

## A COHORT ANALYSIS OF WEALTH-AGE PROFILES: LESSONS FROM PSID\*

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*Given the importance of the shape of the wealth-age profile according to the life cycle model, and the fact that the theory does not imply a specific functional form, we argue that a non-parametric estimation strategy is ideal. Nonparametric profiles and semiparametric partial linear models indicate that typical parametric representations can be misleading. Moreover, we find that there are strong and clear patterns of wealth accumulation through the mid-50s, flat wealth holdings during the late 50s and mid-60s, followed by decumulation during the rest of the life cycle, which is consistent with predictions of the life cycle model.*

JEL Classification: C1, J1

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### I. INTRODUCTION

A tenet of the life cycle model is that assets are accumulated during the working years to support consumption during the retirement years, implying older people decumulate assets (dissave). Despite the substantial amount of research devoted to establishing whether people actually decumulate assets - and the exact shape of the wealth-age profile more

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generally – no conclusive evidence has yet emerged (Hurd, 1990; Attanasio and Hoynes, 2000). The lack of consensus may arise for several reasons, including use of cross-sectional versus pooled cross-sectional versus panel data, differing time periods of analysis that may be subject to different period effects that vary by age, and differing assumptions about the parameterization of the wealth-age profile (Hurd, 1990; Jappelli, 1999). Our contribution is on this last dimension: allowing a general functional form in the estimation of the wealth-age profile.

Economic theory does not predict an exact form of the wealth-age profile. And to date only parametric frameworks have been used to estimate the profile. While Jappelli (1999) considers quintic terms of age, most studies consider linear or quadratic regression specifications. For example, Mirer (1979) and Diamond and Hausman (1984) considered linear functional forms, King and Dicks-Mireaux (1982) considered a linear spline, and Burbidge and Robb (1985) specified quadratic and cubic functional forms. If the profile is nonlinear, which previous studies have shown to be the case, a poor approximation of the wealth-age profile by parametric specification may lead to inappropriate conclusions about the extent of wealth accumulation and decumulation. We argue that a nonparametric or semiparametric approach is most appropriate since it does not impose a functional form; it allows for a flexible analysis of the data.

Using wealth data collected in the Panel Study of Income Dynamics starting in 1984, we apply nonparametric estimation techniques based on kernel smoothing. In addition, a semiparametric partial linear model is considered comprising a nonparametric and a parametric component, which allows one to take into account control variables. Because the individuals interviewed in any cross-section belong to different birth cohorts with different preferences and productivity, we construct cohort data from five waves of the PSID: 1984, 1989, 1994, 1999, and 2001. These data allow us to analyze wealth-age profiles for birth cohorts and investigate whether the differences in profiles across cohorts are due to differences in productivity effects, while at the same time continuing to allow for nonparametric and semiparametric specifications of age.

The paper is organized as follows. Section 2 describes the modeling of

the wealth-age profile. The results from cross-section data are presented in Section 3. To account for disparities across birth cohorts, we construct cohort data from repeated cross-sectional data in Section 4, and wealth-age profiles for cohorts are then analyzed. Section 5 concludes.

## II. MODELING FRAMEWORK

The basic household wealth model takes wealth as a function of age and demographic factors. Theory provides no guidance as to the appropriate functional form to use for estimation. Moreover, flexible nonparametric methods cannot be used to help specify the entire model because there are numerous plausible demographic variables besides age. Consequently, some modeling restrictions must be imposed.

To allow for the greatest flexibility in the wealth-age profile, we begin with a partial linear model that takes wealth as a general function of age plus a linear function of the qualitative variables. The semiparametric model is summarized as:

$$w_i = g(a_i) + z_i\beta + \varepsilon_i \quad (1)$$

where  $w_i$  is wealth,  $a_i$  years of age, and  $z_i$  denotes the remaining demographic variables for individual  $i$ . We assume  $E(\varepsilon_i | a_i, z_i) = 0$ . The function  $g(a_i)$  has the standard regression interpretation, namely as the wealth-age profile holding other demographic variables constant. Here, it is assumed that demographic variables have no effect on the shape of the profile; they are modeled to only shift the profiles<sup>1</sup>. We estimate  $g(\cdot)$  nonparametrically and display it graphically.

