

Household Income, Demand, and Saving: Deriving Macro Data with Micro Data Concepts

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Frontiers of Measuring Household Economic Behavior

Federal Reserve Bank of Boston, April 27, 2015

Acknowledgements

Multi-year research project linking household finances and economic growth

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- Joint work with Steve Fazzari
- Generous support from INET
- Opinions are mine and not those of the Fed

This Session

Reconciling macro and micro estimates of
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- Understand how the aggregate measures are distributed
- Validate survey measures comparing to trusted aggregate measures
- Learn from aggregates consistent with micro data concepts

Motivation for Measurement

INEQUALITY AND CONSUMPTION

“Inequality, the Great Recession, and Slow Recovery”

Forthcoming in the *Cambridge Journal of Economics*

Working paper available at SSRN: <http://ssrn.com/abstract=2205524>

The Original Goal

Investigate relationship between income inequality and Great Recession

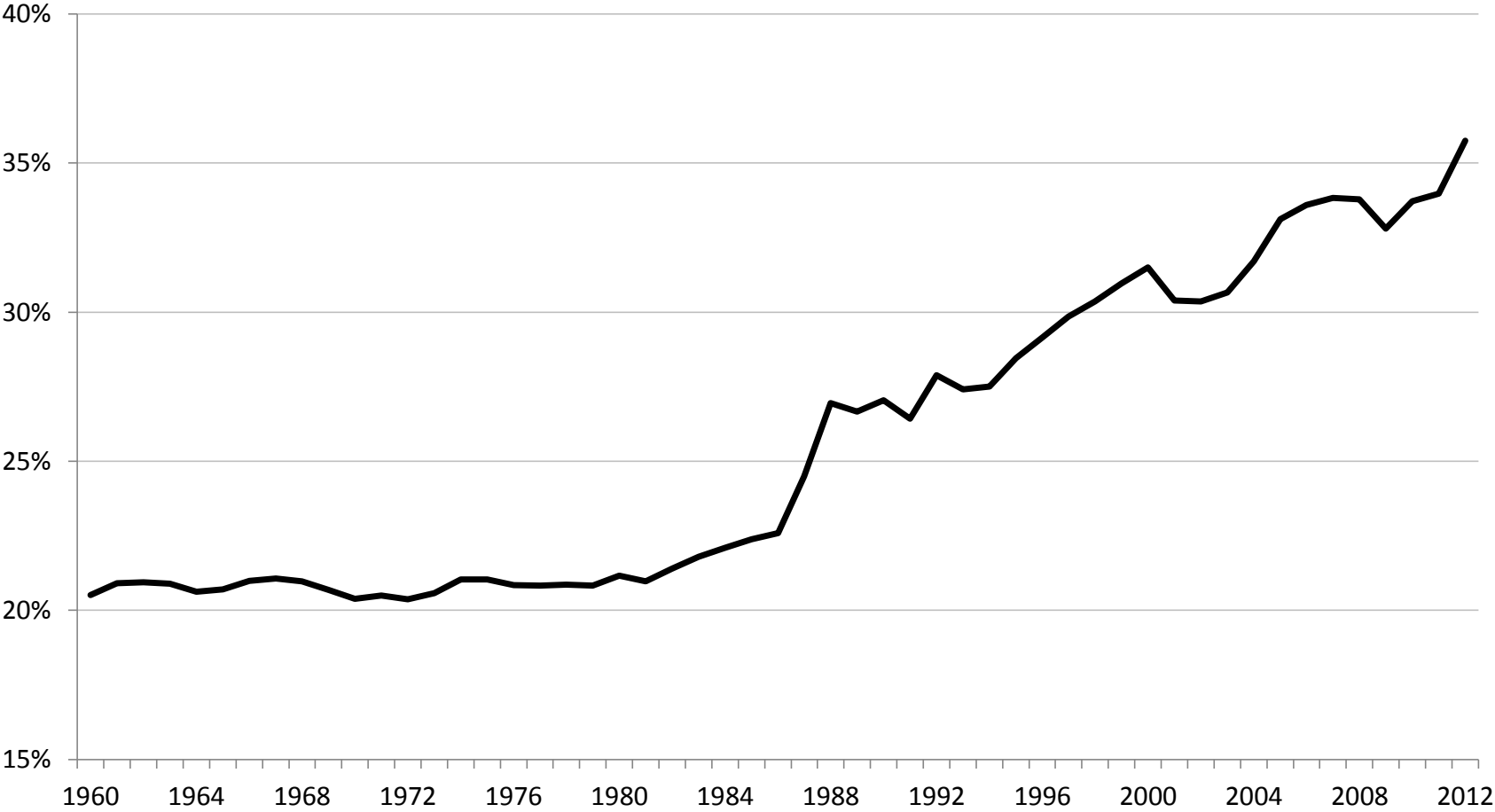
The Original Goal

Investigate relationship between income inequality and Great Recession

- Rich have lower propensity to consume
 - (Maki and Palumbo 2001)
- Increasing share of income flowing toward rich
 - (Piketty and Saez, 2003; CBO, 2013; Johnson and Smeeding, 2014)
- Downward pressure on aggregate consumption ?

Increasing share of income flowing toward rich

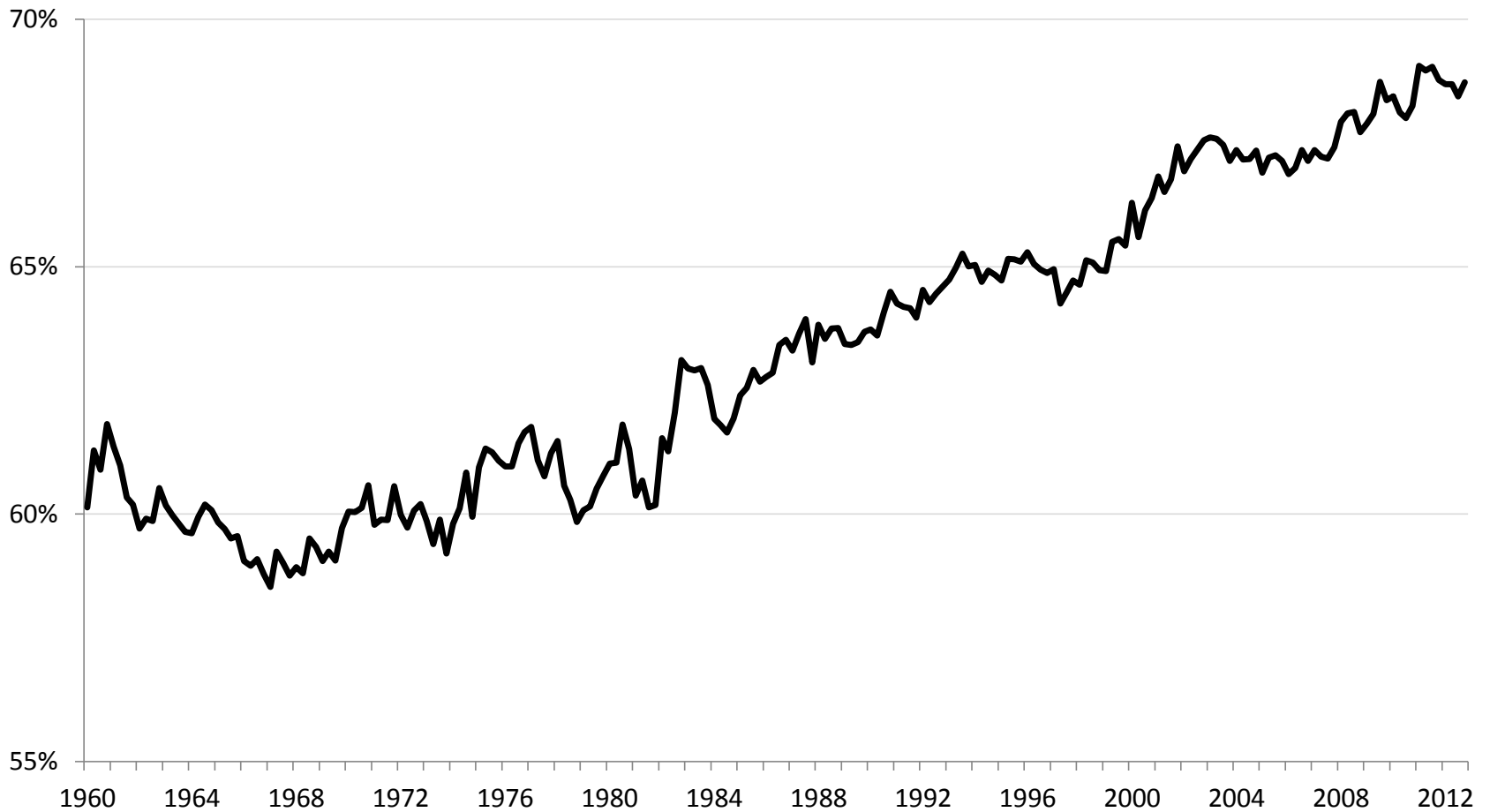
Income share of the top 5% of US households



