

Robustness Appendix for “Deconstructing Lifecycle Expenditure”

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This appendix presents results documenting the robustness of the primary results of “Deconstructing Lifecycle Expenditure” to various alternative specifications. This appendix of course does not contain all sensitivity checks we performed. Rather, we selected those that either addressed a prominent concern discussed in the text or yielded interesting insights into the data. Interested readers may want to consult the NBER working paper version (<http://www.nber.org/papers/w13893>) for additional results not reported in the current draft or this appendix.

1. Alternative Family Size Adjustment

In this section we explore an alternative scheme for translating household expenditure into per capita expenditure. The benchmark analysis presented in the text used a regression approach with a rich set of family size controls to convert household expenditure into “individual” consumption. The advantage of this approach is its flexibility. In particular, it allows for different scales for different goods, reflecting the fact that the returns to scale for expenditures for cable television subscriptions are different than expenditures on food. However, it may be biased by the fact that family size is correlated with permanent income, and family size varies over the life cycle. This may induce an artificial age profile to expenditure. A popular alternative (although one that still takes family size as exogenous) is to adjust household expenditure using an adult equivalent scale. Three such measures are popular in the literature. The first is the original or “old” OECD equivalence scales (see <http://www.oecd.org/dataoecd/61/52/35411111.pdf>). Specifically, this scale weights the first adult as 1, each additional adult in the household 0.7, and each child 0.5. We define child as someone in the household under age 15. A second scale, the “modified” OECD scale, places a weight of 0.5 to additional adults and 0.3 to children. A third scale is the square root of total household size. We have investigated all three alternatives. In general, the lifecycle patterns documented in the paper for core and work related goods hold regardless of how we adjust for family size. As a general rule, the higher the weight given to additional family members, the smaller the decline in mean expenditure post middle age and the smaller

the increase in cross-sectional variance over the life cycle. However, changing the choice of equivalence scales did not affect the dichotomy between core and work related expenses.

Consider Robustness Appendix Figure R1, which corresponds to figure 1a in the text. Specifically, we construct adult equivalents for each household using the old OECD scale and the modified OECD scale. We then subtract log adult equivalents from log expenditure to form an adjusted expenditure measure. We then regress log adjusted expenditure on cohort and normalized year dummies, which is equation (1) in the text, dropping all other demographic controls, including marital status. Figure R1 (panel A) depicts our benchmark result for nondurables alongside those using the two OECD equivalence scales. Figure R1 (panel B) depicts nondurables plus housing services. We see that the OECD scales generate a flatter profile early in the lifecycle and a smaller drop (panel A) or a larger increase (panel B) in the latter half of the life cycle. The fact that the hump can be removed with certain family size adjustment is emphasized in Browning and Ejrnaes (*Review of Economics and Statistics* 2009).

In Figure R2 we replicate Figure 1b from the text, which is the cross-sectional variance of log expenditure over the life cycle. Specifically, we take the residuals of the regressions reported in Figure R1 and compute a cross-sectional variance for each age-cohort pair. We then regress the variances on age and cohort dummies and plot the coefficients on the age dummies. We only present the results for nondurables (without housing services). As was the case in the benchmark, the life cycle profile of cross-sectional variances is the same for nondurables plus housing as it is for nondurables excluding housing. This equivalence holds true across the alternative family size controls, so we present the results for nondurables excluding housing services alone to simplify the figures. From Figure R2, we see that the OECD scales lead to a smaller increase in variance over the life cycle. The old OECD scales indicates an increase that is one half of our benchmark results (or 0.08 points), while the modified scale lies halfway between the benchmark and the old OECD scale.

We now turn to whether the alternative family size controls affect our results on dis-aggregated consumption categories. We focus on the old OECD scales as this alternative represents the largest departure from our benchmark, as evidenced from figures R1 and R2. In figure R3 we replicate figure 2 from the text. Figure R3 panel A indicates that mean expenditure on our core consumption categories all have an increasing profile over the life cycle, as was the case in our benchmark analysis. Moreover, panel B of Figure R3 indicates that clothing and food away from home decline post-middle age, as before, but the magnitude is smaller. Transportation has a slight hump in Figure R3a as it does in the benchmark, but the benchmark results had a much sharper decline post middle age. In sum, the contrast between core and

work related goods is robust to the alternative controls for family size. However, the OECD scale reduces the size of the decline in work related expenditures, which is reflected in the flatter lifecycle profile (after middle age) in Figure R1.

