Comparing seven approaches to poverty measurement and their relevance to wellbeing

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Poverty Measurement

- A shortfall of resources compared to needs
- Measured in the U.S. since 1965 in the Official Poverty Measure

"The best you can say for the measure is that at a time when it seemed useful, it was there" (Orshansky, 1976).

"Those that examine the official measure closely almost uniformly end up seeking to move beyond it" (Brady, 2009)

Continued debate

- The Supplemental Poverty Measure
  - Improved definition of households, resources.
  - Usability
  - Improvements to the SPM
  - Changes to what is considered a household need
- Relative poverty measures
  - Based upon median income

Comparability across time and place

Availability & reliability of data

- Survey response
- Underreporting of income & program participation

Table 2
SPM resource and expense parameters

Household resources	Derivation from PSID data
Additions	
Cash income	Value reported in PSID.
Federal + state tax credits (e.g. EITC, Child Tax Credit)	Calculated using NBER's TAXSIM, as described in Kimberlin et al. [20]. EITC amount then subtracted for ineligible immigrants.
SNAP (food stamps)	Value reported in PSID.
WIC	Receipt but not value reported in PSID. Value estimated using average national per capita amount for each year for WIC recipients from USDA admin data x number of eligible family members, following Census CPS-SPM method.
School lunch	Receipt but not value reported in PSID. Value estimated using value per lunch each year from USDA administrative data x number of eligible children, following Census CPS-SPM method.
School breakfast	Receipt but not value reported in PSID. Value estimated using value per breakfast each year from USDA administrative data x number of eligible children, paralleling Census CPS-SPM method for calculating value of school lunch.
Low Income Home Energy Assistance Program (LIHEAP)	Value reported in PSID.
Housing subsidy	Receipt but not value reported in PSID. To calculate value, first household rent payment amount calculated per U.S. Dept. of Housing and Urban Development tenant rent rules based on income and household characteristics reported in PSID. Then rent amount subtracted from portion of SPM threshold representing geographically-adjusted shelter costs, to obtain estimated value of housing subsidy.
Subtractions	
FICA (federal payroll tax)	Calculated with TAXSIM.
Federal + state income tax liabilities	Calculated with TAXSIM.
Child care expenses	Value reported in PSID.
Other work-related expenses	Number of weeks worked by head and wife reported in PSID. Value of work-related expenses calculated by multiplying weeks worked by weekly average expense amount for each year used in Census CPS-SPM methodology. Combined value of child care and other work-related expenses then capped at wages of lowest earner.
Child support paid	Value reported in PSID.
Alimony paid	Value reported in PSID.
Medical out-of-pocket expenses (MOOP)	Value reported in PSID for two-year period prior to survey date. Divided by two to obtain estimated value for past year.

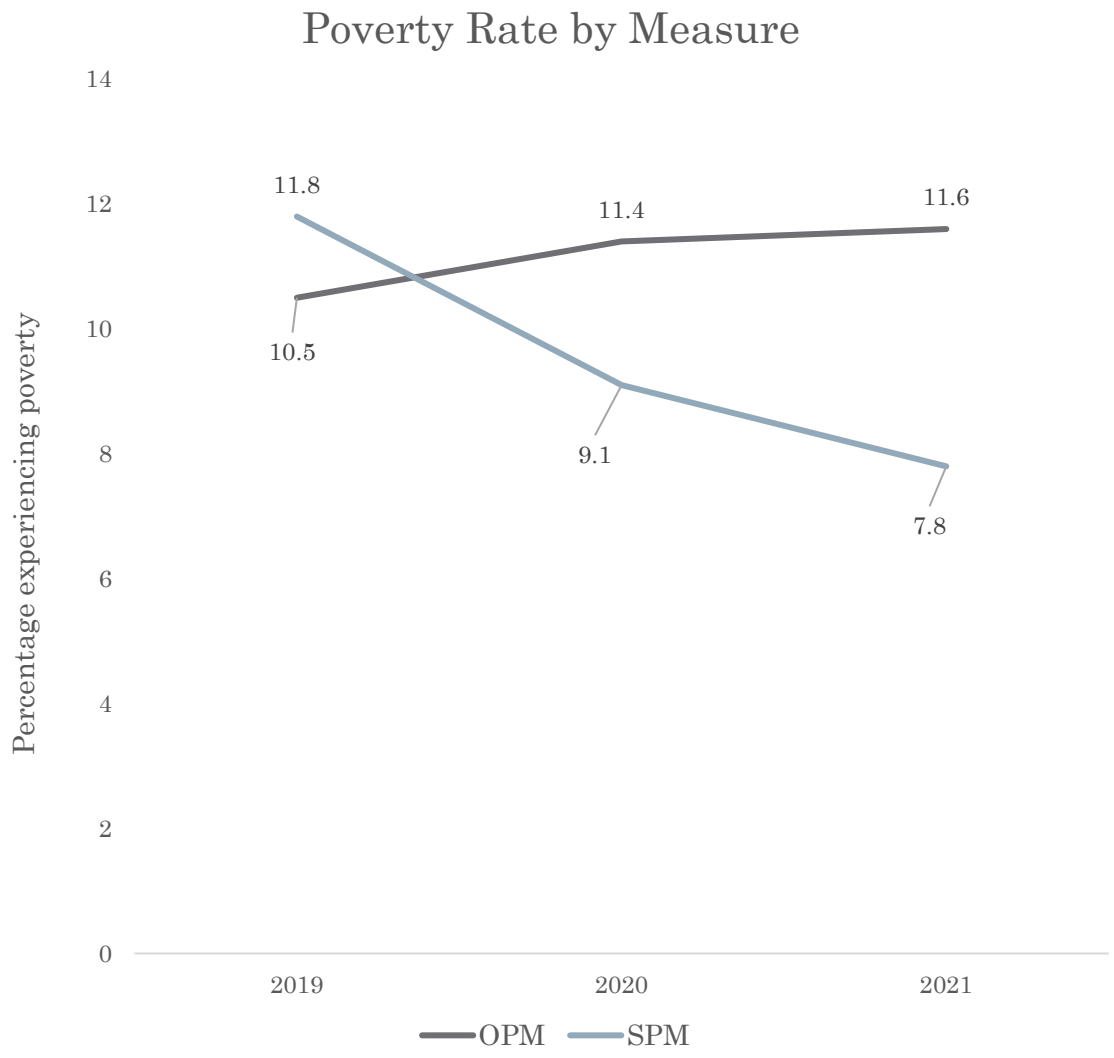
Alternative approaches

How else can we measure if a household has enough resources to meet its needs?