Source: The World Top Incomes Database

Consumption Drove Economic Growth

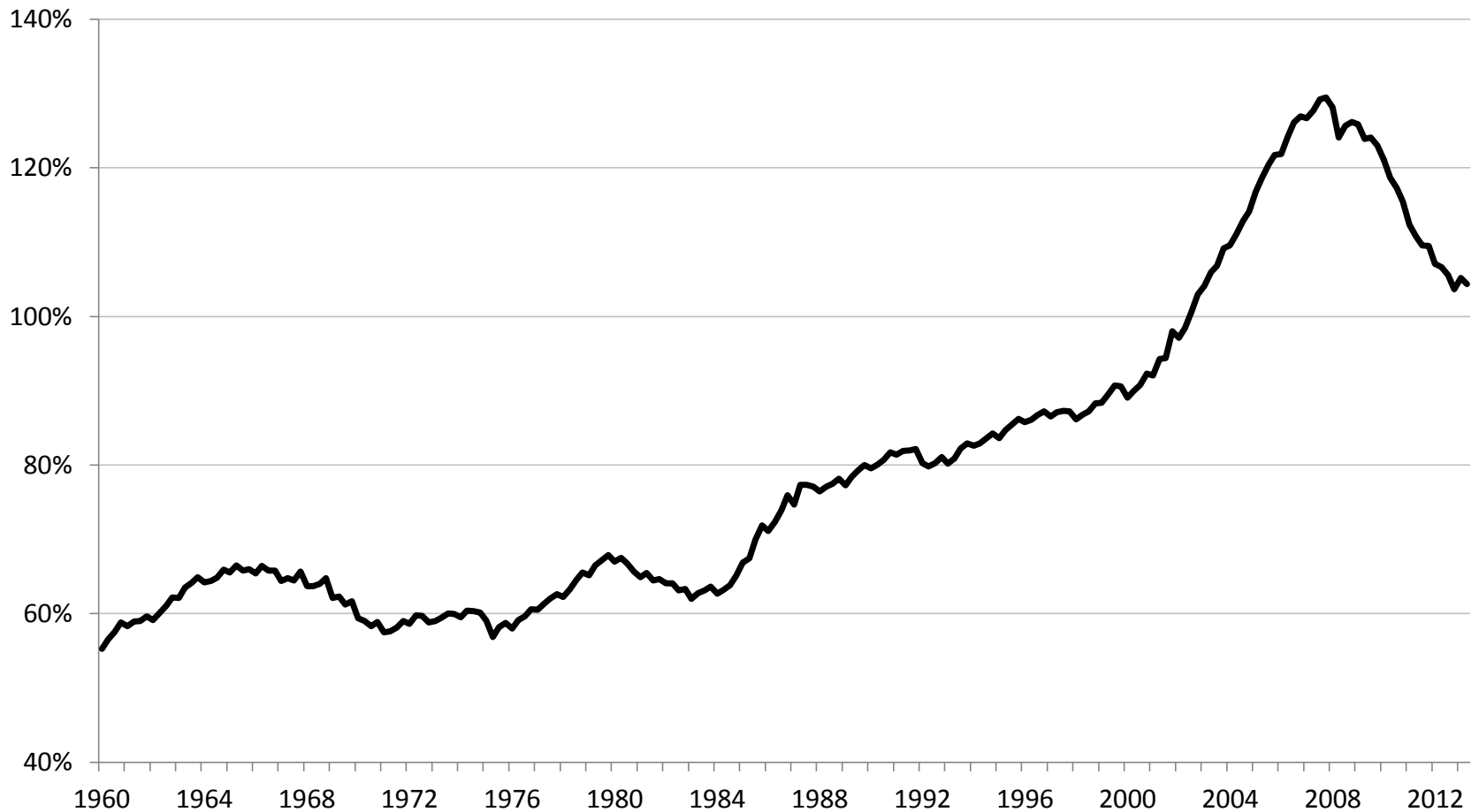
Consumption share of GDP



Source: BEA National Income and Product Accounts

Households Doubled their Leverage

Debt to income ratio of US households



Source: FRB Financial Accounts of the United States

Initial Plan

Find a micro data set with income and consumption expenditure

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Find a micro data set with income and consumption expenditure

- SCF: oversamples wealthy, but no consumption data
- CPS: annual and large sample, but no consumption
- CE: fails to match aggregate data in level or trend
 - Under-reporting especially among higher income households (Sabelhaus, Johnson, Ash, Swanson, Garner, Greenlees, Henderson, 2013)

Revised Plan

Use a mix of aggregate and micro data to generate results at “group” level

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- SCF: for distribution of balance sheet accounts
- CPS: for distribution of income
- National accounts: for authoritative time series

Maki and Palumbo (2001)

	Assets and Liabilities		Income
	<i>Stocks</i>	<i>Flows</i>	
Aggregate	FAOTUS	FAOTUS	NIPA
			disposable personal income
Micro	SCF	*identification	CPS
	shares interpolated linearly between waves	assume flows proportional to holdings	money income

- Numbers add up to net worth and saving for the personal sector published in the FAOTUS
- Distribution matches the SCF in every survey year

Revised Plan ii

M&P for group-level *saving* numbers and
then back out consumption numbers

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M&P for group-level *saving* numbers and then back out consumption numbers

- Mark Zandi provided us with saving rate information derived using the M&P approach
- First, we adjusted those FAOTUS saving numbers to match NIPA saving numbers
- Then we allocated NIPA transfers and interest between our groups so we could back out “group” consumption

