Economic Analysis and Piketty and Saez (2003 + updates). NIPA Market Income is Personal Income less government transfers to persons, employer contributions for pension and insurance funds, and interest and dividends earned on retirement funds. Retirement benefits received are then added back in. NIPA data for retirement funds is available beginning in 1984. See Appendix B for details.

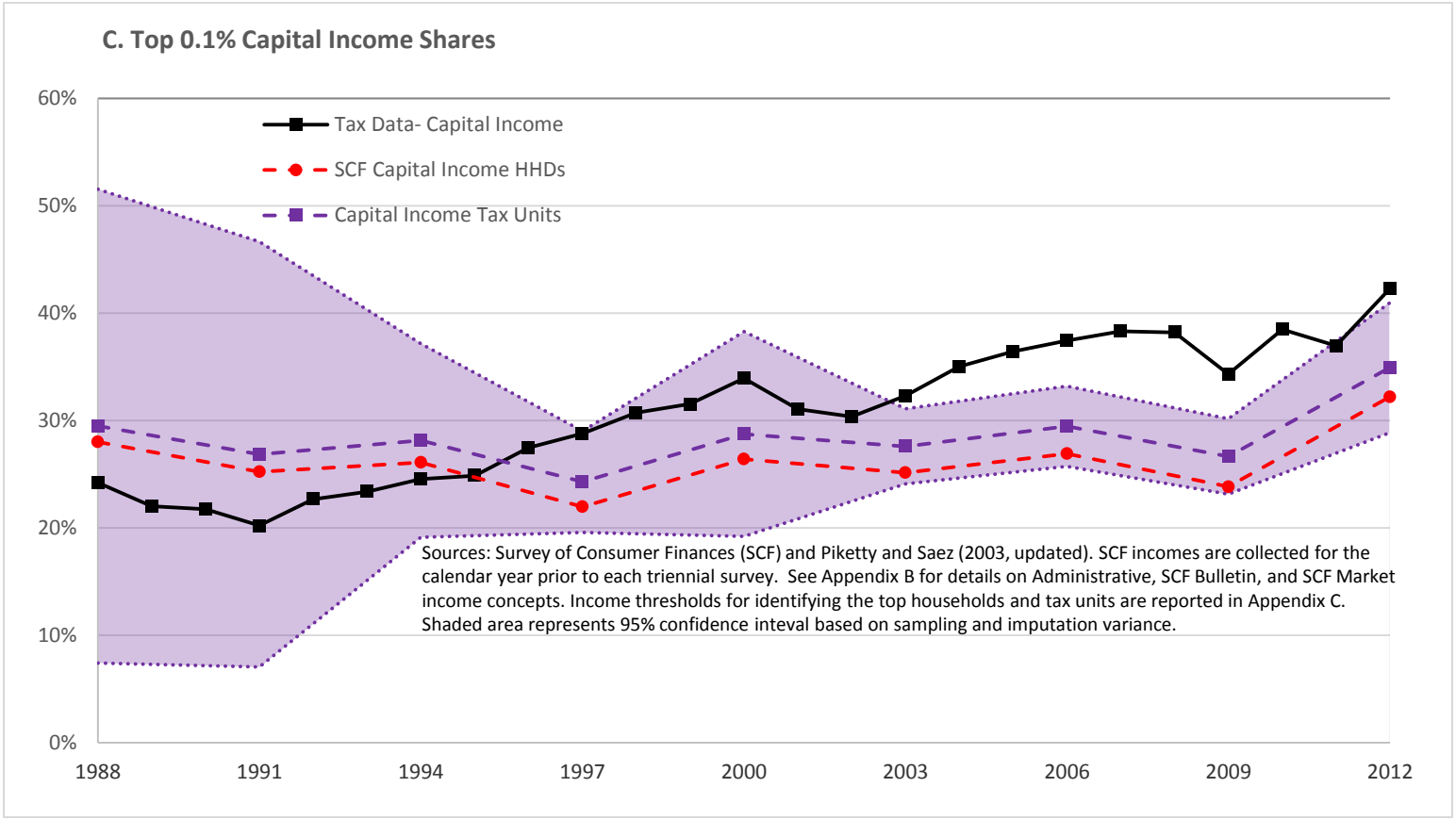

A. Top 10% Total Income Shares
65%
55%
45%
35%
25%
Administrative Data
SCF Bulletin Income, Households
SCF Market Income, Tax Units
1988
1991
1994
1997
2000
2003
2006
2009
2012

