Measuring Consumption and Consumption Inequality using Household Surveys

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Outline

- Goals of our research
  - Compare income inequality and consumption inequality from 1984-2012 (Fisher, Johnson, and Smeeding 2015) and poverty (Fisher, Johnson, Marchand, Smeeding, and Torrey, 2009)
  - Explore multidimensional inequality using income, consumption, and wealth (Fisher, Johnson, Smeeding, and Thompson 2021)
- Our preferred consumption measure & why
- How we use the Consumer Expenditure (CE) Survey
  - 12-month consumption
  - Impute vehicle flows
  - Income in the CE and how it affects consumption measures
- Recommendations

Goal: Compare <u>income inequality</u> and <u>consumption inequality</u> from 1984-2011
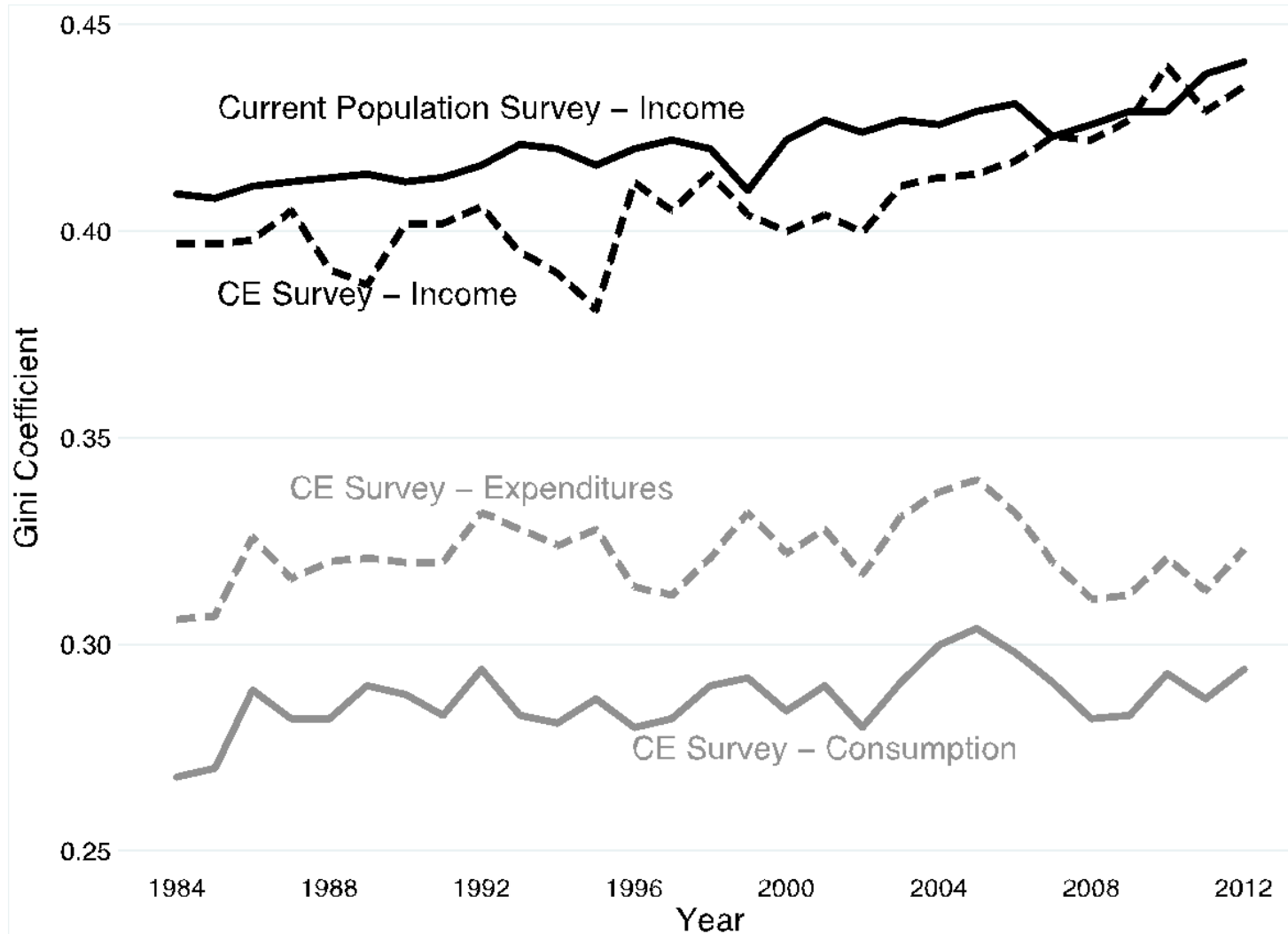
Income inequality increased by 5.1% (1984-2006) and by 4.9% (1986-2006).