Revised Plan ii

M&P for group-level *saving* numbers and then back out consumption numbers

$$\text{Disposable Income} - \text{Saving} = \text{Outlays}$$

$$\text{Outlays} = \text{Consumption} + \text{Transfers} + \text{Interest}$$

$$\text{Consumption} = \text{Disposable Income} - \text{Saving} - \text{Transfers} - \text{Interest}$$

The Story

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Before Great Recession:

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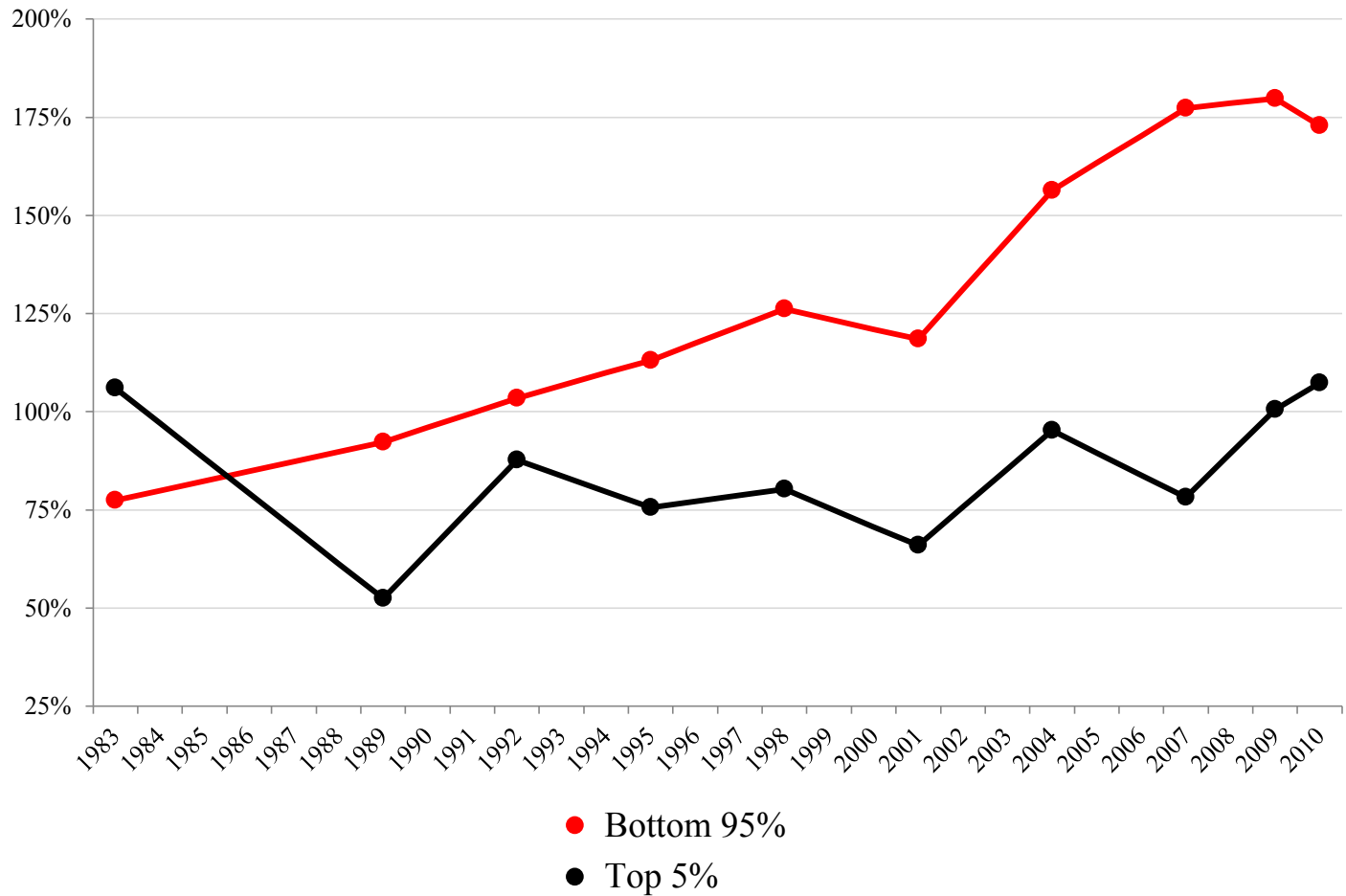
Before Great Recession:

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After Great Recession:

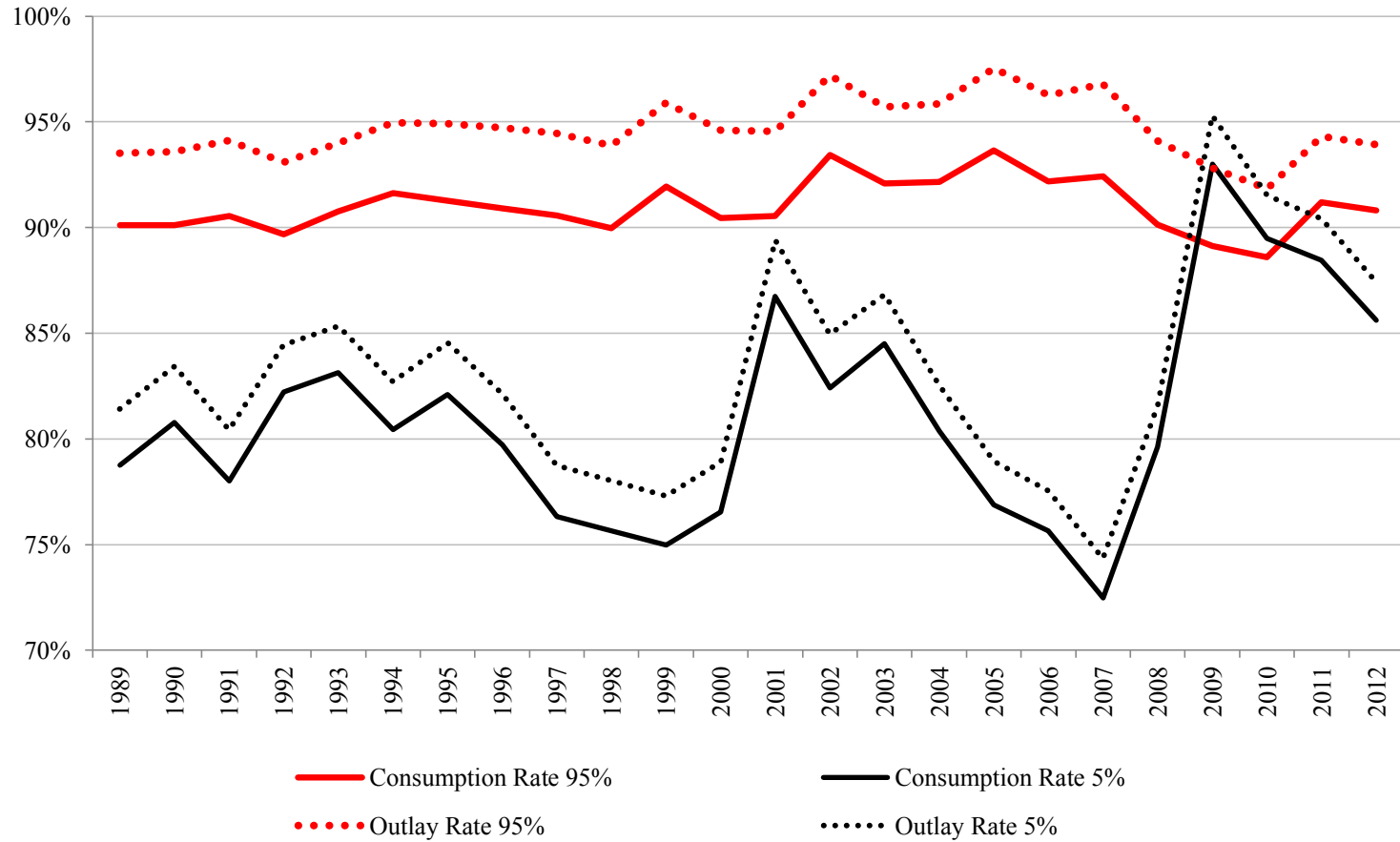
- Consumption of rich only has recovered
- Per capita, real GDP far below trend after Great Recession