Measures that do not rely on income:

- Consumption & Expenditures (Meyer & Sullivan, 2012, 2018)
  - Households may pull on savings or other resources to smooth spending
  - Similar to some international approaches
- Wealth (Brandolini et al., 2010; Gibson-Davis et al., 2021, 2023)
  - Ability to withstand shocks
  - Reduced financial pressure & stress

Contradictory trends



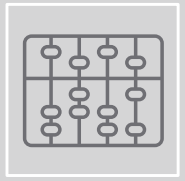
Poverty & Wellbeing

- The relationship between economic deprivation & wellbeing is a classic social science finding (Brady et al., 2023; Angel, 2016; Chetty et al., 2016; Link & Phelan, 1995).
- Yet, social science focuses more often on the consequences of poverty than on its measurement (Smeeding, 2016).
- Different poverty measures capture different portions of the population who are deprived in different ways.
- If we conceptualize poverty as a shortfall of resources compared to needs, then poverty should be reflected in individuals' and households' wellbeing.

Can we learn about the quality of poverty measures by examining which poverty measures most strongly predict wellbeing?

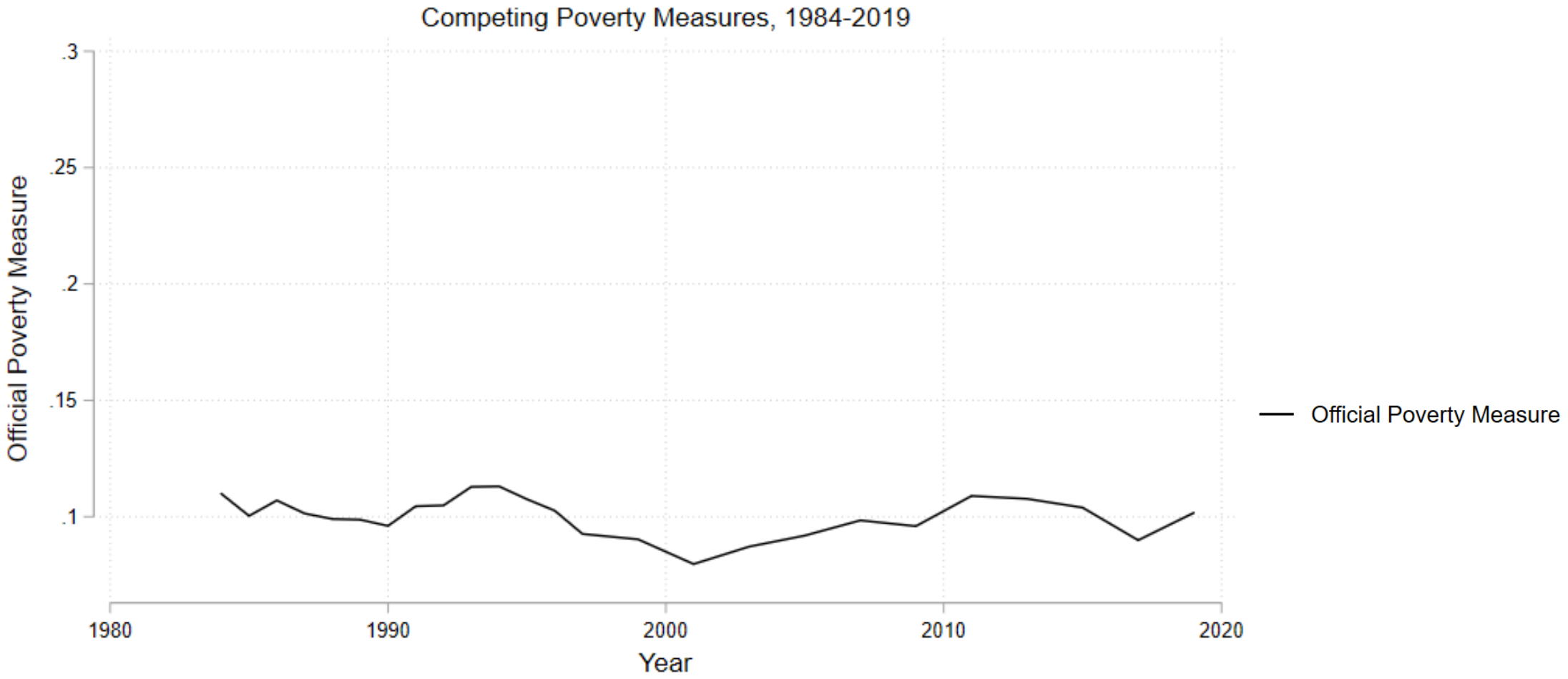
Research Question: Are these measures meaningfully distinct? Which measures best predict different elements of wellbeing?

Data: The Panel Study of Income Dynamics (PSID) supplemented with improved income (+ tax and transfer) data from the Cross-National Equivalent File (CNEF), 1984-2019.



Methods: Three-way (person, age, wave) fixed effects.

Poverty Measure	Resources & Characteristics Considered	Creators/Users
Official Poverty Measure (quasi)	Pre-tax **income,** household composition.	Census/BLS, commonly used for program eligibility
Supplemental Poverty Measure (quasi)	**Income**, taxes, transfers, program receipt. Household composition, rent or own. Adjustment by region, urbanicity, & more.	Census/BLS
Relative Poverty Measure	**Income**, taxes, transfers, household composition. 50% of the U.S. median income.	Common in Europe & among poverty researchers
Anchored Poverty Measure	**Income**, taxes, transfers, household composition. Relative poverty threshold in a set year (1984), then adjusted for inflation.	Common in Europe & among poverty researchers