Consumption inequality increased by 11.0% (1984-2006) and by 3.0% (1986-2006) using our consumption measure defined in subsequent slides.

Fisher, Johnson, and Smeeding "Inequality of Income and Consumption in the U.S.: Measuring the Trends in Inequality from 1984-2011 for the Same Individuals" *Review of Income and Wealth,* 2015.

Goal: Compare <u>income poverty</u> and <u>consumption poverty</u>

1984-2003	Ages 55-64	Ages 65-74	Ages 75+
% below official income poverty threshold			
Annual income	16.2%	15.0%	15.0%
Annual consumption	7.9%	5.9%	6.1%
Income & consumption	5.3%	4.1%	3.6%

Among those 55-64 years old, 5.3% are income poor and consumption poor.

Fisher, Johnson, Marchand, Smeeding, and Torrey "Identifying the Poorest Older Americans" *Journal of Gerontology: Social Sciences 64(B)6 2009*.

Inequality in 3-D: <u>Share of households</u> in the top 5% of two or three resource measures
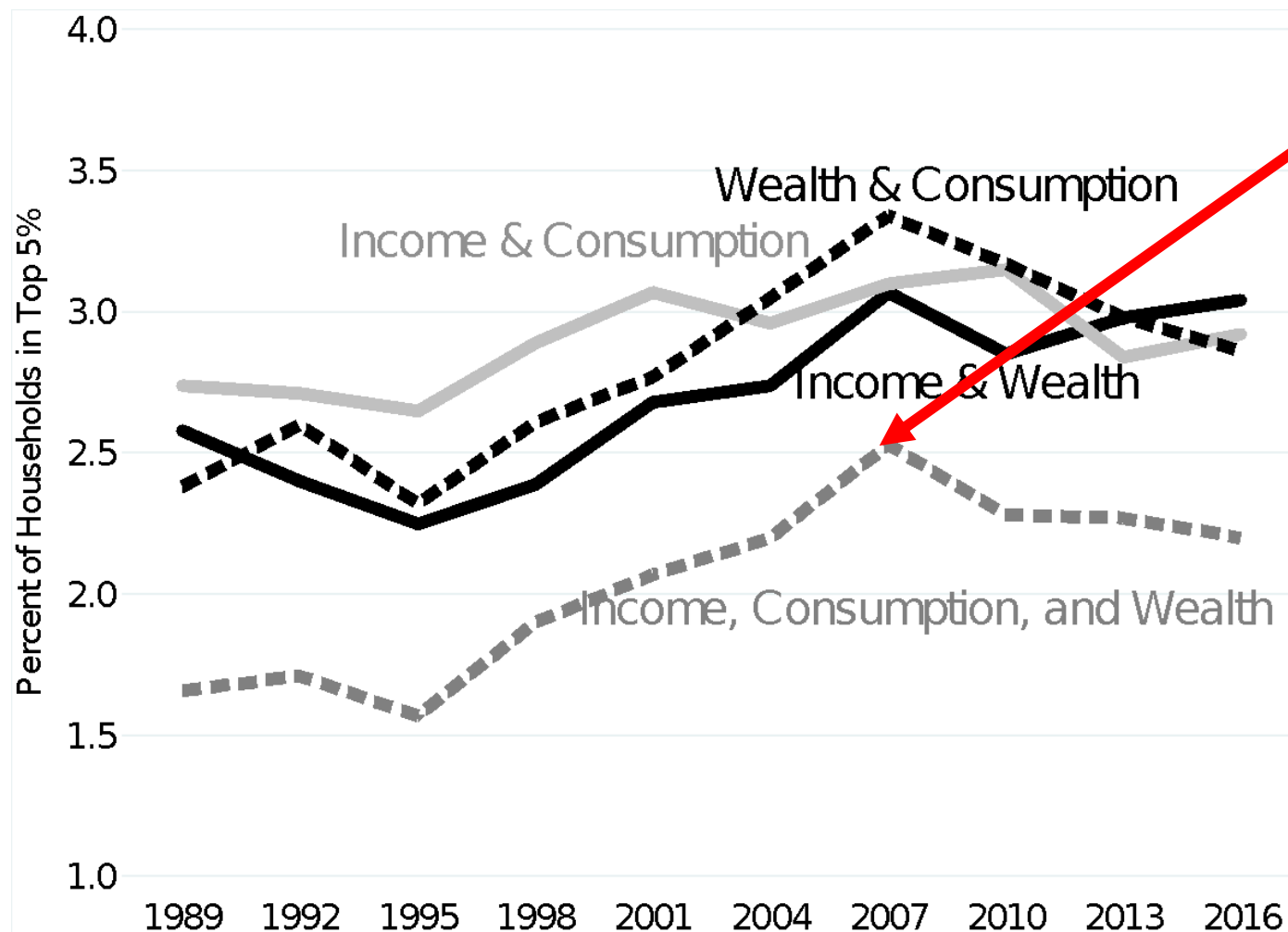
In 2007, half of households that were in the top 5% of income were also in the top 5% of consumption and the top 5% of wealth.