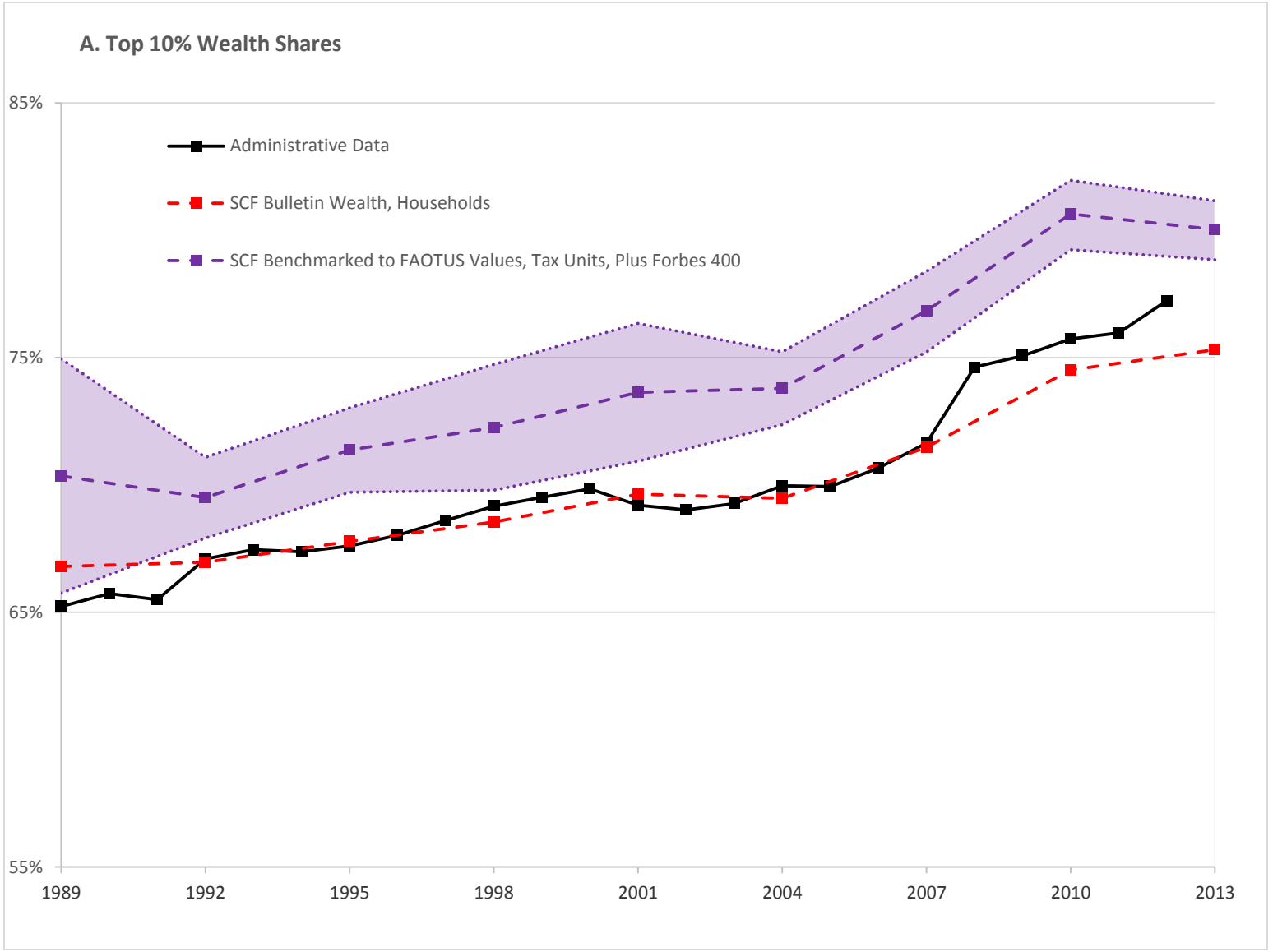
C. Top 0.1% Total Income Shares



Sources: Survey of Consumer Finances (SCF) and Piketty and Saez (2003, updated). SCF incomes are collected for the calendar year prior to each triennial survey. See Appendix B for details on Administrative, SCF Bulletin, and SCF Market income concepts. Income thresholds for identifying the top households and tax units are reported in Appendix C. Shaded area represents 95% confidence interval based on sampling and imputation variance.