Competing Poverty Measures, 1984-2019
Official Poverty Measure
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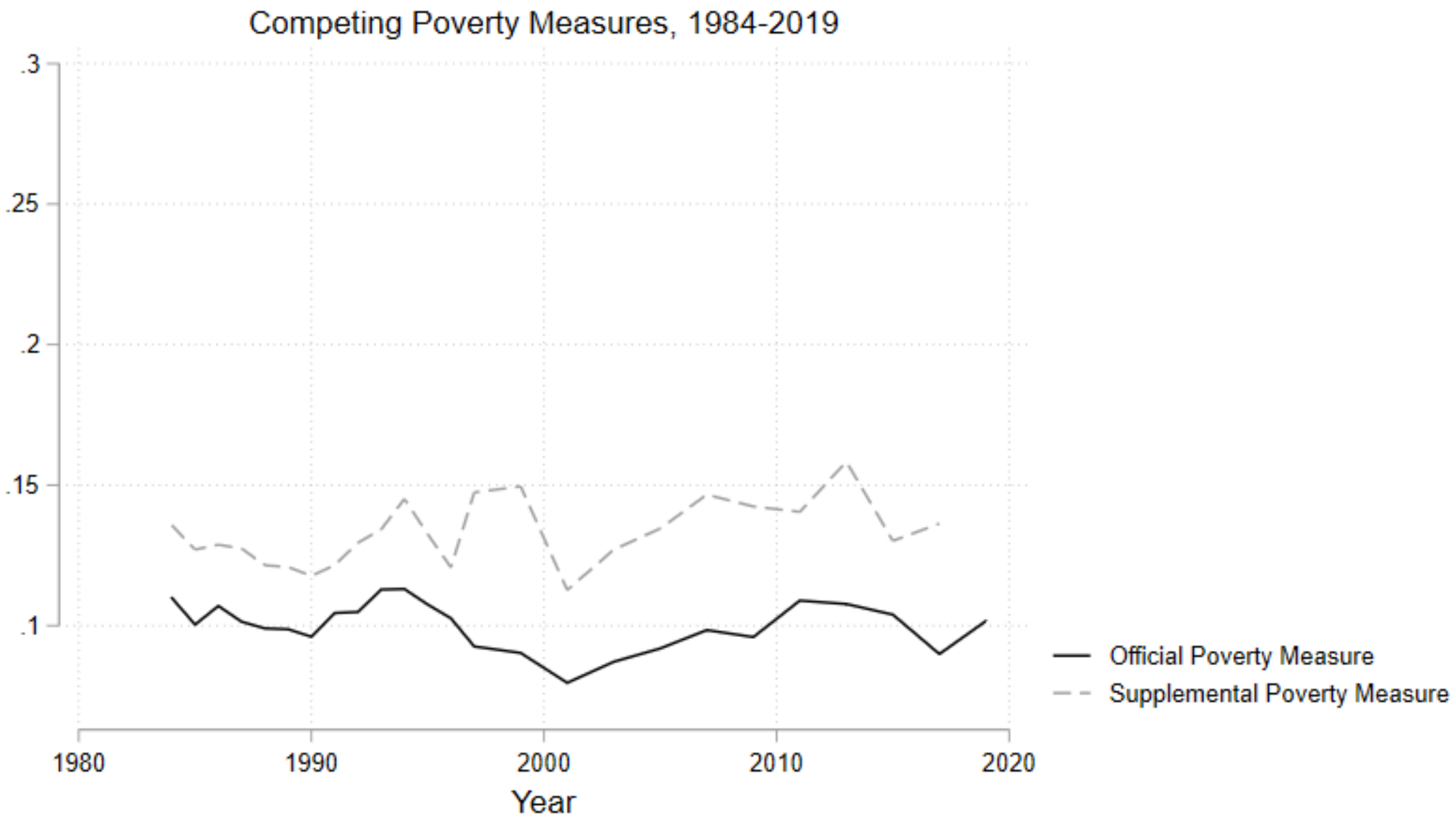
Official Poverty Measure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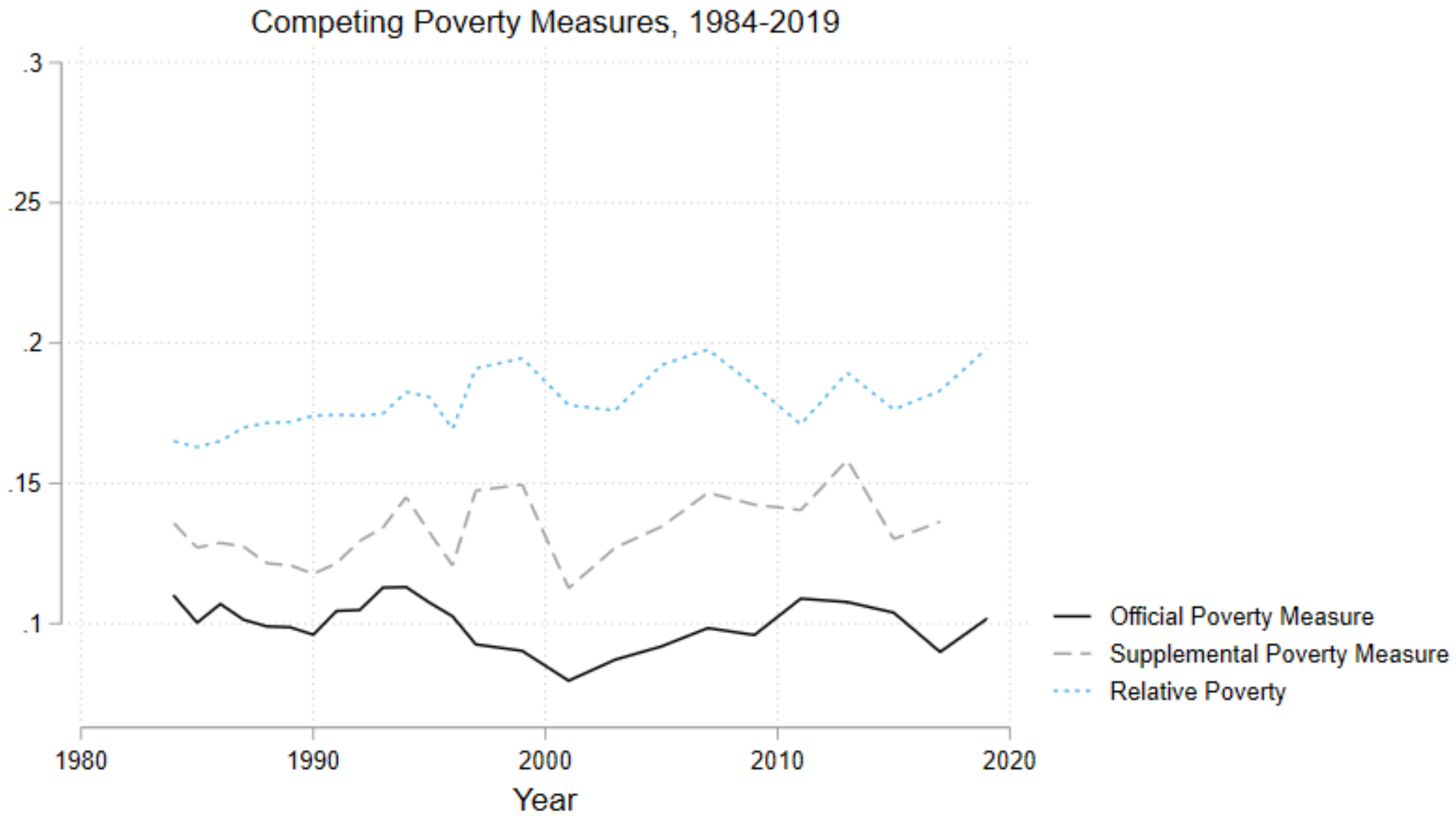
