

# Household Estimates Conundrum

Effort to Develop More Consistent  
Household Estimates Across Surveys

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# Outline of Presentation

- Importance of household concept to both population and housing statistics
- Conundrum posed by inconsistent household estimates
- Possible sources of inconsistency
- Research to address main source of differences – estimation
- Additional research that must be done

# What Is a Household?

Defined consistently across surveys:

“A household includes all of the people who occupy a housing unit.”

Households can contain families, one person, only unrelated individuals, or combinations of families and unrelated individuals

# Important First Concept

Housing Unit Universe

Population Universe

Owner Occupied

Family Householders

Occupied Housing Units = Households

Renter Occupied

Nonfamily Householders

# The Conundrum

- Definition of a household same across household surveys and the decennial census

BUT

- Household estimates differ, sometimes substantially, across surveys

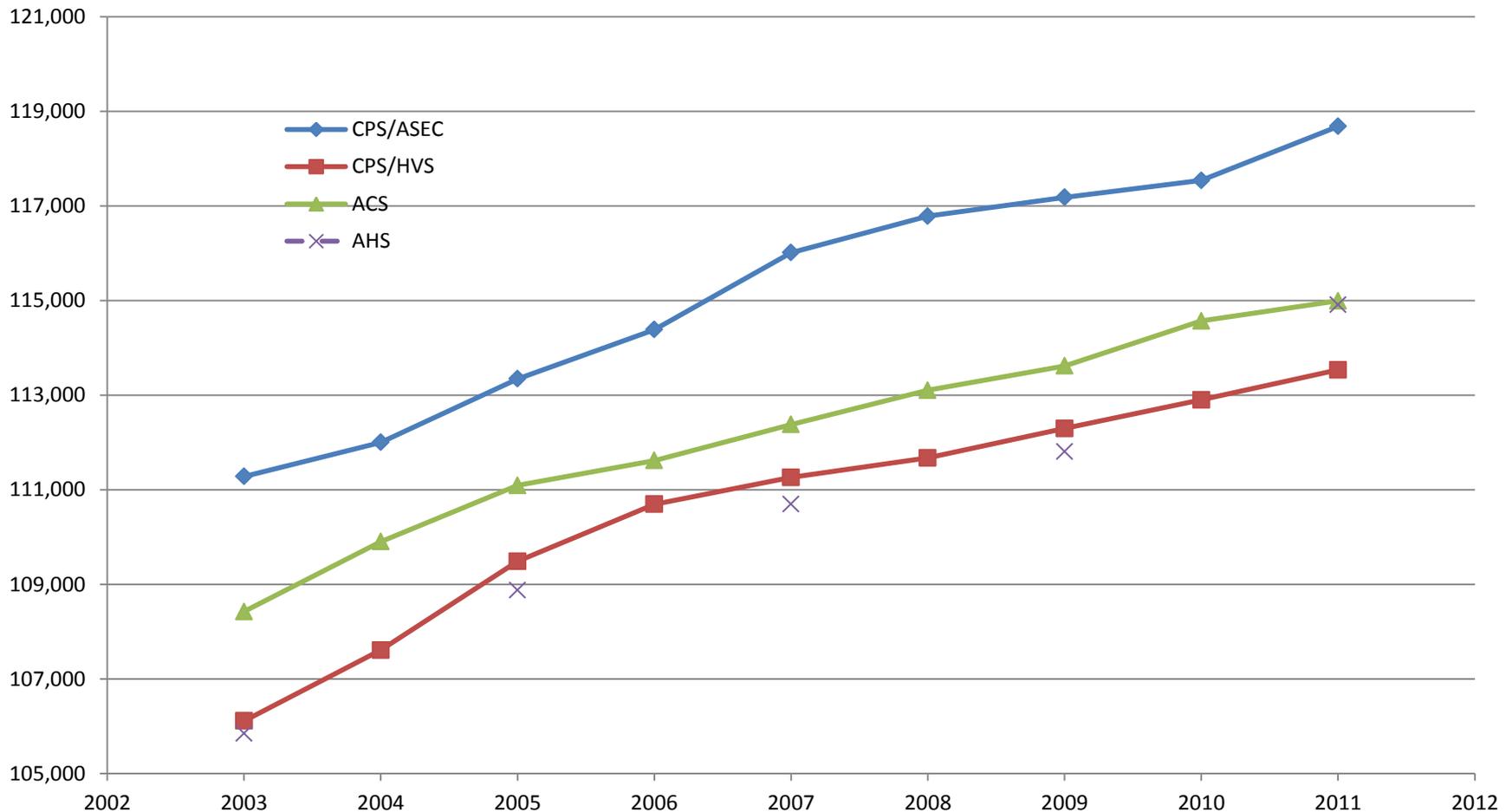
AND

- Sometimes estimates are not always consistent within same survey

# Brief Description of Household Surveys Used in this Paper

- **CPS/ASEC** – Current Population Survey Annual Social and Economic Supplement – conducted over a 3-month period using both basic CPS and supplemental questions – produces key income and poverty data
- **CPS/HVS** – Current Population Survey Housing Vacancy Survey – conducted each month with results based on quarterly averages – produces economic indicator data on housing vacancy
- **ACS** – American Community Survey – conducted continuously with results presented on an annual basis
- **AHS** – American Housing Survey – conducted in odd-numbered years

