Matthew Unrath
matthew.unrath@census.gov
Chief, Income Statistics Branch
Social, Economic and Housing Statistics Division
U.S. Census Bureau

Committee Members:

Please accept my application for the Robert Summers Economic Measurement Fellowship opportunity offered by the National Bureau of Economic Research (NBER) and the Conference on Research on Income and Wealth (CRIW). I currently serve as the Chief of the Income Statistics Branch (ISB) in the Social, Economic and Housing Statistics Division (SEHSD) at the U.S. Census Bureau. I am at the start of my career at Census, but I have already taken the lead on several internal projects related to improving income measurement and I believe I would particularly benefit from this opportunity to interact with fellow experts, expand my professional network, and improve my understanding of frontier issues in economic measurement.

The attached summary of my research attests to my ongoing work related to income measurement. This work extends back to my graduate work at UC Berkeley, where I initiated an unprecedented match between social service and state tax data to measure take-up of the Earned Income Tax Credit (EITC). At Census, I have played a key role in the National Experimental Well-Being Statistics (NEWS) project, spearheaded by Jonathan Rothbaum and other Census staff. I've also undertaken my own research related to improving income measurement, including probing assumptions of our internal microsimulation tax model, which plays an important role in producing Census's official after-tax income and poverty statistics. I'll present this paper at the joint Census-IRS Workshop on Income Measurement this month. Finally, I led the Census Bureau's work to transition to using a chained price index to inflation adjust historical income estimates, which entailed authoring a working paper, posting a Federal Register Notice, and presenting on this issue to researchers and key stakeholders.

I'm also a part of a small team of researchers at Census who have access to an unprecedented array of IRS data. We are systematically cleaning these tax filings and information returns and matching them at the individual-level to the American Community Survey (ACS) in order to improve income measurement in that survey. Of course, I also serve as the Chief of the Income Statistics Branch, which means I oversee data review of all income-related content in the ACS and the Current Population Survey Social and Economic Supplement (CPS ASEC) and production of our official Income report every year. As the ultimate subject matter expert on income statistics, I'm responsible for communicating with numerous federal, state and local agencies who rely on our data, as well as international organizations (including the OECD), who ask for our data to produce comparative statistics.

I am particularly excited about my involvement in the NEWS project at Census, and I look forward to playing an important role in that initiative and being a leader on incorporating administrative records into official income statistics at Census for many years to come. Participation at CRIW meeting this summer, having the opportunity to meet with national experts and fellow researchers on these questions, and potentially present my research is an exciting opportunity to jumpstart my leadership on these issues.

Thank you for your consideration of my application.

Best,
Matthew Unrath

The following document summarizes three research papers I have authored or co-authored that are examples of my work and expertise relatedy to economic measurement. My cover letter also speaks to the other research in which I've been involved related to income measurement.

1. **National Experimental Wellbeing Statistics**

with Adam Bee, Joshua Mitchell, Nikolas Mittag, Jonathan Rothbaum, Carl Sanders, and Lawrence Schmidt

Accurately measuring household income and poverty is essential to understanding the nation's overall economic wellbeing. Many studies show that measurement error stemming from unit nonresponse, item nonresponse and misreporting biases key official statistics such as mean or median income and the official poverty rate. The direction of bias differs between these sources of measurement error. Unit and item nonresponse have been found to bias income up and poverty down (Rothbaum et al., 2021; Rothbaum and Bee, 2022; Bollinger et al., 2018; Hokayem, Raghunathan and Rothbaum, 2022), while misreporting can bias income down and poverty up (Bee and Mitchell, 2017; Meyer et al., 2021b; Larrimore, Mortenson and Splinter, 2020). Since these error components are typically studied in isolation, their overall impact on the accuracy of survey estimates remains unclear. This paper summarizes the National Experimental Wellbeing Statistics (NEWS) Project, which integrates this research and address each of these sources of bias simultaneously in order to produce more accurate estimates of household income and poverty. The NEWS project makes three unique contributions. First, we address as many sources of measurement error as we can simultaneously – including unit and item nonresponse and underreporting in surveys as well as the various challenges in administrative data such as measurement error, conceptual misalignment, and incomplete coverage. Second, we bring together all of the available survey and administrative data, which allows to address many of the shortcomings of individual data sources. Third, we propose a model to combine survey and administrative earnings data given measurement error in both sources, replacing ad hoc assumptions that have been used in prior work.