A. Top 10% Capital Income Shares
100%
95%
90%
85%
80%
Tax Data - Capital Income
SCF Capital Income HHDs
Capital Income Tax Units
1988
1991
1994
1997
2000
2003
2006
2009
2012


C. Top 0.1% Capital Income Shares
60%
50%
40%
30%
20%
10%
0%
Tax Data- Capital Income
SCF Capital Income HHDs
Capital Income Tax Units
1988
1991
1994
1997
2000
2003
2006
2009
2012
Sources: Survey of Consumer Finances (SCF) and Piketty and Saez (2003, updated). SCF incomes are collected for the calendar year prior to each triennial survey. See Appendix B for details on Administrative, SCF Bulletin, and SCF Market income concepts. Income thresholds for identifying the top households and tax units are reported in Appendix C. Shaded area represents 95% confidence inteval based on sampling and imputation variance.


A. Top 10% Wealth Shares
85%
75%
65%
55%
Administrative Data
SCF Bulletin Wealth, Households
SCF Benchmarked to FAOTUS Values, Tax Units, Plus Forbes 400
1989
1992
1995
1998
2001
2004
2007
2010
2013

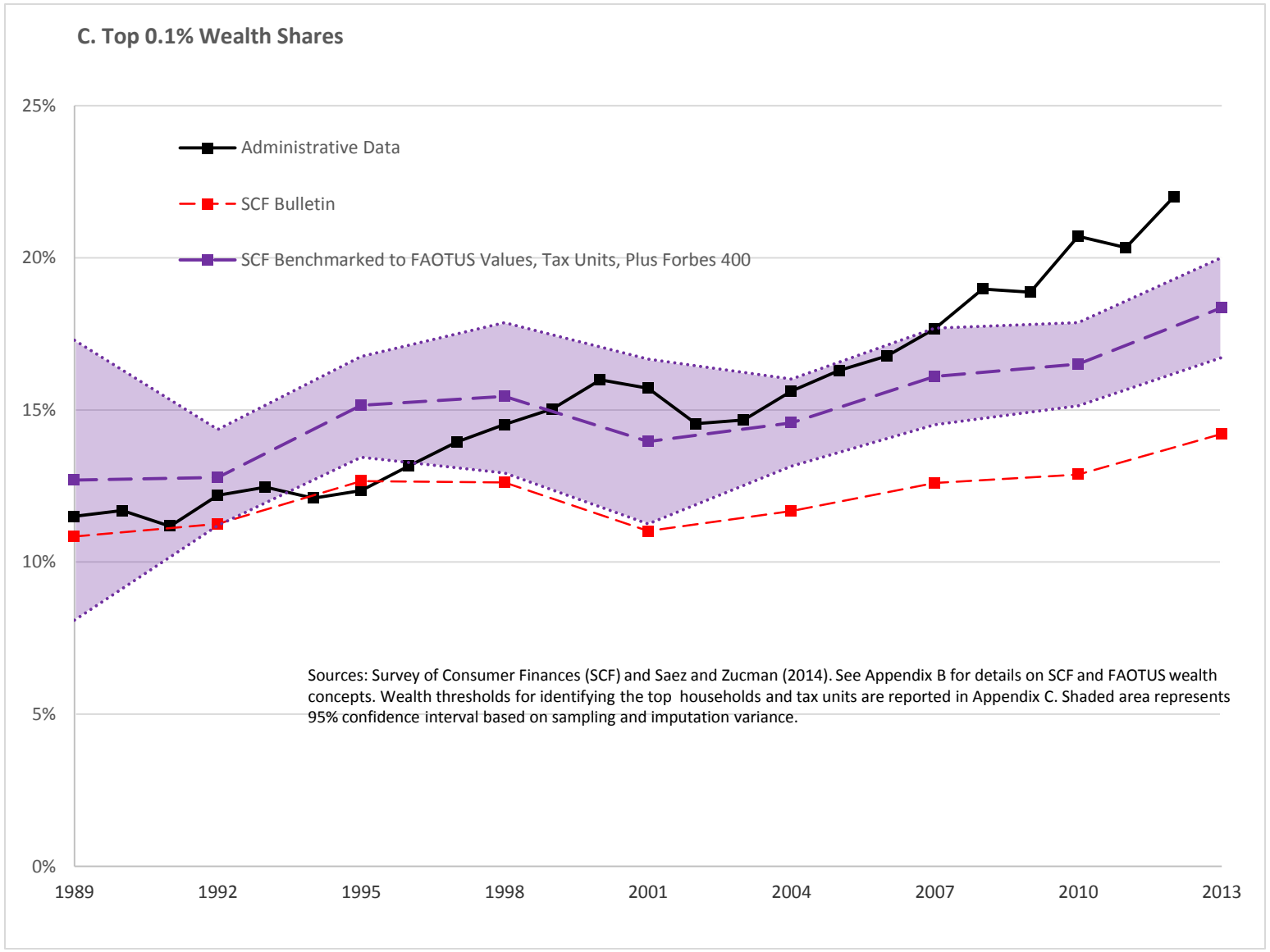

C. Top 0.1% Wealth Shares
25%
20%
15%
10%
5%
0%
1989
1992
1995
1998
2001
2004
2007
2010
2013
Administrative Data
SCF Bulletin
SCF Benchmarked to FAOTUS Values, Tax Units, Plus Forbes 400
Sources: Survey of Consumer Finances (SCF) and Saez and Zucman (2014). See Appendix B for details on SCF and FAOTUS wealth concepts. Wealth thresholds for identifying the top households and tax units are reported in Appendix C. Shaded area represents 95% confidence interval based on sampling and imputation variance.

Table 2. Correlation Between SCF Wealth and Predicted Gross-Capitalization and Empirical Correlation Wealth

	(1)	(2)	(3)
ln(GC model wealth)	0.85	…	0.26
	(0.02)	…	(0.02)
ln(Corr. model wealth)	…	1.02	0.76
	…	(0.01)	(0.03)
Constant	1.57	-0.46	-0.73
	(0.25)	(0.23)	(0.22)
R^2	0.69	0.78	0.80
Obs.	1,450	1,450	1,450
Predicted ln(wealth) at mean:			
	15.42	15.43	15.35