In Figure R4 we replicate figure 3 in the text, which depicts the cross-sectional variance of log expenditure. The profile of each good (i.e., increasing or decreasing) is robust to the alternative family size controls. Again, some of the magnitudes of the increases are smaller, but the overall conclusion remains – the increase in cross-sectional dispersion over the life cycle is prominent only in a few goods, and those are work related.

2. Excluding the “Zeros”

There are a number of households who record zero expenditures for our smaller categories (food away from home, domestic services, and the residual category “other nondurables”). When looking at these categories in isolation, using our method of calculating log deviations implies dropping observations with zero expenditure. The benchmark results in the text bottom coded all zero expenditure on these three categories at one dollar. The rationale for this was that the fraction of households with strictly positive expenditure on these categories changes over the life cycle. Dropping the zeros meant dropping the low spending households at various points in the life cycle, potentially giving a misleading picture of the life cycle pattern. While these small categories do not figure prominently in the analysis, for completeness we report how our handling of this issue changes the profiles for these categories. Note that the log zero issue does not arise for the other categories or for aggregate nondurables.

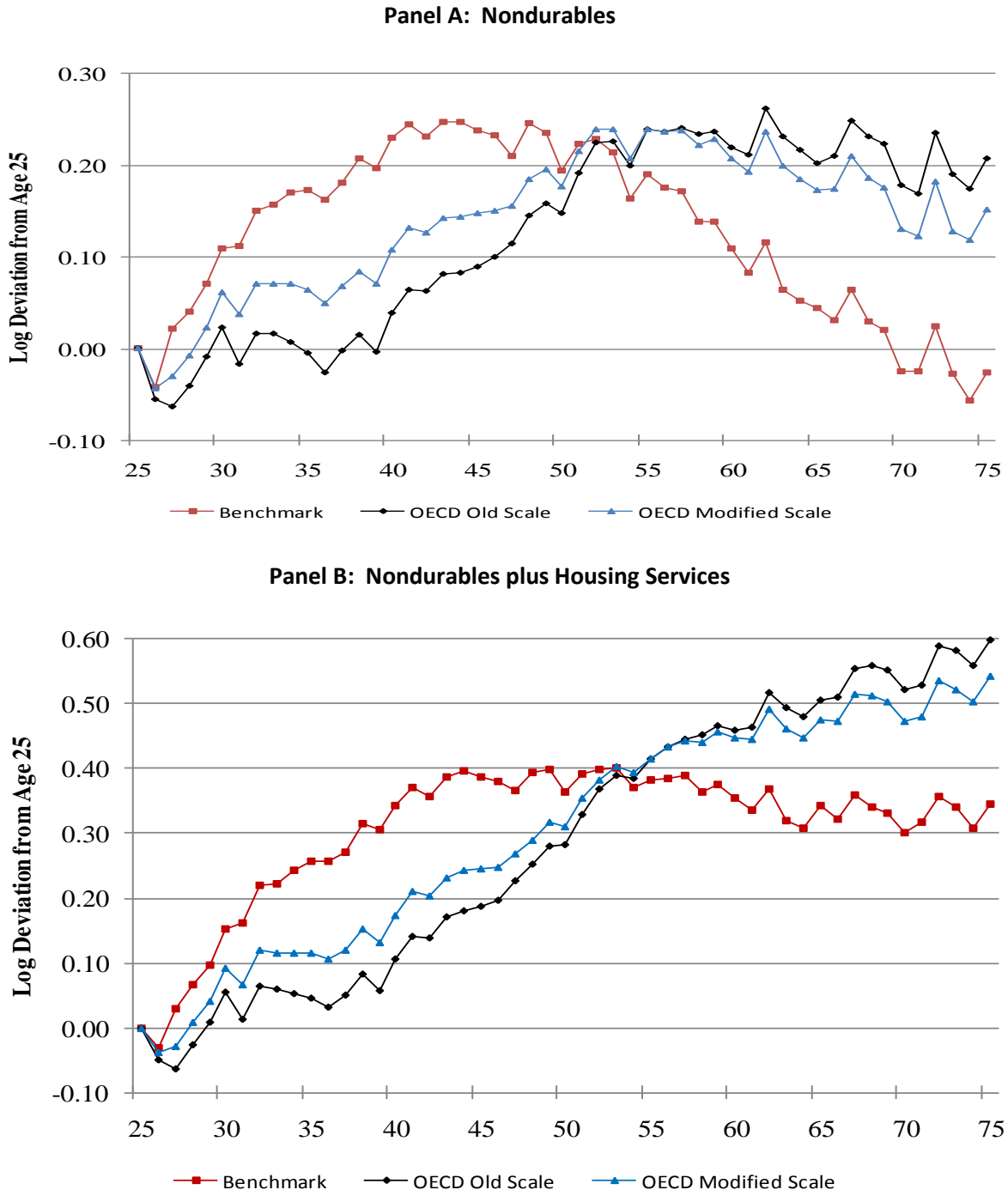
Figure R5 plots the fraction of households with non-zero expenditure at each age for the three goods in question. The figure indicates that young households are less likely to consume positive amounts of domestic services and other nondurables, and are more likely to consume food away from home.

