# Imputing Service Flows from Durables

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# Introduction

- Accounting for durables in a measure of consumption is important

  - Spending on durables accounts for a high fraction (22%) of total spending

  - Durable goods are consumed or yield utility over multiple periods

- To account for durable consumption in a measure of total consumption one needs to determine a value of the flow of services from durables
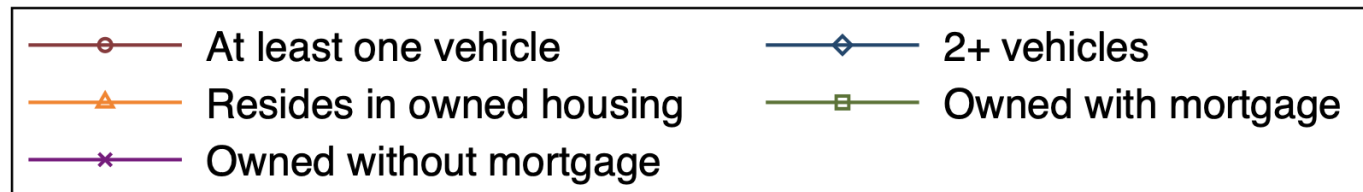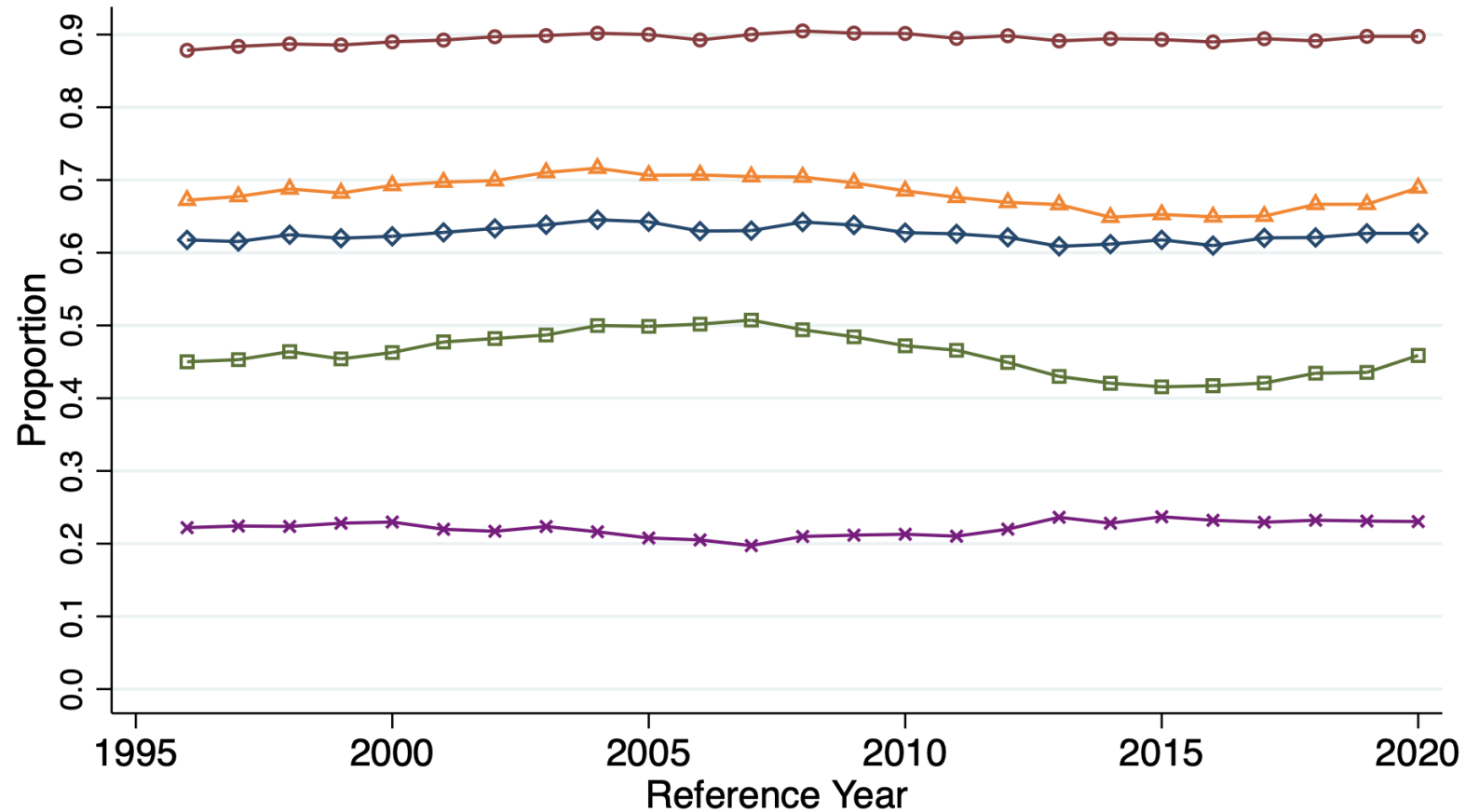
# Spending on durables
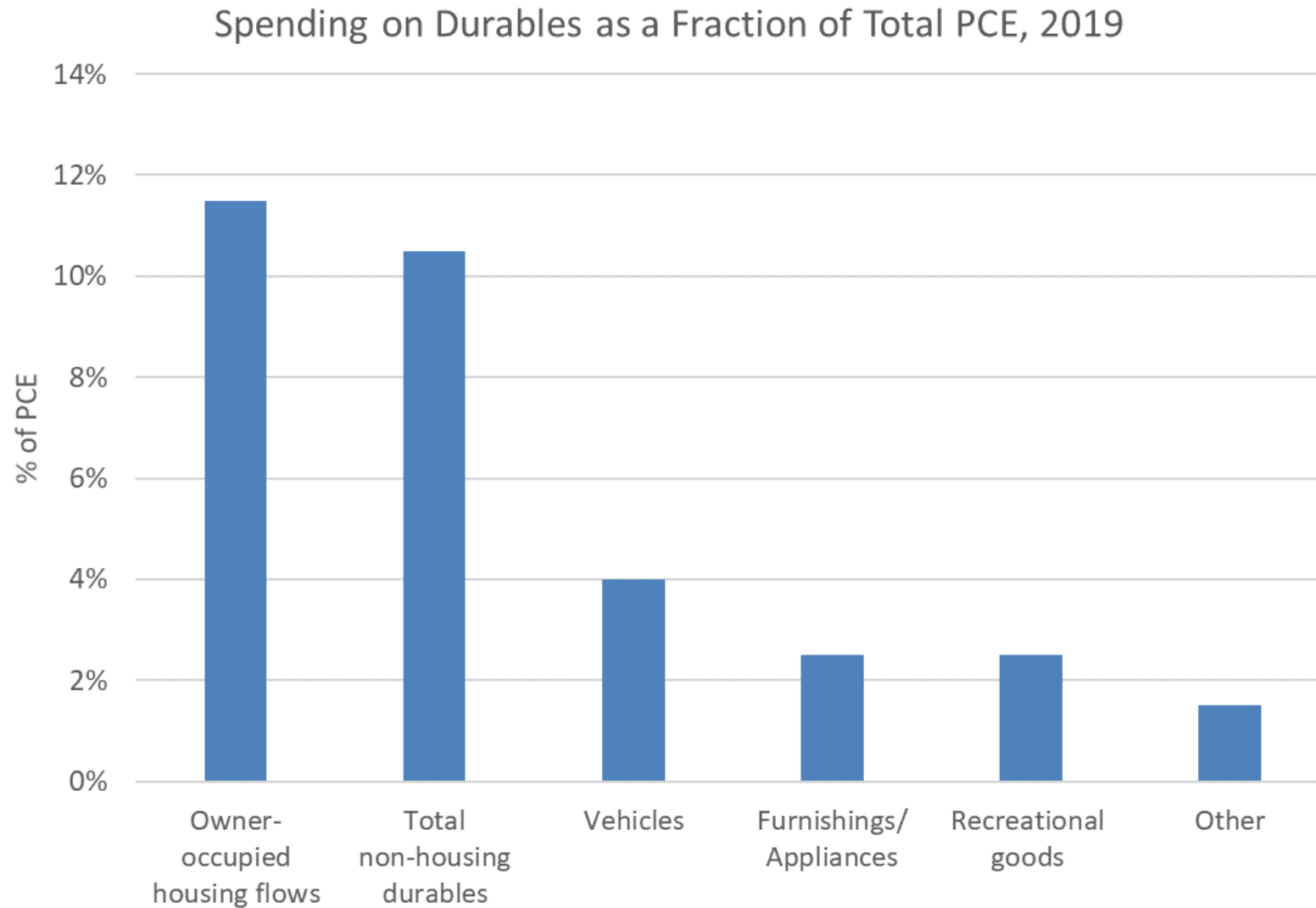