Debt to income ratio of non-rich increased



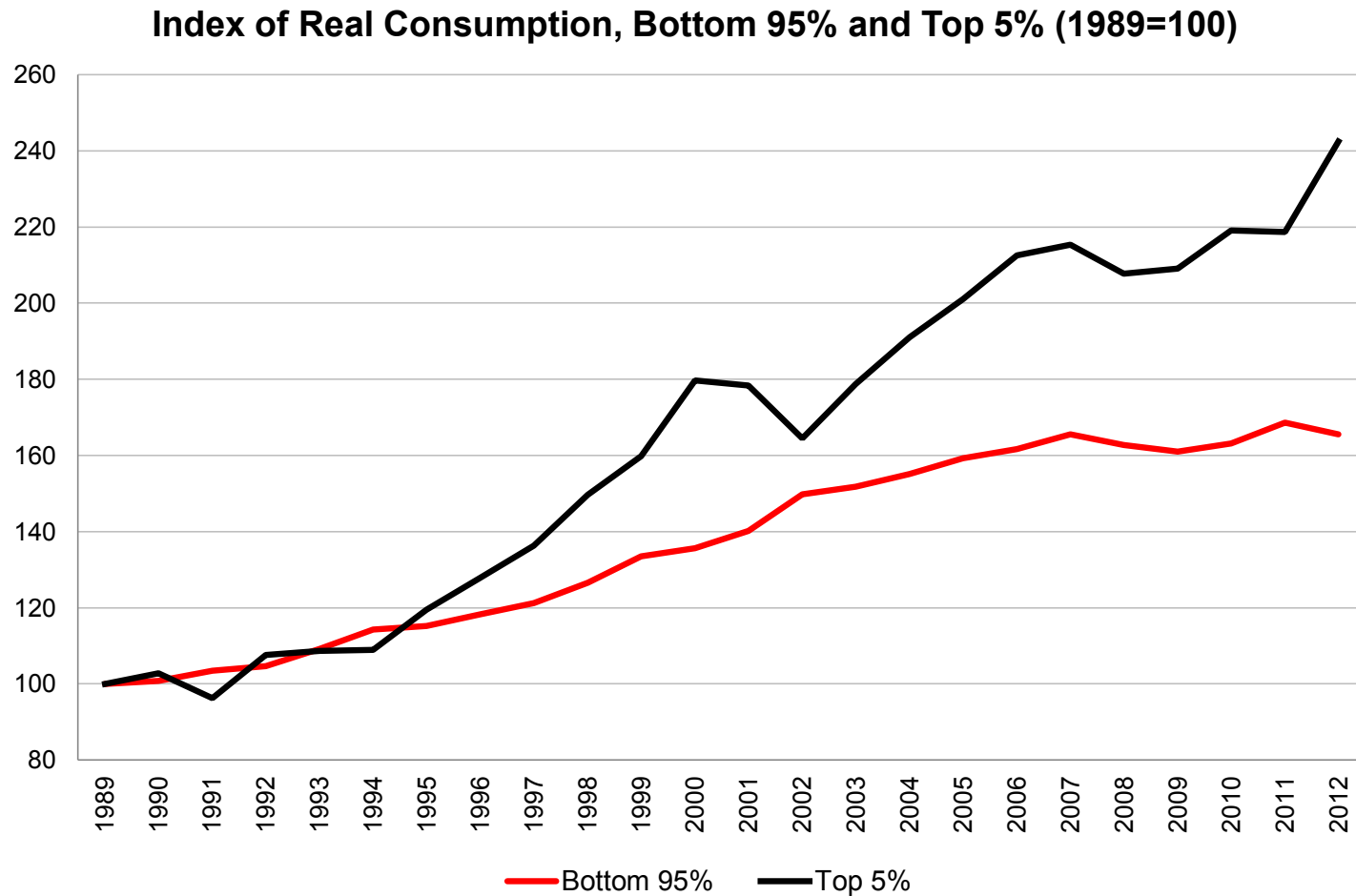
Source: FRB Survey of Consumer Finances, data provided by Romain Ranciere

Consumption rate of non-rich stable or rising



Source: Cynamon and Fazzari (2015)

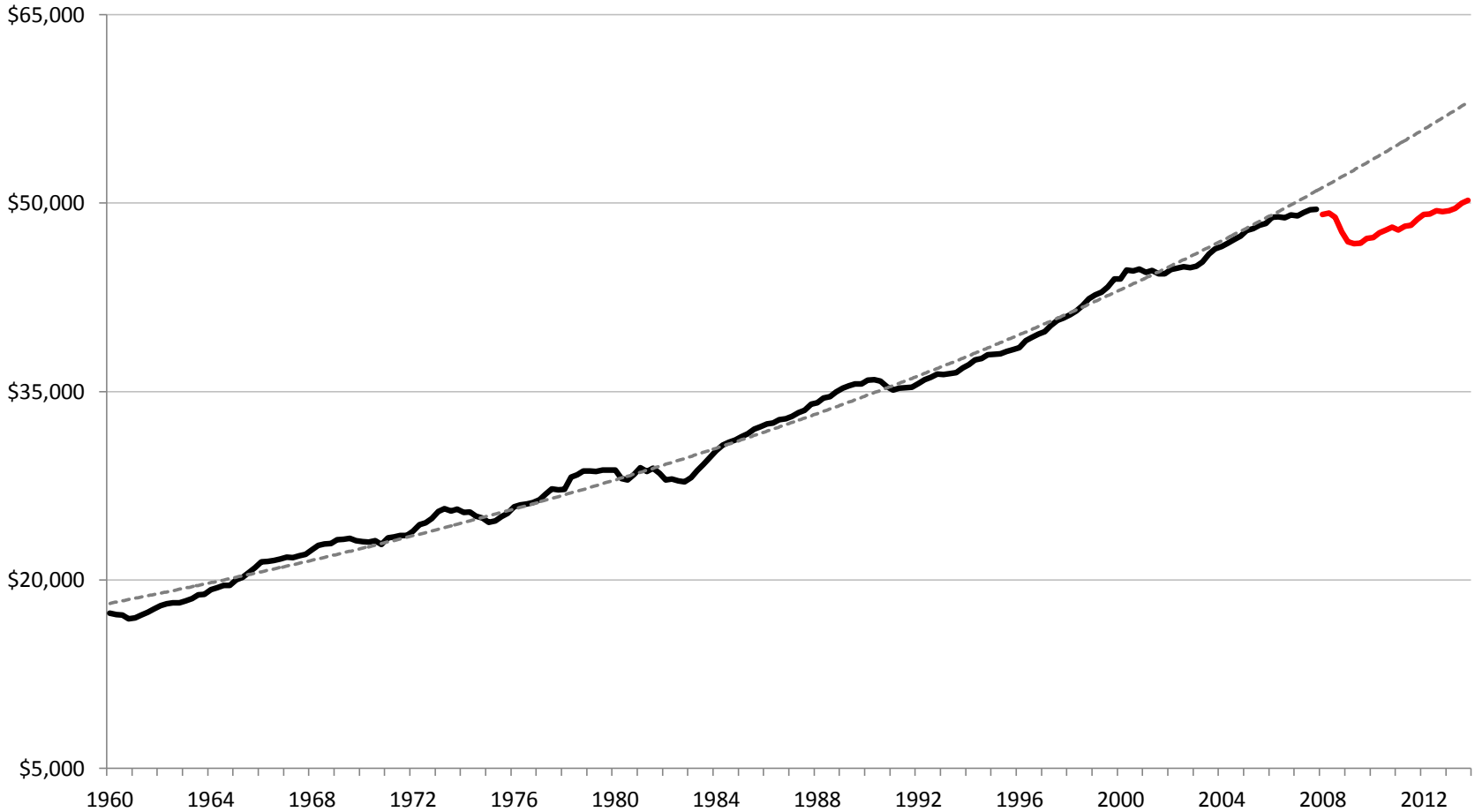
Consumption of rich has recovered; that of non-rich has not



