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Exploring Household Saving and Consumption-Smoothing in the Philippines

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ABSTRACT

This paper explores whether or not the saving behavior of Filipino households fits the life-cycle hypothesis. Using pseudo-panels, which are constructed from the public use data files of the Family Income and Expenditures Survey of 1988 to 2000, it shows that consumption rises with the age of the household head and that the consumption profile has been rising for younger cohorts. Regressions of the natural logarithm of income and of consumption on cohort and age dummies reveal that the cohort profile of consumption has been rising faster than that of income, which seems to imply that bequests are an inferior good for Filipino households. The regressions also indicate that the cohort-independent age effects on consumption simply track those on income across all ages, suggesting that Filipino households do not behave as the life-cycle hypothesis prescribes, possibly because they are liquidity constrained or impatient.

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INTRODUCTION

Household saving—how much of income is set aside and for how long before being drawn down for consumption, donation, or bequest, by households of different types, with different endowments and opportunities, and in different stages of the life cycle—is an important aspect of household behavior that, particularly in developing countries, is still not well understood. Not only is there a lack of consensus on which of the several competing theoretical models gives the correct explanation, new perspectives and ideas continue to be developed and new empirical accounts continue to be reported, making policy prescriptions far from clear or straightforward.

Nonetheless, it remains to be noted that there have not been studies that trace the temporal trajectories of household saving in the Philippines. In part, this state of affairs may be due to the absence of panel data on Filipino households that include information on incomes, consumption expenditures, and savings, and that span the entire life cycle. What has not been attempted thus far, though, is the employment of pseudo- or synthetic panels to explore this important topic.

This paper redresses this lacuna by constructing pseudo-panels from public use data files of the Family Income and Expenditures Survey (FIES) of various years and using them to analyze whether or not household saving and consumption-smoothing behavior in the Philippines fits the life-cycle hypothesis.[1] It is organized as follows: The next section describes certain salient features of the FIES and how the variables of interest in this study were constructed. The third section shows how the data can be inappropriately organized to study consumption and saving behavior over the life cycle. A more appropriate way to organize the data of the same cross-section survey taken at different points in time, which separates the cohort effects from the age effects, is then discussed in the fourth section. In the fifth section, a regression specification that is consistent with the life-cycle hypothesis and that allows cohort-age decomposition of income and consumption is derived and estimated. Said section also reports and interprets the regression results. The sixth section concludes the paper.

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[1] First formulated by Modigliani and Brumberg (1954, 1979), the life-cycle hypothesis posits that individuals and households smooth consumption over the life cycle, saving when young or newly formed and dissaving during the elderly or retirement years. An exposition of the theory can be found in Deaton (1992). Although now often combined with Milton Friedman's permanent-income hypothesis to form the permanent income-life cycle hypothesis (PILCH), it may be distinguished from the Friedman model as focusing more on the entire planning horizon, whereas the latter emphasizes how consumption adjusts to income variability. In this sense, the life-cycle hypothesis is said to deal with low-frequency consumption-smoothing, while the permanent income hypothesis is said to highlight high-frequency consumption-smoothing.

DATA SOURCE AND VARIABLES

This study utilizes data that are drawn primarily from the FIES of 1988, 1991, 1994, 1997, and 2000. A triennial undertaking of the National Statistics Office (NSO) of the Philippine Government, the FIES is a nationwide, regionally representative survey of households that is intended to collect information on detailed categories of receipts and outlays. It has a stratified, multistage, clustered sampling design in which the strata consist of the cities and municipalities of Metro Manila, the urban and rural areas of each of the provinces, and the chartered cities of the country. Sampling in each stratum is done in three stages: barangays (villages) are selected first, followed by enumeration areas (or delineated portions, such as street blocks) within barangays, and finally households within enumeration areas.

Although a long list of variables is available from the FIES, only five variables are used in this study—income, consumption, the household head's age, and the numbers of adults and of children in the household. Household income and consumption, however, are defined somewhat differently: In the FIES, household income is the annual sum of total income from work and ownership of assets, the total value of cash and goods received, the imputed value of an owner-occupied or a rent-free dwelling unit, and other sources, such as transfers (net of taxes) and family sustenance activities. In this paper, household income does not include the imputed value of an owner-occupied dwelling unit, since it is not an actual receipt, but does include the imputed value of a rent-free dwelling unit when it is given as a benefit in an employment contract, as well as compulsory contributions to life insurance, social security, and home loan programs, since these may be regarded as savings that can be used in future periods.

In the case of consumption expenditures, these are defined in the FIES as the annual sum of the total value of food, other goods, and services that were consumed by the household, the value of gifts and donations given away, and the imputed value of an owner-occupied or a rent-free dwelling unit. In this study, the consumption variable subtracts donations and the imputed value of an owner-occupied house, treating both as not actual expenditures, but leaves untouched the imputed value of a rent-free house when it is given as a benefit in an employment contract, since the worker would have to pay for the rent otherwise.

To make the values of household incomes and consumption expenditures comparable across time and space, these are set at the 1994 National Capital Region (NCR) price level using the provincial consumer price indices of the NSO and the 1997 provincial poverty lines in Balisacan (2001).

Finally, it may be noted that, instead of an individual household, an age cohort of households is used as the unit of observation. Hence, the data on household incomes, consumption expenditures, and the numbers of adults and of

children are weighted means of households headed by persons of every specific age, where the weights are the sampling weights or raising factors. The sample sizes of households grouped by the reported age of their household heads are given in Table 1.

Table 1. Sample sizes of households in FIES, by age (in years) of household head in 1988, 1988–2000

Age of Head in 1988	FIES 1988	FIES 1991	FIES 1994	FIES 1997	FIES 2000
15	4	5	6	269	318
16	1	6	3	413	487
17	3	8		428	495
18	7	14	7	587	649
19	18	13	11	673	798
20	27	36	27	740	781
21	50	49	39	876	773
22	90	86	58	848	797
23	125	147	61	970	966
24	187	207	114	933	1052
25	210	268	191	979	1004
26	249	349	208	1123	1078
27	284	368	241	1005	996
28	410	415	338	1185	1261
29	420	466	372	1157	1097
30	479	581	515	1111	1236
31	474	677	498	1167	1089
32	504	654	580	1027	1072
33	474	617	554	1140	1163
34	496	620	646	1123	1119
35	554	677	659	962	1035
36	517	723	663	1065	1025
37	436	728	698	886	883
38	605	736	737	978	1153
39	545	659	686	937	942
40	572	704	788	928	948
41	478	690	652	954	856
42	437	661	753	754	803
43	425	641	648	771	736
44	408	532	661	702	770
45	428	583	687	726	630
46	475	639	600	756	736
47	374	544	561	742	654
48	447	521	638	729	847

