Washington Statistical Society Seminar

Title: Designing an Economy-Wide Survey to Produce Accurate Estimates at Varying Levels: The Annual Integrated Economic Survey
Speakers: Stephen Kaputa and Colt Viehdorfer, U. S. Census Bureau
Chair: Pushpal Mukhopadhyay, U. S. Energy Information Administration
Date: January 23, 2025
Time: 3:00 – 4:00 PM EST

Abstract:
In 2024, the Economic Directorate of the U.S. Census Bureau introduced the Annual Integrated Economic Survey (AIES), an economy-wide survey that replaces a suite of seven independently designed ongoing surveys. Integrating these surveys was a recommendation from a panel of international experts convened by the National Academies of Sciences to address the need for timely and granular annual economic data.

The presentation opens by introducing the AIES sampling design and estimator, then focuses on the variance estimation for this unequal probability cluster sample selected via sequential random sampling (Chromy sampling). We briefly go over the different approaches to variance estimation methods considered, specifically approximate sampling formula estimation and replication (bootstrap) and present selected results from a simulation study conducted to evaluate the performance of each method.

We conclude with a discussion of the use of small area methodology to produce state-level estimates. The AIES survey is designed to produce national detailed industry estimates and limited industry-by-state estimates; however, the sampling strata definitions and allocations generally do not permit accurate estimates at the sub-national publication level. The AIES sampling design accommodates the use of small area estimates for small domains. This research explores the use the Fay-Herriot area-level models, which are fit using design-based domain survey estimates and frame covariates. We will discuss the model selection process which draws from covariates created from historic administrative records and Economic Census data. We conclude with an empirical example for select industries.

About the speakers:
Stephen Kaputa earned his undergraduate and master's degrees in statistics from Virginia Tech. After graduating in 2006, he began his career at the U.S. Census Bureau in the Construction Programs Methodology Branch and then worked as a member of the Complex Survey Methods and Analysis Group in the Economic Statistical Methods Division. While at the Census Bureau, he has had the opportunity to work on many aspects of the survey life cycle, but is most interested in estimation methods, including the use of Bayesian models and third-party data sources. He currently leads the newly created Composite Methods Staff, which specializes in model-based solutions for traditional survey problems. Stephen lives in Alexandria, Virginia, and enjoys a variety of outdoor activities, including sailing, skiing, backpacking, and fly fishing. He is also an avid marathon runner.

Colt Viehdorfer is a mathematical statistician at the U.S. Census Bureau where he is currently focused on developing and implementing the methodology for the new Annual Integrated Economic Survey. Colt has a B.S. in Mathematics from Allegheny College and a Master of Applied Statistics degree from

Pennsylvania State University. He previously worked on construction and manufacturing surveys in the Economic Directorate. Outside of work, Colt enjoys spending time with his wife and two kids, watching Penn State sports, playing the piano, being outdoors, and golfing.

For additional information, please contact Pushpal Mukhopadhyay (pushpalm@gmail.com), WSS Methodology Program Chair.

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