OECD and Eurostat are also publishing statistics on the joint distribution of household income, consumption, and wealth.

Fisher, Johnson, Smeeding, and Thompson, "Inequality in 3-D: Income, Consumption, and Wealth" *Review of Income and Wealth* (forthcoming)

Our consumption measure

Service flows from:

- Homeownership
- Subsidized housing
- Vehicles

Spending on:

- Food
- Other housing (e.g., rent, housing maintenance, appliances)
- Other transportation (e.g., gasoline, public transit)
- Apparel
- Out-of-pocket medical
- Entertainment
- Education
- Miscellaneous items (e.g., safe deposit box fees)

Service flows

Homeownership

Use the rental equivalence of owned primary residences.

Q: "If someone were to rent your home today, how much do you think it would rent for monthly, unfurnished and without utilities?"

Subsidized housing

For those with free or subsidized housing, <u>we impute the full rent</u> using reported rent for non-subsidized units as the dependent variable. Independent variables include number of rooms, age of unit, state, metro area, and more.

Vehicles

Using the purchase price, P_0, and the age, a, of the vehicle, the service flow, S_t, is given by:

$$S_t = (r+d) \times (1-d)^a \times P_0$$

r is the interest rate (5%).

d is the depreciation rate (10%).

Why service flows for some durables?

Appliances and other durables are a small portion of spending

For the typical household, the purchase of apparel and consumer durables are a small portion of their total spending, resulting in small consumption flows.

See results using data from the 1980s and 1990s. Johnson and Smeeding (1998) saw little difference when imputing appliance flows, using the stock of appliances, but bigger differences for owned homes and autos. No longer feasible to estimate consumption flows from appliances because stock of appliances is no longer asked.

Measure	1995
Consumption expenditures	$25,417
Shelter expenditures	-$5,425
Shelter flows	+$7,460
Vehicle expenditures	-$2,851
Vehicle flows	+$1,997
Appliance expenditures	-$133
Appliance flows	+$170
Consumption flows	$26,635

Source: Johnson and Smeeding (1998)

What's excluded from our measure?

Some expenditures are better thought of as savings or do not directly impact well-being of the household

Excluded are expenditures for:
- pensions
- social security
- savings
- life insurance
- principal payments on mortgages
- gifts to organizations or persons outside the household unit