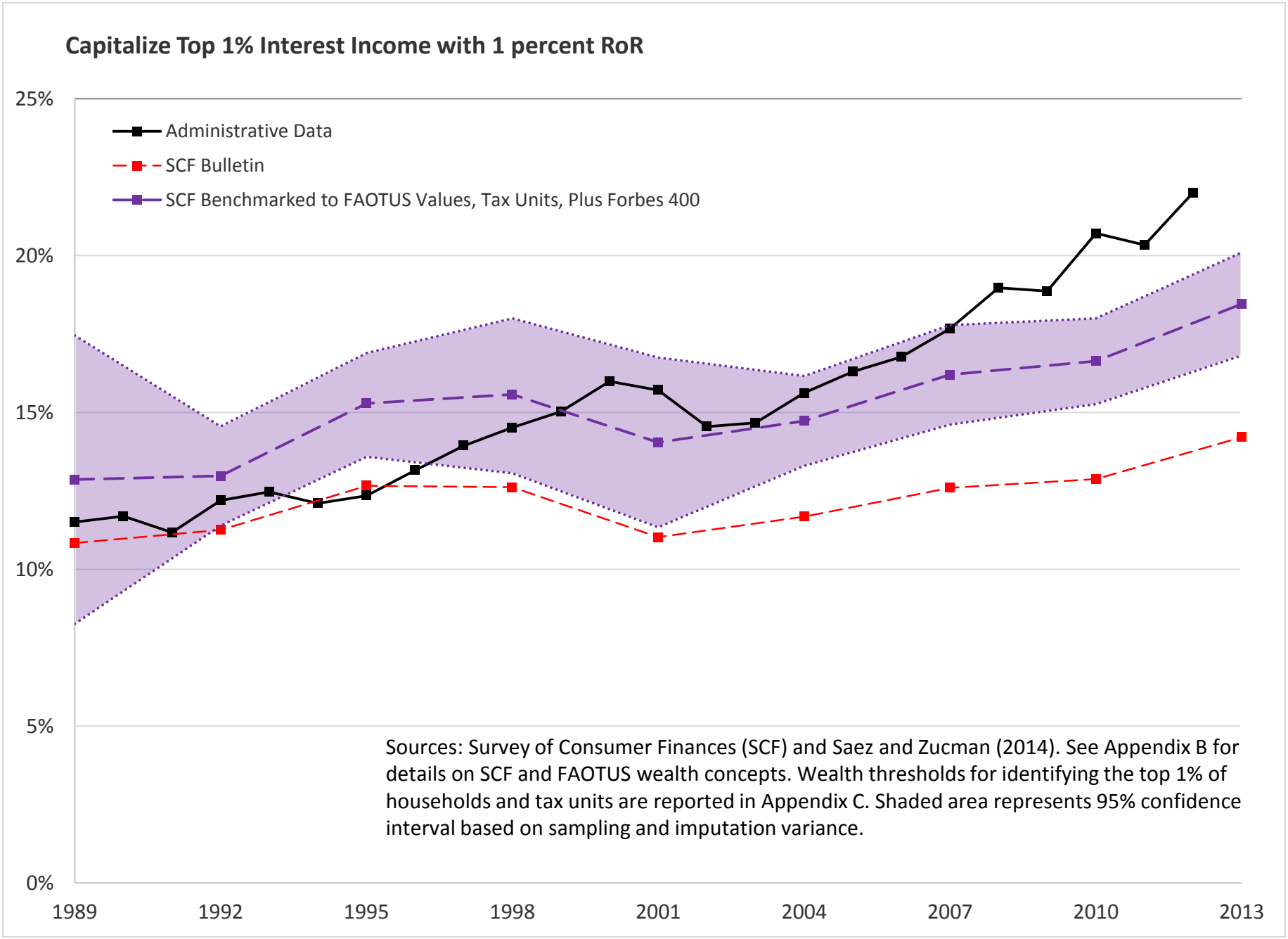
Note: Regression of log of SCF family net worth in 2013 on log of predicted wealth of gross capitalization model (col. 1), correlation model (col. 2), and both (col. 3). Data from first implicate of SCF survey data matched to the wealth predictions that were used to stratify the list sample. Standard error in ().

Table 4. Impact of using multiple years of data to classify families

		2011-only gross capitalization model				
		Bottom 90	90-99	(Top 1) 99-99.9	(Top 0.1) 99.9-99.99	(Top 0.01) 99.99+
2011-2009 gross-capitalization model	Bottom 90	0.98	0.02	0.00	0.00	0.00
	90-99	0.04	0.93	0.03	0.00	0.00
	(Top 1) 99-99.9	0.00	0.06	0.89	0.05	0.00
	(Top 0.1) 99.9-99.99	0.00	0.00	0.06	0.90	0.04
	(Top 0.01) 99.99+	0.00	0.00	0.01	0.05	0.94

		2011-only correlation model				
		Bottom 90	90-99	(Top 1) 99-99.9	(Top 0.1) 99.9-99.99	(Top 0.01) 99.99+
2011-2009 correlation model	Bottom 90	0.97	0.03	0.00	0.00	0.00
	90-99	0.07	0.87	0.06	0.00	0.00
	(Top 1) 99-99.9	0.00	0.08	0.86	0.06	0.00
	(Top 0.1) 99.9-99.99	0.00	0.00	0.11	0.84	0.05
	(Top 0.01) 99.99+	0.00	0.00	0.00	0.14	0.86

Note: Rows sum to 1. Tables show the impact of using 3 years of administrative data (2011, 2010, and 2009) versus 1 year of data (2011) to organize top-end families and are organized similarly to table 1.
Source: 2011 INSOLE data (supplemented with two years of INSOLE or CDW panel data) compared to 2011 INSOLE data only.