Table 1 continued

Age of Head in 1988	FIES 1988	FIES 1991	FIES 1994	FIES 1997	FIES 2000
49	433	601	579	678	635
50	438	562	578	559	601
51	366	509	487	753	602
52	377	546	530	537	609
53	369	466	479	585	625
54	357	468	598	513	487
55	370	497	502	487	469
56	334	479	486	608	445
57	300	384	427	389	360
58	336	461	510	492	488
59	289	393	390	382	358
60	310	425	437	352	322
61	263	398	343	356	333
62	219	358	394	268	262
63	211	304	355	308	293
64	199	287	364	222	242
65	210	330	399	223	177
66	207	269	274	230	186
67	186	241	280	190	146
68	181	208	260	179	190
69	133	178	225	204	117
70	166	207	262	98	100
71	113	196	180	109	59
72	111	184	198	102	57
73	111	150	150	80	64
74	98	125	190	75	62
75	96	127	137	61	43
76	100	134	114	75	32
77	73	89	106	49	23
78	83	98	136	36	25
79	54	100	63	31	9
80	60	95	89	16	6
81	43	72	72	13	7
82	31	37	61	9	9
83	21	37	47	14	3
84	19	33	44	4	1
Total	18480	24672	24646	38931	38696

CROSS-SECTION AGE PROFILES OF SAVING

How may household saving over the life cycle be studied? Perhaps the most straightforward, if naïve, way is to plot income and consumption expenditure—the difference being saving—against the age of the household head. This is done in Figures 1a to 1e for each year that the FIES was conducted between 1988 and 2000. To smooth the graphs as well as to account for age-heaping (i.e., the tendency for age to be reported as a multiple of 5), however, the levels of income and consumption were averaged over households whose heads' ages fell within the five-year interval centered at the plotted age.[2]

But, as it turns out, the graphs do not resemble their expected life-cycle profiles. Not only is there little indication of hump saving,[3] there is also no evidence of dissaving among households headed by the elderly. Moreover, consumption simply seems to track income throughout the life cycle.

But then, as pointed out in Deaton (1997), there are at least three problems with this method of organizing the data. First, the figures give the impression that the profiles are those of a typical household as it moves through the life cycle—in effect implying that, on average, a household with a 30-year-old head will behave like one with a 70-year-old head 40 years hence. But this is patently incorrect because, when the economy is not in long-term equilibrium, households with heads of different ages would not face the same opportunities at similar stages in the life cycle. Indeed, given that the Philippine economy has been growing (albeit slowly),[4] a Filipino household's lifetime resources would be lower, on average, the older its head's age. If so, the true but unknown life-cycle profiles of income and consumption would be rotated in a counterclockwise direction relative to those that are presented in the figures.

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[2] Specifically, the level of consumption or income plotted, $\bar{y}_i$, at age i was estimated by

$$\bar{y}_i = \frac{1}{n_i}\sum_{j=1}^{N} K(i-2 \le a_j \le i+2) y_j w_j ,$$

where y_j, a_j, and w_j are, respectively, the consumption or income level, the age of the head, and the sample weight (or raising factor) of the jth household for $j = 1, \ldots, N$, $K(\cdot)$ is an indicator function that equals one when the condition inside the parenthesis is satisfied and is zero otherwise, and n_i is the population estimate of the number of households whose heads fall in the five-year age interval centered at age i, that is,

$$n_i = \sum_{j=1}^{N} K(i-2 \le a_j \le i+2) w_j .$$

[3] The life-cycle hypothesis posits that a household sets aside a fraction of its income during the working phase of the life cycle and then draws down its wealth upon the retirement of the primary breadwinners. This behavior gives rise to a humped-shaped saving profile.

[4] Since the Philippines' per capita real GDP grew by 1.33 percent per year between 1960 and 2000 (see, for example, Alba 2007), in 2000, households with 30-year-old heads conceivably would have been 1.7 [= exp(0.0133·40)] times better off than those with 70-year-old heads.

Figure 1a. Cross-section age profiles of household income and consumption expenditure, 1988

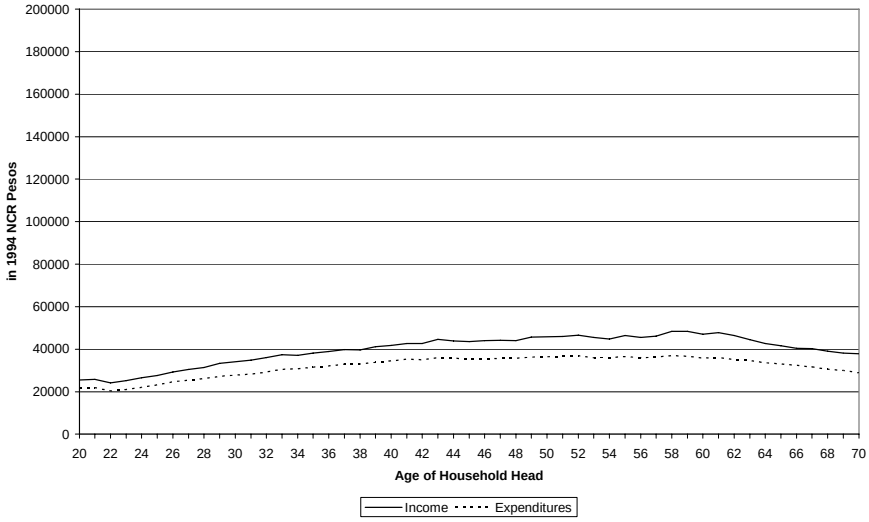
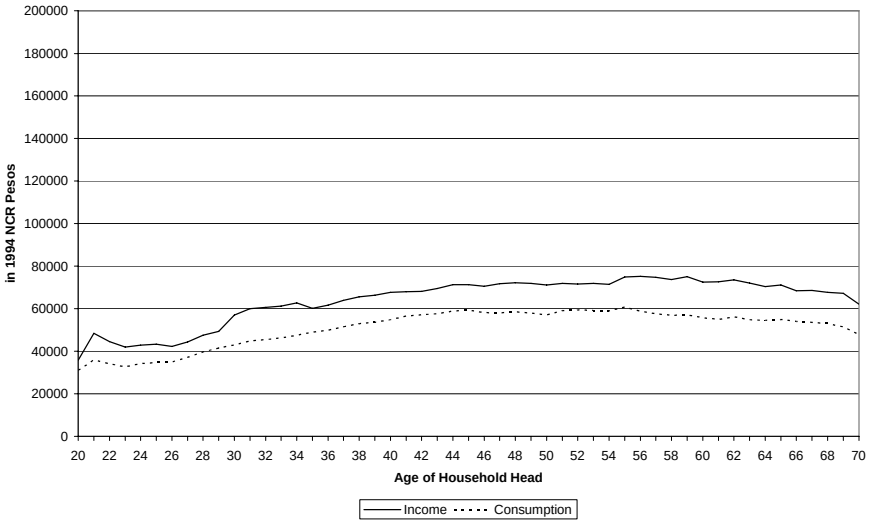


Figure 1b. Cross-section age profiles of household income and consumption expenditure, 1991