In figures R6 and R7, we show how dropping the zeros alters the results depicted in figures 2 and 3 of the text, respectively. The main difference between figure R6 and figure 2 in the text is in regard to other nondurables, which now has a flat profile and had an increasing profile in the benchmark figure. This reflects the fact that many young households report zero expenditures on other nondurables. Dropping these zeros raises young expenditure relative to older expenditure.

In regard to cross-sectional variance (figure R7), dropping the zeros has an ambiguous effect on the life cycle profile of consumption inequality. We see that the increase in the cross-sectional variance in consumption of food away from home is much smaller if we drop the zeros. Specifically, the increase

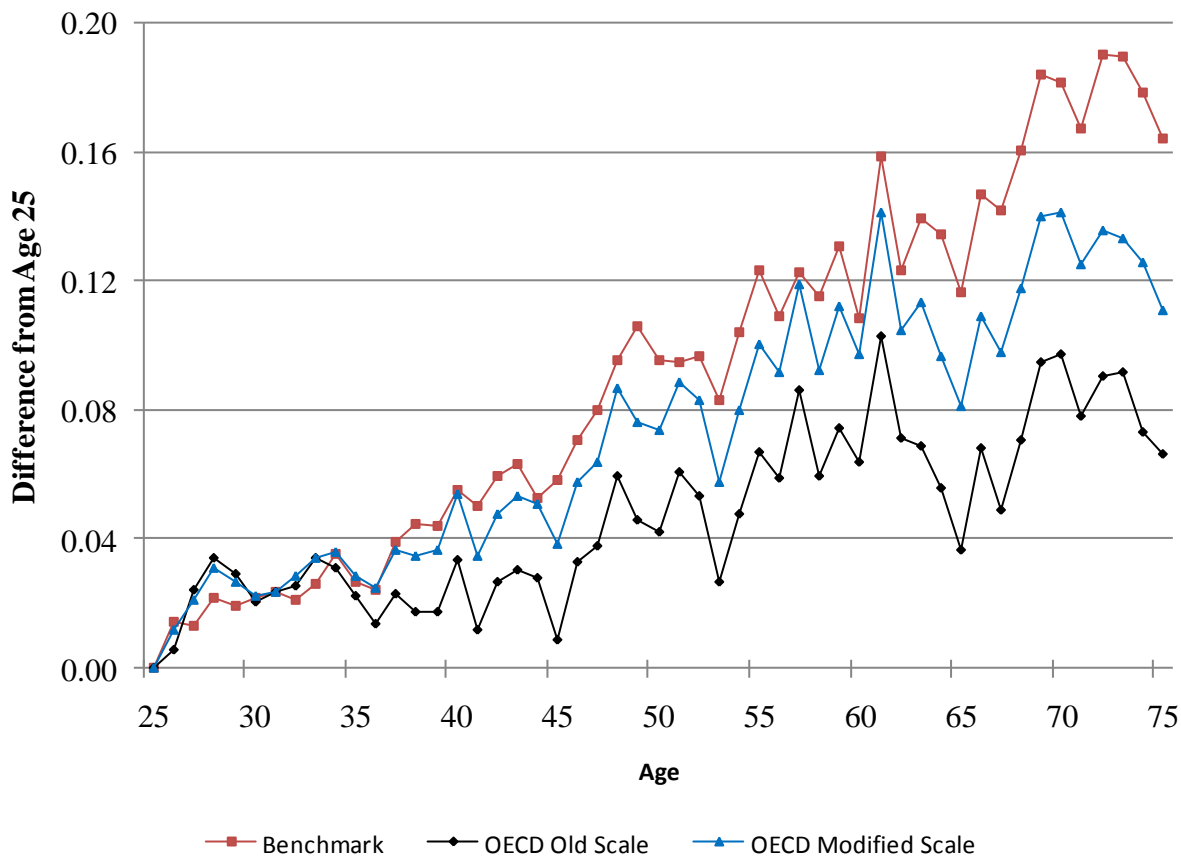
in figure R7 is 0.5 points, while it increase 1.13 points in the benchmark. Dropping the zeros also removes the increase in cross-sectional variance for other nondurables. Finally, dropping the zeros reduces the life cycle decline in inequality for other nondurable expenditure.