From the assumption of  $E(\varepsilon_i | a_i, z_i) = 0$ ,

$$E(w_i | a_i) = g(a_i) + E(z_i | a_i)\beta, \quad (2)$$

so that differencing equations (1) and (2) yields a linear regression:

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<sup>1</sup> While findings from Hubbard et al. (1995) suggest that wealth accumulation patterns differ by educational attainment, Burbidge and Robb (1985) found that education affects only the height but not the shape of the wealth-age profile.

$$w_i - E(w_i | a_i) = [z_i - E(z_i | a_i)]\beta + \varepsilon_i, \quad (3)$$

implying that  $\beta$  can be estimated in a two-step procedure as in Robinson (1988). That is, first the unknown conditional means,  $E(w_i | a_i)$  and  $E(z_i | a_i)$ , are estimated using a nonparametric kernel estimation technique. Because age is observed as a discrete variable, we estimate the two conditional means discretely, in particular,

$$\hat{E}(w_i | a) = \frac{\sum_{i=1}^n I(a_i = a) w_i}{\sum_{i=1}^n I(a_i = a)} \quad (4)$$

where  $I(\cdot)$  denotes an indicator function, that is,  $I(A) = 1$  if event  $A$  occurs and  $I(A) = 0$  otherwise. In this case, the rate of convergence of kernel estimates to the true regression curve is  $\sqrt{n}$ , same as most of the parametric estimates.

Secondly, the nonparametric estimates,  $\hat{E}(w_i | a_i)$  and  $\hat{E}(z_i | a_i)$ , are substituted in place of the unknown functions in equation (3) and OLS is used to estimate  $\beta$ . Recall that our primary interest is in the wealth-age structure, or  $g(a_i)$  in equation (1). It can be estimated as

$$\hat{g}(a_i) = \hat{E}(w_i | a_i) - \hat{E}(z_i | a_i) \hat{\beta}. \quad (5)$$

The asymptotic property of  $\hat{g}(a_i)$  follows the asymptotic property of the usual nonparametric regression function estimation. See Pagan and Ullah (1999) among others.

### III. PSID DATA AND CROSS-SECTIONAL WEALTH-AGE PROFILES

The PSID is ideal for estimating wealth-age profiles because it includes households of all ages and it has collected wealth data for nearly two decades. Wealth was first collected in 1984, with subsequent collections in 1989, 1994, 1999, and 2001. Data from all five waves are analyzed.

Families are asked to report information on a comprehensive list of wealth variables. The definition of net worth includes the market value of cash, deposits, bonds, stocks and shares, registered savings plans, other financial assets, vehicles, owner-occupied houses and other real estate, equity in a business or farm, less debts of various kinds. It excludes social security and pension wealth, consumer durables other than cars, life insurance policies, and other assets such as the expected value of future inheritances and support from relatives or children. Depending on the year, 15-19 percent of families have non-positive wealth.

All nominal values are adjusted for inflation and reported in 2001 dollars (in thousands). PSID family weights are used in all analyses. We restrict our attention to families in which the head's age is at least 25 and at most 85 at the time of survey; samples outside this range are quite small.

Table 1 shows the mean, standard deviation, and median of net worth in 1984 by age, marital status, work status, education, and race. Patterns and differentials for 1984 are similar to those observed in other years.

The first thing to note is that in the full sample there is substantial heterogeneity in the wealth of each age group. Standard deviations are large and the mean of net worth is well above the median, indicating that the distribution is substantially skewed to the right. The data sets on wealth typically include a few observations with very large amounts, hence the wealth distribution has long tails and the mean deviates widely from the median.

As a result, we also report estimates with the upper and lower 5% of the wealth distribution trimmed in each year. The wealth variable in the trimmed sample also exhibits substantial dispersion and skewness, however, the variance is substantially reduced. The size and standard deviations of these changes suggest that it is important to rely on robust estimators when using wealth data from micro data sets. The wealth skewness and the presence of influential values suggest that untrimmed mean or OLS regressions may not adequately characterize the wealth-age profile. In view of robustness criterion of Hampel (1971), the trimmed mean or trimmed LS regressions are more robust to extreme observations<sup>2</sup>.

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<sup>2</sup> Jappelli(1999) also pointed out this issue in estimating the wealth-age profile of Italian