Second, the levels of income and consumption used in plotting the graphs are not adjusted for household size. Since the profile of household size relative to the head's age is likely to be similar to the age-income profile, dividing income and consumption by household size would flatten the trajectories. Whether this result

Figure 1c. Cross-section age profiles of household income and consumption expenditure, 1994

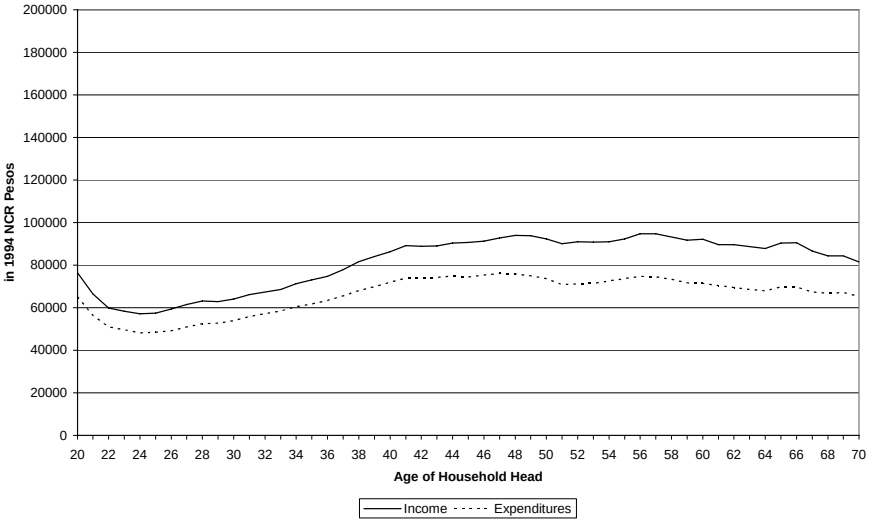
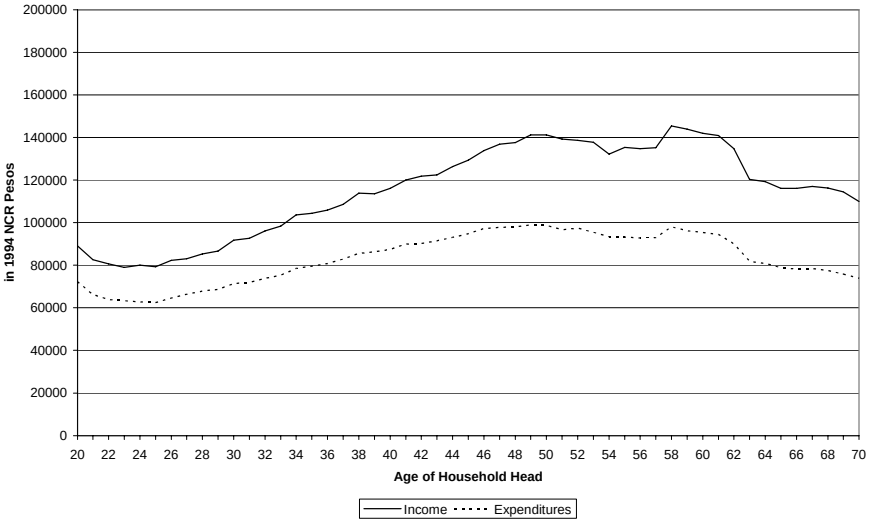
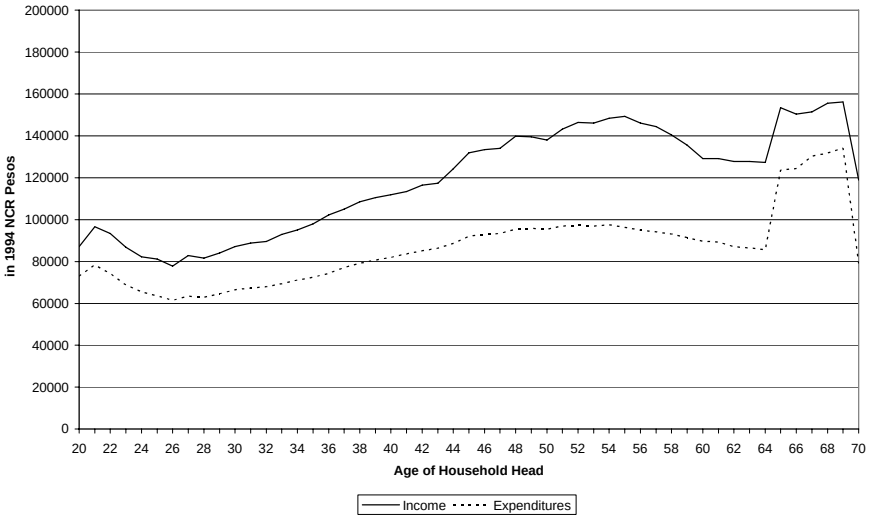


Figure 1d. Cross-section age profiles of household income and consumption expenditure, 1997



(that consumption is not detached from income) should be a policy concern, however, is unclear, at least in the case of households as opposed to individuals. After all, households may be able to adjust size and membership relative to the opportunities facing them—through fertility and migration and through forming extended

Figure 1e. Cross-section age profiles of household income and consumption expenditure, 2000



households or splitting into family subgroups. Moreover, through size and extended networks, households may be able to insure its members against risks associated with income swings.

Third, the subsample of households with elderly heads may be tainted with endogenous selectivity (see, for example, Shorrocks 1975). This is because only those households that are able to accumulate significant savings are able to survive as independent units into the head's twilight years. If so, the profiles overestimate saving levels among households with elderly heads, given that they are conditioned on positive savings.

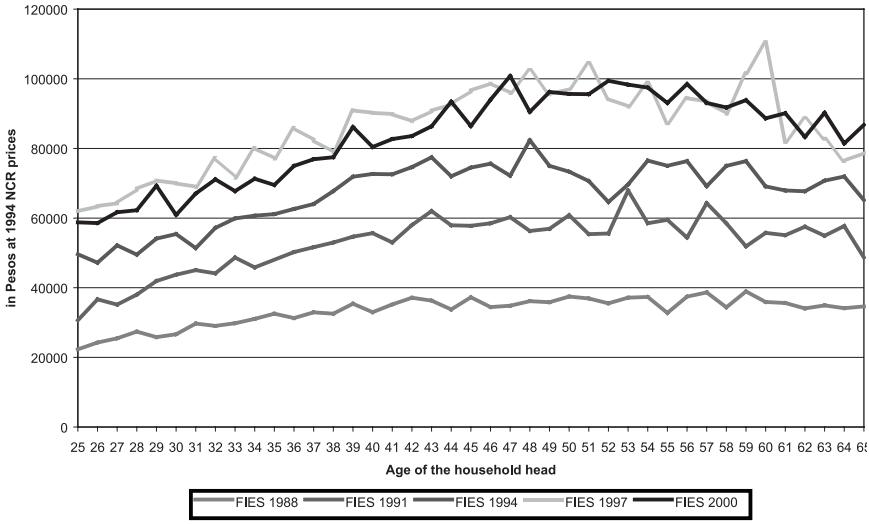
COHORT AGE PROFILES OF CONSUMPTION

How then should the data be organized? Given that the FIES is undertaken at periodic intervals and population-representative estimates of income and consumption at each age may be drawn from each survey run, the age-specific means of income and consumption may be pooled, indexed by age and survey year.

