

Measuring the Dollar Value of Employer-Provided Health Insurance Contribution: A Synthetic Approach

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MOTIVATION

- A measure of the annual employer contribution to the health insurance premium (EC-HIP) allows for the estimation of trends in cost shifting between employers and employees.^{1,2}
- The existing Current Population Survey Annual Social and Economic Supplement (CPS ASEC) estimate, modeled using 1977 data, substantially underestimates EC-HIP.³
- In 2013, census researchers combined microdata from the 2010 Medical Expenditure Panel Survey Insurance Component (MEPS-IC) and the 2011 CPS ASEC, improving measure accuracy.³
 - However, restricted-use MEPS-IC microdata are not available in time for use in the annual CPS ASEC microdata release.

Objective: To create a new model-based (synthetic) estimate of EC-HIP in the CPS ASEC, using timely publicly available aggregate data.

DATA and METHODS

Analyses use data from the 2011 CPS ASEC and the 2010 MEPS-IC. Data for both surveys correspond to estimates from 2010.

- Analyses were limited to policyholders for employer-sponsored health insurance coverage plans, who worked for pay at a private firm during the calendar year (unweighted $n=35,897$; weighted $n = 55,266,882$).

Methods

We treat the EC-HIP estimates in publicly available aggregate MEPS-IC data as priors and update them with existing EC-HIP values from individual-level CPS ASEC data. To do so, we employ a three-step process, estimated separately for single (41.9%), plus-one (3.8%), and family (54.4%) plans:

- Restrict CPS ASEC data to individuals who report that their employer pays "some" or "all" of a premium.
- Use the aggregate tables to construct priors. Specifically, using CPS ASEC data, regress the existing employer contribution (measured in dollars) on 45 indicators of industry-by-firm size, using MEPS-IC means as priors for the coefficients on these indicators:

$$B_{i,f} \sim \text{Poisson}(m_{i,f}^{\text{MEPS-IC}})$$

for CPS respondents in industry i and firm size f .

- Draw EC-HIP values from the posterior predicted distribution.

RESULTS

Overall, the synthetic measure appears to make progress towards addressing the documented underestimate of employer contributions in the CPS ASEC. Our mean employer contribution values are higher than the current 2011 CPS ASEC values and lower than the MEPS-IC microdata-based benchmarks. Median values are also higher with our aggregate-based approach than in the current version. (Medians for the MEPS-IC microdata-based benchmark were unavailable.)

FIGURE 1. Comparison of Mean and Median Employer Contribution, by Method and Plan Type