Figure R1: Non Durable Expenditures over the Lifecycle with alternative Family Size Controls



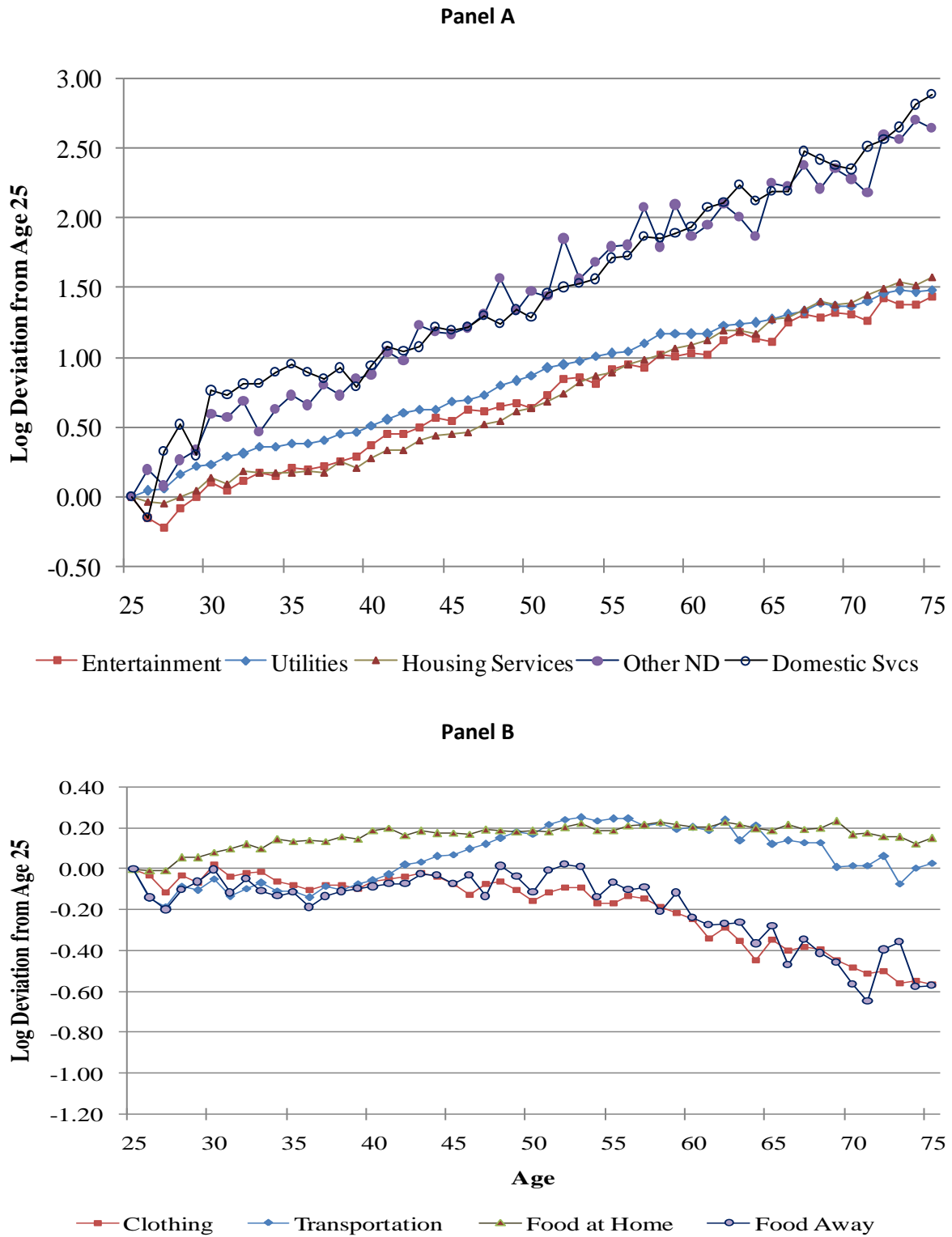
Notes: Figure R1 replicates Figure 1 from the text using the alternative adult equivalence controls. Panel A is nondurables and Panel B is nondurables plus housing.