Thus, Figure 2 presents the cross-section age profiles of consumption for every FIES year from 1988 to 2000. Unlike in Figures 1a to 1e, however, the levels of consumption in this chart are sampling-weighted averages of households with heads of each specific age. In other words, no attempt at smoothing or accounting for age heaping is undertaken.

Three points may be noted about the graphs in Figure 2. First, increases in real consumption are raising the age profiles over time, perhaps as a result of

Figure 2. Cross-section age profiles of consumption expenditure for 1988, 1991, 1994, 1997, 2000



economic growth. Second, the graphs for 1997 and 2000 more or less overlap, which implies that the 1997 Asian financial crisis had relatively mild effects on consumption at least by 2000. Third, as already noted in the previous section, the cross-section profiles do not reflect the experience of any cohort of households. To take a specific example, a household with a 30-year-old head in 1988 would have a 33-year-old head, not in 1988 but in 1991. Thus, to trace the average consumption experience of a cohort, what ought to be connected are points, not in the same survey year, but of the same cohort across consecutive survey years.

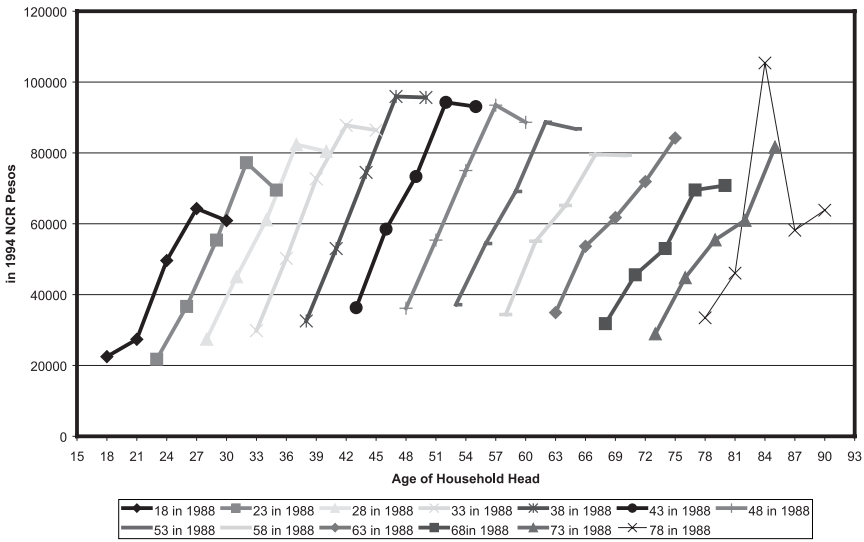
Implementing this insight, Figure 3 shows the age-consumption profiles of every fifth cohort, starting with those who were born in 1970 and then moving back five years per cohort until those born in 1910 is reached. In effect, the first line segment in the figure constitutes the average consumption of the youngest cohort when they were 18 years old in 1988 to when they were 30 years old in 2000, while the last one traces the average consumption of the oldest cohort when they were 78 years old in 1988 to when they were 90 years old in 2000.[5]

Comparing the charts, note how misleading the cross-section age-consumption profiles of Figure 2 are. Instead of being flat or slightly humped-shaped, the

[5] Note that Figures 2 and 3 are based on exactly the same information. Moreover, if the consumption profiles of all the cohorts had been graphed in Figure 3, the two charts would contain the same data points, except that the points would be connected differently.

cohort profiles of Figure 3 rise rapidly.[6] Moreover, the consumption profiles of the younger cohorts tend to be to the left and above those of the older cohorts, indicating that the younger cohorts generally have higher consumption at a given age. Thus, the decline in consumption among elderly households, which can be observed from the age profiles of Figure 2, is really an artifact of the lower consumption profile and of the lower lifetime wealth of the older cohorts. The conclusion that may be drawn from cohort analysis is therefore that (a) consumption generally rises with age throughout the life cycle, and (b) older cohorts have lower consumption profiles due to the lower value of their lifetime budget constraint.

Figure 3. Age-consumption profiles of selected cohorts



DECOMPOSING THE COHORT AND AGE EFFECTS IN INCOME AND CONSUMPTION

The analysis in the previous section suggests that the trajectory of consumption over the life cycle reflects the effects of the household head's cohort, which proxies for the lifetime wealth constraint, and his age, which proxies for tastes and preferences. This section provides a specification for estimating and decomposing these effects that is consistent with, but is not restricted to conform to, the life-cycle hypothesis.

[6] Note, though, that the last consumption point in every cohort tends to be lower than the immediately preceding point. This reflects the effect on household consumption of the 1997 Asian financial crisis by 2000, when by then the shocks to the asset markets had found their way into the real sector (see Alba 2001).

Consider a household whose head was born in year b and which was observed in survey year t. Following the life-cycle hypothesis under certainty or perfect foresight, one may specify the consumption level c_j of such a household as a proportion of its lifetime wealth, W_j, where the factor of proportionality, γ_j, depends on the head's age, $t - b_j$, and the household's demographic composition, Ω_j (to allow for differences in the consumption needs of adults and children), i.e.,

$$c_j(b_j, t - b_j, \Omega_j) = \gamma^j(t - b^j, \Omega_j)W_j(b_j). \quad (1)$$

Note that, in this simple model, lifetime wealth (or the sum of the household's asset holdings and the discounted present value of its future labor earnings and net transfers) is assumed to be set at the head's birth (which proxies for the household's inception), so that the household's problem is simply to allocate consumption over time according to its preferences as mediated by age and demographic composition through $\gamma_j j$

Taking the natural logarithm of (1) and averaging across households by cohort, as reflected in b, as well as by year of observation, as reflected in $t - b$, and demographic composition, Ω, yields

$$\overline{\ln c(b,t-b,\Omega)} = \overline{\ln \gamma(t-b,\Omega)} + \overline{\ln W(b)}. \quad (2)$$

Equation (2) states that the natural logarithm of consumption averaged over households belonging to the same cohort, survey year, and demographic composition ($b \times t \times \Omega$) cell is the sum of two components, one which depends only on age and demographic composition and another which depends only on the cohort of the household head. Consequently, the cohort-age-household-composition averages of the natural logarithm of consumption may be regressed on sets of cohort and age-group dummies as well as household composition variables.