Supplemental Poverty Measure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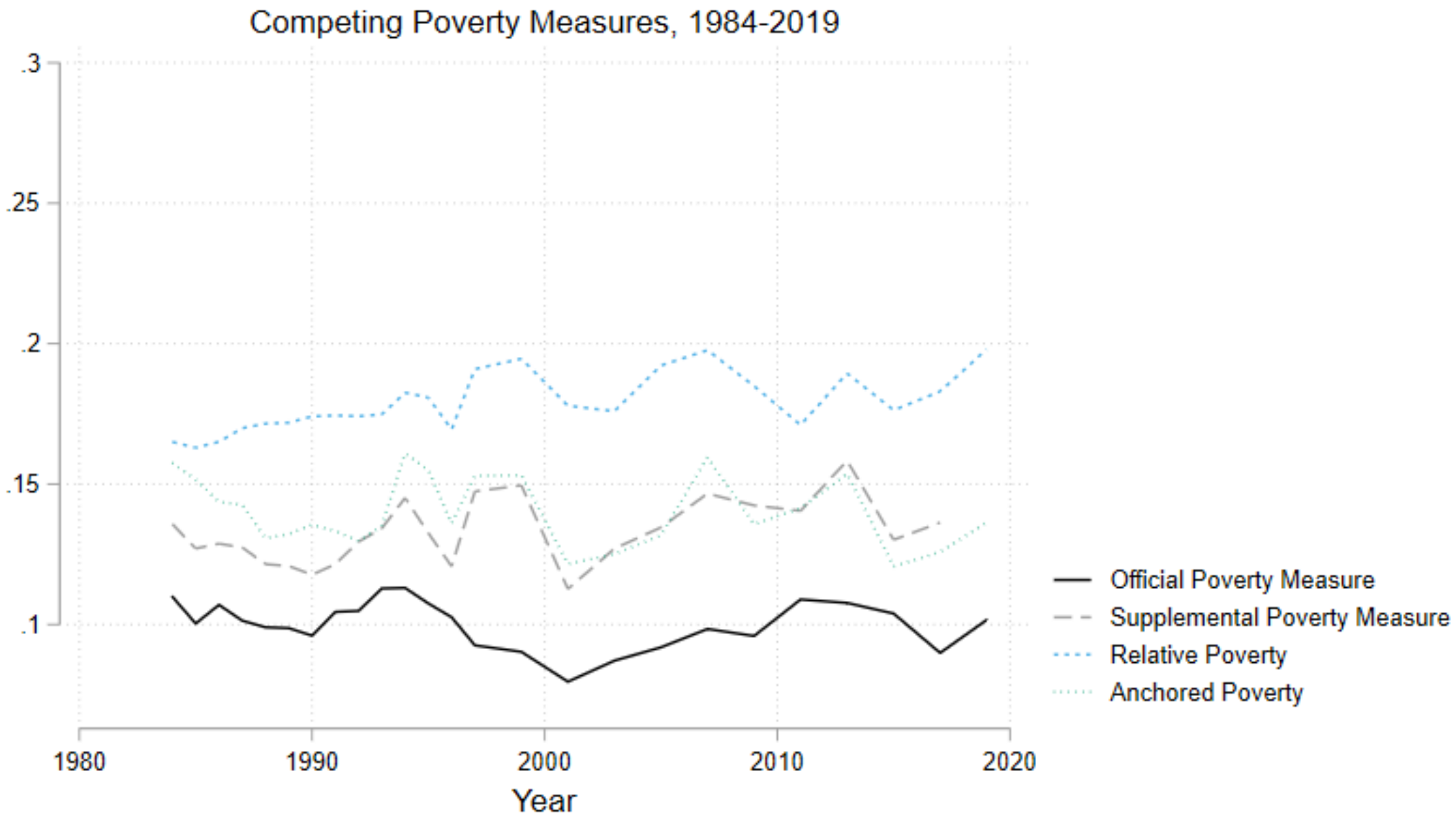
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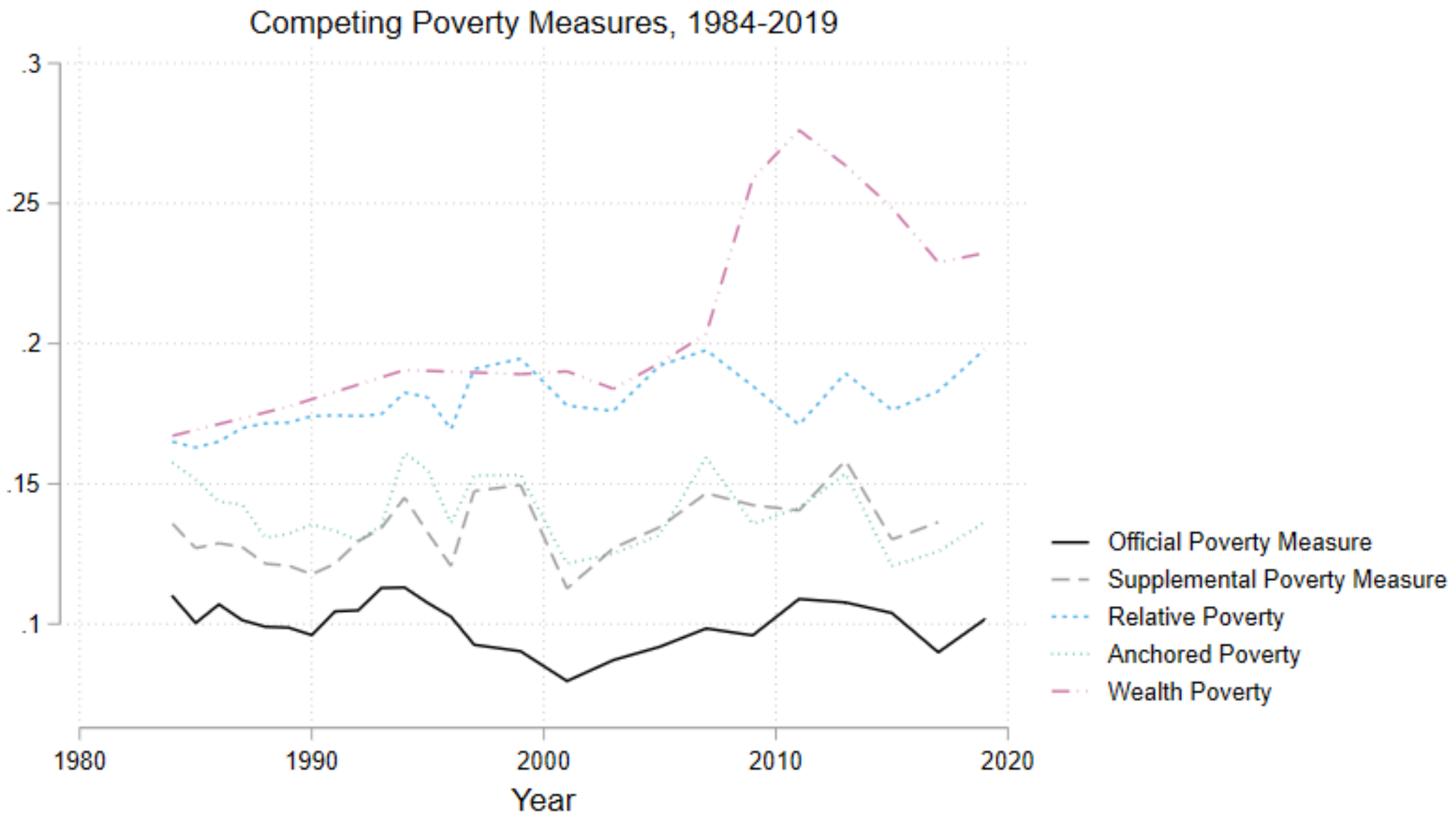
Relative Poverty
Anchored Poverty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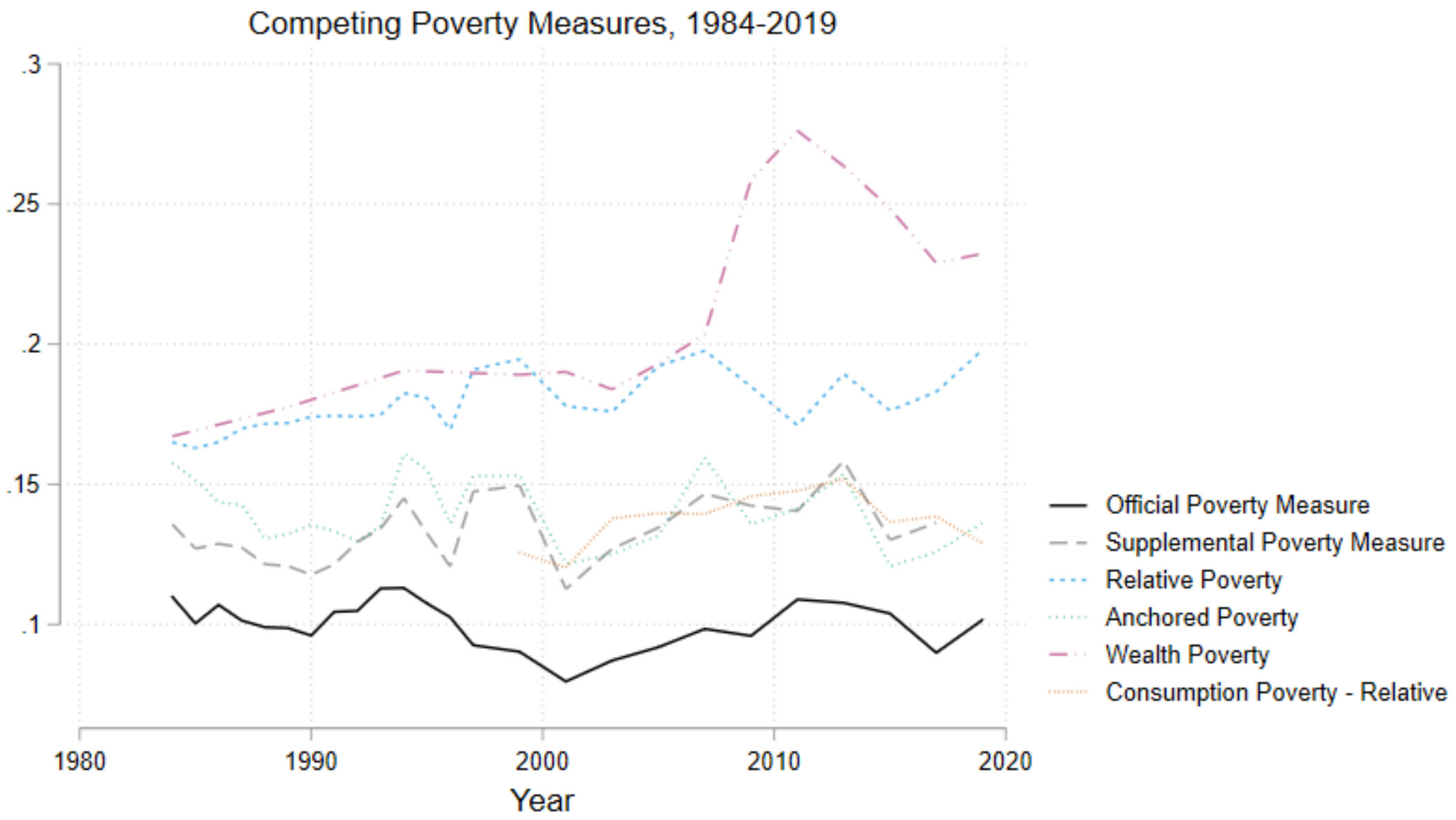
Year