Capitalize Top 1% Interest Income with 1 percent RoR
25%
20%
15%
10%
5%
0%
Administrative Data
SCF Bulletin
SCF Benchmarked to FAOTUS Values, Tax Units, Plus Forbes 400
1989
1992
1995
1998
2001
2004
2007
2010
2013
Sources: Survey of Consumer Finances (SCF) and Saez and Zucman (2014). See Appendix B for details on SCF and FAOTUS wealth concepts. Wealth thresholds for identifying the top 1% of households and tax units are reported in Appendix C. Shaded area represents 95% confidence interval based on sampling and imputation variance.

IV. Targeting Permanently Wealthy

- Why does SCF find lower and flatter trajectory top 0.1% shares for both income or wealth?
- SCF sampling strategy finds *permanently* wealthy by grossing up capital income *and* empirical correlation between wealth/income
- Predicted wealth based on just gross capitalization too high relative to empirical

Figure 13. Predicted Top 0.1 Percent Wealth Share from Gross-Capitalization and Empirical Correlation Model

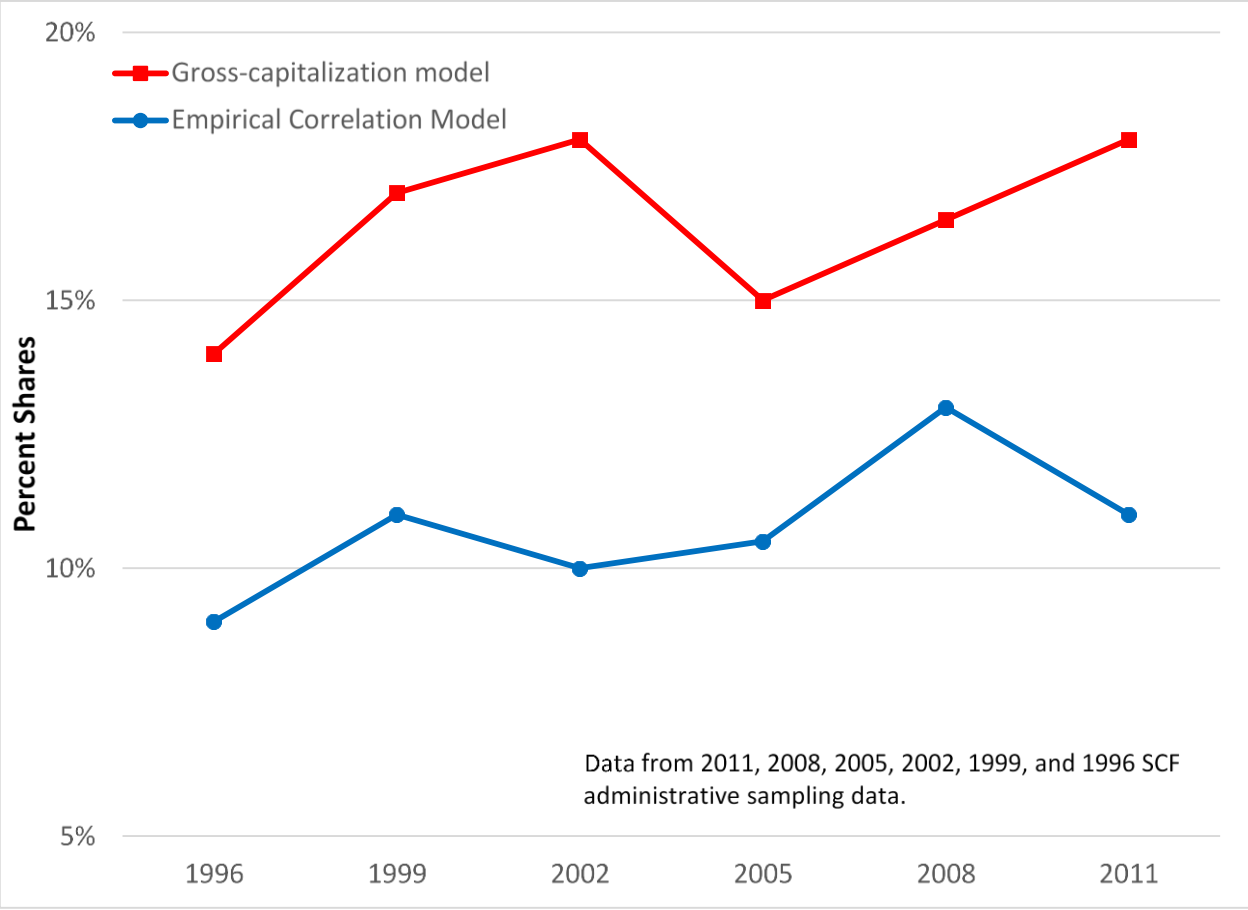


Table 1. Impact of ranking top-end families by an alternate model

		Correlation Model Percentile				
		Bottom 90	90-99	(Top 1) 99-99.9	(Top 0.1) 99.9-99.99	(Top 0.01) 99.99+
Gross-capitalization Percentile	Bottom 90	0.89	0.10	0.01	0.00	0.00
	90-99	0.20	0.48	0.28	0.04	0.00
	(Top 1) 99-99.9	0.05	0.22	0.48	0.23	0.02
	(Top 0.1) 99.9-99.99	0.03	0.10	0.31	0.46	0.10
	(Top 0.01) 99.99+	0.01	0.03	0.11	0.39	0.47

Note: Rows sum to 1. Table describes where a family ranked in gross capitalization model would be ranked in the empirical correlation model. For example, in the last row, of families ranked in top 0.01 percentile in the gross capitalizations model, 1 percent of families are ranked in the bottom 90 percentiles by the correlation model, 3 percent are ranked between the 90-99th percentiles by the correlation model, 11 percent are ranked between the 99th-99.9th percentile by the correlation model, 39 percent are ranked between the 99.9th and 99.99th percentile by the correlation model, and 47 percent are ranked in the top 0.01 percent by the correlation model. Source: 2011 INSOLE data, supplemented with two years of INSOLE or CDW panel data.

Table 1. Impact of ranking top-end families by an alternate model

