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HOUSEHOLD SAVING IN CHILE: MICROECONOMIC EVIDENCE

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Resumen

El comportamiento del ahorro de los hogares no ha sido analizado en Chile en las últimas décadas usando evidencia de origen micro. Este trabajo utiliza las Encuestas de Presupuestos Familiares de 1988 y 1996-7 para presentar un análisis del comportamiento de ahorro de los hogares chilenos. El análisis se extiende para otras formas de ahorro tales como la inversión en capital humano y compra de bienes durables. Se observa que el ingreso y características más permanentes tales como la educación son importantes determinantes de la tasa de ahorro de los hogares. Adicionalmente, se observa un paralelismo entre el ingreso y el consumo de los hogares y tasas positivas de ahorro en los últimos años del ciclo de vida. Si bien estos resultados son contradictorios con las predicciones de la teoría del ciclo de vida, estas conclusiones cambian cuando se utilizan correcciones relacionadas con aspectos demográficos y con un tratamiento diferente de las pensiones. Para estudiar el efecto de las restricciones de liquidez se presenta alguna evidencia de que distintos grupos de la población tienen diferentes grados de acceso al mercado financiero. Finalmente, se estudia en detalle el ahorro de los viejos con especial énfasis en los contradictorios resultados obtenidos respecto de los estudios que usan datos agregados.

Abstract

Saving behavior at a micro level in Chile has not been analyzed in recent decades. Based on 1988 and 1996-7 Chilean microeconomic evidence (Household Budget Survey), we present an analysis of household's saving behavior. The analysis is extended to include broader definitions of saving such as investment in human capital and durable goods purchases. We have learned that both income and more permanent characteristics such as education are important determinants of household saving rate. Furthermore, we find an income/expenditure parallelism and positive saving rates for the elderly. At a first stage of analysis, these facts contradict the predictions of the life cycle hypothesis, but some corrections (using demographic characteristics and a different treatment of pensions) change these preliminary conclusions. The differences in the credit constrains by groups are explored in order to study its likely effects on consumption smoothing. Finally, elderly saving are analyzed focusing on their contradictory effect in macro and micro studies

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Introduction

There is an increasing number of studies analyzing the evolution and determinants of private saving in Chile (See Agosín et al., 1996; Hachette, 1998; Morandé, 1998; and Agosín, 1999). Without any doubt, the impressive increase observed in the private saving rate in Chile (from an average of 6.7% of GDP between 1960 and 1985, to an average of 15.8 % in the period 1986-97, Bennett et al. 1999), motivates this literature. However, these studies use only aggregate macroeconomic data while this paper uses Chilean microeconomic data for 1988 and 1996-7, applying the standard approach developed in the literature on microeconomic household saving behavior (See Poterba, 1994).

This paper is the first part of a project which final purpose is to study changes in saving, consumption and indebtedness behavior of households during this decade of high growth in Chile. The purpose at this initial stage is mainly descriptive, because we want (i) to identify the main stylized facts of the saving behavior in Chile, and (ii) to test some implications and predictions of the *Life Cycle Hypothesis (LCH)*.

The first section of this paper presents a brief description of the data and definitions used in the analysis. The second section presents a first group of stylized facts related to total saving rates, saving rates by different socioeconomic classifications, and saving rates using alternative definitions of saving. In the third section, we analyze income and expenditure age profiles to contrast some of the life cycle hypothesis (LCH) implications and predictions. In the fourth section, in order to assess some contradictions between our results and the LCH, (i) we propose and test an explanation for the income/expenditure parallelism based on demographic factors; (ii) we correct the income definition to study the effect of the pensions in the positive saving rates observed for the elderly; and (iii) we describe the evolution of household indebtedness behavior in the last decade to identify their effects on the results obtained. In the fifth section**,** elderly groups' saving is analyzed in depth and explanations are proposed for the contradictions found between the micro and macroeconomic studies concerning the effect of the older population on total saving Finally, the last section presents the main conclusions.

I.- Data and Definitions

Household saving analyzed in this article is built on the information of income and expenditures flows, reported in the 1988 and 1996-7 Household Budget Survey (HBS) of the National Institute of Statistical. This survey is the main input to build the basket of the Chilean Consumer Price Index, and it is mainly an expenditure survey, with a complementary income survey.[1] The first survey was carried out between the months of December 1987 and November 1988 in the Great Santiago and the second between August 1996 and July 1997.[2] The sample size is 5076 in the first survey and around 8445 in the second. The complete database includes information about expenditure and income at the household level, information on individual characteristics such as number of individual in

[1] The earlier survey has been used in several expenditure studies, see for example Contreras and Cáceres (1999).
[2] Great Santiago comprises Santiago's County and the cities of Puente Alto and San Bernardo.

the household, their age and educational attainment. Unfortunately, the complete database for the 1996-7 survey is not yet available, since we still lack the information on individual characteristics.

The survey is applied in the household during a given period of time (for instance, in the 1988 survey the consultation period was 3 months), in which there are several referential periods for different kind of goods. For instance, the habitual expenditure data is collected in a random week in the central month, while the non-habitual expenditures are collected during the three months. Furthermore, the expenditure (durable and non-durable) is accounted at the time when the good is purchased (that is in accrued base) independent of the way the purchase has been financed.