Spending on Durables as a Fraction of Total PCE, 2019

# Ownership of durables

**Vehicle and Home Ownership Rates, CE**

# Outline

I. Discuss how the flow of services from durables is typically measured and the pros and cons of these approaches

II. Present evidence on how well the CE captures the ownership of key durables

III. Show how converting spending on durables to a service flow affects the distribution

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# Imputing service flows

- Conceptually, we are interested in the value of the flow of services from the durable good.

- Two general approaches to estimate this price:

  - Estimate (or directly ask) what a respondent would have to pay to rent the good for the specified time period. Or alternatively, what the respondent could rent out the good for

  - If information on renting is not available, estimate it as the product of the current market price to purchase the durable and a depreciation rate

# Imputing the service flow from owned homes

- Standard approach: use the reported rental equivalent

    CE: "If someone were to rent this [unit] how much do you think it

    would rent for monthly, unfurnished and without

    utilities?"

- Pros

    - The right concept: captures the service flow from owned homes

    - Straightforward to measure in a survey

- Cons

    - Not clear respondents have good information on the rental value of their home / hard to validate

    - CE doesn't ask for rental equivalent for those in public or subsidized housing

# Imputing the service flow from vehicles

- **Approach 1**: Estimate the current market price of a vehicle and the depreciation rate using blue book values

  - Pro: observe prices for most make, model, year combinations

  - Con: Requires merging outside information to vehicles in the CE; may be hard to get this information for earlier years

- **Approach 2**: Estimate the current market price of a vehicle and the depreciation rate using the purchase prices reported in the CE survey for similar vehicles

  - Pro: can be implemented using data available from the survey

  - Con: may not have a reported price for less common or older vehicles
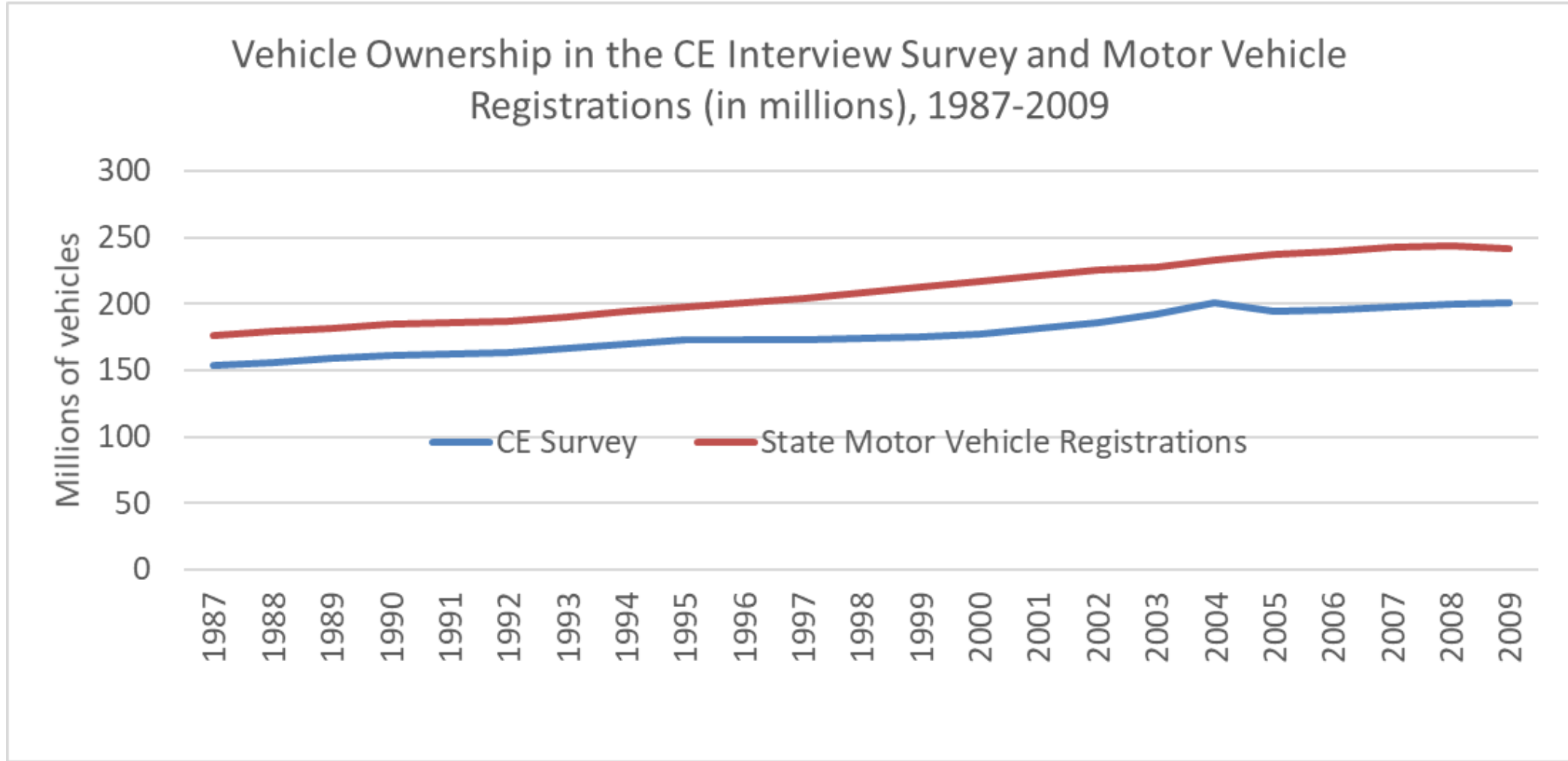
# Imputing services flows from other durables

- In theory one could also impute the flows from other durables such as furniture, recreational goods, etc. However:
  - Some of these goods might depreciate quickly (i.e. smartphone)
  - Hard to get good estimates of the market value or depreciation rate without a well-developed market for used goods
  - All together, these other durables account for about 6.5% of spending

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# Evidence on the quality of reporting of durables in the CE

- In order to construct an accurate measure of service flows from durables, the ownership and/or value of these durables must be well-reported in the CE

- Are these durables well reported?