Tables 2 and 3 present the results of these income and consumption regressions on cohort and age-group dummy variables, without and with household composition variables, respectively. Although there really is no theoretical justification for the income regressions, the exercise was undertaken anyway to provide a basis of comparison for the consumption regressions and to obtain the cohort saving rates and the cohort-independent age-saving-rate profiles.

Turning to Table 2, notice that the coefficient estimates of the younger cohorts are not significant. In the income regression, it is not until the cohort headed by the 43-year-olds in 1988 is reached that the coefficient estimate becomes statistically different from zero. In the consumption regression, the first cohort with the statistically significant estimate is the one headed by the 36-year-

Table 2. Regressions of income and consumption on cohort and age groups and the implied saving rate, without demographic composition

Variables	ln(Income) Coefficient estimate	ln(Income) Standard error	ln(Consumption) Coefficient estimate	ln(Consumption) Standard error	Saving rate
Age in 1988					
15					
16	-0.23936	0.136	-0.17711	0.116	-0.06423
17	-0.16100	0.137	-0.11964	0.116	-0.04223
18	-0.16844	0.137	-0.15367	0.117	-0.01487
19	-0.05762	0.138	-0.03587	0.118	-0.02198
20	-0.13905	0.141	-0.11865	0.120	-0.02061
21	-0.16597	0.143	-0.16423	0.121	-0.00174
22	-0.19984	0.144	-0.19931	0.123	-0.00053
23	-0.19502	0.144	-0.18206	0.123	-0.01304
24	-0.20632	0.146	-0.20365	0.124	-0.00267
25	-0.20648	0.149	-0.20003	0.126	-0.00647
26	-0.19686	0.150	-0.18988	0.127	-0.00701
27	-0.17047	0.152	-0.16684	0.129	-0.00363
28	-0.19006	0.152	-0.19268	0.129	0.00261
29	-0.21667	0.153	-0.22099	0.130	0.00431
30	-0.20776	0.156	-0.22166	0.133	0.01380
31	-0.21781	0.157	-0.22680	0.134	0.00894
32	-0.21265	0.159	-0.22487	0.135	0.01214
33	-0.22812	0.159	-0.23851	0.135	0.01034
34	-0.20932	0.161	-0.23407	0.137	0.02445
35	-0.21980	0.163	-0.24569	0.139	0.02556
36	-0.26678	0.164	-0.28058	0.140 *	0.01371
37	-0.27274	0.166	-0.28272	0.141 *	0.00993
38	-0.27108	0.166	-0.29640	0.141 *	0.02501
39	-0.26739	0.168	-0.29630	0.142 *	0.02849
40	-0.29940	0.170	-0.32627	0.145 *	0.02651
41	-0.30288	0.171	-0.33692	0.145 *	0.03346
42	-0.31454	0.173	-0.34838	0.147 *	0.03328
43	-0.36855	0.173 *	-0.39436	0.147 **	0.02548
44	-0.37633	0.174 *	-0.40700	0.148 **	0.03020
45	-0.41099	0.177 *	-0.44199	0.150 **	0.03052
46	-0.45553	0.178 *	-0.48383	0.151 **	0.02790
47	-0.43712	0.179 *	-0.47005	0.152 **	0.03239
48	-0.45234	0.179 *	-0.48012	0.153 **	0.02740
49	-0.48324	0.181 **	-0.50479	0.154 **	0.02132
50	-0.50849	0.183 **	-0.52945	0.156 **	0.02074
51	-0.47954	0.184 **	-0.52677	0.156 **	0.04613
52	-0.56055	0.186 **	-0.60065	0.158 **	0.03931
53	-0.55578	0.186 **	-0.59180	0.158 **	0.03538

Table 2 continued

Variables	ln(Income) Coefficient estimate	ln(Income) Standard error	ln(Consumption) Coefficient estimate	ln(Consumption) Standard error	Saving rate
54	-0.56781	0.187 **	-0.60812	0.159 **	0.03951
55	-0.56444	0.189 **	-0.58667	0.161 **	0.02199
56	-0.65164	0.190 **	-0.69200	0.162 **	0.03955
57	-0.60605	0.192 **	-0.65174	0.163 **	0.04466
58	-0.65599	0.192 **	-0.71218	0.163 **	0.05464
59	-0.67069	0.193 **	-0.72864	0.164 **	0.05630
60	-0.72924	0.195 **	-0.77948	0.166 **	0.04900
61	-0.68885	0.196 **	-0.73060	0.167 **	0.04089
62	-0.79368	0.198 **	-0.84464	0.168**	0.04968
63	-0.78235	0.198 **	-0.82617	0.168 **	0.04287
64	-0.78884	0.199 **	-0.82767	0.169 **	0.03808
65	-0.83356	0.201 **	-0.88862	0.171 **	0.05357
66	-0.80014	0.202 **	-0.87742	0.171 **	0.07437
67	-0.85819	0.203 **	-0.91917	0.173 **	0.05916
68	-0.93244	0.203 **	-1.00226	0.173 **	0.06744
69	-0.98616	0.204 **	-1.03487	0.174 **	0.04754
70	-0.92895	0.207 **	-0.98519	0.176 **	0.05469
71	-1.10191	0.207 **	-1.15378	0.176 **	0.05055
72	-1.08900	0.209 **	-1.18529	0.177 **	0.09179
73	-1.06957	0.209 **	-1.13699	0.178 **	0.06519
74	-1.18418	0.210 **	-1.25978	0.178 **	0.07282
75	-1.15534	0.212 **	-1.24371	0.180 **	0.08458
76	-1.30220	0.213 **	-1.35793	0.181 **	0.05421
77	-1.26439	0.214 **	-1.31986	0.182 **	0.05396
78	-1.17678	0.214 **	-1.25623	0.182 **	0.07638
79	-1.17784	0.215 **	-1.28873	0.183 **	0.10496
80	-1.21005	0.217 **	-1.33013	0.185 **	0.11315
81	-1.42764	0.219 **	-1.54360	0.186 **	0.10949
82	-1.55176	0.220 **	-1.61282	0.187 **	0.05924
83	-0.90583	0.220 **	-1.15468	0.187 **	0.22031
84	-1.74123	0.222 **	-1.80999	0.188 **	0.06645
Age Group in Survey Year					
$15 \leq x < 19$					
$20 \leq x < 25$	0.19960	0.105	0.16211	0.089	0.03679
$25 \leq x < 30$	0.37558	0.104 **	0.33680	0.089 **	0.03804
$30 \leq x < 35$	0.53071	0.115 **	0.50584	0.098 **	0.02457
$35 \leq x < 40$	0.67422	0.125 **	0.65272	0.106 **	0.02127
$40 \leq x < 45$	0.80179	0.134 **	0.78206	0.114 **	0.01954
$45 \leq x < 50$	0.92473	0.142 **	0.89193	0.121 **	0.03228
$50 \leq x < 55$	1.00760	0.150 **	0.95766	0.127 **	0.04872