**[Table 1]** Distribution of Wealth, 1984 (Thousands of 2001 dollars)

	Full sample			Trimmed sample			
	Mean	Std. Dev.	Median	Mean	Std. Dev.	Median	% in Sample (weighted)
Total	182.6	3,138.2	63.6	105.6	557.7	59.7	100
Age of head							
25 to 29	30.0	308.2	10.2	19.8	93.1	10.2	14.4
30 to 34	80.9	2,140.7	24.2	41.0	175.1	23.5	14.1
35 to 39	159.9	2,171.3	62.9	95.2	428.9	61.0	12.8
40 to 44	221.8	2,366.5	83.4	119.6	528.4	78.4	7.9
45 to 49	206.4	1,845.2	105.9	137.1	662.4	98.9	7.1
50 to 54	349.5	6,121.4	123.6	162.6	737.3	118.3	7.6
55 to 59	376.9	6,828.7	134.3	171.6	774.6	126.1	8.6
60 to 64	195.2	1,269.1	119.7	145.1	635.9	117.2	7.6
65 to 69	248.1	1,775.4	136.5	165.0	723.4	126.1	5.8
70 to 74	160.8	1,004.8	97.8	128.6	626.3	93.9	6.0
75 to 79	160.1	1,290.0	88.3	122.8	694.9	81.5	5.1
80 to 85	272.6	9,089.3	68.2	110.6	715.4	68.2	3.1
Marital status							
Married couple	260.9	3,983.4	105.9	134.0	581.8	92.0	57.6
Single male	72.5	657.9	17.0	61.3	438.4	18.1	12.5
Single female	73.7	617.2	22.6	69.3	481.3	27.2	29.9
Work							
Work for others	143.8	2,959.3	55.4	95.9	508.2	55.2	89.7
Work for self	459.7	4,180.1	192.6	189.4	833.4	136.4	10.3
Education of head							
High school Dropout	92.6	793.1	37.5	74.5	398.6	39.7	29.8
High sch. degree	159.2	2,152.0	66.5	105.7	536.0	63.1	52.0
College degree	341.7	6,004.7	106.4	138.3	756.8	84.4	12.4
Post col. degree	452.7	8,670.1	151.7	193.5	949.9	136.8	5.8
Race of head							
Black	34.3	394.1	6.3	33.8	157.8	9.1	12.8
Non-black	203.6	3,920.6	76.9	116.0	676.8	71.1	87.3
Total observations	6,088			5,480			

The striking feature of Table 1 is that for both the full and the trimmed sample, there is clear evidence of a hump-shaped pattern in the mean

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households, where he used quantile regressions.

value of wealth. Wealth accumulation is rapid in the age range 30-40, reaches a plateau in the pre-retirement phase, and then decumulation begins sometime in the 60s.

The maximum value of wealth is found in the age bracket 55-59. There is a puzzling dip in the mean of wealth for the group aged 60-64, and then wealth rises again at age range 65-69. There is a large difference between the full sample and trimmed sample at ages 80-85. In the full sample, wealth holdings rise in the last part of the life cycle. By contrast, in the trimmed sample, elderly in this age range clearly dissave, hence wealth-age profiles from the trimmed sample display the hump-shaped pattern consistent with life cycle predictions. This pattern is consistent with the median wealth holdings both from the full sample and the trimmed sample. The difference between mean holdings from the full sample and trimmed sample strongly supports the use of the trimmed sample when considering the life cycle model.

Breakdowns of wealth holdings by other demographic categories are also given in Table 1. The table shows that mean wealth holdings of married couples is approximately two times higher than those of singles. Wealth varies widely across education groups. Families in which the head has a post-college degree have 2-4 times greater total net worth than families in which the head is a high school drop out. Consistent with prior literature, the table shows that mean wealth holdings of non-black families are substantially higher than those of black families.

The next step is to estimate the cross-sectional wealth model given by equation (5). Table 2 reports the semiparametric estimates of  $\beta$  along with two parametric results. All of the coefficients from the parametric models and semiparametric model have the predicted signs though not all are significantly different from zero at conventional levels in all specifications. We checked whether quadratic and cubic parameterizations are consistent with the semiparametric estimates using the statistics of Aït Sahalia, Bickel, and Stoker (2001)<sup>3</sup>; the p-value was

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<sup>3</sup> This test is a goodness-of-fit test based on  $n^{-1} \sum_{i=1}^n (\hat{g}(a_i) - \tilde{g}(a_i)) I_i$ , where  $\tilde{g}(a_i)$  is the fitted value of the parametric regressions and  $I_i$  indicates trimming of the 5% of sample values with lowest estimated density.

0.000. Consequently, we reject the two parametric specifications against the semiparametric partial linear model.

[Table 2] Wealth-Age Profile Estimates: Cross Section for 1984

Variable	Quadratic	Cubic	Semiparametric
Constant	-0.390** (0.040)	-0.181** (0.036)	
Single male	-70.781** (5.653)	-47.137** (5.808)	-47.582** (5.721)
Single female	-68.551** (4.622)	-55.723** (4.722)	-52.498** (4.510)
Work-self	79.002** (8.759)	77.957** (8.553)	73.923** (8.441)
High school diploma	41.678** (4.083)	55.584** (4.416)	60.366** (4.465)
College degree	79.890** (7.735)	95.048** (7.928)	98.860** (8.045)
Post-college degree	103.400** (12.312)	113.231** (12.252)	115.752** (12.418)
Black	-20.158** (5.098)	-26.863** (4.878)	-39.291** (3.833)
# of children	-8.932** (1.726)	-1.811 (1.670)	-2.208 (1.714)
Age	2.945** (0.319)	-4.248** (0.725)	
Age squared	-0.006* (0.004)	0.225** (0.024)	
Age cubic		-0.002** (0.000)	
$R^2$	0.426	0.446	0.464