Three other measures used

	Consumption		Non-durables	
	Fisher, Johnson, & Smeeding (2013)	Meyer & Sullivan (2013)	Heathcote, Perri, & Violante (2010)	Attanasio, Hurst, and Pistaferri (2012)
Food at home, away from home, alcohol	Yes	Yes	Yes	Yes
Housing				
Rental equivalence for owned home	Yes	Yes		
Rent for renters	Yes	Yes		
Maintenance, repair, and insurance	Yes	Yes		Partial
Other lodging	Yes	Yes		
Utilities (e.g., electricity…)	Yes	Yes		Yes
Household operations (e.g., cleaning)	Yes	Yes	Yes	Yes
Home furnishings and equiment	Yes	Yes		Partial
Apparel	Yes	Yes	Yes	Yes
Out-of-pocket health expenditures	Yes		Yes	
Entertainment				
Fees and admissions	Yes	Yes	Yes	Yes
Durable equipment	Yes	Yes	Yes	
Personal care items	Yes	Yes	Yes	Partial
Reading materials (e.g., books)	Yes	Yes	Yes	Partial
Education	Yes		Yes	
Tobacco	Yes	Yes	Yes	Yes
Miscellaneous	Yes	Yes		Yes
Life insurance				Yes

Research differs in how it uses the CE Survey in other ways too, which I discuss more later.

The appendix in Fisher, Johnson, and Smeeding (2015) includes additional definitions.

How does the consumption measure affect our perception of inequality?
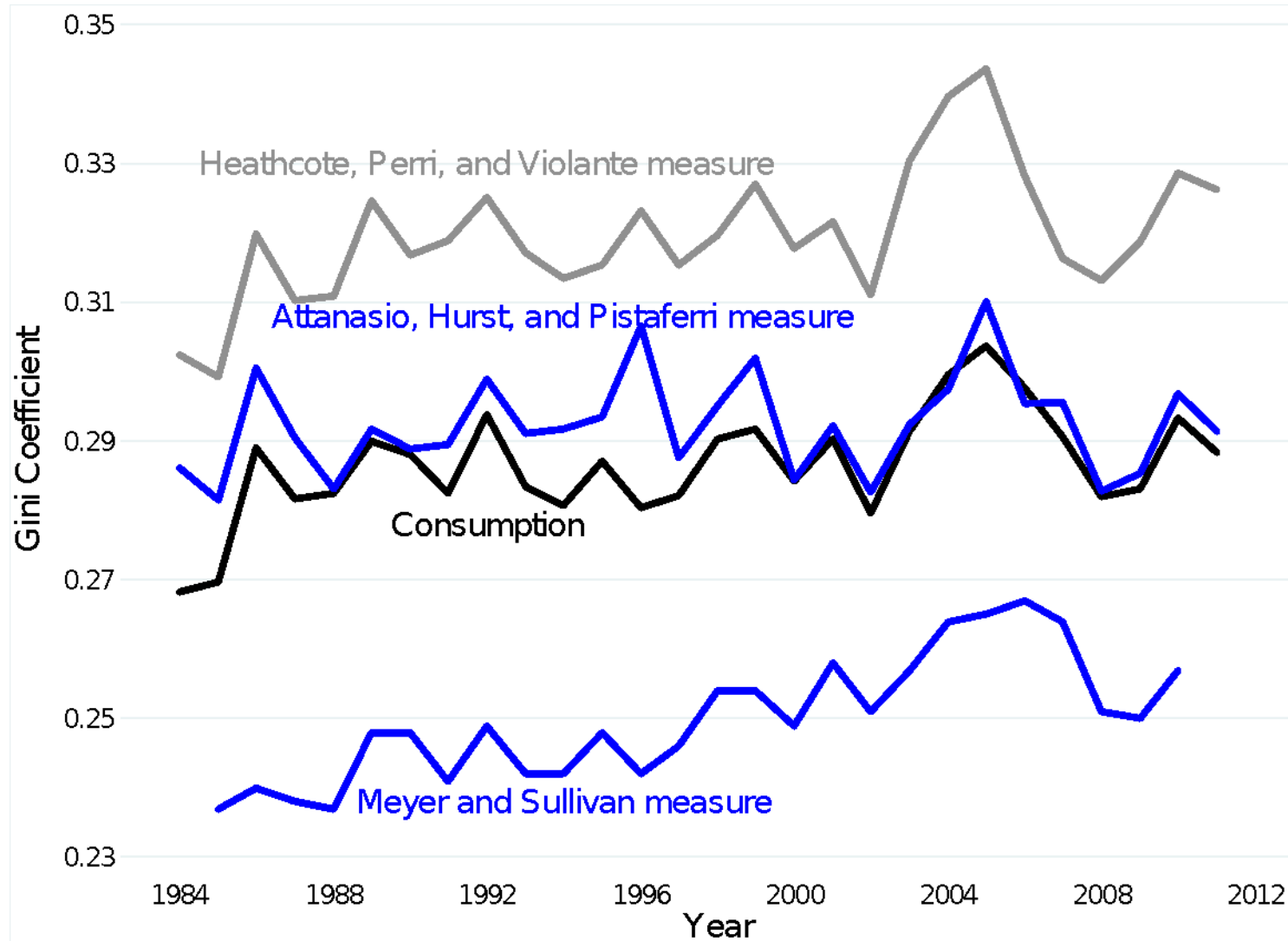
Gini coefficients calculated in Fisher, Johnson, and Smeeding (2015).
The data are the same except for the consumption definition.