- To answer this we:

  - Compare ownership rates in the CE to administrative aggregates

  - Compare spending on specific types of durables to national accounts

  - Compare durable values in the CE to other sources on durable prices

# Reporting of vehicle ownership



Vehicle Ownership in the CE Interview Survey and Motor Vehicle Registrations (in millions), 1987-2009

Source: Bee, Meyer, Sullivan (2015)

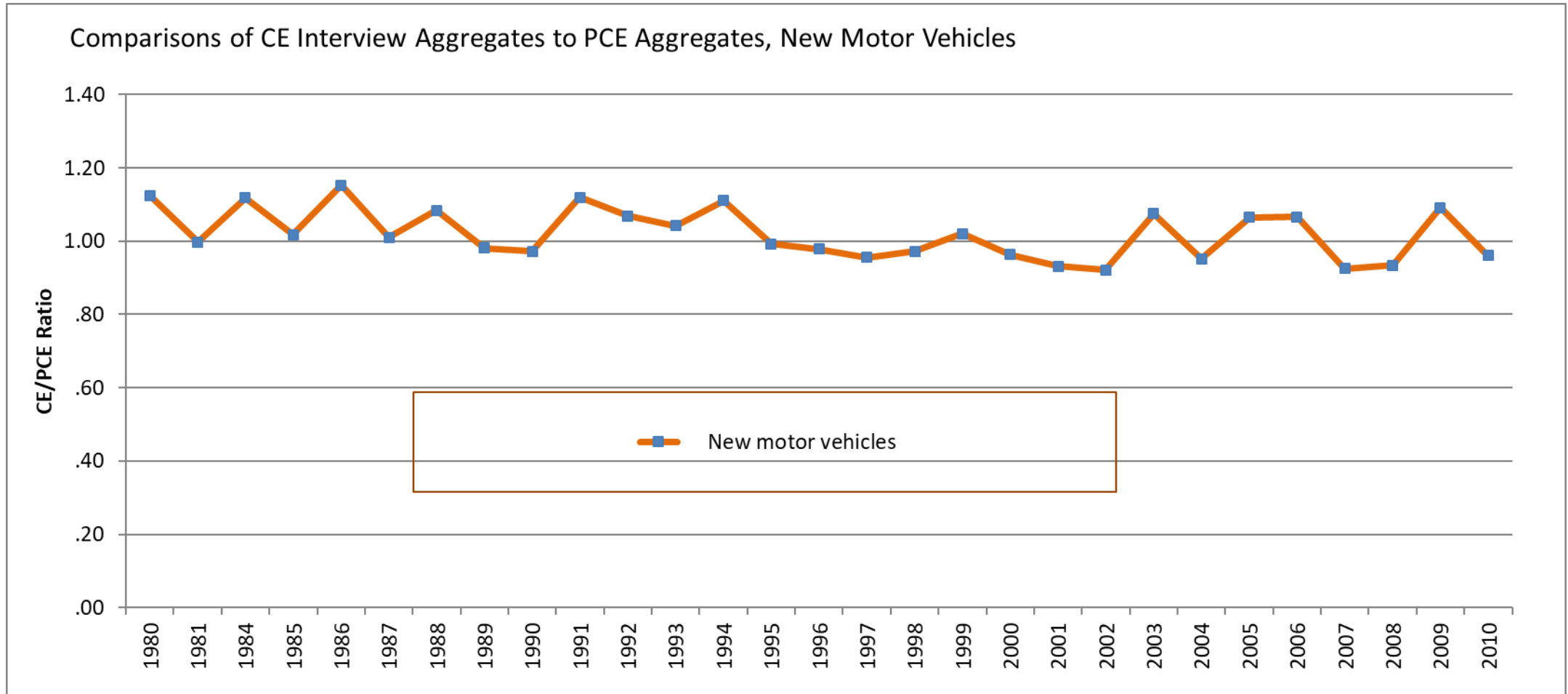UNIVERSITY OF NOTRE DAME

# Reporting of vehicle purchase price

Correlation of Reported Vehicle Purchase Price in the CE Interview Survey to NADA values, New and Used Vehicles