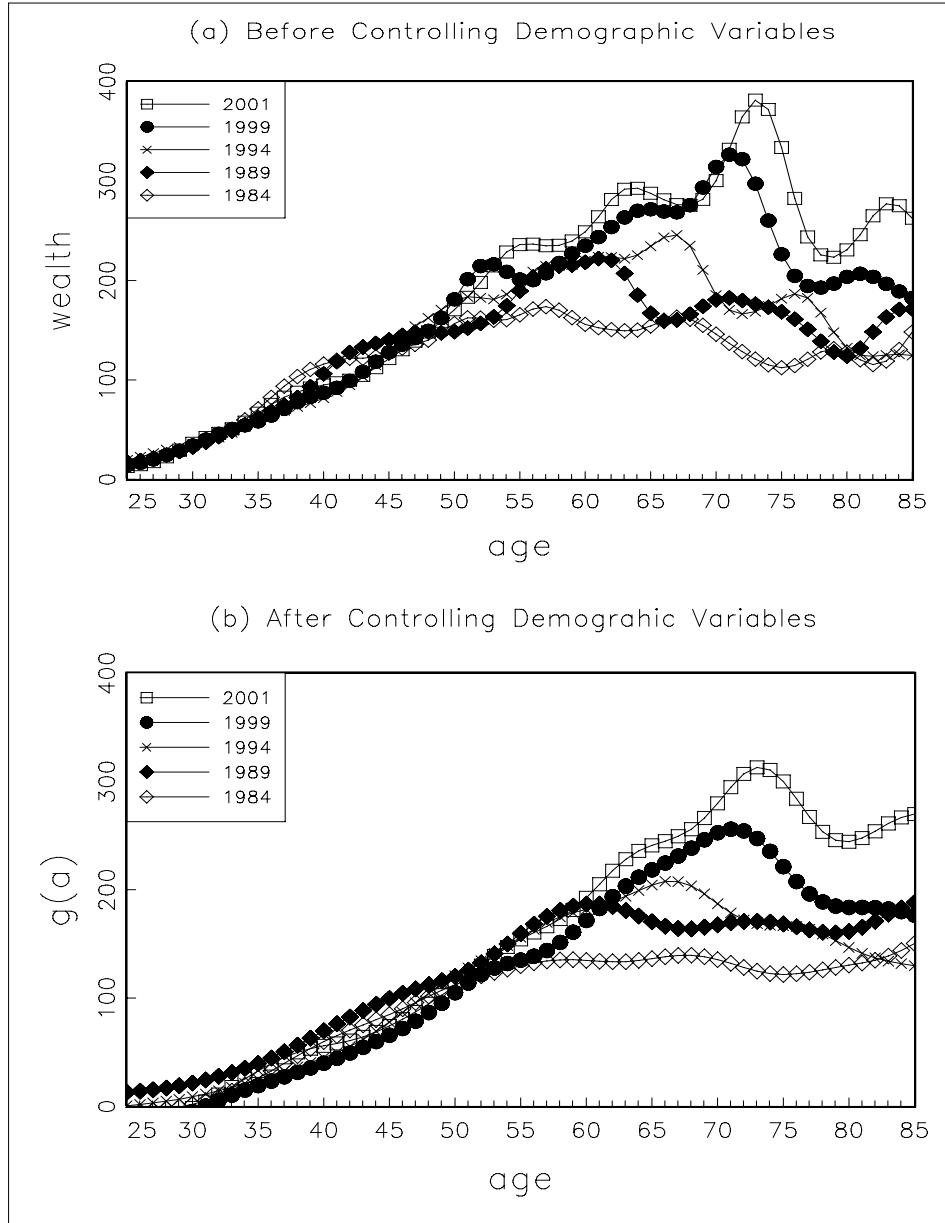
Heteroscedasticity corrected standard errors in parentheses.

\* Significant in 10% significance level.

\*\* Significant in 5% significance level.

Figure 1 illustrates the wealth-age profiles for each cross-section: 1984, 1989, 1994, 1999, and 2001. In this figure, we present some prima facie evidence concerning the validity of a simple version of life cycle hypothesis. We examine the distribution of wealth across the life cycle



**[Figure 1]** Semiparametric Estimation of Cross-Section Wealth-Age Profiles

non-parametrically by using a kernel-smoothing estimator<sup>4</sup>. In particular, we investigate one of the key predictions of this model, namely, that

<sup>4</sup> We use a standard normal kernel and set the bandwidth to  $h = 1.5 \times S_X \times n^{-0.2}$  where  $S_X$  denotes the standard deviation of age.

households run down their assets in old age. Panel (a) shows nonparametric wealth-age profiles for all sample years before controlling for the demographic variables, i.e., the profiles represented by  $\hat{E}(w_i|a_i)$ , and panel (b) shows the profiles after controlling for the demographic variables, i.e., the profiles represented by  $\hat{g}(a_i)$  in equation (5). In panel (b) of Figure 1, we see a moderately hump-shaped age profile in every profile. While the wealth-age profiles for 1994, 1999, and 2001 have clear hump shapes, the profiles for 1984 and 1989 show some plateaus from ages 58-73. Wealth holdings at younger ages do not show much difference across sample years; however the wealth-age profiles show vertical shifts at ages 62-70.