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		Bottom 90	90-99	(Top 1) 99-99.9	(Top 0.1) 99.9-99.99	(Top 0.01) 99.99+
Gross-capitalization Percentile	Bottom 90	0.89	0.10	0.01	0.00	0.00
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	(Top 1) 99-99.9	0.05	0.22	0.48	0.23	0.02
	(Top 0.1) 99.9-99.99	0.03	0.10	0.31	0.46	0.10
	(Top 0.01) 99.99+	0.01	0.03	0.11	0.39	0.47

Note: Rows sum to 1. Table describes where a family ranked in gross capitalization model would be ranked in the empirical correlation model. For example, in the last row, of families ranked in top 0.01 percentile in the gross capitalizations model, 1 percent of families are ranked in the bottom 90 percentiles by the correlation model, 3 percent are ranked between the 90-99th percentiles by the correlation model, 11 percent are ranked between the 99th-99.9th percentile by the correlation model, 39 percent are ranked between the 99.9th and 99.99th percentile by the correlation model, and 47 percent are ranked in the top 0.01 percent by the correlation model. Source: 2011 INSOLE data, supplemented with two years of INSOLE or CDW panel data.

Table 3. Pearson and Spearman Correlations: SCF Wealth and Predicted Gross-Capitalization and Empirical Correlation Wealth

	Spearman correlations				
	2013	2010	2007	2004	2001
Gross-capitalization model	0.83	0.82	0.83	0.82	0.78
Empirical correlation model	0.90	0.91	0.90	0.91	0.87

Note: Data from first implicate of SCF survey data matched to wealth indices used to stratify the list sample.

Why Does Sampling Matter?

- Samples at very top diverge because of non-income generating wealth and volatility
- Imagine two very wealthy families
  - 50% chance of 2*average income, 50% zero
  - Remember high end volatility figure!
- Gross capitalization model only counts the one who realizes the income, SCF gets both
- Is classification bias increasing over time?

Why Do We Care?

- Are top shares just high and rising, or *really* high and rising *really* fast?
- Useful to (1) confirm SCF is capturing high end and (2) understand why administrative and survey-based top share estimates diverge
- Reasons for divergence vis a vis NIPA speak to shortcomings of SCF concepts as well
  - SCF income and wealth also not comprehensive
  - SCF top shares predictably biased up!