It is well known that this type of surveys poses several problems, mainly related to underreporting. In order to analyze the extension of this problem in the data collected in these surveys, we compare the average household income obtained in these surveys with the average household income reported by the CASEN surveys (for the Great Santiago).[3] In the case of the 1988 survey, there is a huge difference of around 35% in the average household real income for the Great Santiago between the HBS and the CASEN 1987.[4] While in the case of the 1996-7 HBS survey and the CASEN 1997, the difference is only 6.5%. That is, there is evidence the income is substantially underreported in the first survey, but in the second the under-reporting seems to be very limited.

With the evidence presented above, we can draw some conclusions related to our use of the survey: (i) it is inadequate to compare the figures obtained in both surveys because an important part of the changes may be due to changes in underreporting, and not to changes in saving (consumption and/or income) behavior; and (ii) if we suppose there is no correlation between the degree of underreporting and the classifications used in this paper (classification by age, income and expenditure levels, and educational attainment), we can use the information for cross-sectional analysis.[5]

In general, we will refer to saving as the difference between total household income and expenditures, considering both as income and expenditures the imputed rent of owner occupied housing. In the survey income corresponds to the household's total disposable income, excluding contributions to mandatory retirement saving and taxes, and including public and private transfers, and pensions, among others. Additionally, since saving corresponds conceptually to a postponement of consumption toward the future or, in other words, to substitution between present and future consumption, other forms of saving will also be analyzed. For this purpose, the analysis is extended to include broader definitions of

[3] The CASEN is an income survey applied every 2 years throughout the country. Of course, this survey is not exempt of underreporting, but corrections are applied before the publication of the data (for methodology, see CEPAL (1996)).

[4] IN CASEN there is an even higher degree of underreporting. For 1987 it was 46% with respect to National Accounts. This comparison is important to keep in mind, in order to not undervalue the information obtained in the HBSs. In future versions of this work we will contemplate making adjustments to our income information on the lines of those applied to CASEN.

[5] For the temporal evolution of the household saving using Chilean aggregate data, see Agosín (1999).

saving such as investment in human capital and durable goods purchases.[6]

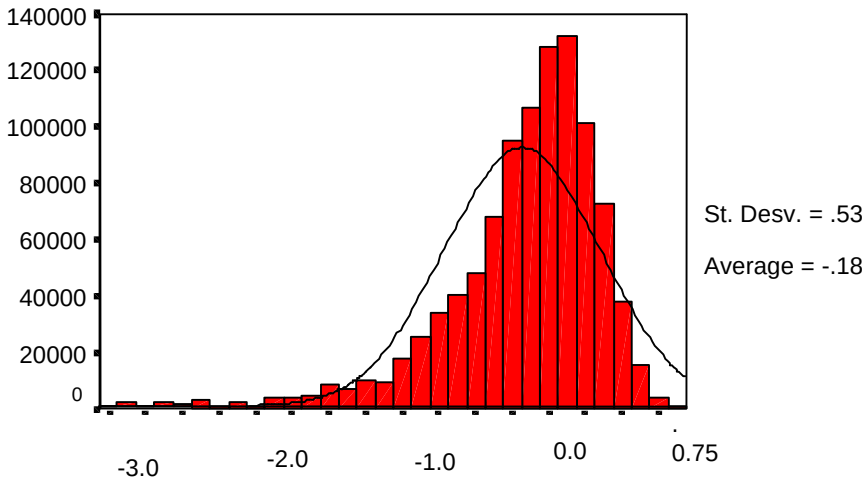
An alternative method to measure saving is to estimate changes in wealth, accounting for changes in assets and liabilities (See Bosworth et al., 1991). Unfortunately, although the HBS picks up some information about these changes, the information was not registered in the database and it has been impossible to gain access to it.

II. - Saving Rates

a). Aggregate Rates

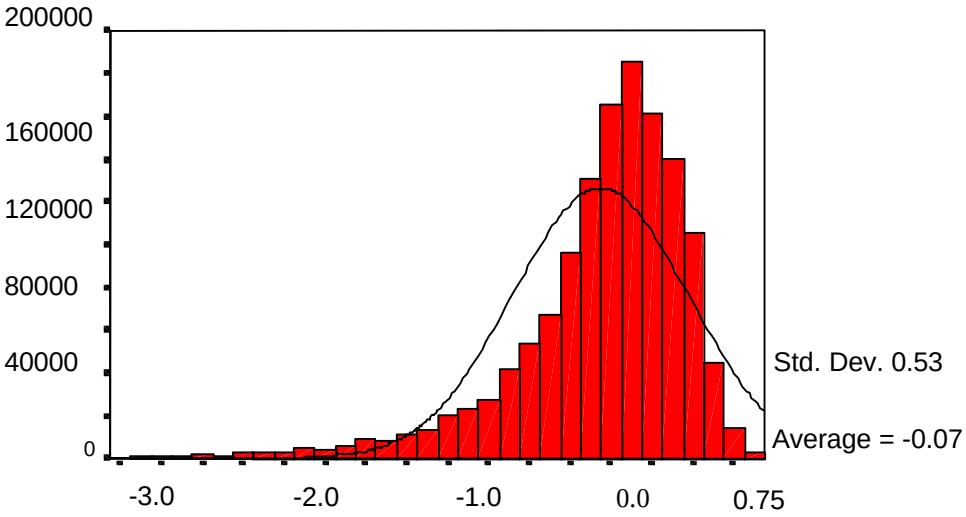
The average rate of household saving is defined as the simple average of household saving rates without weighting by their share in total income. The average rate of household saving in the sample is negative during 1988 at a level of -21.8% and for 1996-97 this rate is also negative at -9.2%. The corresponding median, on the other hand, is -6.8% in 1988 and 4.3% in 1997. The large difference between the average and the median is due to households with highly negative saving rates (see figures 1a and 1b).