In Figure 1, the hump-shaped pattern is clearly evident beyond age 65. On the basis of this, one might be tempted to conclude that the elderly reduce their wealth in order to finance consumption after retirement. However, it should be realized that Figure 1 is constructed taking into account only the cross-sectional aspect of the PSID. Consequently, cohort and age effects are not disentangled in this figure. As underlined by Shorrocks (1975), this pattern has no implications for the shape of the lifetime profile of wealth ownership.

## IV. WEALTH PROFILES FROM COHORTS

### 4.1. Results for Cohorts

For most of the interesting questions about wealth and the life-cycle, it is necessary to track individuals or cohorts of households over time and to observe changes in wealth holding as people age. The models above confound the age and cohort effects, and it is possible that older cohorts are simply poorer or richer than younger ones. Thus, in cross-sectional data, one cannot identify both age and cohort effects.

In this section we track birth cohorts. For each year of data, we track the sample from the same cohort in the subsequent survey. In this way, we can examine cohort wealth holdings as the cohort ages. Analysis is restricted to the trimmed sample, and households headed by persons born before 1920 and after 1959 are excluded because of small sample sizes. The final sample covers 19,282 households. We divide the whole sample

into four cohorts; pre-Depression, Depression, WWII, and baby boomer. Table 3 reports the year of birth intervals and the numbers of households in each of these four cohorts. The first two columns in Table 3 define each cohort by the year of birth and the next five columns report the range over which the age of each cohort is observed in each sample year.

[Table 3] Design of Trimmed Cohort Sample

	Year of birth	Age of cohort in 1984	Age of cohort in 1989	Age of cohort in 1994	Age of cohort in 1999	Age of cohort in 2001	Total
Pre-Depression	1920-29	55-64 (719)	60-69 (650)	65-74 (595)	70-79 (412)	72-81 (400)	55-81 (2776)
Depression	1930-39	45-54 (724)	50-59 (669)	55-64 (607)	60-69 (442)	62-71 (457)	45-71 (2899)
WWII	1940-49	35-44 (1145)	40-49 (1039)	45-54 (999)	50-59 (766)	52-61 (809)	35-61 (4758)
Baby boomer	1950-59	25-34 (2094)	30-39 (1994)	35-44 (1844)	40-49 (1328)	42-51 (1589)	25-51 (8849)

Number of observations reported in parentheses in each cell.

Table 4 reports the summary statistics of wealth for each cohort across age groups. All cohorts hold a substantial amount of wealth. The mean and median wealth holdings of Depression, WWII, and baby boomer cohorts steadily increase as they age. For the pre-Depression cohort, wealth holdings peak at ages 70-74 and then decline, demonstrating the typical life-cycle pattern, with the exception being the very oldest ages, ages 80-85.

To separate the cohort effect from age effect, equation (1) can be estimated using cohort data by regressing the wealth holdings of households against age, demographic variables, and birth cohort indicators. Most studies regarding cohort effects, for example Deaton and Paxson (1994), assume the shapes of wealth-age profiles are the same across different cohorts. However, the saving behavior of households may be different across the cohorts. Indeed, the assumption of common age effects across cohorts was rejected in our sample, therefore we predict cohorts to have different wealth-age profiles. Therefore, each cohort behaves according to the life-cycle model according to the estimates from

**[Table 4]** Wealth Distribution of Cohorts (Thousands of 2001 dollars)

Year of birth	Pre-Depression			Depression			WWII			Baby boomer		
	1920 - 29			1930 - 39			1940 - 49			1950 - 59		
	Mean	S.D.	Median	Mean	S.D.	Median	Mean	S.D.	Median	Mean	S.D.	Median
Age of head												
25 to 29										19.8	93.1	10.2
30 to 34										39.9	184.2	21.6
35 to 39										71.3	339.7	39.4
40 to 44										95.6	465.5	50.4
45 to 49										139.1	634.0	78.9
50 to 54										169.1	818.6	87.0
55 to 59	171.6	852.3	126.1	137.1	662.4	98.9	95.2	428.9	61.0			
60 to 64	183.5	1,292.5	129.9	160.4	763.8	111.3	125.9	602.7	79.3			
65 to 69	210.0	1,531.4	132.3	215.9	995.8	152.4	148.9	765.2	93.2			
70 to 74	267.9	1,862.6	158.9	248.1	1,368.2	164.9	205.4	1,010.9	127.0			
75 to 79	212.2	2,026.0	138.0	272.9	1,457.4	174.0	226.3	1,083.7	156.3			
80 to 85	239.4	1,132.0	117.5	311.4	1,865.1	225.4	225.0	1,176.3	146.0			
Total	213.3	1,213.8	135.6	213.6	1,152.4	135.5	162.9	849.2	99.2	78.3	439.7	35.0

equation (3), which are given in Table 5<sup>5</sup>. Although the magnitude of the estimates are somewhat different across cohorts, each cohort generates the same expected signs of the estimates.