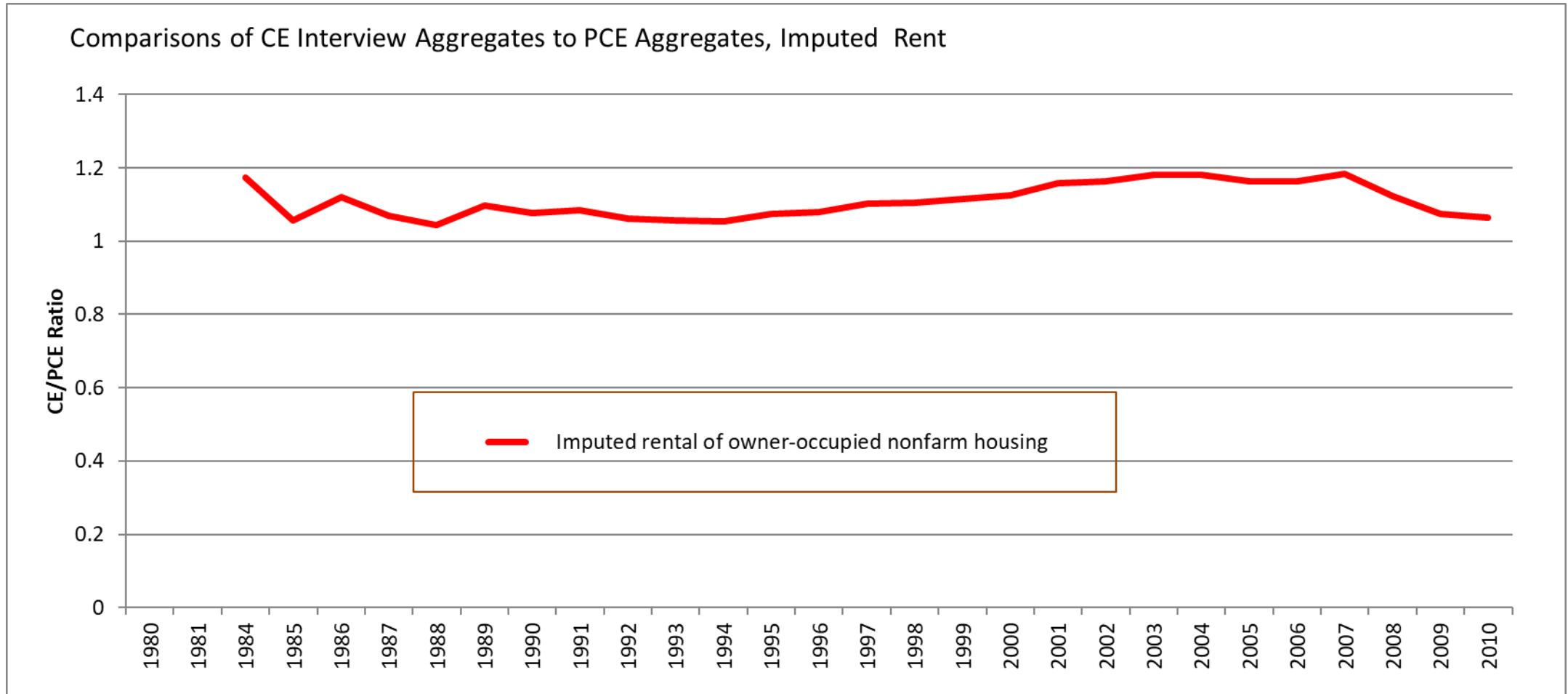| Survey Year | 1990 | 2000 |
|---|---|---|
| Cars owned 6 months or less | 0.956 | 0.912 |
| Cars owned 12 months or less | 0.937 | 0.790 |
| Cars owned 24 months or less | 0.879 | 0.779 |

Source: Bee, Meyer, Sullivan (2015)

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# Comparison to national accounts: vehicles