Figure 1
Saving Rate Distribution (income base)
Figure 1a: 1988



[6] This is a usual extension in the literature analyzing household saving, see Attanasio and Székely (1998) and Gourinchas and Parker (1999), among others.

Figure 1b: 1996-97



This high rate of dissaving is explained because the average is strongly influenced by households that report very low income and high expenditure level. Indeed, the reported minimum saving rate is -26,000% in 1988 and –12,000% in 1996-7. There are two possible explanations for these extremely negative rates: negative transitory income shocks and income underreporting among the families in the lowest quintile, among whom the negative rates are concentrated.[7]

However, when analyzing the observations with saving rates below -100% for the 1988 survey we observe that some of them have their head of household unemployed, and - in general - their educational level is superior to that of the rest of the individuals in their quintile. All this leads to think that, to a great extent, rather than errors, these rates are probably due to negative shocks in the income of these households that do not affect expenditures in same magnitude, thanks to savings accumulated in the past or indebtedness against future income.[8]

To partly solve this problem we have re-calculated the saving rate with the expenditure as denominator, not only because in that way the dispersion of the saving rate is reduced but also because expenditure may be a better proxy for permanent income. In this new calculation the average rate rises to 1.47% in 1988, and to 17.36% in 1996-97. On the other hand, in this case we observe that the median is lower than the average (see figures 2a and 2b).

[7] Those household not reporting income but not unemployed are assigned income according to their characteristics, i.e. education, age, sex, occupation, and economic sector.
[8] We cannot do the same exercise with the 1996-97 data because some characteristics of the household are not yet available.

Figure 2
Saving Rate Distribution (expenditure base)
Figure 2a 1988

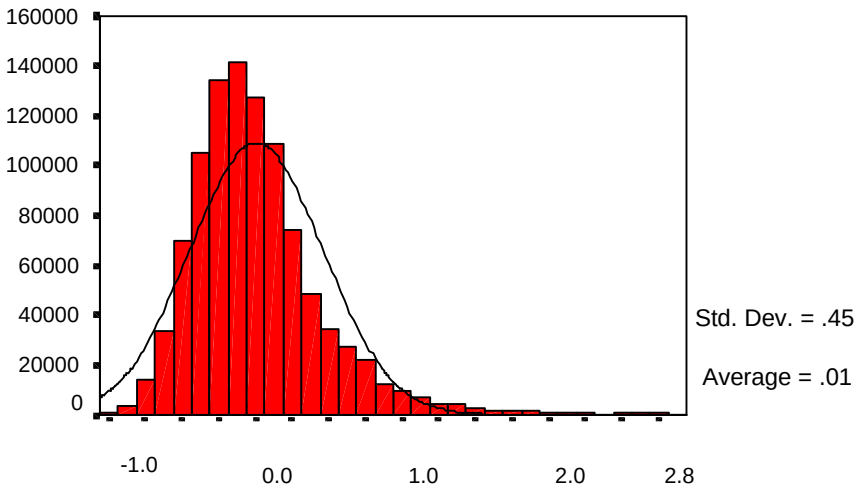
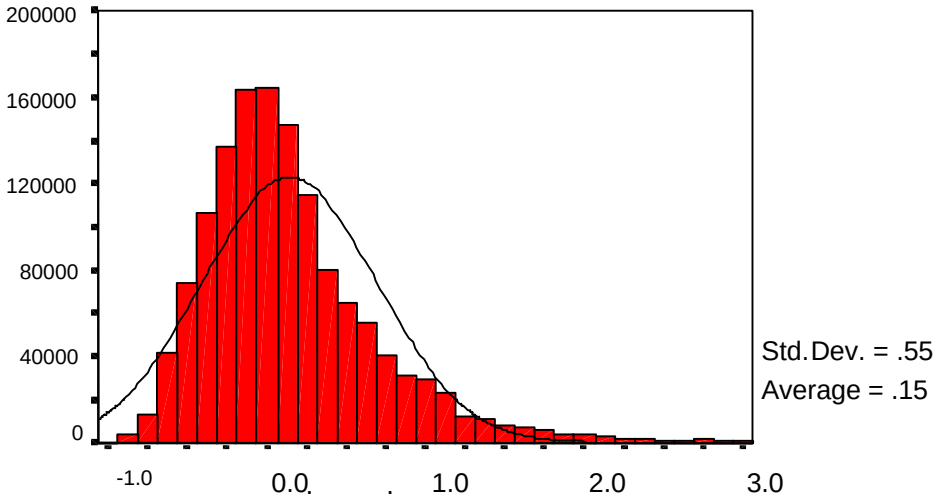


Figure 2b 1996-97



Finally, the average rate represents the simple average of the household saving rate, i.e., unweighted for the household's share in total income. At least for that fact, it should differ from the saving rate calculated in National Accounts which computes saving adding total income and total of expenditures of the economy. That is algebraically equivalent to the

average household saving rate weighted by income--from now on this rate will be denominated the weighted average saving rate. This last calculation, with the information of the SFB, gives a rate of saving of 3.9% of total income in 1988 and 6.1% in 1996-7.[9]

b). Average rate of saving by income quintiles

In this section we analyze saving rates by income. This classification is relevant to understand what determines saving, but it has the problem that transitory shocks to income will not only affect the rate of household saving but they will also affect our classification of households in the different income quintiles. This last effect accentuates the positive relationship between saving rate and income level found in the international evidence (See Poterba, 1994, for example).