[Table 5] Semiparametric Estimation of Wealth-Age Profile for Cohorts

Variable	Pre-Depression	Depression	WWII	Baby boomer
Single male	-85.809** (17.920)	-112.062** (16.532)	-74.296** (10.091)	-48.357** (3.820)
Single female	-135.786** (9.705)	-111.920** (10.161)	-91.111** (6.086)	-50.881** (2.894)
Work-self	132.922** (28.280)	80.069** (16.144)	105.155** (11.148)	60.294** (6.002)
High school diploma	103.248** (9.561)	76.246** (9.363)	69.308** (6.435)	35.230** (2.463)
College degree	240.498** (24.546)	187.815** (21.996)	104.658** (9.124)	68.639** (4.318)
Post-college degree	281.327** (28.841)	201.224** (21.211)	171.024** (11.541)	86.044** (6.846)
Black	-56.168** (11.998)	-86.046** (11.113)	-48.954** (6.216)	-27.081** (2.416)
# of children	-18.027 (7.883)	-21.702** (5.689)	-6.015** (2.674)	-1.787* (1.141)
$R^2$	0.378	0.374	0.336	0.344

Heteroscedasticity corrected standard errors in parentheses.

\* Significant in 10% significance level.

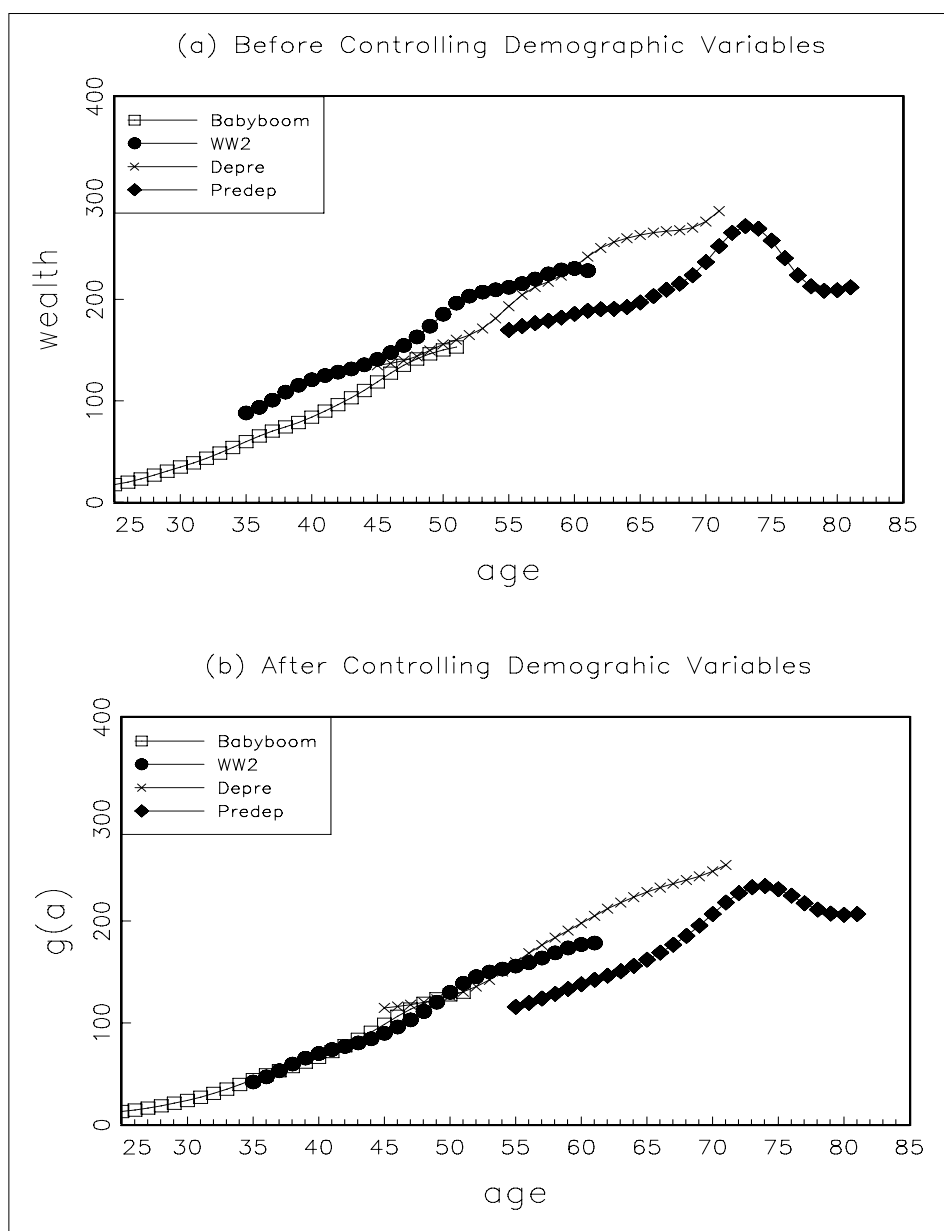
\*\* Significant in 5% significance level.