Source: Data from Cynamon and Fazzari (2015)

GDP well below trend after Great Recession

Per capita, real GDP, chained dollars (exponential trend)



Source: BEA National Product Accounts

Measurement Exercise

MEASURING DEMAND

“Household Income, Demand, and Saving: Deriving Macro Data with Micro Data Concepts”

Forthcoming in the *Review of Income and Wealth*

Working paper available at SSRN: <http://ssrn.com/abstract=2211896>

Motivation

Reconcile macro and micro estimates of U.S.
household income and expenditures

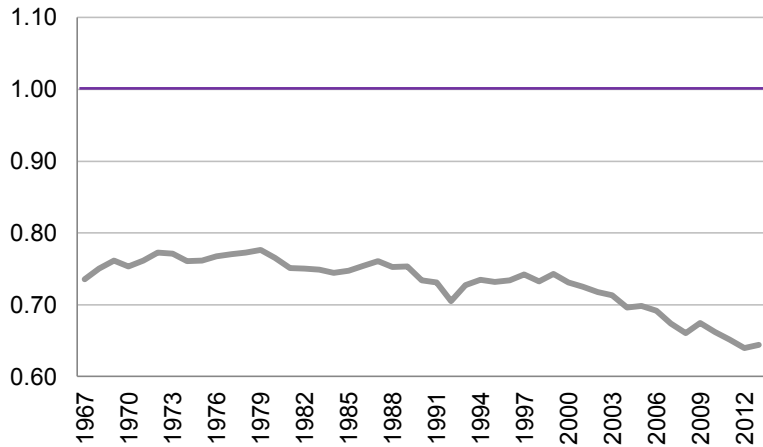
Motivation i

Reconcile macro and micro estimates of U.S. household income and expenditures

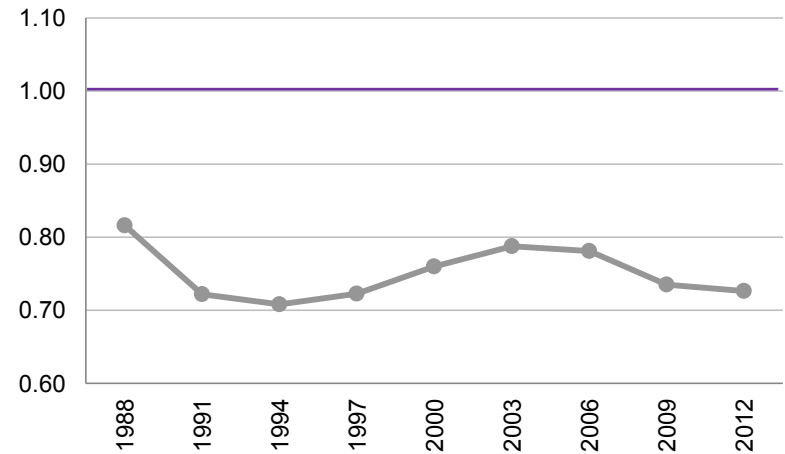
- Maki and Palumbo (2001) reliant on consistent concepts
 - CPS income distribution applied to NIPA disposable personal income
 - SCF net worth distribution applied to FAOTUS balance sheet
- But there are inconsistencies between micro and macro data
 - Not just sampling error; important conceptual differences
- Previous efforts to match NIPA and survey income
 - Katz (2012), Bosworth *et al.* (2007)

Comparisons to Survey Data

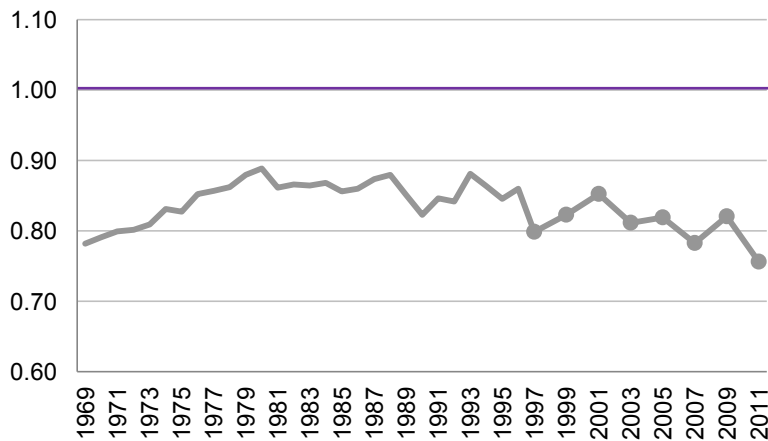
CPS



SCF



PSID



Pre-tax income data from surveys well below 100% of NIPA personal income

Motivation ii

Reconcile macro and micro estimates of U.S. household income and expenditures

- Might learn from macro measures adjusted to match micro concepts
 - PCE vs. what households actually spend
 - Different definitions of saving may tell different stories

Objective

Measure the flows of purchasing power under the control of the household

- Eliminate imputed value of services in consumption
 - Example: Imputed rent
- Eliminate spending not controlled by households
 - Example: Medicare

Objective

Measure the flows of purchasing power under the control of the household

- Household financial flows the way households actually see these flows
- Concept likely to correspond better with flows households report on surveys

Key Identity

- Accounting identity maintained before and after adjustments:

$$\text{Disposable Income} = \text{Consumption} + \text{Household Investment} + \text{Transfers \& Interest} + \text{Financial Saving}$$

- Identity holds in NIPA
 - Household investment not distinguished from financial saving
- Adjustments to consumption or income require balancing change elsewhere

Housing Example (2013 \$billions)