Takeaways:
- Dropping durables increases inequality (Heathcote et al.)
- Dropping medical out-of-pocket and education decreases inequality (Meyer and Sullivan)

The consumption definitions come from:
* Attanasio, O., E. Hurst, and L. Pistaferri, "The Evolution of Income, Consumption, and Leisure inequality in the US, 1980-2010," *NBER working paper #17982*, 2012.
* Heathcote J., F. Perri and G. Violante, "Unequal We Stand: An Empirical Analysis of Economic Inequality in the US, 1967-2006", *Review of Economic Dynamics* 13, pp 15-51, 2010.
* Meyer, B., and J. Sullivan, "Consumption and Income Inequality and the Great Recession," *American Economic Review* 103(3), 2013.

How we use the Consumer Expenditure Survey

12-month consumption - We combine the four quarterly interviews to measure annual consumption along with annual income.

Issue: Attrition – not all households complete all four interviews.

Some small proportion move, and the CE Survey interviews whoever is living at the address. Some proportion choose to not be interviewed all four times.

Attrition is not random. Low-income, renters, and younger people attrit at a higher rate.

Solution: Reweighting – we reweight the sample to account for differential attrition. Usually makes a small difference, but it is important to recognize the differential attrition and account for it.

12-month consumption is preferred

We want to compare:

annual income poverty
to
annual consumption poverty

Who is poor using both measures? Who is poor with only one?

Fisher, Johnson, Marchand, Smeeding, and Torrey "Identifying the Poorest Older Americans" *Journal of Gerontology: Social Sciences 64(B)6 2009*.

Impute vehicle flows

In 2015, we wrote "The CE Survey collects data on the ownership of vehicles, including the age and <u>make and/or model</u> type… Since most of the vehicles had their make reported, we sorted the data by model type and whether the vehicle was new or used and obtained the mean value of the <u>purchase price for each make-model-year</u>…"

Before 2004, the CE public-use data file included vehicle make and model. Since 2004, the public-use file only included vehicle make.

<u>The removal of vehicle model adds noise to our consumption measure.</u>

Impute vehicle flows

Year-make-model
- 2021 Ford Edge $48,750
- 2021 Ford Expedition $78,210

Year-make average
- 2021 Ford $63,480

Pre-2004, we could more accurately measure the purchase price when imputing vehicle flows because we had the make, model, and year. With just the year and make since 2004, we must take the average across a wide range of model prices, which decreases the accuracy of our imputation.