Official Poverty Measure
Supplemental Poverty Measure
Relative Poverty
Anchored Poverty
Wealth Poverty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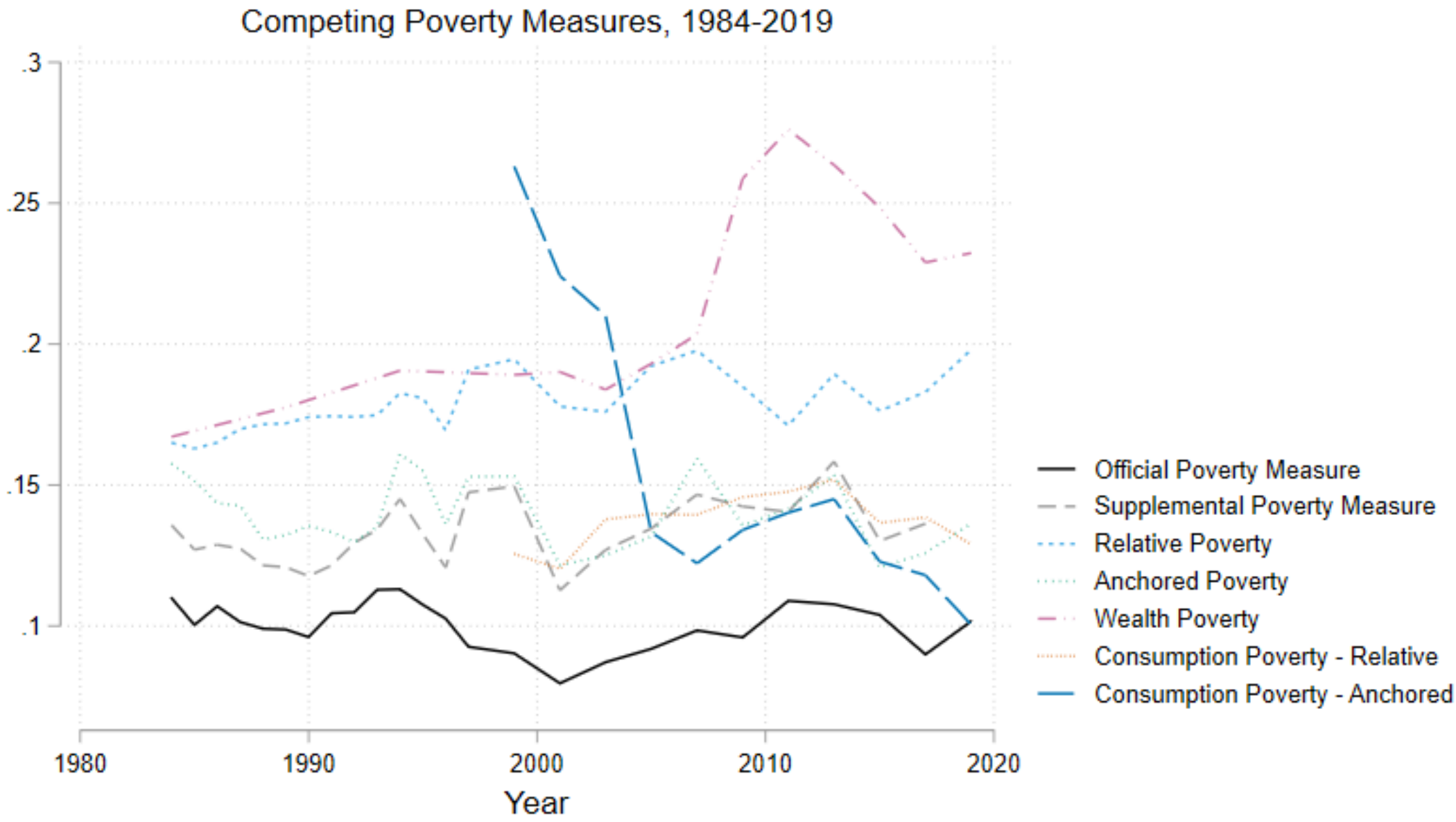
Official Poverty Measure
Supplemental Poverty Measure
Relative Poverty
Anchored Poverty
Wealth Poverty