Figure 2, panels (a) and (b), show nonparametric wealth-age profiles across cohorts before and after controlling for the demographic variables, respectively. In panel (b), the profiles for each cohort are shown to have similar shapes, with the profile for the pre-Depression cohort having the smaller intercept and maximum wealth holdings attained at around age 73. All cohorts have similar rates of growth in wealth until age 73. The lesson from Figure 2 is that although the other three cohorts have not reached age 73, the wealth-age profile drawn from pre-Depression cohort has a clear hump-shaped pattern which supports the standard life-cycle

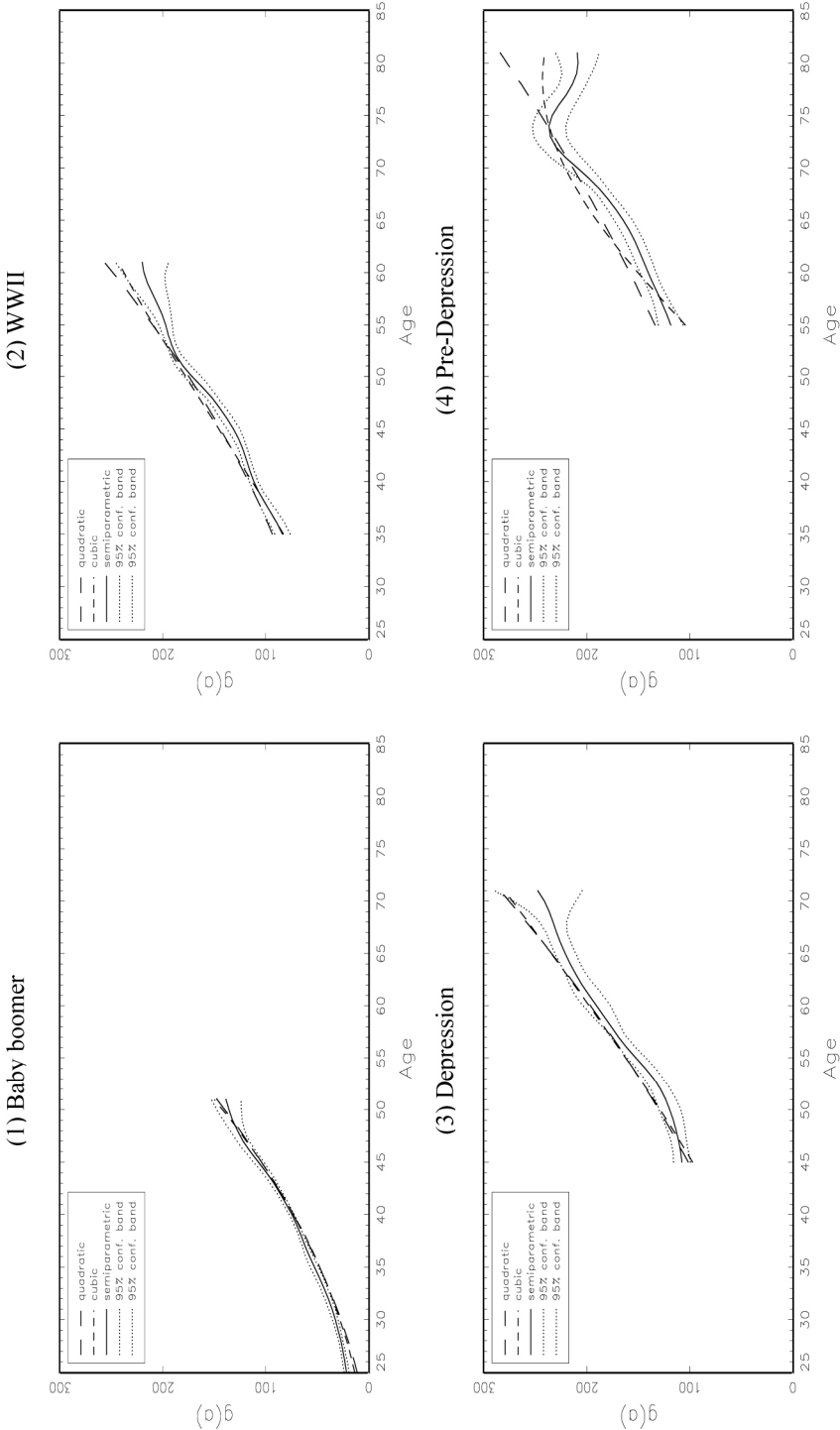
<sup>5</sup> Again, we conduct tests for quadratic and cubic models and reject the two parametric specifications against the semiparametric one. Herein, we do not report the results for parametric models; the results are available from the authors upon request.

hypotheses. Wealth is accumulated throughout the life and then decumulated after roughly age 75.