2. **Measuring Take-up of the California EITC with State Administrative Data**

with John Iselin and Taylor Mackay
Revised and Resubmit at *Journal of Public Economics*

The Earned Income Tax Credit (EITC) is the country's largest cash-based means-tested transfer program, delivering $63 billion to 25 million households in 2019. Twenty-eight states supplement the federal credit. Though an estimated one-fifth of eligible households fail to claim the federal credit, little is known about take-up of these state supplements. We use administrative data from California on the population of Supplemental Nutrition Assistance Program (SNAP) recipients, linked to state tax records, to estimate the number of households who are eligible for California's supplement to the federal EITC but do not claim it. We find that nearly half a million households who receive SNAP benefits and who were eligible for the state EITC in 2017 did not receive the credit. This includes approximately 42,000 eligible households who claimed the federal EITC but not the state credit; 110,000 eligible households who filed a state tax return but did not claim the state credit; and 290,000 eligible households who did not file a state tax return. The corresponding take-up rate for the CalEITC among eligible SNAP-enrolled households was 54%. Altogether, these households left on the table a total of $75 million in state EITC funds. If received, these credits would have increased incomes among these households by 2.6% and increased total state EITC outlays by 38.8%

3. **Married… With Children?: Assessing Alignment Between Tax Units and Survey Households**

The Census Bureau's official income and poverty estimates are based on responses to the Current Population Survey Annual Social and Economic Supplement (CPS ASEC). The CPS ASEC does not collect tax information, so the Census Bureau relies on an in-house microsimulation tax program to predict individuals' filing behavior and estimate their tax liabilities. The Census Bureau uses these modeled estimates to produce after-tax income and Supplemental Poverty Measure (SPM) estimates. The process of transforming survey variables into inputs appropriate for a tax model, however, is not straightforward. CPS ASEC questions related to income and expenses do not necessarily map onto the US tax code's definitions of income and

deductions, actual tax liabilities are a function of many more items than what can be captured in a single survey, and it's not always clear how survey households divide into tax units. The assumptions built into the CPS ASEC tax model to handle these issues are likely imperfect but have received limited study.

In this paper, I study the initial step of the CPS ASEC tax model: the construction of tax units from survey households. CPS ASEC respondents are not asked if they filed a tax return for the prior income year nor, if they did, with whom they filed a return. Misassigning a tax unit's filing status or number of dependents can have an important impact on estimates of tax liability. Using linked survey and tax data, I document the extent to which the tax units constructed from the CPS ASEC compare to tax unit rosters observed on filed 1040 returns. My primarily analysis entails a person-level match between the CPS ASEC and the 1040s for tax year 2019. To this match, I also add information returns and birth records, which allow me to characterize patterns of misalignment by income, age, and parent/child relationships.

I document non-trivial disagreement between CPS ASEC tax units and 1040 rosters. Less than 60 percent of CPS ASEC tax units are exactly reflected on their counterpart 1040 return. Among CPS ASEC tax units in which the tax unit head can be matched to a 1040, over 30 percent were assigned a different filing status than what's listed on their 1040, and more than 20 percent were assigned a different number of dependents than the number claimed on the tax unit head's actual return. Among CPS ASEC children who can be matched to a 1040, 13 percent were claimed by someone other than whom the CPS ASEC tax model predicted would claim them. Non-claiming and misassignment are more common among lower-income households.[1] Despite these differences, reassigning dependent does not yield a statistically significant change in estimates of average and median after-tax income. More reassignments among lower-income households might imply larger impacts on poverty estimates.

4. Alternative Inflation Indices for Adjusting Historical Income Estimates from the CPS ASEC
with Jessica Semega and Melissa Kollar

In its annual report Income and Poverty in the United States, the U.S. Census Bureau presents historical income and earnings statistics that are adjusted for inflation. A variety of price indices produced by federal statistical agencies are available for this adjustment. Currently, the income and earnings series are adjusted using derivations of the Consumer Price Index for All Urban Consumers (CPI-U), including the CPI-U Research Series (R-CPI-U-RS), produced by the U.S. Bureau of Labor Statistics. However, the CPI-U might overstate the real change in the cost of living because it does not fully account for consumer substitution among goods and services as relative prices change. Chained price indices address this potential bias. This paper documents the implications of using such indices to adjust income and earnings based on suggestions by a recent Interagency Technical Working Group on Consumer Inflation Measures. This paper compares the use of two alternative inflation series -- the Chained Consumer Price Index for all Urban Consumers (C-CPI-U) produced by the Bureau of Labor Statistics and the Personal Consumption Expenditures Price Index (PCEPI) produced by the Bureau of Economic Analysis -- to the current method to understand the impact on historical median income and earnings dating back to 1967. Using the combined C-CPI-U and PCEPI measure, inflation-adjusted median household income increased approximately 45 percent between 1970 and 2020, compared to 30 percent according to the current method. Inflation-adjusted median earnings for full-time, year-round workers increased 32 percent between 1974 and 2020 using the chained measures as compared to 18 percent using the current method. There were no statistically significant differences in inflation-adjusted annual median household income or earnings growth among full-time, year-round workers using the chained measures compared to the current method between 2015 to 2020.

[1] These results are limited to children who could possibly have been linked to a 1040, meaning they had a valid Personal Identification Key (PIK). Missing PIKs is more common among children from lower income families, however, suggesting that these results might be a lower bound on the share unclaimed and misassigned.