Comparisons of CE Interview Aggregates to PCE Aggregates, New Motor Vehicles

Source: Bee, Meyer, Sullivan (2015)

# Comparison to national accounts: imputed rent



Comparisons of CE Interview Aggregates to PCE Aggregates, Imputed Rent
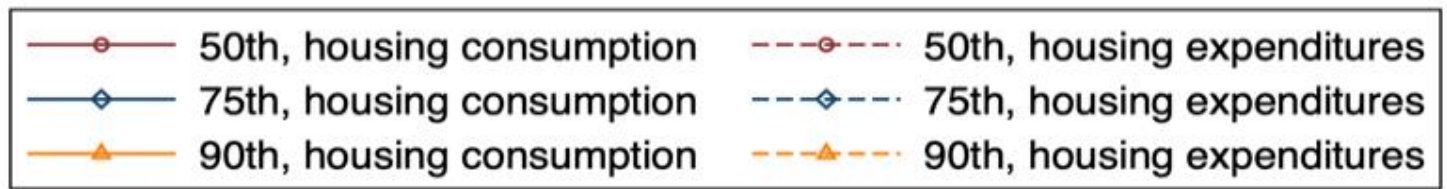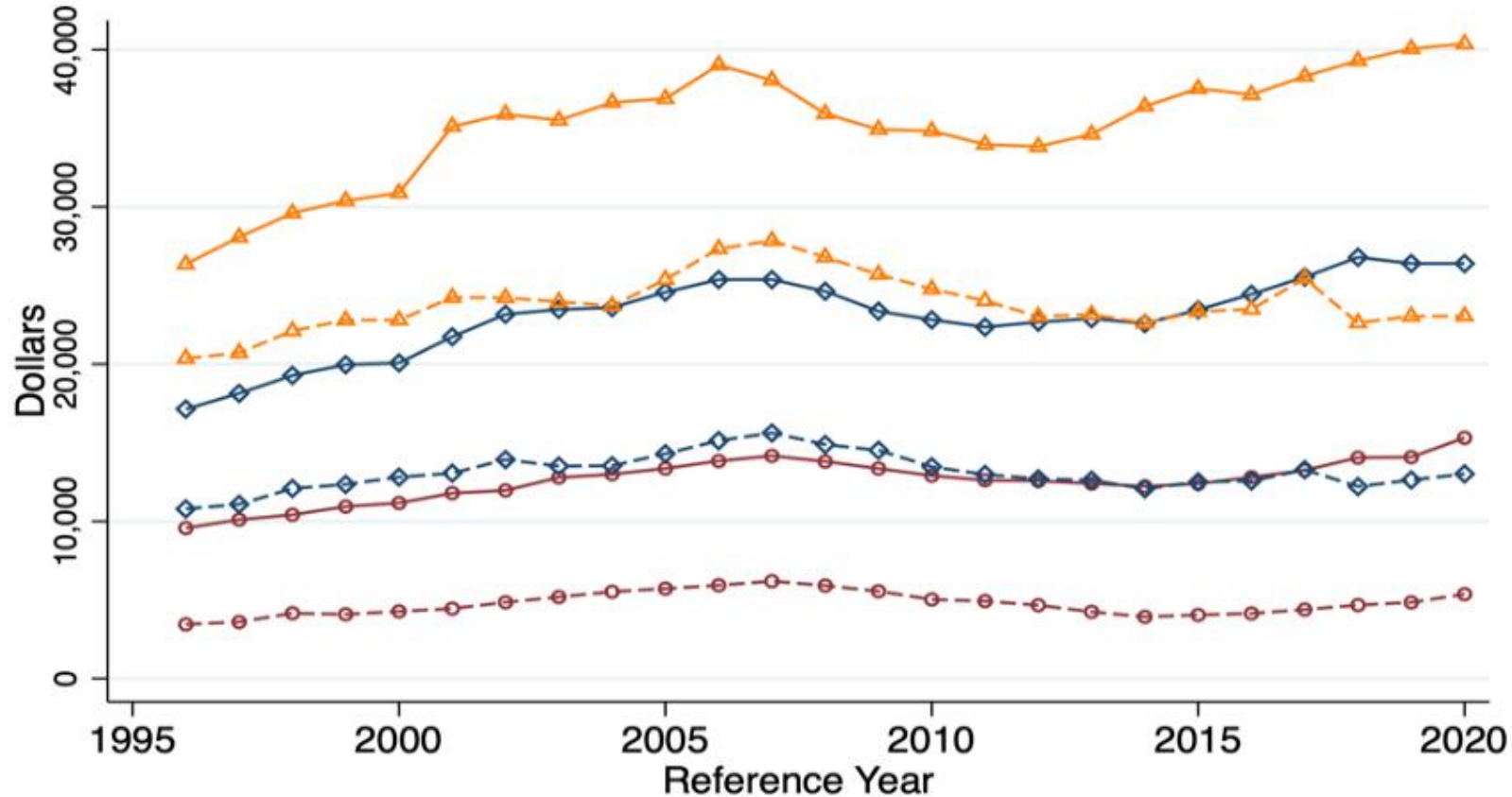
Legend: Imputed rental of owner-occupied nonfarm housing