Consumption Poverty - Relative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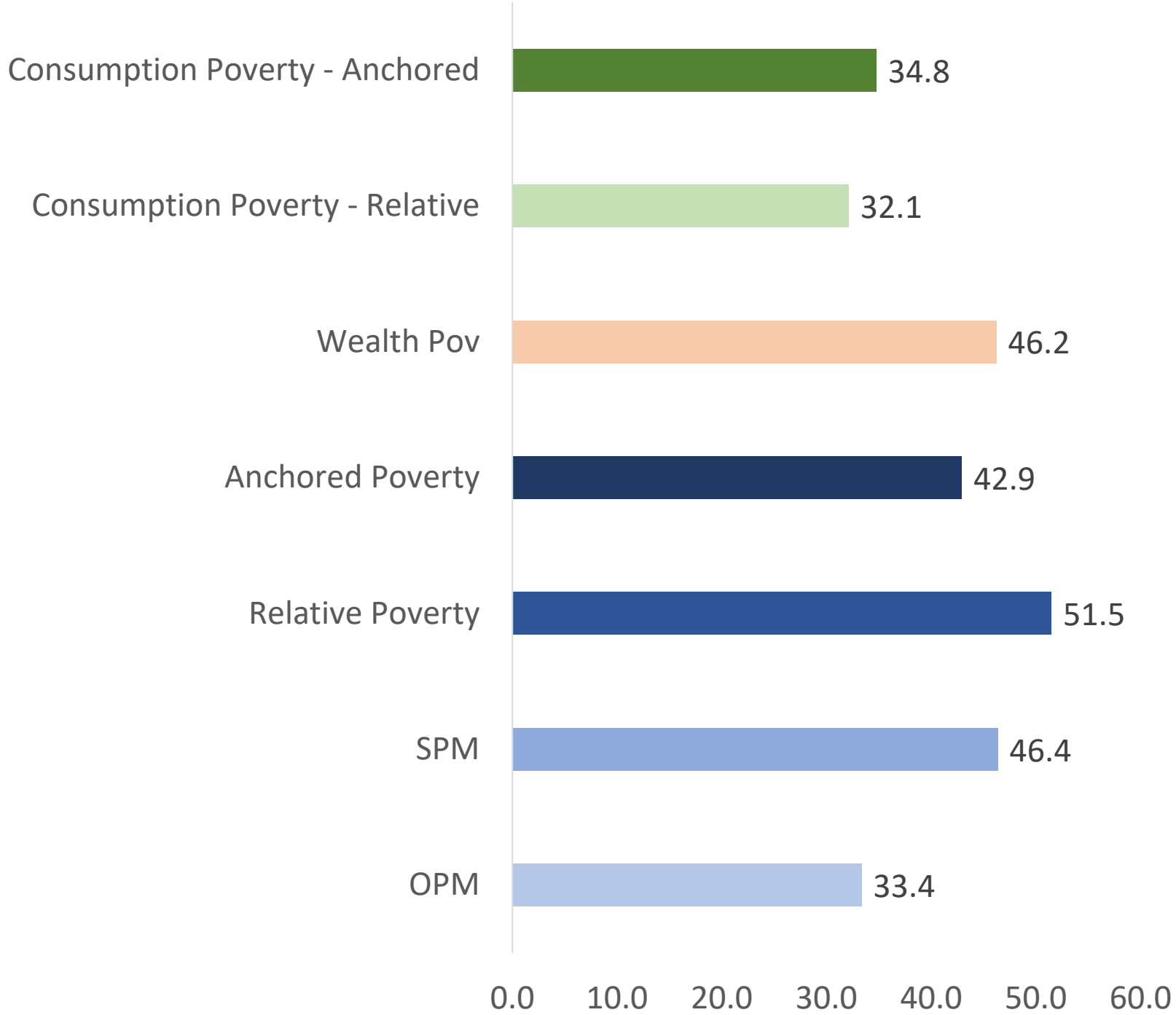
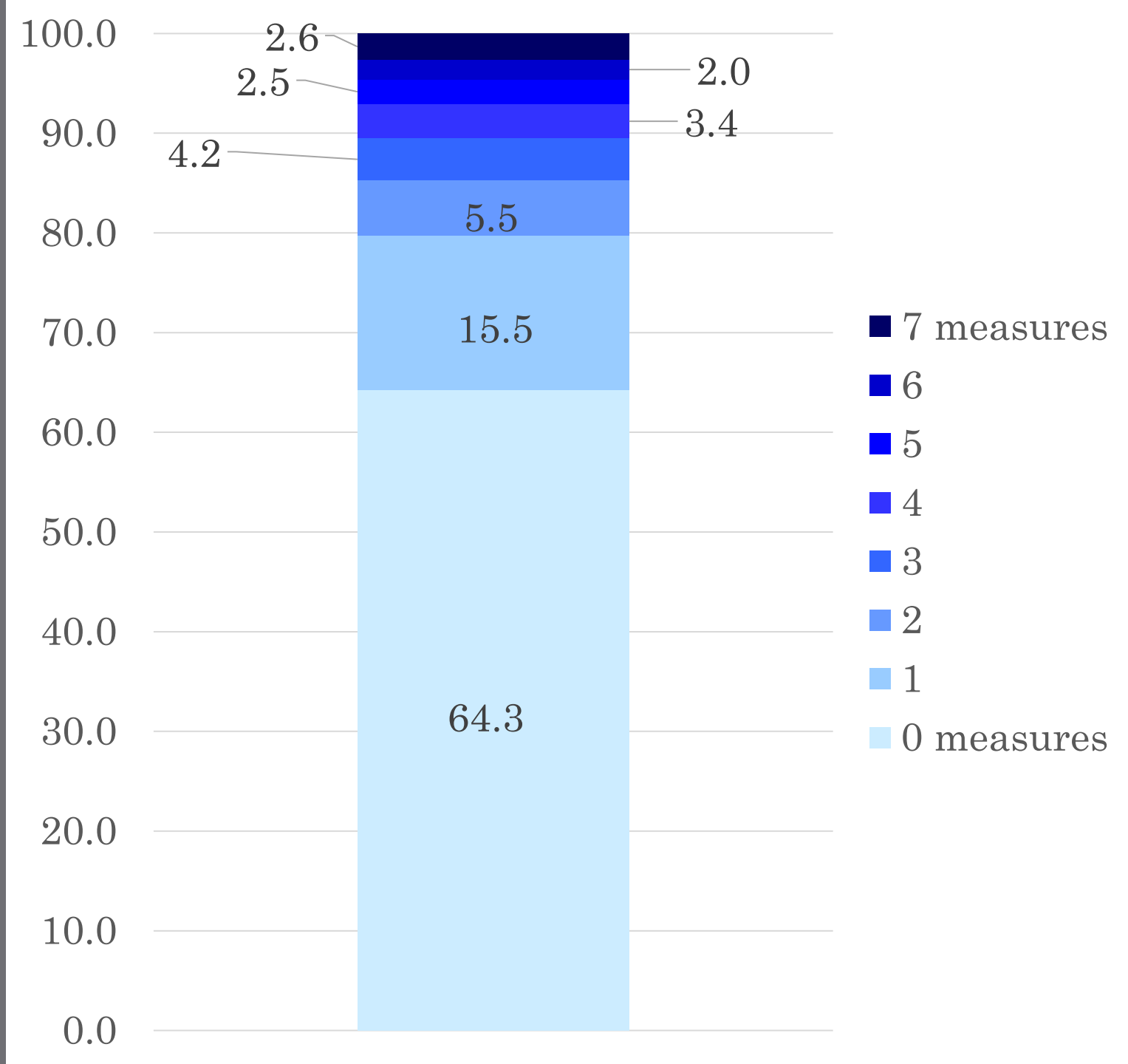
Year
Official Poverty Measure
Supplemental Poverty Measure
Relative Poverty
Anchored Poverty
Wealth Poverty
Consumption Poverty - Relative
Consumption Poverty - Anchored