	Disp. Income	Cons.	HH Invest.	Trans. & Int.	Fin. Saving
Implicit Rent	- 1326	- 1326			
Intermediate Inputs	+ 152	+ 152			
Mortgage Interest	+ 334			+ 334	
Depreciation	+ 312				+ 312
New Construction Single-Family Homes			+ 426		- 426
Broker commissions		+ 105	- 105		
Total	- 528	- 1068	+ 321	+ 334	- 115

- Eliminate “rent home to yourself” business

Other Important Adjustments

- About 40 separate adjustments
- Remove non profit institutions that serve households
- Free financial services
- Medical care
 - Employer and government, not households
- Retirement accounting
 - Exclude contributions by employers and government to defined benefit plans
 - Include benefits from DB plans

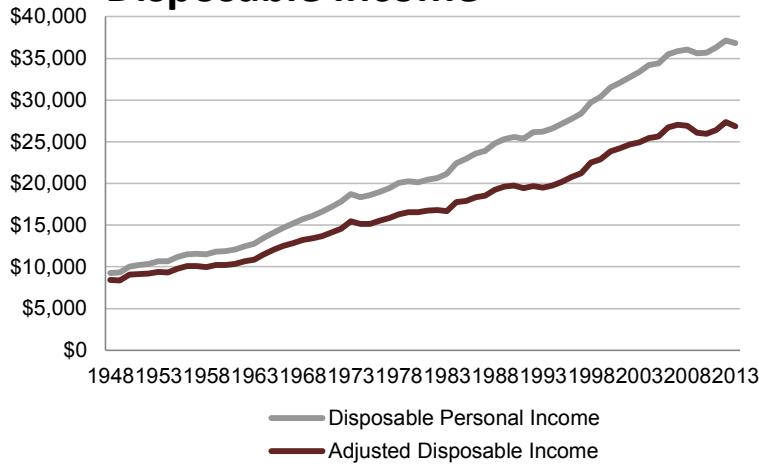
Other Important Adjustments

Category	Disposable Income	Consumption	Transfers & Interest	Financial Saving
Owner-Occupied Housing	-4%	-9%	81%	-19%
Financial Services	-6%	-2%		-76%
Defined Benefit Pensions	-1%			-27%
Third-Party Paid Medical Services	-13%	-14%		
Non-Profit Sector	-1%	-4%	61%	8%
Other	-2%			-30%
Adjusted Data	73%	70%	242%	-44%

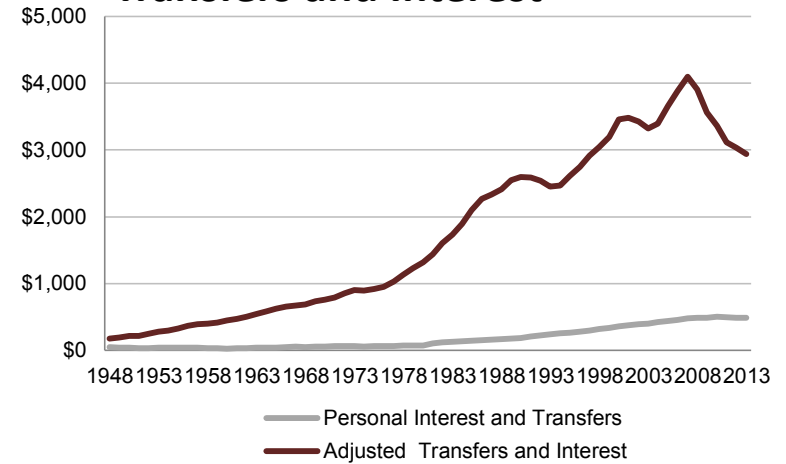
Note: Household investment excluded from table, because it has no clear personal sector counterpart in the NIPA