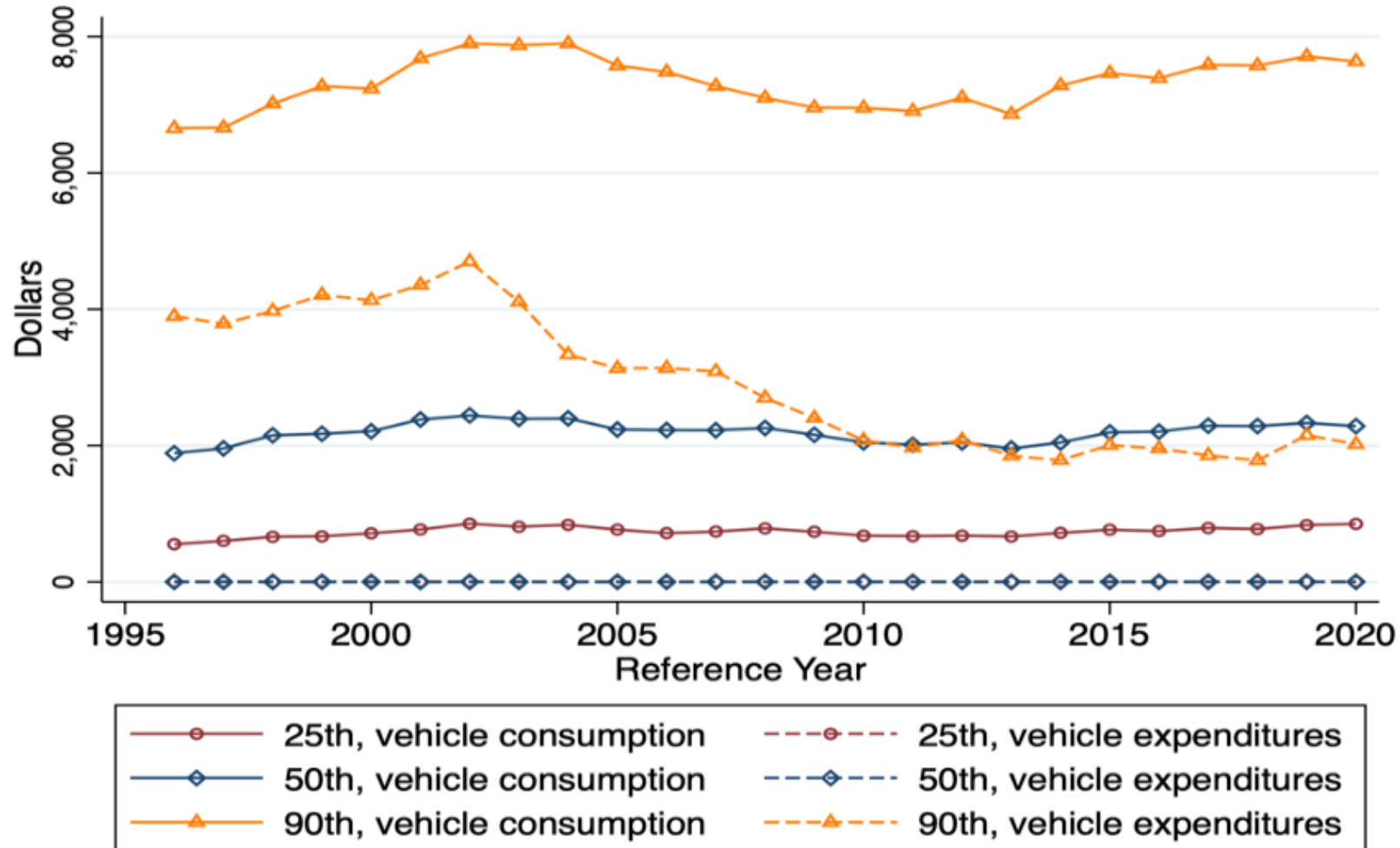Source: Bee, Meyer, Sullivan (2015)