Table 2 continued

Variables	ln(Income) Coefficient estimate	ln(Income) Standard error	ln(Consumption) Coefficient estimate	ln(Consumption) Standard error	Saving rate
$55 \leq x < 60$	1.08487	0.157 **	1.02149	0.134 **	0.06142
$60 \leq x < 65$	1.09578	0.164 **	1.04102	0.140 **	0.05329
$65 \leq x < 70$	1.13050	0.171 **	1.08752	0.145 **	0.04207
$70 \leq x < 75$	1.14559	0.178 **	1.09542	0.151 **	0.04893
$75 \leq x < 80$	1.21717	0.184 **	1.19691	0.156 **	0.02006
$80 \leq x < 85$	1.35539	0.190 **	1.32340	0.162 **	0.03149
$85 \leq x < 90$	1.38535	0.196 **	1.39625	0.167 **	-0.01096
$90 \leq x$	1.60028	0.205 **	1.56621	0.175 **	0.03349
Constant	10.77542	0.112 **	10.59885	0.096 **	
R^2		0.5860		0.6605	
Adjusted R^2		0.4548		0.5529	
$F(84, 265)$		4.47		6.14	
Number of Observations		350		350	

**significant at two-tailed ± = α .01
* significant at two-tailed ± = α .05

Table 3. Regressions of income and consumption on cohort and age groups and the implied saving rate, with demographic composition

Variables	ln(Income) Coefficient estimate	ln(Income) Standard error	ln(Consumption) Coefficient estimate	ln(Consumption) Standard error	Saving rate
Number of Adults	0.37395	0.027 **	0.29131	0.023 **	
Number of Children	0.43949	0.025 **	0.36336	0.021 **	
Age in 1988					
15					
16	-0.09791	0.092	-0.06883	0.080	-0.02951
17	-0.04507	0.093	-0.03231	0.080	-0.01284
18	-0.20460	0.092 *	-0.18963	0.080 *	-0.01508
19	-0.08789	0.093	-0.06722	0.081	-0.02089
20	-0.04304	0.096	-0.04917	0.083	0.00611
21	-0.16263	0.096	-0.16899	0.083 *	0.00634
22	-0.10955	0.097	-0.13453	0.084	0.02467
23	-0.19444	0.097 *	-0.18911	0.084 *	-0.00534
24	-0.20236	0.098 *	-0.20832	0.085 *	0.00594

Table 3 continued

Variables	ln(Income) Coefficient estimate	ln(Income) Standard error	ln(Consumption) Coefficient estimate	ln(Consumption) Standard error	Saving rate
25	-0.12633	0.100	-0.14323	0.087	0.01676
26	-0.16071	0.101	-0.16738	0.087	0.00665
27	-0.10449	0.102	-0.11982	0.089	0.01521
28	-0.12922	0.102	-0.14811	0.089	0.01871
29	-0.16429	0.103	-0.18261	0.089 *	0.01815
30	-0.12182	0.105	-0.15580	0.091	0.03340
31	-0.12227	0.106	-0.15133	0.092	0.02865
32	-0.12635	0.107	-0.15618	0.093	0.02939
33	-0.10001	0.107	-0.13366	0.093	0.03309
34	-0.10341	0.108	-0.14546	0.094	0.04118
35	-0.09976	0.110	-0.14446	0.095	0.04372
36	-0.11421	0.111	-0.15115	0.096	0.03626
37	-0.15869	0.112	-0.18285	0.097	0.02387
38	-0.09982	0.112	-0.14752	0.097	0.04658
39	-0.07800	0.113	-0.13044	0.098	0.05108
40	-0.14448	0.115	-0.18697	0.100	0.04161
41	-0.11891	0.116	-0.17133	0.100	0.05107
42	-0.11751	0.117	-0.16982	0.102	0.05097
43	-0.11680	0.118	-0.16853	0.102	0.05042
44	-0.12997	0.119	-0.18206	0.103	0.05076
45	-0.14466	0.121	-0.19838	0.105	0.05230
46	-0.18076	0.122	-0.23000	0.106 *	0.04805
47	-0.13271	0.124	-0.18954	0.107	0.05524
48	-0.11085	0.125	-0.16549	0.108	0.05318
49	-0.10804	0.126	-0.15959	0.109	0.05024
50	-0.09897	0.129	-0.15252	0.111	0.05214
51	-0.05872	0.130	-0.13666	0.113	0.07498
52	-0.09713	0.132	-0.17303	0.114	0.07309
53	-0.05508	0.133	-0.12966	0.115	0.07187
54	-0.05364	0.135	-0.13100	0.117	0.07444
55	-0.02245	0.137	-0.08370	0.119	0.05941
56	-0.00734	0.140	-0.10218	0.121	0.09048
57	-0.00094	0.142	-0.08940	0.123	0.08466
58	-0.00281	0.143	-0.10685	0.124	0.09881
59	0.04378	0.145	-0.06976	0.126	0.10733
60	0.04417	0.148	-0.06954	0.129	0.10748
61	0.07891	0.150	-0.02112	0.130	0.09519
62	0.06035	0.153	-0.06113	0.133	0.11439
63	0.03384	0.154	-0.06921	0.134	0.09792
64	0.09670	0.157	-0.00976	0.136	0.10099
65	0.10354	0.160	-0.02529	0.139	0.12088

Table 3 continued

Variables	ln(Income) Coefficient estimate	Standard error	ln(Consumption) Coefficient estimate	Standard error	Saving rate
66	0.13856	0.162	-0.00860	0.140	0.13685
67	0.09063	0.165	-0.03803	0.143	0.12073
68	0.13722	0.167	-0.02028	0.145	0.14573
69	0.07401	0.169	-0.05662	0.146	0.12246
70	0.18714	0.172	0.04222	0.149	0.13491
71	0.12643	0.175	-0.03208	0.152	0.14659
72	0.13841	0.178	-0.05908	0.154	0.17920
73	0.21336	0.179	0.03593	0.155	0.16258
74	0.10448	0.182	-0.07673	0.158	0.16574
75	0.13414	0.185	-0.05521	0.161	0.17250
76	0.06544	0.187	-0.10483	0.162	0.15656
77	0.23569	0.192	0.04516	0.166	0.17348
78	0.14428	0.191	-0.03195	0.166	0.16158
79	0.25289	0.195	0.02892	0.169	0.20067
80	0.27743	0.198	0.03707	0.172	0.21366
81	0.22127	0.204	-0.03821	0.177	0.22855
82	0.11636	0.207	-0.08883	0.179	0.18550
83	0.27449	0.200	-0.02866	0.173	0.26151
84	0.07270	0.213	-0.16095	0.185	0.20836
Age Group in Survey Year					
15 ≤ x < 20					
20 ≤ x < 25	-0.18872	0.074 *	-0.15737	0.064 *	-0.03184
25 ≤ x < 30	-0.76315	0.098 **	-0.57982	0.085 **	-0.20120
30 ≤ x < 35	-0.65522	0.105 **	-0.44923	0.091 **	-0.22874
35 ≤ x <40	-0.40150	0.105 **	-0.21762	0.091 *	-0.20186
40 ≤ x < 45	-0.16512	0.106	-0.00806	0.091	-0.17006
45 ≤ x < 50	-0.04052	0.110	0.09254	0.095	-0.14232
50 ≤ x < 55	-0.09867	0.118	0.03071	0.102	-0.13813
55 ≤ x < 60	-0.24455	0.130	-0.10243	0.112	-0.15272
60 ≤ x < 65	-0.45248	0.142 **	-0.27846	0.123 *	-0.19008
65 ≤ x < 70	-0.61937	0.155 **	-0.41518	0.134 **	-0.22653
70 ≤ x < 75	-0.71793	0.166 **	-0.51940	0.144 **	-0.21961
75 ≤ x < 80	-0.80952	0.179 **	-0.56998	0.155 **	-0.27066
80 ≤ x < 85	-0.77738	0.191 **	-0.55003	0.166 **	-0.25527
85 ≤ x < 90	-0.83535	0.202 **	-0.56443	0.175 **	-0.31116
90 ≤ x	-0.79110	0.222 **	-0.56252	0.193 **	-0.25682
Constant	10.39738	0.080 **	10.30063	0.069 **	

