

# Investigating the Imputation of Assets and Liabilities in the CE Interview Survey

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# The Consumer Expenditure Survey (CE) collects information on:

- Expenditures
- Income
- Taxes (income and other)
- Assets and Liabilities



**Nonresponse is a problem for each. However, corrections are in place for most of these items:**

- **Expenditures: Since the 1980s**
- **Income: Since 2004**
- **Taxes (income only): Since 2013**



**Assets and Liabilities are currently under investigation.**



# **Assets and Liabilities**

# Project Overview

- “The purpose of this team is to initiate and conduct a research project designed to impute missing Interview asset and liability data, leveraging models from income imputation and other relevant procedures.”
- “The goal is to implement this into production with 2017 Quarter 2 data.”

Source: Charter for the Asset and Liability Imputation Team, 9-9-2014



# This presentation describes three aspects of the project:

- What asset and liability data are collected?
- What processes have been considered for imputation of missing values?
- What are the next steps in the investigation?

# Asset/Liability Data

## Assets:

- Retirement accounts
- Stocks, bonds, mutual funds
- Checking, savings, money market, CDs
- Whole life insurance
- Other, including annuities, trusts, royalties

## Liabilities:

- Credit cards
- Student loans
- Other loans, including medical and personal

# Collection

- Questions are asked in the final survey (4<sup>th</sup> interview)
- Most are asked in two parts: Did you have \_\_\_\_\_? If yes, how much?
- For some items, only a total value is collected. In these cases, it is not clear whether \$0 means:
  - ▶ No, I did not have such an account or
  - ▶ Yes, I had an account, but it is empty.



# Collection, continued:

- For each asset/liability, the total value/balance/amount owed is collected:
  - ▶ As of today
  - ▶ As of one year ago today
- Bracket questions are asked when the respondent cannot provide a specific value.

# The team considered several methods:

- Survey of Consumer Finance method (multiple imputation, iterative process)
- Regression trees
- Hotdeck

...But none is feasible.

# Going back to the original motivations (charter):

A system based on income imputation processing is being investigated.

- ▶ Regression-based, multiple imputation of each component asset/liability, from which “total change in” values can be derived.
- ▶ For each component, separate models are run for demographic groups across which large variation in parameter estimates is observed or expected.

**For example:**

# Consider IRAX.

- Amount reported when asked: “What is the total value of all retirement accounts such as 401(k)s, IRAs, and Thrift Savings Plans that you or your household own/owns?”
- Expected to vary considerably by age
- Preliminary tests support use of one model for each age group (group 1:  $\text{age} < A$ ; group 2:  $A \leq \text{age} < B$ , etc.)

# Bracket imputation will also be used:

- Respondent identifies range in which asset/liability falls (e.g., less than \$X; \$X to \$Y; etc.)
- Five values are selected based on current methods used in income imputation; each falls within the specified bracket range.
- Open-ended brackets (\$Z or over) also are treated in income imputation

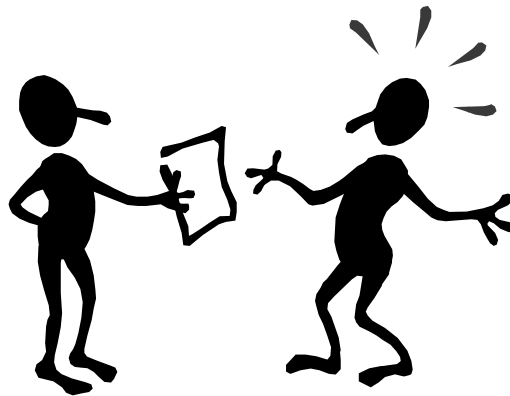
# Related Challenges:

- How to distinguish \$0 meaning no balance from \$0 meaning no account.
- How to identify groups upon which to base models. That is:
  - ▶ Grouping variable: Is IRAX (e.g.) based on age, occupation, or something else?
  - ▶ Variable range: If age, where do the breaks occur—under 35, 35 to 64, 65 and older, or under 25, 25 to 34, etc.?

# Work in progress:

- Identifying groups, and selecting variables to include within each model.
  - ▶ ANOVA/Chow tests have been used so far to test differences/pooling potential across groups.
  - ▶ Variables used in income imputation are considered the “starter group,” with some to be added, deleted, or redesigned. (Example: Age ranges used in binary variables could be widened or narrowed.)

# Comments/Suggestions are welcome!





# Contact Information

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