# Housing consumption vs. spending on owned home

**Owned housing expenditures and consumption, (50th, 75th, and 90th percentiles), CE**
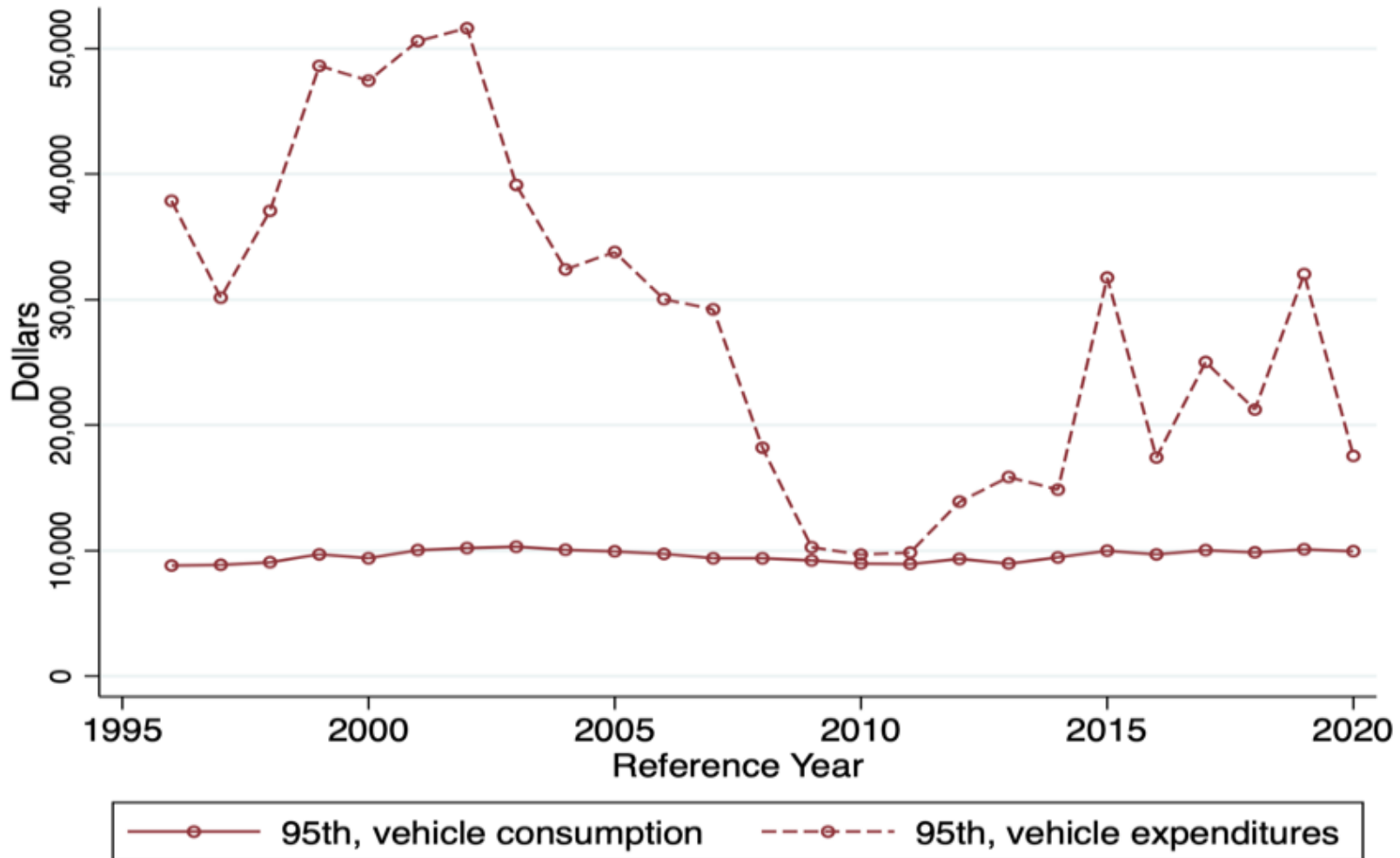
# Vehicle consumption vs. spending on owned vehicles