Consistent with the international evidence, Table 1 shows that the rate of saving -average and median - grows rapidly as we move from lower to higher income groups both in 1988 and in 1996-7.[10] In the Chilean case the saving rate is negative for all quintiles, except for the highest income group in 1988 and for the two highest income quintiles in 1996-7 (also the third quintile shows a positive median saving rate). In general, for developed countries, the negative saving rate is observed only for the lowest income quintile (Bosworth et. al., 1991; Poterba, 1994). In Mexico, on the other hand, -depending on the year - approximately the first 4 deciles would show negative saving (Székely 1998).

This evidence on the relationship between income and saving rate is consistent with the positive correlation between income level –and income growth— and private saving rate using macro data (Loayza et al. 1999). A theoretical basis for this evidence can be found in a Stone-Geary type of utility function in which individuals start saving after a certain level of income (in general a level of income needed to cover basic needs) at a constant marginal rate. The average rate of saving converges up to the marginal rate. A similar line of argument, for the correlation between saving rates and income level, is that the inheritance motive has a high-income elasticity.

[9] Beyond our under-reporting problem, it is impossible to compare this figure with those of National Accounts since the former, on the one hand, only represents total saving of the Great Santiago and, on the other, the National Accounts in Chile do not give information on household saving. Estimates on the base of Bennett et al. (1999) indicates that the rate of household saving comparable with our calculations – using disposable income net of social security contributions— for 1988 would be negative at a level of –9.6% in 1988 and at a level of –8.7% in 1996-97. Despite the difference in levels, both sources coincide on an increasing tendency of saving between the two periods. Beyond the limitations mentioned above it is always difficult to compare saving rates from micro data with those given by national accounts since definitions of income and expenditure are different (Bosworth, et. al. 1991).

[10] See Coronado (1998) for Chile; Székely (1998) and Attanasio and Székely (1998) for Mexico; Denizer and Wolf (1998) for Bulgaria, Hungary and Poland; Browning and Lusardi (1996) for United States; and Bostwoth et.al. (1991) and Poterba (1994) for other developed countries.

Table 1:
Saving Rate by income groups (%)

	Year	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Average	1988	-21.8	-72.5	-29.2	-14.3	-4.9	11.6
	1996-7	-9.3	-37.5	-17.6	-5.2	1.4	12.5
Median	1988	-6.8	-41.9	-18.9	-4.2	1.7	17.3
	1996-7	-4.3	-17.6	-3.1	6.2	10.9	22.9
Weighted Average	1988	3.9	-59.9	-28.4	-13.8	-4.3	17.6
	1996-7	6.1	-32.3	-17.3	-4.7	2.0	17.0
Share on Total Income	1988	100	3.7	7.0	11.1	18.6	59.5
	1996-7	100	4.8	8.5	12.5	19.7	54.6
Average Income (1997-Thousand $)	1988	264.1	49.7	92.5	146.3	246.1	785.1
	1996-7	574.3	136.8	243.2	359.0	565.7	1566.3

c). Average rate of saving by expenditure quintiles

Since the classification of households by income quintile is influenced by transitory shocks to this variable, the analysis is complemented with the relationship between saving rate and the household's expenditure quintile, which should be more stable than the income classification if we believe in some version of the permanent income hypothesis.

Table 2 presents the results using a classification by expenditure quintiles. We notice, as expected, that there is less dispersion in saving rates by expenditure quintiles than in the case of the income quintiles. Furthermore, the positive relationship between saving rates and income becomes non-monotonic. But, as it is shown in table 6, this ambiguous relationship vanishes when other kinds of saving are considered. In other words, once one considers the expenditure level as a proxy for permanent income, and controls by the level of durable purchases, there is no correlation between permanent income and saving rates.

Table 2:
Saving Rate by expenditure groups (%)

	Year	Total	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Average	1988	-21.8	-15.3	-24.1	-27.5	-29.4	-12.8
	1996-7	-9.3	9.9	-1.0	-7.7	-18.1	-29.4
Median	1988	-6.8	-3.5	-7.6	-12.1	-12.5	0.6
	1996-7	-4.3	17.5	8.0	2.7	-3.2	-5.8
Weighted Average	1988	3.9	3.0	-1.0	-5.0	-3.3	8.6
	1996-7	6.1	25.5	15.5	12.7	8.6	-1.2
Share on Total Income	1988	100	4.8	8.2	11.6	18.8	56.7
	1996-7	100	6.4	9.8	14.0	20.7	49.1
Average Income (1997-Thousand $)	1988	264.1	63.2	108.0	153.3	247.6	748.4
	1996-7	574.3	182.6	282.8	403.1	594.2	1408.9

d). Average rate of saving by educational attainment

Finally, the analysis is complemented with the relationship between saving rate and the household head's educational level, which is a better proxy for permanent income.[11]

With this classification of households, we find in Table 3 a negative saving rate for all educational groups in 1988. The dissaving rate diminishes as we move toward groups with higher educational level, with the exception of the second group. This exception is probably due to a higher indebtedness capacity of that group and better access to formal mechanisms of social security compared to those of the lowest educational level group (for instance, this group has higher durable goods purchases than the lowest educational level group, see next section). The median saving rate is higher than the average for every group and the group with superior education shows a positive median rate.