Wellbeing Measure	Definition	Years available
Self-rated health	5-category measure from 1(poor) to 5(excellent)	1984-2019
Life Satisfaction	5-category measure ranging from 1(not at all satisfied) to 5(completely satisfied)	2009-2019
Psychological Distress (Kessler-6)	Score of 0-24; higher values represent more distress	2001-2003; 2007-2019
Chronic Conditions	A count of the following conditions; asthma, blood pressure, cancer, diabetes, arthritis, lung disease, heart disease	1999-2019
Food Insecurity	USDA Food Insecurity module, scored according to USDA guidelines. Scale ranges from 0-9	1999-2003; 2015-2019



Percentage ever considered poor

Overlap of poverty measures



Methods

How to compare measures?

I compare all measures against each other. I compare two measures at a time in the same model; coefficients for poverty measures are compared using a Wald test.

For a given outcome, I consider a measure better if it has a statistically significantly larger coefficient.

Methods

I use three-way fixed effects regression, fixing for individuals i, age categories j, and survey waves t;

$$Y_{ijt} = \beta_0 + \beta OPM_{ijt} + \beta Poverty_{ijt} + \beta P_i + \beta Z_j + \beta W_t + \beta X_{ijt} + \epsilon_{ijt}$$

The individual fixed effects absorb individuals' stable unobserved characteristics, age categories absorb age differences, and survey wave fixed effects absorb population-wide changes over time.

I also control for characteristics (X) that may vary over time, such as household size, education, marital status, and region.

Outcomes are standardized (i.e. a standard deviation change in Y).