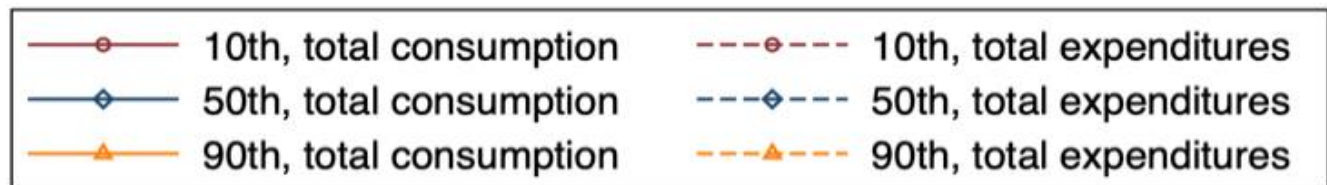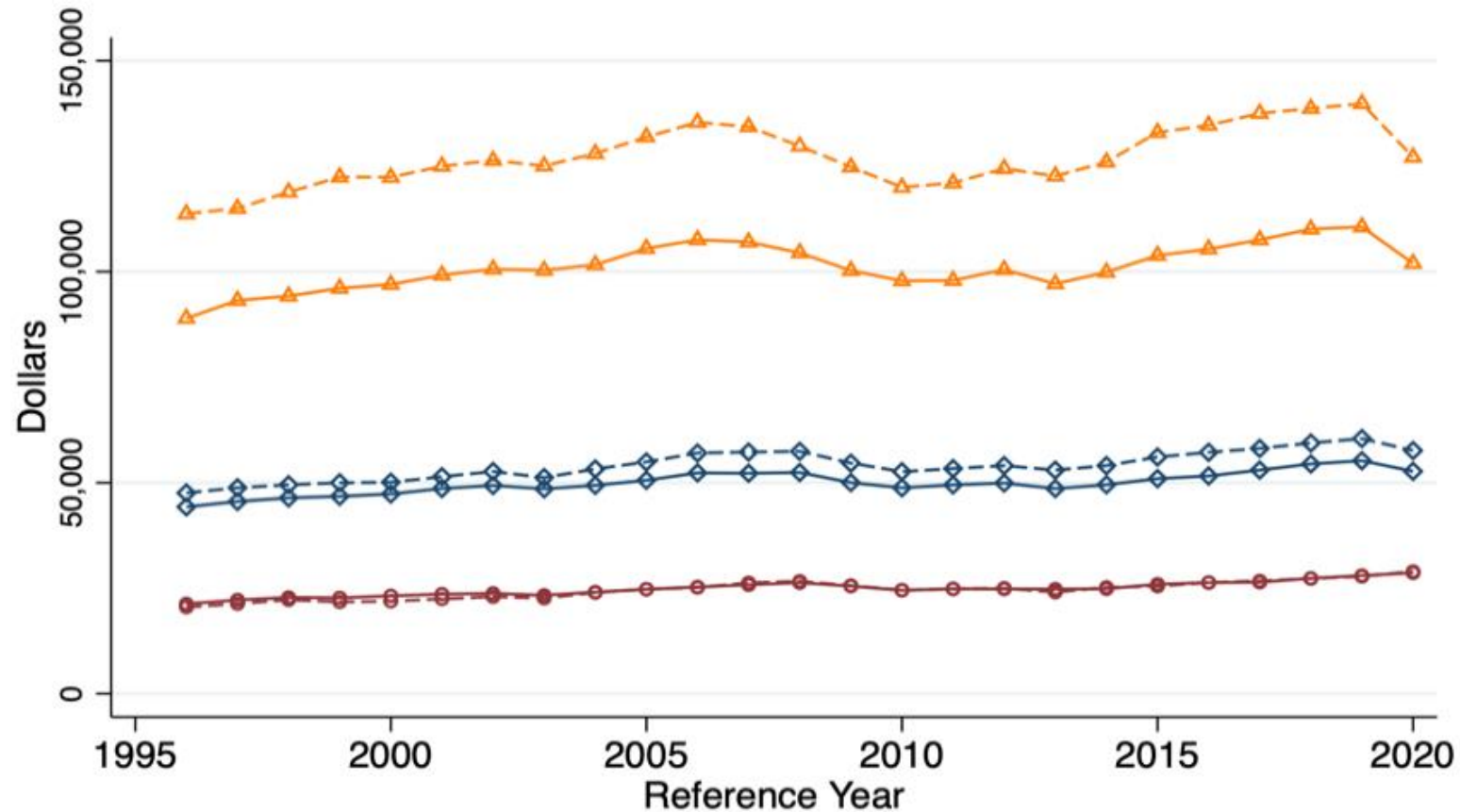Vehicle expenditures and consumption (25th, 50th, and 90th percentiles), CE

# Vehicle consumption vs. spending on owned vehicles

**Vehicle expenditures and consumption (95th percentile), CE**

# Total expenditures vs. total consumption



Total expenditures and consumption (10th, 50th, and 90th percentiles), CE

# Other Considerations

- Additional information could be gathered to better determine the value of durables in the CE:

  - Link CE to administrative data on the value of subsidized housing

  - Collect information on the value of the unit for those in public housing

  - Collect detailed information on vehicles