Impact of vehicle durables on inequality
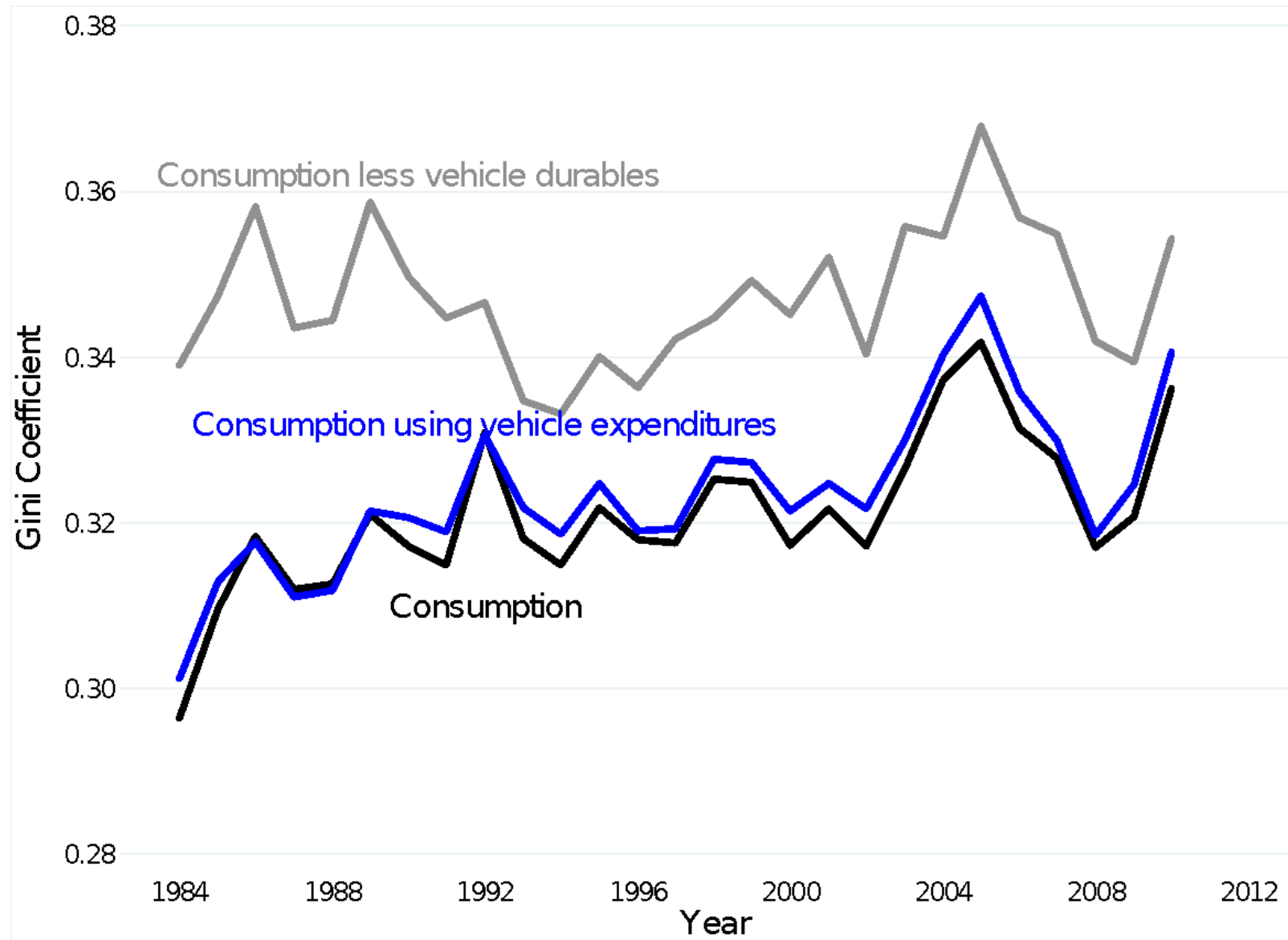
"Consumption" is our preferred measure and uses durable vehicle flows as described in a previous slide.

Fisher, Johnson, and Smeeding (2015).

Income in the CE Survey and how it affects measurement of consumption

Three issues:

- Income imputation began in 2004 and not applied retroactively

- Income is underreported at the bottom of the income distribution

- Failure to capture the top of the income distribution

Income imputation began in 2004 and not applied retroactively – has implications for how researchers use the data for trend analysis

Using expenditures	Complete income reporters*	Incomplete income reporters
Mean expenditures	$35,441	$31,099
10th percentile	$11,899	$9,973
50th percentile	$29,542	$25,905
90th percentile	$64,577	$58,543
Poverty rate	10.94%	11.85%

Those who reported all income sources are not randomly drawn from the U.S. population. Those
who fail to report some income sources have lower expenditures.

Time-series analysis is hampered by this break. A handful of researchers have asked us for our imputation series that goes back to 1984.

* Complete income reporters is an unusual variable. Be wary of using it. Request the imputed data back to 1984 from me.

Fisher, Jonathan. 2006. ''Income imputation and the analysis of consumer expenditure data,'' *Monthly Labor Review*.