Adjusted measures: real, per capita

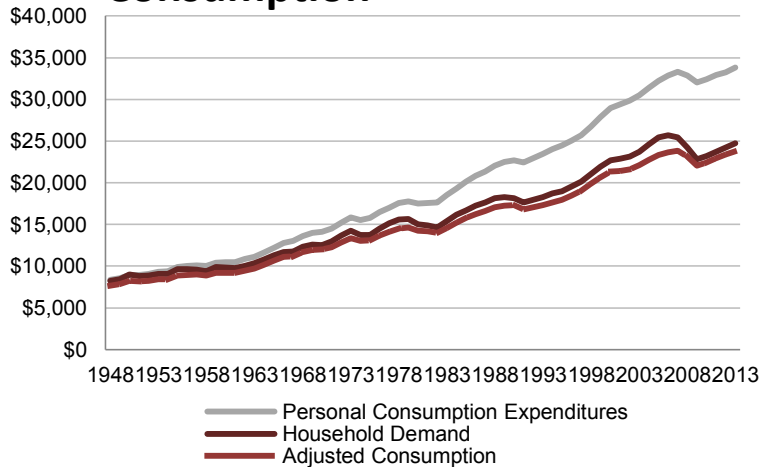
Disposable Income



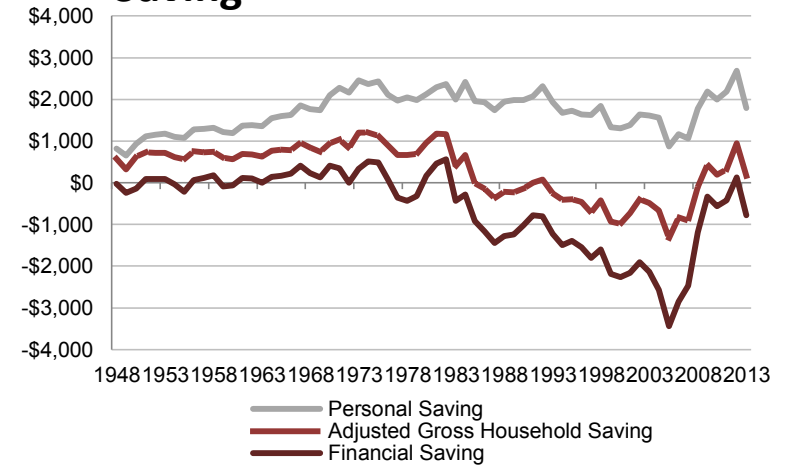
Transfers and Interest



Consumption

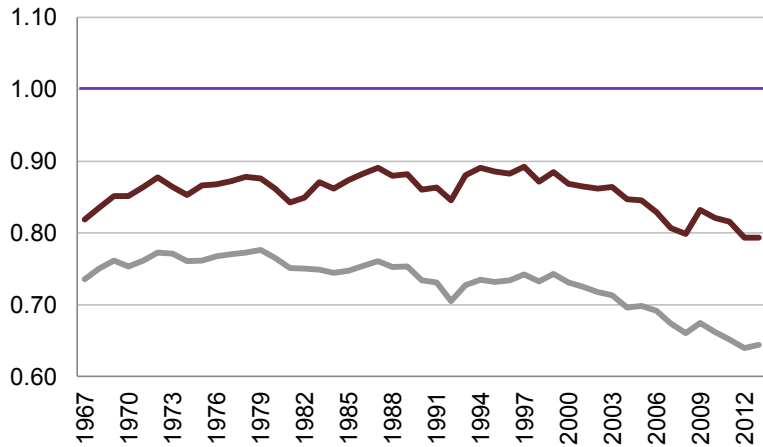


Saving

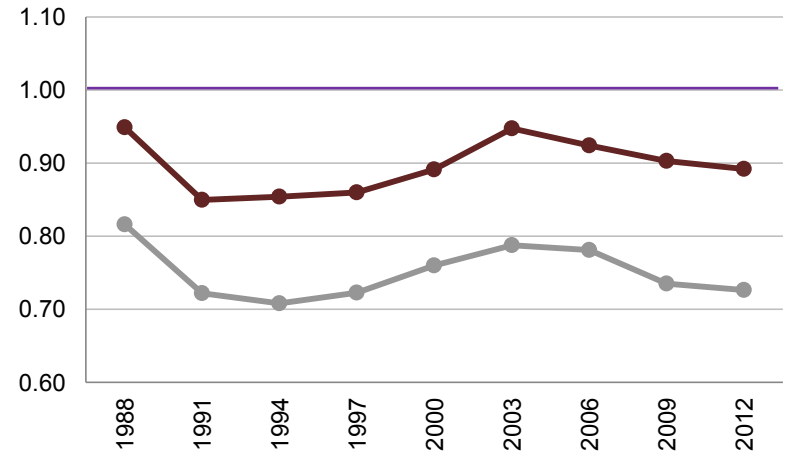


Comparisons to Survey Data

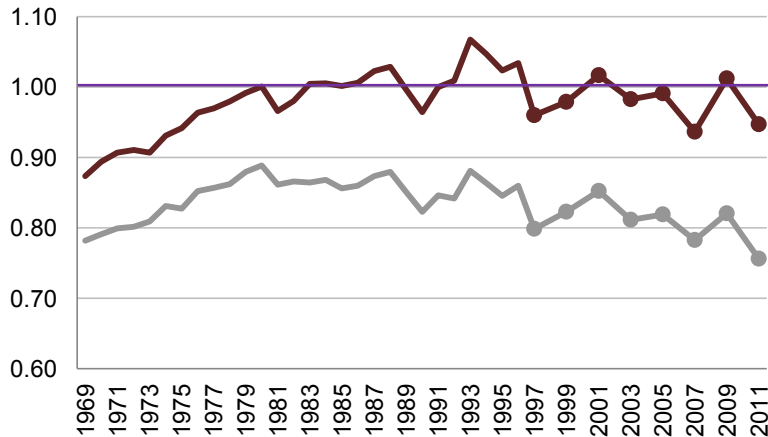
CPS



SCF

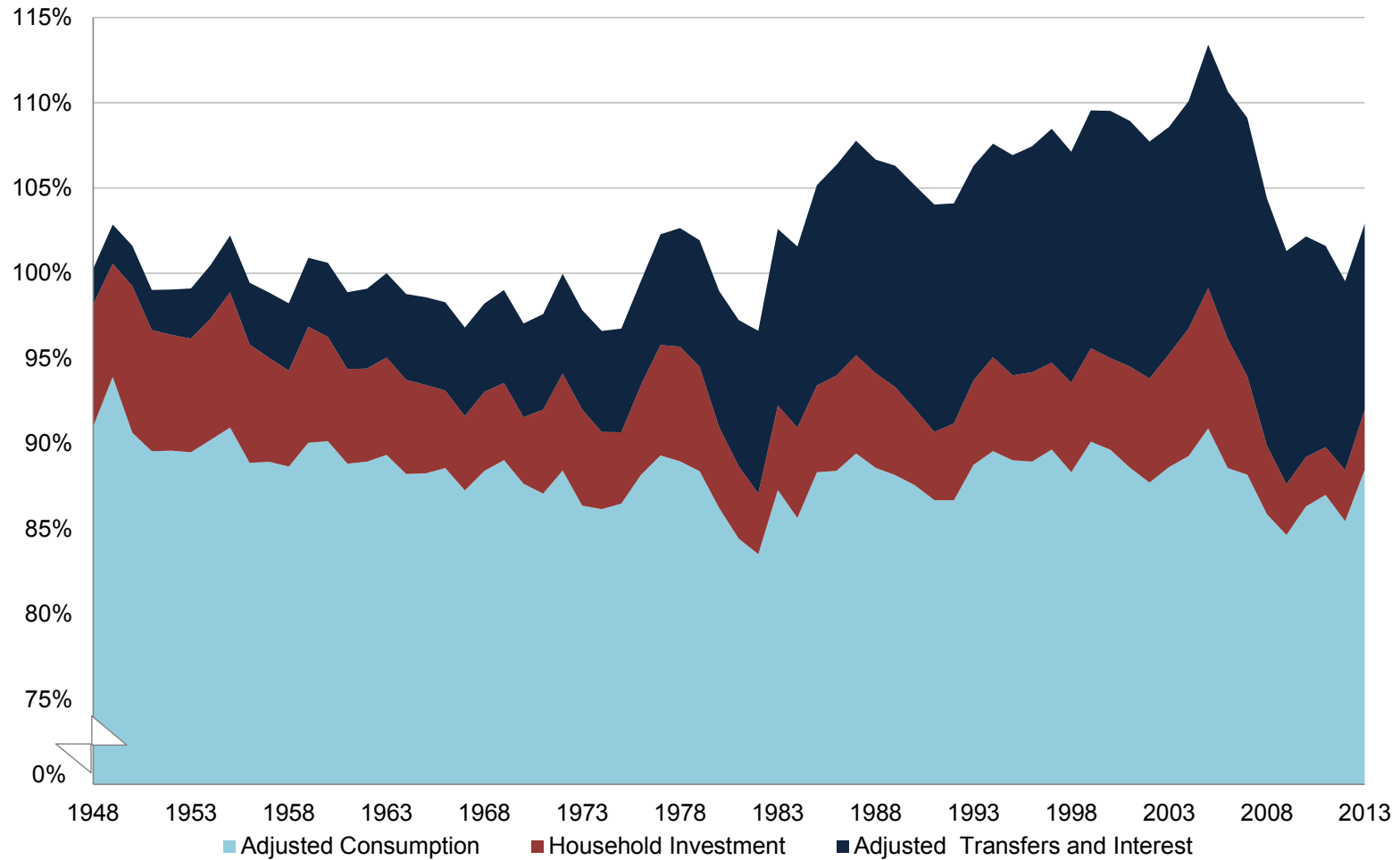


PSID



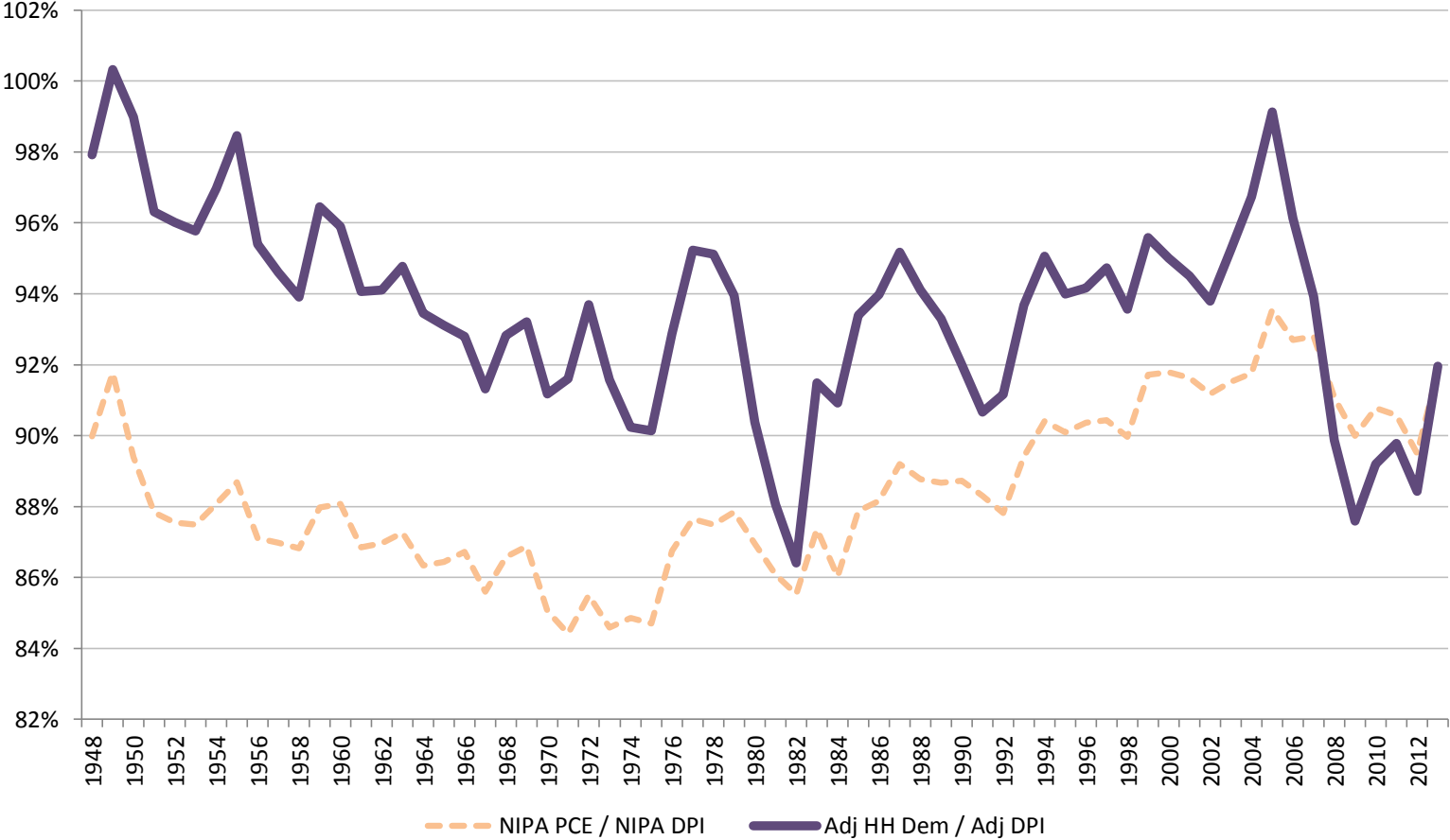
Note: All measures shown pre-tax; CBO net realized capital gains added to adjusted disposable income to match SCF, which includes realized gains.