Furthermore, we do an ANOVA analysis that allows us to observe that the division by educational group explains only 1% of the total variance in household saving rate (between variance). In the division by income quintiles, on the other hand, a 12.3% of the total variance is accounted for by the between variance on the quintiles. In other words, the fact that in each educational group transitory income may have a large variance produces a high dispersion in saving rate within each educational group. Or, another way to put it, since similar people in terms of permanent income may fall in different income quintiles due to transitory shocks in income and they will sustain very dissimilar saving rate at that point in time, there is greater between variance in the case of income quintiles.

As a consequence, with this classification of households--by educational level-- a greater difference is noticed between the weighted rate and the simple average that in the case of the division for income quintiles.

Table 3: Saving Rate by Educational Levels, 1988(%)

	Total	Incomplete Primary	Incomplete High School	Complete High School	Superior
Average	-21.8%	-27.0%	-28.7%	-16.0%	-5.4%
Median	-6.8%	-10.1%	-14.3%	-1.3%	3.8%
Weighted Average	3.9%	-5.7%	-10.3%	7.4%	11.9%
Share of Total Households	100%	43.8%	29.2%	28.4%	16.2%
Share on Total Income	100%	19.2%	14.4%	30.6%	35.7%

It is important to keep in mind that the average rate is not weighted by income and, therefore, it does not represent the contribution made by each group-- in proportion to its income-- to national saving. Indeed, if we calculate the rate of saving of each group

[11] This relationship between educational attainment (measured by years of schooling) and income has been profusely documented in the literature since the publication of Mincer (1974). For Chile, see Robbins (1996) for example.

weighted by the income of each household (third line in Table 3), we notice that both the group with complete high school education and the one with superior education make a positive contribution to the national saving with rates of 7,4 and 11,9% of their total income, respectively.

The positive relationship between educational attainment and saving rate is also commonly found in the international evidence (see Avery and Kennickell, 1991; Bernheim and Scholz, 1993 and Attanasio, 1993). There are two types of explanations for this positive relationship. On the one hand there is the obvious influence of education on income and of the latter on the saving rate (as we mention above). On the other hand, there are explanations that suppose a direct relationship between educational level and saving rate. For example, people that invest more in education have a lower intertemporal rate of discount which leads them to save more as well (Browning and Lusardi, 1995).[12]

It may be possible to identify which force is leading the relationship between education and saving rate in the following way. The influence of education on income occurs through the permanent component, not the transitory income. Hence, if there is an influence of education on the saving behavior it should be due to a correlation of permanent income and saving rates. But this explanation can be tested using the results presented in tables 2 and 6. Table 6 presents that only the highest expenditure quintile presents positive for 1988 data, while in the classification by educational level the two more educated groups (44.6% percent of households) have positive and high saving rates. It could be interpreted as if the correlation between saving rate and education is not due to a correlation between permanent income and saving rate, but due to a correlation between education and saving rate.

Another possible explanation for the positive relationship between saving and educational level -controlling for income level - is that the propensity to consume depends negatively on the proportion of human wealth in total wealth (Friedman, 1957).

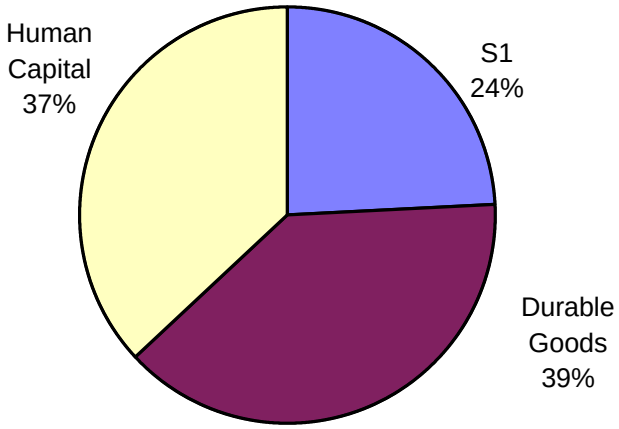
e). Average saving rates using other definitions of saving

In this section an analysis is carried out considering two additional definitions of saving different to the one used up to now (S1). The second definition (S2) adds expenditures in durable goods. The third definition (S3) adds expenditure in durable goods as well as private investment in human capital.[13]

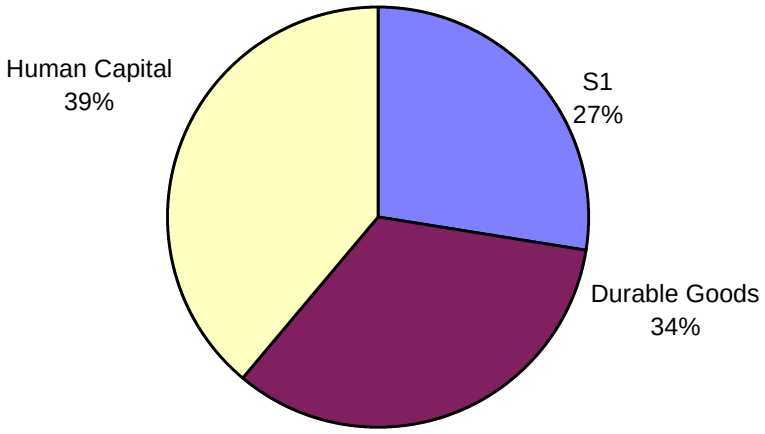
In figure 3, the distribution of total household saving is shown. Conventional savings are around a quarter of total saving, while most of savings are carried out through the purchase of durable goods and investment in human capital. This would partly compensate the negative rates of saving observed in some socioeconomic groups, as shown below.