Methods

This will result in a lot of comparisons!

7 choose 2 poverty measures = 21 combinations

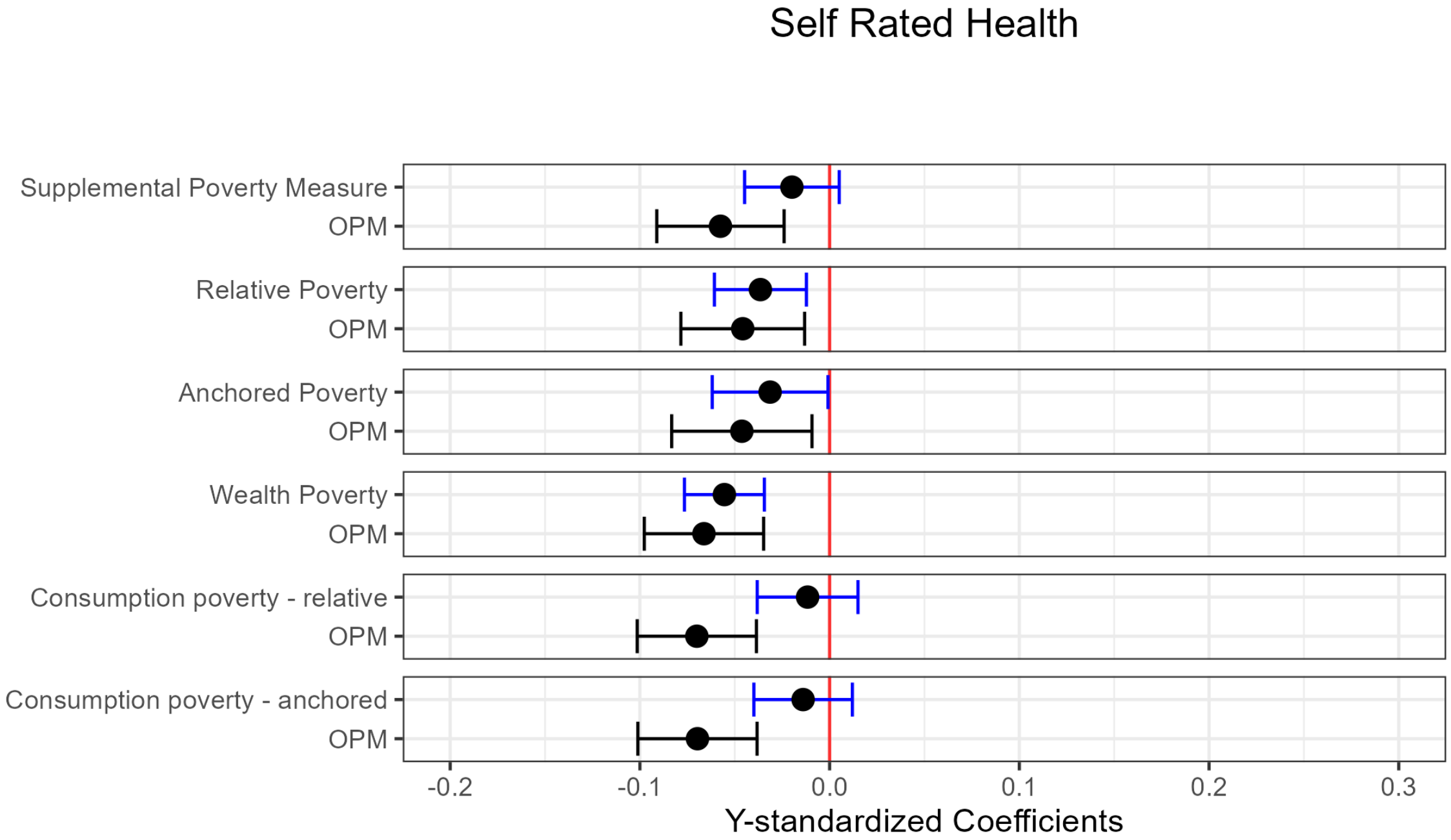
X 5 outcomes = 105 regressions

Methods

Those regressions will be summarized in this table. Each cell reflects 6 regressions. The cell contains a count of how many times that measure 'wins' against the others.

	Self Rated Health	**Food Insecurity**	**Life Satisfaction**	**Psychological Distress**	**Chronic conditions (N)**	***Total***
Official Poverty Measure						
Supplemental Poverty Measure						
Relative Poverty Measure						
Anchored Poverty Measure						
Wealth Poverty Measure						
Consumption Poverty Measure – Relative						
Consumption Poverty Measure – Anchored						

Results


Self Rated Health
Supplemental Poverty Measure
OPM
Relative Poverty
OPM
Anchored Poverty
OPM
Wealth Poverty
OPM
Consumption poverty - relative
OPM
Consumption poverty - anchored
OPM
-0.2
-0.1
0.0
0.1
0.2
0.3
Y-standardized Coefficients

Results

	Self Rated Health	Food Insecurity	Life Satisfaction	Psychological Distress	Chronic conditions (N)	*Total*
Official Poverty Measure	2	1	0	2	2	*7*
Supplemental Poverty Measure	0	0	0	2	2	*4*
Relative Poverty Measure	2	5	0	2	1	*10*
Anchored Poverty Measure	1	2	1	2	2	*8*
Wealth Poverty Measure	2	3	3	2	0	*10*
Consumption Poverty Measure – Relative	0	1	1	0	1	*3*
Consumption Poverty Measure – Anchored	0	0	0	0	2	*2*

Results

- Relative Poverty, Wealth Poverty, and Anchored Poverty perform quite well
- OPM also performs better than expected
- SPM does not ‘win’ often, despite being the only one adjusting by region.
- Consumption poverty performs poorly

Limitations

- Conflation of type of poverty and depth
  - Though this reflects how these measure are actually used

Thank you!

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Table 5. Correlation matrix of Poverty Measures

	OPM	SPM	Relative Poverty	Anchored Poverty	Wealth Poverty	Consumption – Relative	Consumption - Anchored
OPM	1.00						
SPM	0.63	1.00					
Relative Poverty	0.68	0.60	1.00				
Anchored Poverty	0.77	0.67	0.81	1.00			
Wealth Poverty	0.29	0.29	0.31	0.28	1.00		
Consumption – Relative	0.43	0.39	0.46	0.43	0.28	1.00	
Consumption – Anchored	0.41	0.37	0.43	0.40	0.26	0.82	1.00

Percent poor by education level