Figure R2: Non Durable Expenditures over the Lifecycle with alternative Family Size Controls – Cross-Sectional Variances



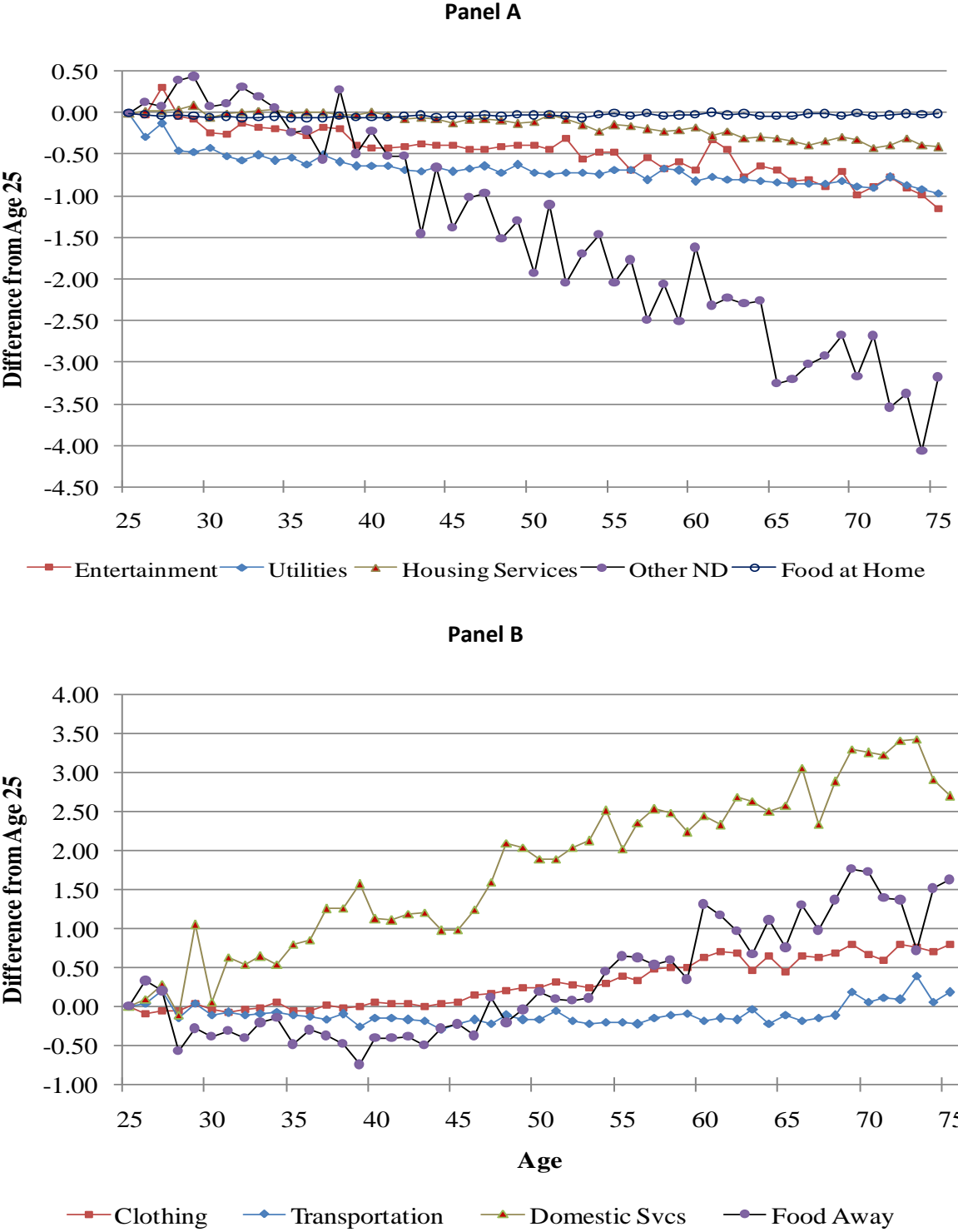
Notes: Figure R2 replicates Figure 2 from the text using the alternative adult equivalence controls. The figure depicts the results for nondurables excluding housing services.