Table 3 continued

Variables	ln(Income) Coefficient estimate	ln(Income) Standard error	ln(Consumption) Coefficient estimate	ln(Consumption) Standard error	Saving rate
R^2		0.8143		0.8417	
Adjusted R^2		0.7535		0.7899	
F(86, 263)		13.41		16.26	
Number of Observations		350		350	

**significant at two-tailed α = .01

* significant at two-tailed α = .05

olds in 1988. What these results indicate is that the cohort effects on income and consumption were not different over the youngest 20 or more cohorts of households—the equivalent of one generation—possibly because of the slow growth of the Philippine economy and the corresponding lack of increases in earnings and lifetime wealth since 1960 (see Alba 2007).

This result notwithstanding, it remains to be asked what the cohort effects are. To facilitate the interpretation of the regression results, Figure 4a presents the graphs of the cohort effects on income, consumption, and the saving rate. The following may be gleaned from the figure: First, the cohort effects on the natural logarithm of income and consumption are declining, which implies that younger cohorts of households have higher lifetime income and consumption profiles. Second, the cohort effect raises the age profile of income by 2.5 percent per year and of consumption by 2.6 percent per year, which are much faster than the 1.29 percent and 0.25 percent average annual growth rates of the Philippines' GDP per capita and GDP per worker between 1990 and 2000, respectively. Third, as a consequence of the higher rates of growth of the cohort effects on consumption relative to those on income, the saving rate is declining from older to younger cohorts, although at a very gradual rate.

Under what circumstances does the cohort effect on the saving rate decline? From an intertemporal choice and life-cycle perspective, it may be inferred that consumption profiles would grow faster than income profiles if bequests are an inferior good, so that lifetime consumption would have an increasing share in lifetime resources, which include intergenerational transfers. In other words, asset accumulation that is not intended to be drawn down in old age is not an important motive of saving among Filipino households.

As for the cohort-independent effects of age, Figure 4b shows that consumption is just a little lower than income throughout the lifetime of the household head, so that the saving rate is positive but very close to zero throughout the life

Figure 4a. Cohort effects on income, consumption, and the saving rate (without accounting for demographic composition)

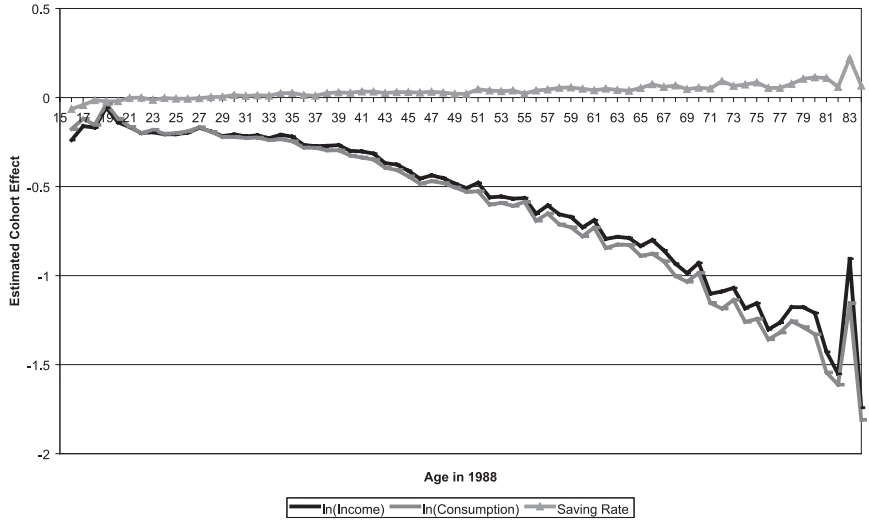
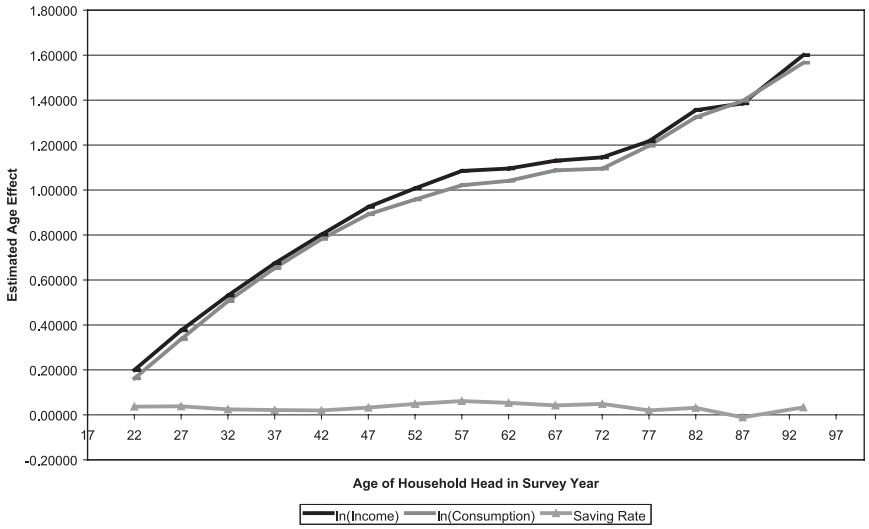


Figure 4b. Age effects on income, consumption, and the saving rate (without accounting for demographic composition)



cycle. In other words, consumption simply tracks income throughout the life cycle, which suggests that, in general, Filipino households may be liquidity constrained or simply impatient, and there is no evidence of dissaving among households headed by elderly persons, possibly because of sample selectivity.