[12] But Gourinchas and Parker (1999) find no relationship between educational level and the subjective rate.
[13] See the annex 1 with the list of goods considered in these categories.

Figure 3
Different Kinds of Saving Share
(a) 1988 Survey



(b) 1996-7 Survey



On the other hand, in relation to average rates of saving of the families, including the consumption in durable goods causes an increase from –21.8% to –16.7% in 1988 and from –9.3% to –2.4% in 1996-97. Including the investment in human capital takes the saving rate to –12.0% and 4.5%, in 1988 and 1996-97 respectively. With respect to the median, it also increases although the same biased pattern shown in previous sections is present.

The average saving rates weighted by income or the rate of total saving S1 was 3.9% in 1988 and 6.1% in 1997. These rates go up to 10.2% in 1988 and to 13.6% in 1997 when expenditures in durable goods are included and to 16.2% and 22.3%, in 1988 and 1996-7

respectively, when we add the expenditure in human capital.

Table 4 presents results for different definitions of saving for the different quintiles of income. There are some important changes in the results when we include other kinds of saving, using the information of both surveys. Two (three) quintiles have positive average and median saving rates before including durable good expenses (durable good expenses and investment in human capital) for the 1988 survey. While only one quintile presents negative median saving rate after including other kinds of saving using the 1996-7 survey. The results for weighted saving rate are very similar to the median rates for the 1996-7 survey. Furthermore, when the non-conventional kinds of saving are considered, the differences between median and average saving rates by income quintile are reduced, while the differences in the weighted saving rates increase marginally.

Table 4
Saving Rates, by Income Quintiles
(in percentage)

			Income Quintile					
		Year	1	2	3	4	5	Total
S_1	Average	1988	-72.5	-29.2	-14.3	-4.9	11.6	-21.8
		1996-7	-37.5	-17.6	-5.2	1.4	12.5	-9.3
	Median	1988	-41.9	-18.9	-4.2	-1.7	18.0	-6.8
		1996-7	-17.6	-3.1	6.2	10.9	22.9	-4.3
	Weighted Average	1988	-59.9	-28.4	-13.8	-4.3	17.6	3.9
		1996-7	-32.3	-17.3	-4.7	2.0	17.0	6.1
S_2	Average	1988	-67.0	-24.9	-9.1	-1.9	17.8	-16.7
		1996-7	-31.2	-10.0	0.7	8.8	20.4	-2.4
	Median	1988	-37.8	-14.4	-1.8	5.9	21.2	-3.1
		1996-7	-14.5	-0.5	9.5	15.5	28.4	8.2
	Weighted Average	1988	-54.3	-24.0	-8.8	0.2	25.0	10.2
		1996-7	-26.6	-9.7	1.2	9.3	25.1	13.6
S_3	Average	1988	-63.6	-21.1	-5.3	5.3	25.0	-12.0
		1996-7	-27.3	-4.0	6.3	16.1	31.2	4.5
	Median	1988	-34.2	-11.2	2.3	10.6	28.0	1.2
		1996-7	-11.1	4.8	14.8	21.5	36.7	14.6
	Weighted Average	1988	-50.8	-20.4	-5.0	5.7	31.9	16.2
		1996-7	-22.2	3.8	6.8	16.7	35.7	22.3

Table 5 presents the same kind of results for expenditure quintiles. As in Table 2, adding expenditures in human capital and durable goods reduces the differences in saving rates for the different expenditure quintiles, especially for the 1996-7 data.

Table 5
Saving Rates, by Expenditure Quintiles
(in percentage)

			Expenditure Quintile					
		Year	1	2	3	4	5	Total
S_1	Average	1988	-15.3	-24.1	-27.5	-29.4	-12.8	-21.8
		1996-7	9.9	-1.0	-7.7	-18.1	-29.4	-9.3
	Median	1988	-3.5	-7.6	-12.1	-12.5	0.6	-6.8
		1996-7	17.5	8.0	2.7	-3.2	-5.8	-4.3
	Weighted Average	1988	3.0	-1.0	-5.0	-3.3	8.6	3.9
		1996-7	25.5	15.5	12.7	8.6	-1.2	6.1
S_2	Average	1988	-13.7	-20.5	-23.4	-23.4	-3.6	-16.7
		1996-7	11.3	2.1	-2.8	-9.6	-12.9	-2.4
	Median	1988	-1.2	-4.5	-8.1	-7.7	6.9	-3.1
		1996-7	18.9	10.3	6.9	1.9	2.4	8.2
	Weighted Average	1988	4.4	1.5	-1.7	1.1	17.2	10.2
		1996-7	26.6	17.9	16.0	13.7	10.3	13.6
S_3	Average	1988	-11.7	-17.8	-19.4	-17.6	5.5	-12.0
		1996-7	13.4	5.6	2.6	-1.8	2.4	4.5
	Median	1988	0.3	-2.7	-4.3	-2.3	15.2	1.2
		1996-7	20.8	13.5	11.1	8.7	16.9	14.6
	Weighted Average	1988	6.1	3.7	1.8	5.7	25.1	16.2
		1996-7	28.1	20.6	20.2	19.9	23.5	22.3