Figure R3: Non Durable Expenditures over the Lifecycle with alternative Family Size Controls -- Means



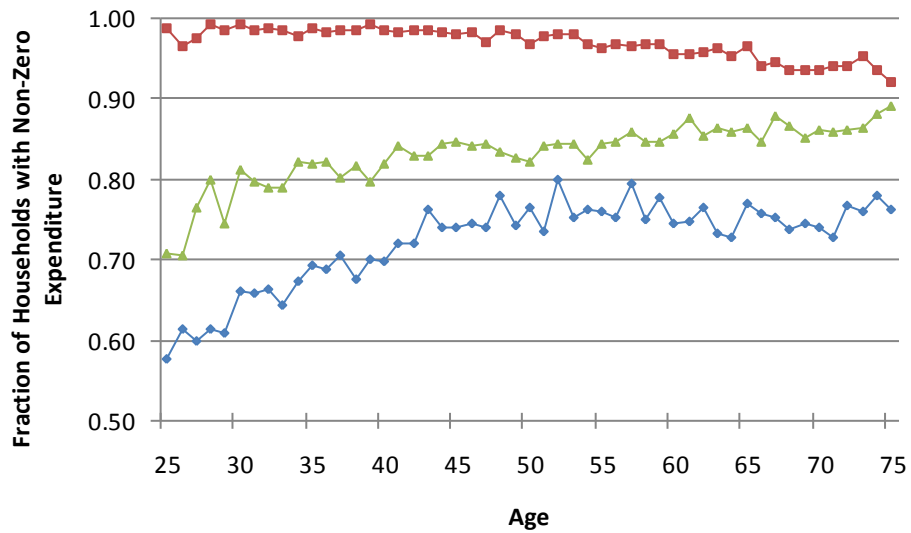
Notes: Figure R3 replicates Figure 2 from the text using the "old" OECD adult equivalence controls.

Figure R4: Non Durable Expenditures over the Lifecycle with alternative Family Size Controls – Cross Sectional Variances



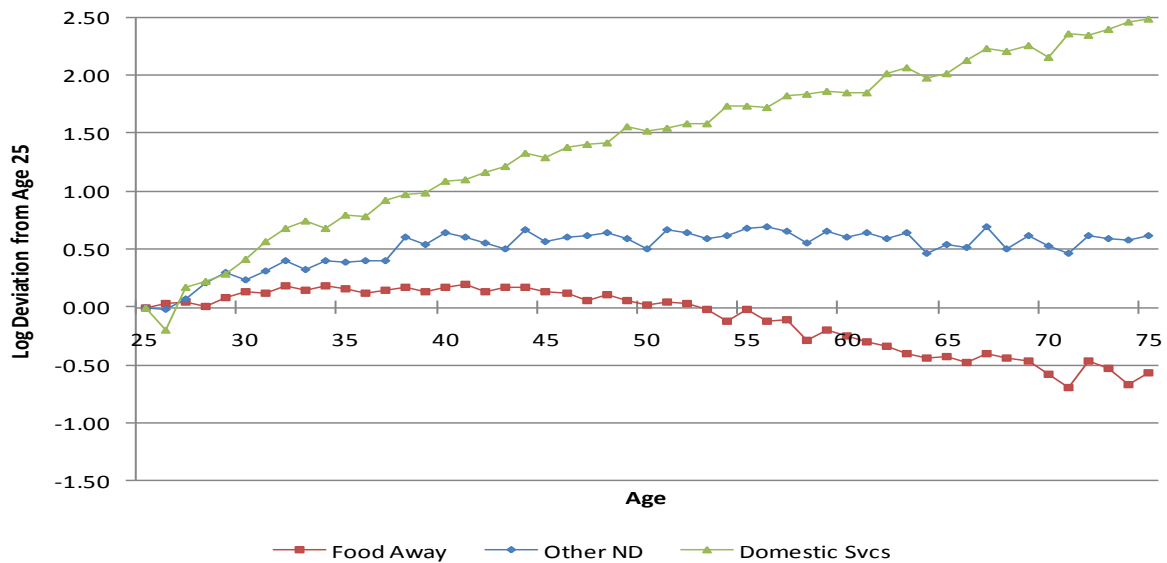
Notes: Figure R4 replicates Figure 3 from the text using the "old" OECD adult equivalence controls.