[Figure 2] Wealth-Age Profiles: Cohort Analysis



[Figure 3] Estimated Wealth-Age Profiles with 95% Confidence Bands for Each Cohort



To evaluate whether there is a disparity between parametric methods and the semiparametric method, the semiparametrically estimated wealth-age profiles for each cohort are presented together with 95% confidence bands and two parametric curves in Figure 3. The parametric curves provide an adequate representation of the wealth-age relationship for the baby boomer cohort. However, for the other cohorts, the approximations are poor. Especially for the pre-Depression cohort, the parametric curve does not capture the hump-shaped pattern that exists between the late 60's and late 70's. In general, the wealth-age relationship becomes highly non-linear at older ages, and parametric representations mis-represent this relationship. For example, for the pre-Depression cohort, the quadratic profiles imply that wealth continues to be accumulated at least through age 80, while the semiparametric estimates show clear evidence of decumulation beginning around age 73.

#### **4.2. The Next Generations: Richer or Poorer?**

Table 4 provides estimates of the age-adjusted ranking of the wealth holdings across cohorts at the same age level. For most age groups, the pre-Depression cohort has the lowest wealth, followed by the Depression cohort, with the WWII cohort the richest among these three cohorts. This may be due to the fact that subsequent generations have been more productive than their predecessors, so that, at the same age, the profiles of younger generations lie above the profiles of older generations. However, when the other factors were controlled, the baby-boomer cohort does not appear to be wealthier than earlier cohorts.

This ranking is clearer if we look at profiles displayed in Figure 2. In Figure 2, the vertical shifts of curves are due to cohort effects, and the general shape of the curves represents the process of wealth accumulation/decumulation as people age. From Figure 2, both before and after controlling for the demographic variables, we confirm the above stylized facts. In Figure 2 (a) and (b), the vertical shift of wealth profiles from pre-Depression cohort to the other cohorts may be explained changes in productivity; that is, younger cohorts were able to produce more goods and services and earn more income. The increasing wealth



shows up in the profiles as a pronounced vertical shift, or cohort effect, as we move from one cohort to the next.

Another feature of Figure 2, particularly panel (b), is that there are no clear differences in vertical intercepts among the profiles of the three most recent cohorts: Depression, WWII, and baby boomer cohorts. This pattern is consistent with no differential productivity across cohorts. This may be explained in terms of a business cycle effect; a certain generation may be luckier than the other generations in wealth accumulation.

## V. SUMMARY AND CONCLUSION

The goal of this paper is to assess the validity of the life-cycle model of wealth by estimating the wealth-age profile. To avoid a priori judgments on whether the elderly actually save or dissave, we employed a nonparametric estimation method. Since it does not impose a functional form, this method allows flexibility in the wealth-age profile throughout the life cycle. We find that the added flexibility is quite important. Conclusions about the extent of accumulation and decumulation as well as the age at which decumulation begins, depend to a large degree on functional form assumptions.

In cross-section studies, the wealth-age profiles have a clear hump-shaped pattern, with an exception at the very oldest ages. Because the individuals in any cross-section belong to different cohorts, the estimated cross-sectional wealth-age profiles may be misleading to the actual wealth-age profiles. Constructing cohort data, the pattern of wealth accumulation conforms reasonably well to the predictions of the life-cycle model. The hump-shaped pattern is clear, with most wealth accumulation occurring by young and the middle-age families; the wealth profile has a peak at around 73, and then at the last stage of life assets are decumulated.

The oldest cohort - the pre-Depression cohort - experienced particularly large gains in wealth in the 1990s through 2001, which are considered business cycle changes, after accounting for business cycle effects in the semiparametric models, there are strong and clear patterns of wealth accumulation through the mid-50s, flat wealth holdings during the late 50s and mid-60s, followed by decumulation during the rest of the life cycle. This pattern is consistent with predictions of the life cycle model.

Despite unique lifetime economic, social, and demographic experiences across birth cohorts, the data indicate that three of the cohorts - Depression, WWII, and baby boomers - have almost identical life cycle wealth holdings, at least through the common life cycle stages covered by the PSID. It is only the pre-Depression cohort who diverged; this cohort had lower wealth, and this gap persisted with controls for demographic effects.

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