Expenditure Shares of Income

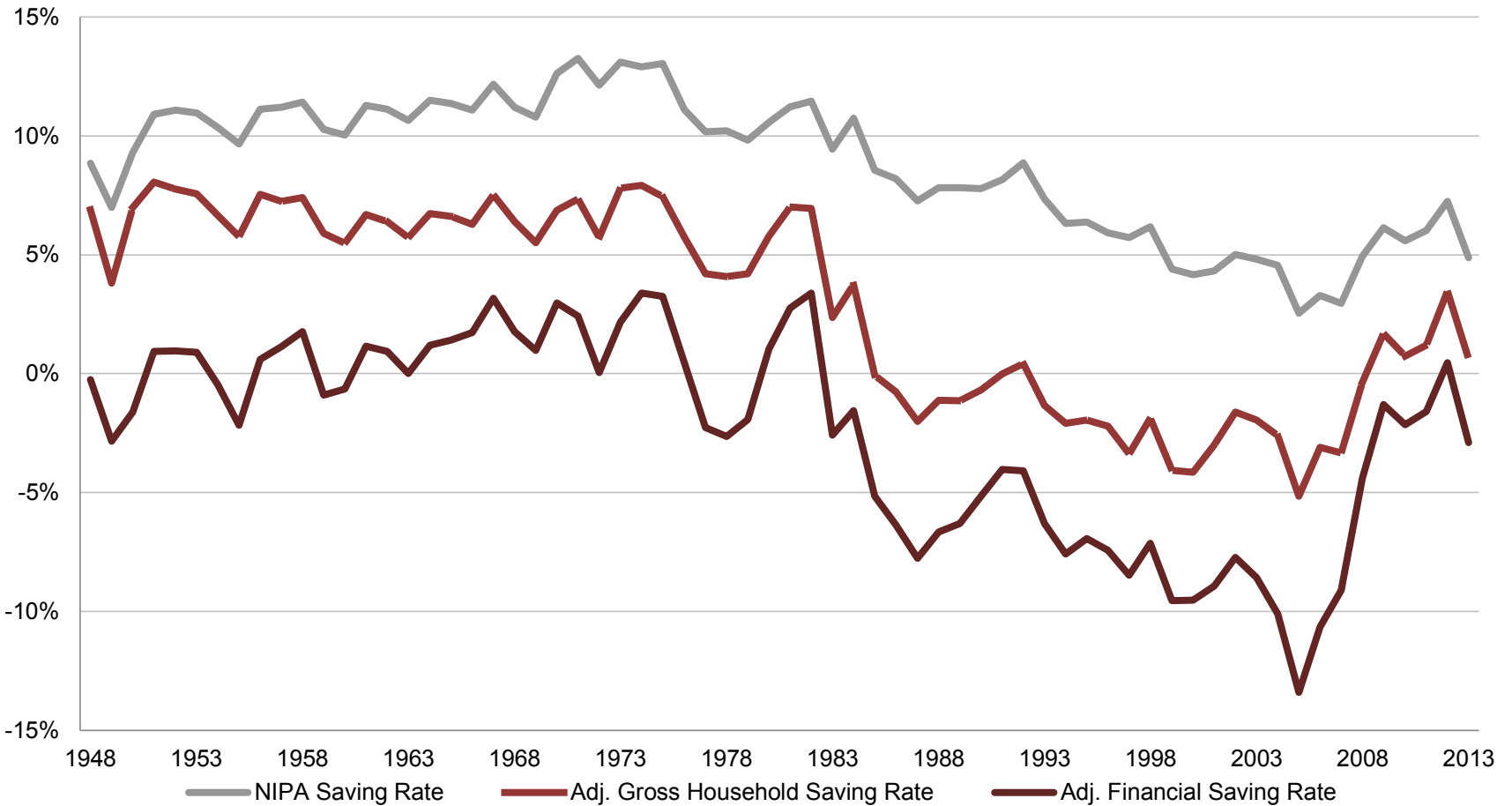


Bigger Collapse: Cash Flow Measure

Demand Rates: NIPA Definition and Adjusted



New saving rate concepts



Future Directions

1. Use the Maki and Palumbo procedure with micro-consistent aggregate income and saving series; see if the results change
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3. Exploit panel structure of PSID to see if story of rising balance sheet fragility among non-rich followed by discrete fall in consumption during GR holds up at household level
 - Joint work with Daniel Cooper