Table 6
Saving Rate

		Educational Group				
		Incomplete Primary	Incomplete High School	Complete High School	Superior	Total
S_1	Average	-27.0	-28.7	-16.0	-5.4	-21.8
	Median	-10.1	-14.3	-1.3	3.8	-6.8
	Weighted Average	-5.7	-10.3	7.4	11.9	3.9
S_2	Average	-23.1	-22.8	-10.3	9.9	-16.7
	Median	-6.7	-9.1	2.5	8.9	-3.1
	Weighted Average	-2.6	-4.8	15.5	18.6	10.2
S_3	Average	-19.7	-19.2	-4.5	9.6	-11.9
	Median	-3.6	-5.9	6.8	17.1	1.2
	Weighted Average	0.1	0.0	21.3	26.6	16.2

Finally, Table 6 also shows the differences between educational groups decrease, although on average rates remain negative. This becomes clearer as we decompose total variance between inter and intra-group variance for educational attainment classification. In an Anova type of analysis, we observe that the intergroup variance of rates S2 in the case of

educational attainment classification represents only 1.3% of the total variance (while in the case of income quintiles the proportion was 13.7%) and with the saving definition S3, 1.3% of the total variance is explained by educational intergroup variance (by income quintiles the proportion was 15.4%).

As it can be seen in Table 5, that may be evidence for the hypothesis that part of the negative and positive rates presented above are explained by transitory shocks to income. Another explanation is that families that maintain negative rates of saving (S1, S2 and S3) have expectations of higher future income, which may make sense in a period in which economic recovery began to consolidate. On the other hand, when the saving rate (S3) are weighted by income (equivalent to the rate of total saving of the educational group), no group contributes negatively to aggregate saving and the two groups with more education sustain positive and high saving rates. As a conclusion one can assert that other forms of saving compensate an important part of negative conventional saving.

III.- Age Profiles

A common way to study saving behavior in the literature is to analyze age profiles for consumption, income and,- therefore- saving. That idea is derived from the denominated life cycle hypothesis originally developed by Modigliani and Brumberg (1954) who proposed that consumption is not a function of current income but of wealth and expected flows of future income.[14] Then, in general the behavior of consumption through life would be independent of the behavior of income, and saving would have a U-inverted shape, with low or negative saving at the beginning of working life (when income is low), positive saving during the period of high income and negative saving toward the end of the life (during the period of retirement and before the retirement when income is reduced). However, in most of the international studies the evidence shows high parallelism between consumption and income profiles, with a high correlation between both variables.[15] In this section evidence on income profiles and consumption of the Great Santiago's households using only the 1988 HBS Survey will be analyzed.

a). Age profiles for the whole sample

In general we will consider smooth profiles for household head's age, between 20 and 80 years. These adjustments are common in the literature. On the one hand, we classify households according to the head's age since in most of the cases this defines the income profiles of the family. The age range is limited because at very young and very old ages an important selection phenomenon takes place on the type of individuals who are considered heads. For example, among the poor, old people who were formerly heads become part of household where they are no longer heads (see Deaton, 1997 for further details). Additionally, due to noise in the information of saving, we have decided to use two alternative smoothing techniques. On the one hand, following Deaton (1997), we use 5

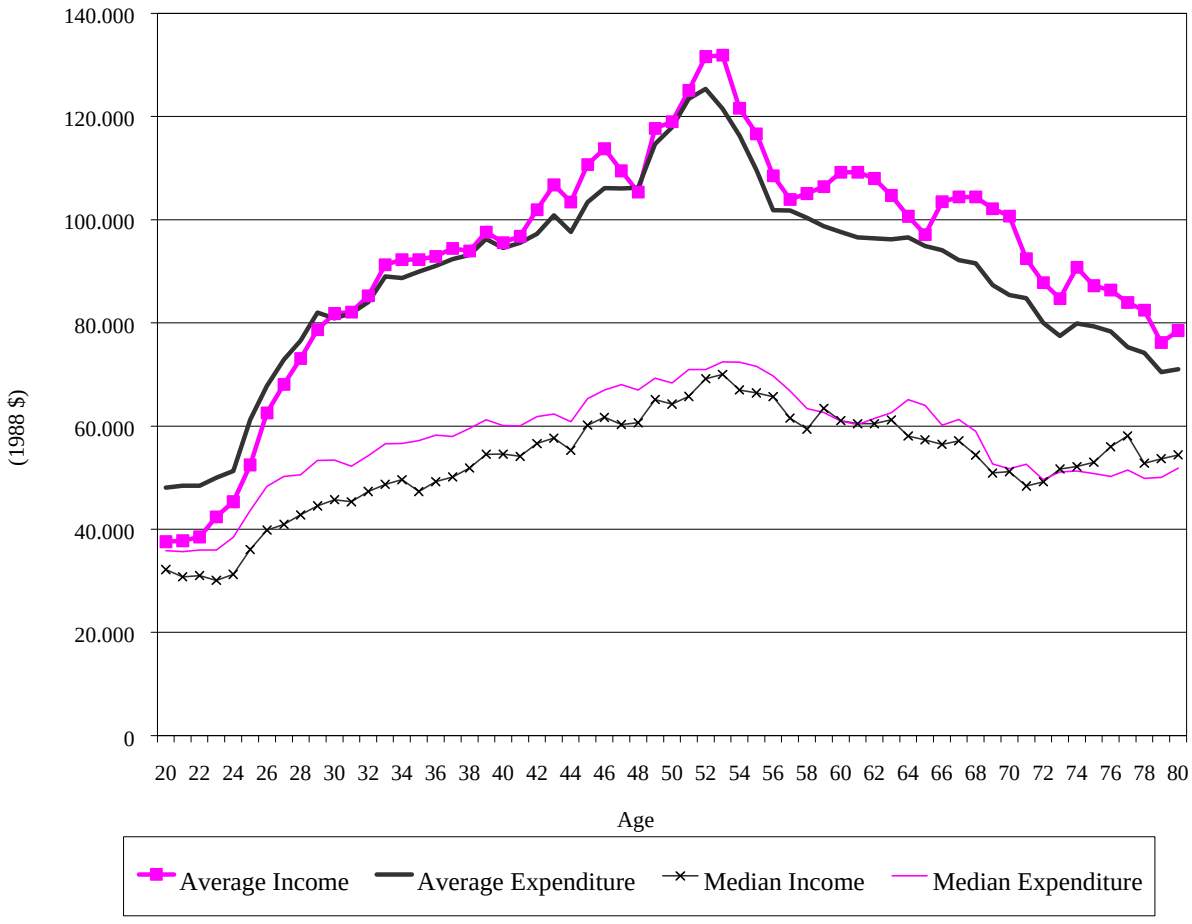
[14] Behind this is the assumption that in the maximizing process the consumer tries to keep the ratio of marginal utility of consumption constant for adjacent periods.