Income is underreported at the bottom of the income distribution

Evidence

- Program receipt is under-reported in federal surveys (Medalia et al. 2019)

On the right, you see that the over half of households in the bottom 10% of the income distribution reported consuming more than twice their annual income in 2010.
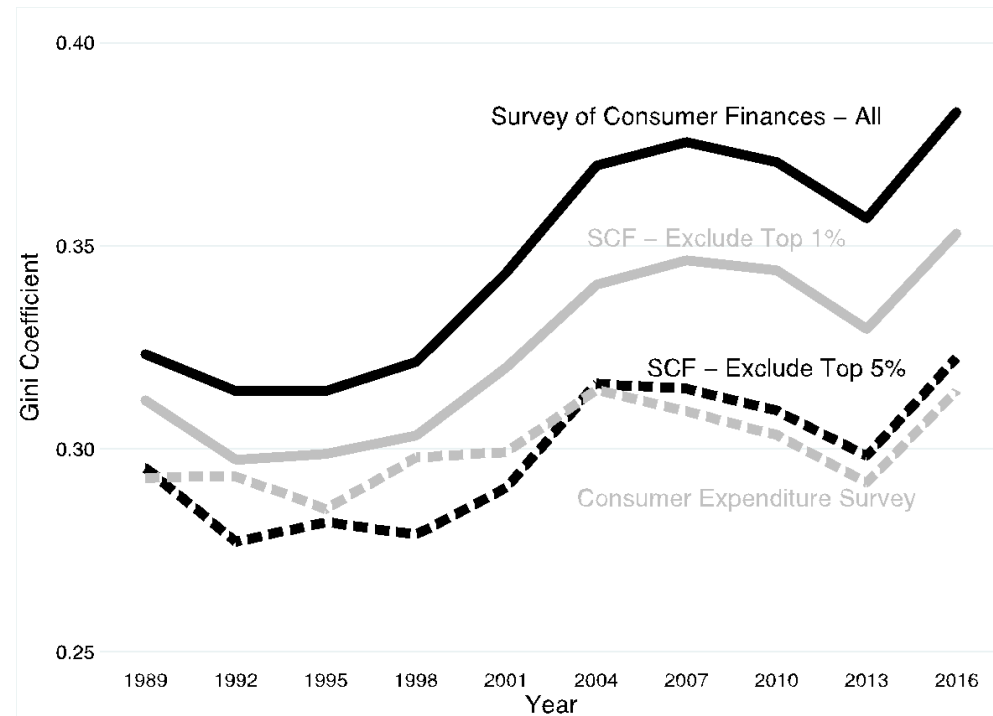
Overestimated consumption relative to income

Median propensity to consume
By income decile
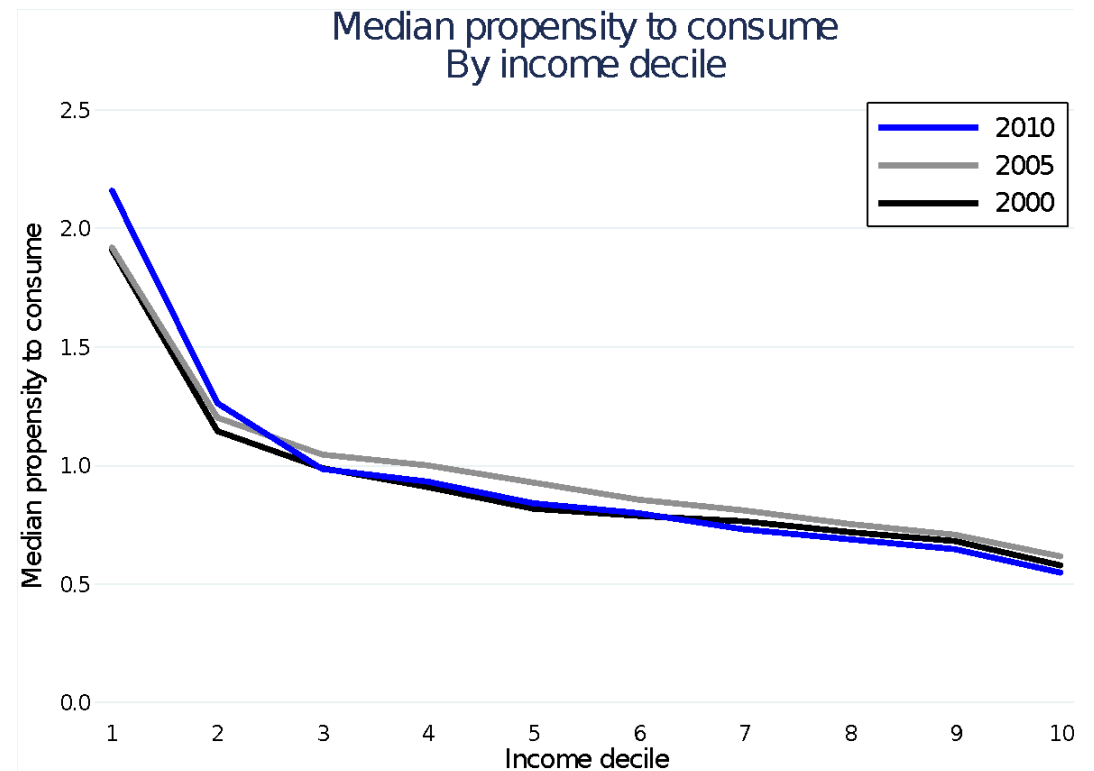
Failure to capture the top of the income distribution

