Data Appendix for "The Effects of Population Aging on the Relationship among Aggregate Consumption, Saving, and Income"

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1. Consumer Expenditure Survey (CEX) Data

    a. *Background about the CEX.* Our main household-level data source was the Consumer Expenditure Survey (CEX) conducted by the Bureau of Labor Statistics. The CEX is a quarterly survey of households that has been conducted continuously for close to four decades. The public-use microdata files include information about expenditures from up to four interviews per household, spaced three months apart. Information about the income and demographic profiles of respondents is also gathered, primarily during the first and the fourth of these interviews. After its final interview, a household is rotated out of the panel and replaced with a new randomly selected household. Roughly 5,000 households were interviewed each quarter through the late 1990s, at which point the panel size was stepped up to about 7,000 households per quarter. Our sample was drawn from CEX data files corresponding to the period 1983:Q1 (earlier data had more significant problems with quality) through 2007:Q1 (the latest quarter available at the time that the paper was written).

    b. *Consumption Measure.* Our measure of consumption was derived from the detailed CEX expenditure files and constructed to correspond as closely as possible to Personal Consumption Expenditures (PCE) in the U.S. National Income and Product Accounts. We excluded from the measure spending that is not counted as consumption, such as loan interest payments and payments to contractors for home renovations (which essentially add to the wealth of the household). The annual housing services consumed by homeowning households was measured as 6 percent of the value of the home. For each household, we measured total annual consumption as the sum across all four interviews; we dropped households for which fewer than four interviews were available.

    c. *Income Measure.* Our income measure was based primarily on the household's income after taxes for the past 12 months, taken from the CEX family file corresponding to the household's final interview so that it covers the same period as the consumption measure. To make the measure more complete, we added the value of any rent, food, or transportation received as compensation.

d. *Deflating.* To adjust consumption and income for inflation, we constructed household-specific deflators by taking a weighted average of the aggregate PCE chain-weighted price indexes for each major category of consumption, where the weights correspond to the share of each household's consumption represented by that category. The base-year for the deflated variables is 2000.

e. *Age Groups.* The age group of the household was based on the reported age of the head as of the last interview.

f. *Weights.* The CEX includes probability weights in the quarterly samples, but their use is not clearly justifiable when using observations from a period other than a calendar quarter or after having selected observations based on demographic or data quality selection criteria. Accordingly, we follow many previous authors in not using the CEX weights.

g. *Sample Selection.* We dropped households for which we had some indication that the data might be of poor quality—those for whom reported income is flagged as being incomplete or for whom reported food consumption equals zero. We also dropped households for which we did not have four quarters of data. In addition, to avoid assigning households to the wrong cohort, we dropped those for whom the reported age of the head of household changes by more than one year between two successive interviews. We did not drop households for whom income or consumption was flagged as topcoded, as our cohort analysis was based on medians, which should not have been greatly affected by topcoding. All told, our final CEX household-level sample contained 80,214 households.

2. Population Data from the U.S. Census Bureau

a. *Historical Data.* Estimates of the share of the population in different age groups through 2000 were taken from Demographic Trends in the 20th Century, Census 2000 Special Reports, U.S. Census Bureau, November 2002, page 163; http://www.census.gov/prod/2002pubs/censr-4.pdf.

b. *Projections.* Estimates of the share of the population in different age groups for 2010 and 2020 were taken from the U.S. Census Bureau website, U.S. Population Projections, File 2: annual projections by 5-year and selected age groups by sex, http://www.census.gov/population/projections/DownldFile2.xls.

3. Aggregate Time Series Data

   a. *National Income Product Accounts (NIPA) data from the Bureau of Economic Analysis*.
      i. Consumption: real personal consumption expenditures (chained 2000 dollars).
      ii. Income: real disposable personal income (chained 2000 dollars).
      iii. Transfer income: nominal personal current transfer receipts deflated using the personal consumption expenditure deflator.
      iv. Potential output growth: computed using a kalman filter of real gross domestic product growth.

   b. *Wealth measure*. Household net worth from the Flow of Funds Accounts of the United States published by the Federal Reserve Board, deflated using the NIPA personal consumption expenditure deflator.

   c. *Interest rate measure*. The effective Federal Funds rate, as published by the Federal Reserve, deflated using a moving average of inflation over the previous two years. Inflation is computed using the NIPA personal consumption expenditure deflator.

   d. *Unemployment rate measure*. Total unemployment rate for the civilian noninstitutional population from the Household Survey published by the Bureau of Labor Statistics.

   e. *Sentiment measure.* Index of consumer sentiment from the Reuters/University of Michigan Survey of Consumers.