# Data Shown Graphically from Table 1 of Paper



# What Is the Source of These Differences?

- Estimation
- Sample Frame
- Operational

# Estimation

- Interdivisional working group (early 2000's) – looked at use of housing unit controls instead of population controls for CPS Housing Vacancy Survey
- Key finding – weight adjustment using population controls (by age, sex, race, and Hispanic origin) tend to produce higher estimates of households (occupied housing units) than weight adjustment using housing unit controls

# Example of Impact of Using Housing Unit Controls vs Population Controls

## Comparison of CPS Housing Vacancy Survey Estimates Based on Population-Based vs Housing-Based Weights

(Numbers in thousands)

	2002 - Housing Based	2002 – Pop Based
<b>Total Housing</b>	<b>119,297</b>	<b>123,318</b>
<b>Occupied</b>	<b>104,965</b>	<b>108,539</b>
<b>Vacant</b>	<b>14,332</b>	<b>14,779</b>

# Problem Posed by Use of Housing Unit Controls for CPS/HVS

- Provides differing estimates of households for the same survey (CPS/HVS (housing unit based) vs CPS/ASEC (population based))
- Two other household surveys have dealt with this problem
  - New York City Housing and Vacancy Survey
  - American Community Survey

# Sample Frame Differences

- Know from research on differences between 2010 ACS 1-year estimates and 2010 Census – both based on Master Address File (MAF) but different versions
- CPS – current sample based on 2000 census results and updates from new construction
- American Housing Survey – longitudinal survey 1985 sample based originally on 1980 census and updated for new construction
- All of these surveys will be based on the MAF within the next two years

# Operational Differences

- Different methods of identifying occupancy status
  - ACS method vs CPS/HVS and AHS
- Possible different application of rules by field representatives for identifying occupancy status

# Addressing Estimation Issues: Focus on Basic CPS Weighting Procedure

- Current stages of CPS weighting
  1. Non-interview Adjustment
  2. First Stage Ratio Adjustment (Adjustment to Persons in Non-Self Representing PSU's)
  3. National Coverage Adjustment (Ratio Adjustment to Population Controls for Race/Age/Sex Classifications)
  4. State Coverage Adjustment (Ratio Adjustment to Population Controls for State/ Black, Non-Black/ Age Classifications)
  5. Second Stage Raking Ratio Adjustment (3-Way Raking to Pop Controls for State/Ethnicity/Race)
  6. Composite Weighting (Rakes weights to sum to composite estimates)
- Note that there is no use of housing unit controls in current CPS weighting

# Current Research on Basic CPS Estimation: Assumptions and Initial Determinations

- Total housing unit controls are created by the U.S. Census Bureau's Population Division
- The number of occupied housing units is unknown and must be estimated
- By definition, there can only be one householder per household i.e., Households = Householders
- Current research indicates:
  - If we benchmark to housing controls in an early stage of weighting, the adjustment gets washed out by population controls in later stages.
  - If we benchmark to housing controls after population controls, we obtain HU estimates more consistent with HVS, but causes benchmarks to population control constraints to fall out of kilter.
- It is important that we constrain to pop controls and housing controls at the same time.

# Current Research on Basic CPS Estimation: Initial Approach

- New Idea: Include New Weighting Step and Revised Second Stage
  - Keep steps 1-4 of basic CPS estimation procedure
  - Create estimate of occupied housing units (householders) using survey results applied to housing unit controls
  - Create estimate of “non-householders” by subtracting the new estimate of householders from population controls
  - New Second Stage Ratio Adjustment (Revised Step 5)
    - Rake householders to a margin containing the estimate of the number of householders from previous step
    - Rake residual of the population to the estimate of non-householders from previous stage.
    - Other margins from current weighting procedure remain intact.
- This procedure will give estimates of number of households more consistent for HVS and ASEC, but research must be done on the impact on statistics produced from these surveys

# Next Stage of Research

- Include family equalization into estimation procedure
- Investigate impact of adjusting the householder's and non-householder's weights to achieve goal
  - “Basic” CPS – labor force estimates
  - CPS/ASEC:
    - Number of households
    - Household income
    - Poverty rate
  - CPS/HVS:
    - Rental Vacancy Rate
    - Homeowner Vacancy Rate
    - Homeownership Rate
- Work with sponsors, especially BLS, and other stakeholders to assess these impacts

# Additional Research

- Compare methodology chosen with those used for the ACS and NYCHVS and develop feasibility of developing a common methodology
- Apply this same methodology to the Survey of Income and Program Participation (SIPP) and assess impact of methodology on key statistics produced by SIPP
- Ensure field procedures to identify occupancy status are consistently applied across surveys

# Conclusion

- Successful implementation of new estimation methodology for CPS will address core issue of the conundrum
- Much more work to be done

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