Evidence – reported consumption higher in SCF at the top of the income distribution

Reported Consumption
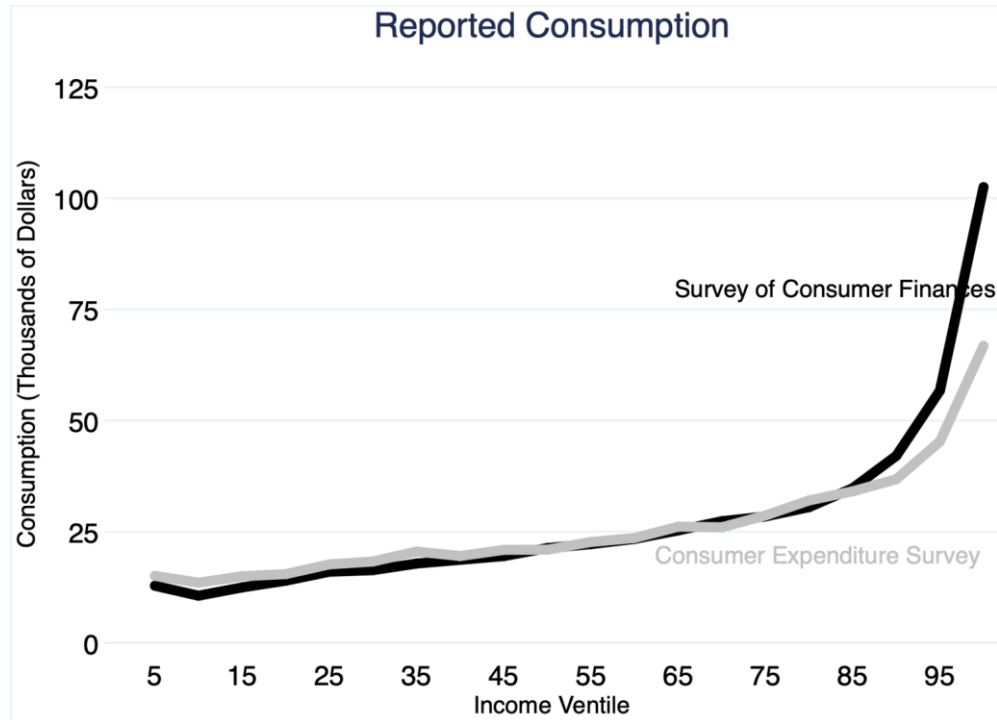
Underreported consumption inequality

We used a variable in the Survey of Consumer Finances (SCF) that asks about spending relative to income to help impute consumption to the SCF. Such a variable could be useful in the CE Survey to help understand misreporting of income and spending.

Recommendations

- A consumption measure needs to impute vehicle flows
  - And having make, model, and year are important
  - Link to Kelly Blue Book Value if possible and conduct research into proper interest rate and depreciation value.
- An annual measure of consumption is important, in large part to be able to compare to annual income.
- Impute income back to 1980 for researchers who want to study the entire history of CE.
- Consider adding a question regarding income relative to spending to help understand measurement error in spending and income.