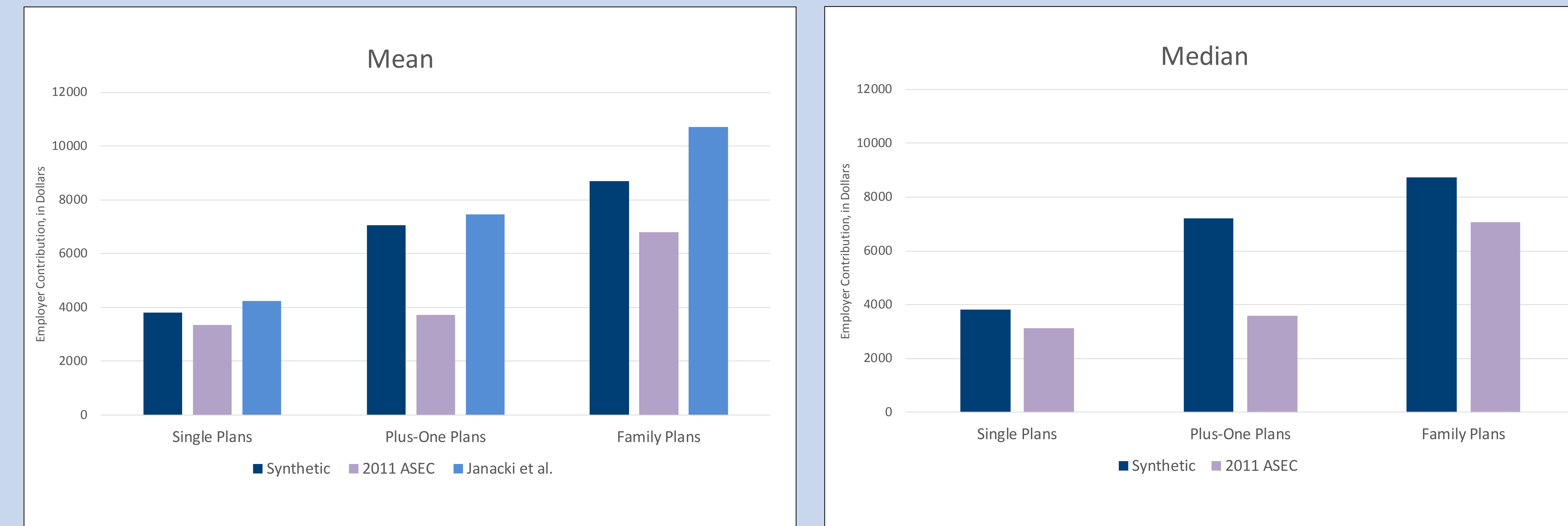
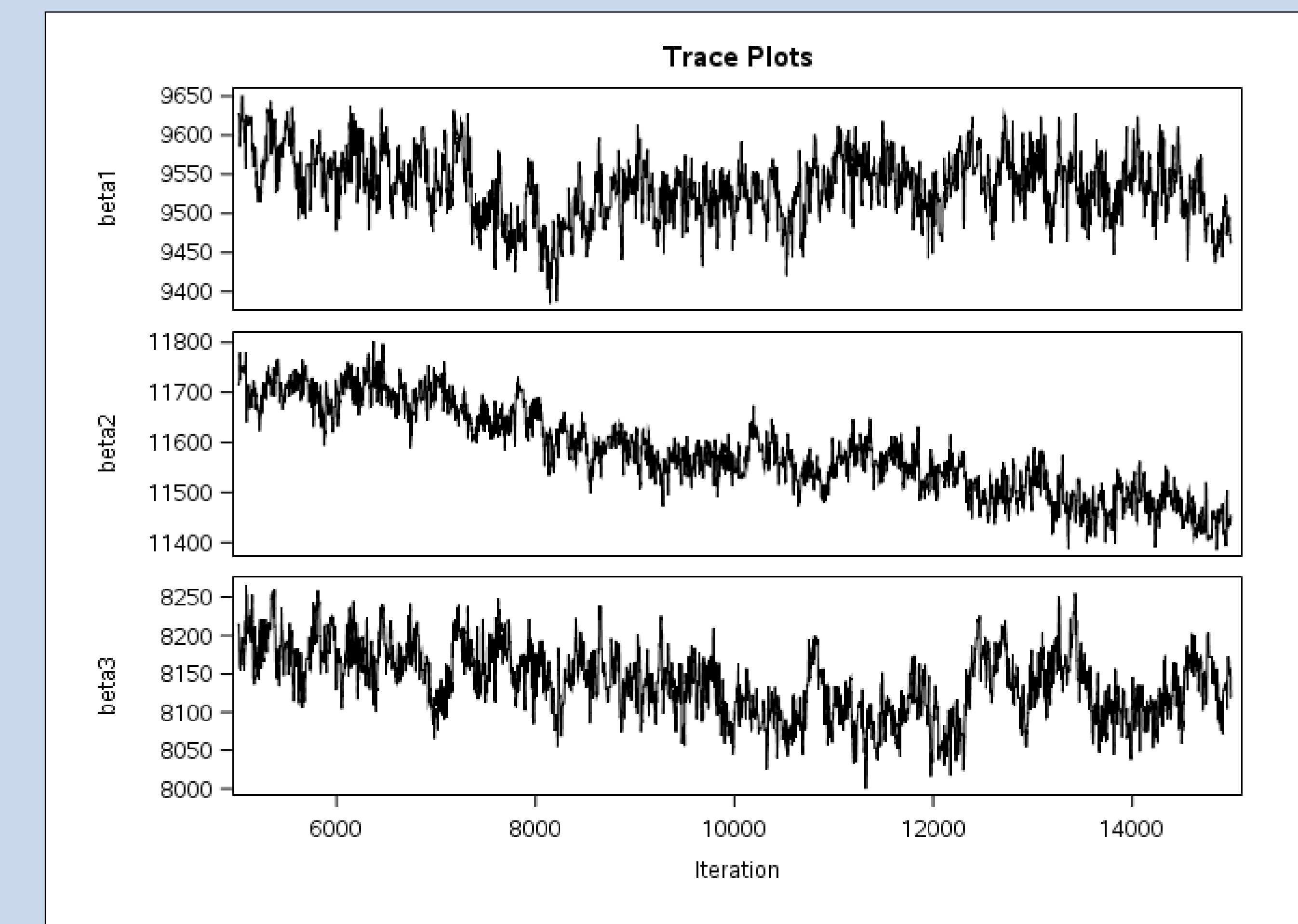


FIGURE 2. Trace Plot for Selected Parameters



However, this model still needs additional refinement. Due to the magnitude of the EC-HIP underestimate in the CPS ASEC,³ substantial autocorrelation remains after 10,000 iterations (excluding a 5,000 iteration burn-in period). The trace plot on the right suggests that some of the parameters in the model have not converged.

The approach offered here is a first step in finding a way to use aggregate, benchmark data to improve the measure in a household-based survey.

DISCUSSION

- We adopt a Bayesian perspective and combine current data processing approaches with a post hoc approach that uses publicly available and timely aggregate data.
- The aggregate-data-based synthetic measure partially offsets the current underestimate, highlighting the viability of using other data sources to improve estimates even without access to restricted-use data.
- Additional research is necessary to improve the model.

NEXT STEPS

- Investigate alternative priors.
 - Potentially draw from other data sources or published estimates from Janicki and colleagues' analyses.³
- Expand models to enable the inclusion of government employees (excluded from present analysis).
- Examine variation across demographic and socioeconomic characteristics to see how the synthetic measure compares to benchmarks across key populations.
- Use reprocessed 2014 CPS ASEC data, as premiums estimates from these data are closer to MEPS-IC benchmarks (see Jackson and O'Hara's 2017 APPAM presentation).
- Apply the method for other survey years to measure trends in cost shifting.

REFERENCES

- Congressional Budget Office. 2016. "Private Health Insurance Premiums and Federal Policy." Washington, D.C.: United States Congress.
- Cutler, David. 2002. "Employee Costs and the Decline of Health Insurance." NBER Working Paper.
- Janicki, Hubert, Brett O'Hara, and Alice Zawacki. 2013. "Comparing Methods for Imputing Employer Health Insurance Contributions in the Current Population Survey." Joint Statistical Meetings' Proceedings, Government Statistics Section: 1061-1075.

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