But what happens when demographic composition is included in the regression specification? From Table 3, it may be gleaned that, when the average numbers of adults and of children are accounted for, most of the cohort coefficients turn out to be no different from zero. What this outcome means, however, needs to be further explored. On the one hand, one may argue that, in the regressions of Table 2, the cohort (and age) dummies merely reflect the omitted variable effects of demographic composition.[7] If so, the results reported in Table 2 and in Figures 4a and 4b are spurious. On the other hand, one may contend that household composition variables are endogenous explanatory variables, since, as pointed out in Section 3, households are able to adjust their size and composition relative to their opportunities and to risks associated with the variability in incomes. If so, instrumental variables methods must be used to correctly estimate the specification with demographic composition. Unfortunately, identifying instruments are not so readily found, and, in their absence, the specification without demographic composition may perhaps be considered a reduced form model.

In any case, the lack of statistical significance of the coefficient estimates of the cohort dummies in Table 3 suggests that not too much stock should be given to the cohort effects that are shown in Figure 5a.

As for the cohort-independent age-consumption profile, Figure 5b shows that (a) the natural logarithm of income and of consumption reach a peak at about age 47 and decline thereafter, and (b) throughout the life cycle, the natural logarithm of consumption tracks the natural logarithm of income, but is higher than the latter variable, so that incredulously the saving rate never turns positive.

CONCLUSION

In this paper, pseudo-panels are constructed from the public use data files of the FIES of 1988 to 2000 to explore whether or not the saving behavior of Filipino households fits the life-cycle hypothesis. It is initially shown that cross-section age profiles of income and consumption are an inappropriate organization of the data, which leads to the misleading inference that consumption and saving behavior is inconsistent with the life-cycle hypothesis in that (a) there is little evidence of hump saving, (b) there is no evidence of dissaving among households with

[7] Comparing Tables 2 and 3, note that while, in Table 2, the coefficient estimates of the cohort dummies decline (i.e., become more negative) as the cohort "ages," the inclusion of adults and children as regressors in Table 3, both of which have positive and statistically significant effects, raises them so that they become less negative for all cohorts or even turn positive for the older cohorts. What seems to be happening is that when the household composition variables are omitted, their positive effects on income and consumption and their positive correlations with the age of the cohort muddle the cohort effects on income and consumption, by increasing by a little bit the coefficient estimates of young cohorts, since young households are associated with small household sizes, and by increasing by much more the coefficient estimates of older cohorts, since old households are associated with large household sizes.

Figure 5a. Cohort effects on income, consumption, and the saving rate (accounting for demographic composition)

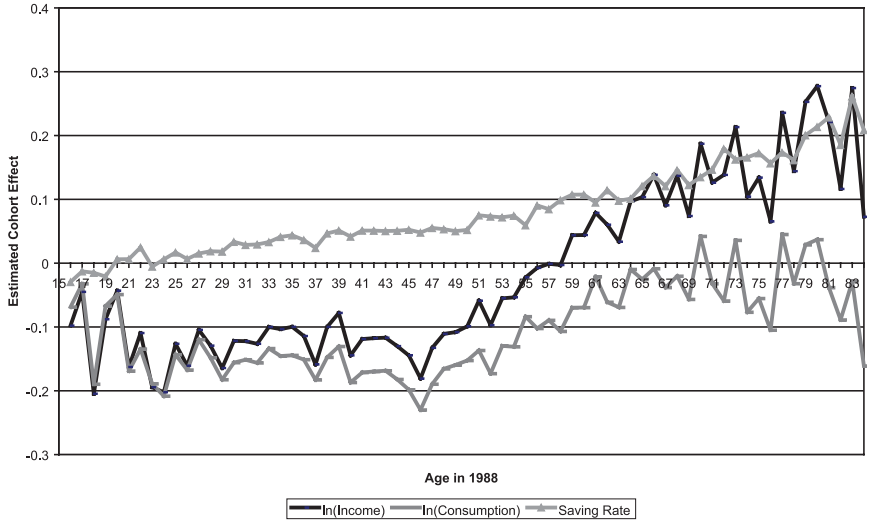
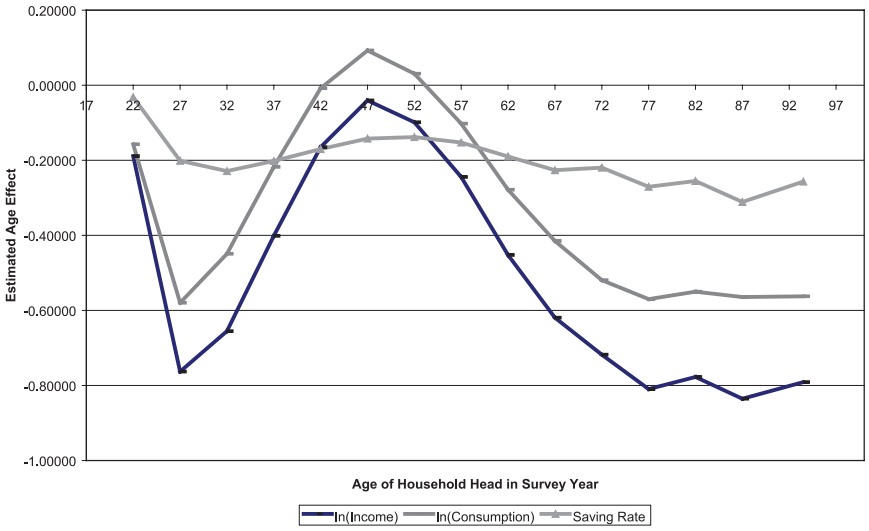


Figure 5b. Age effects on income, consumption, and the saving rate (accounting for demographic composition)



elderly heads, and (c) consumption is apparently not detached from income throughout the life cycle.

In contrast, when pseudo-panels are used, so that the cohort effects can be separated from the age effects, it can be demonstrated that consumption rises

with age and that the consumption profile has been rising for younger cohorts. In addition, when the pseudo-panel data set is used in regressions of the natural logarithm of income and of consumption on cohort and age group dummies, the cohort profile of consumption is found to be rising a bit faster than that of income, so that the cohort profile of the saving rate is declining, although at a very slow rate. An interpretation of this result under the life-cycle hypothesis is that bequests are an inferior good, implying that saving for the sake of saving is not an important motivation among Filipino households. The cohort-independent age effects on consumption are also found to track those on income across all ages, so that the saving rate is positive but close to zero, suggesting that Filipino households do not behave as the life-cycle hypothesis prescribes, possibly because they are liquidity constrained or impatient.

When the numbers of adults and of children are included as regressors, however, the cohort dummies lose their significance. What this outcome means, however, needs to be explored further. In particular, the correct specification—whether demographic composition variables may be dropped, whether they are their own instruments, or whether they are endogenous explanatory variables that need to be instrumented—remains to be resolved.

It thus appears that two further areas of inquiry before the consistency between the saving behavior of Filipino households and the life-cycle hypothesis can be established are (a) whether Filipino households are liquidity constrained or simply impatient, and, if so, how to control for either finding, and (b) what the proper treatment of household demographic composition is in regression models.

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