Figure R5: Fraction of Households with Non-Zero Expenditure on Three Small Categories



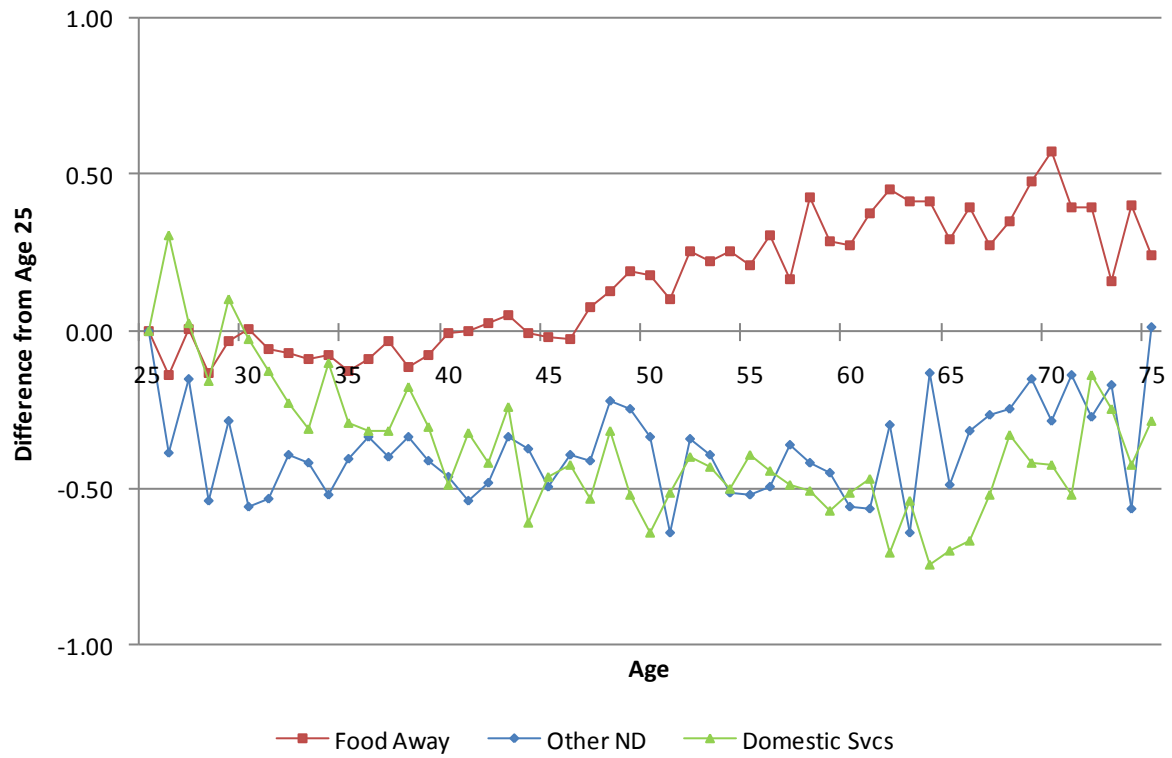
Notes: Figure R-Fraction depicts the fraction of households with non-zero expenditure at each age for food away from home (red, ■), domestic services (green, ▲), and other nondurables (blue, ◆).

Figure R6: Mean Life Cycle Expenditure Excluding Zeros



Notes: Figure R6 replicates figure 2 in the text for the small categories which may have respondents recording zero expenditure in a year. Respondents with zero expenditure were dropped.

Figure R7: Cross-Sectional Variance of Life Cycle Expenditure Excluding Zeros



Notes: Figure R7 replicates figure 3 in the text for the small categories which may have respondents recording zero expenditure in a year. Respondents with zero expenditure were dropped.