[15] However, this evidence can be explained in the context of the LCH augmented to incorporate other factors, for example precautionary saving due to uncertainty and liquidity constrains (See for example, Gourinchas and Parker, 1999).

years moving averages, as an alternative method we use a polynomial of fifth degree on age (see, for example Gourrinchas and Parker, 1999).

These smoothed profiles –both average and medians-- are shown in figure 4; they show no independence between income and expenditure. Comparing medians and averages gives very different results; in the case of averages the period of indebtedness lasts only until age 30, from then on we observe positive saving. On the other hand, medians show income below expenditure up until age 72. This important difference is explained by the greater importance of rich individuals when calculating averages as we see in section III.b we observe positive saving for all ages only for the richest quintile. Furthermore, there is no evidence of dissaving –or lower saving-- during the old age. Before age 30, consumption is higher to income but the tendency of both variables is similar what may reflect credit constraints. Another relevant point is that the saving profile has a positive slope, not an inverted U-shape as predicted by the LCH. This fact is also found in other studies. For instance, Gourinchas and Parker (1999) find a saving profile with a similar increasing slope –between 25 and 65 years— and the explanation is that people start to save for retirement only after age 40.

Figure 4
Smoothing Profiles: Moving Average Technique



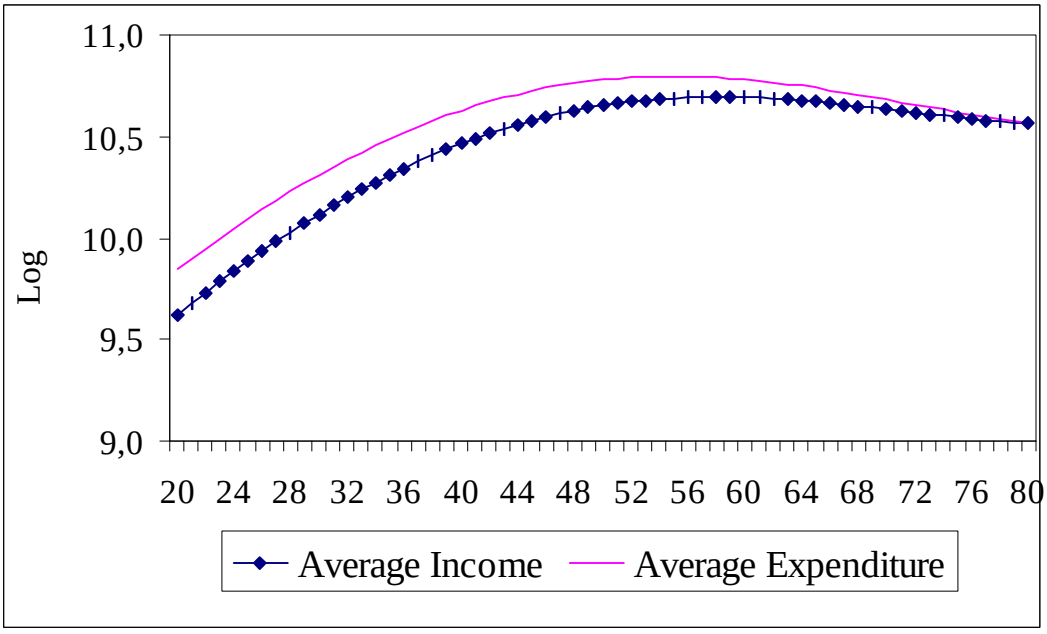
The dependence relationship between income and expenditure –seen in the average profiles of figure 4-- is what is known in the literature as the "consumption/income parallelism" with ample evidence in the literature.[16] However a difference in the Chilean case compared to what is found in the literature is the fact that young households do have negative saving, in accordance with the life cycle hypothesis.

b). Age Profiles for Educational Level

For the reasons exposed in the previous section, we prefer to concentrate the analysis on the income and expenditure profiles for different educational levels (not for income levels). Although being a cross-section we still have the problem of not following the same household as it ages we are, at least, analyzing the profiles of households with a key characteristic in common. Furthermore, this characteristic is related with their permanent income and, therefore, there will not be movements from a group to another due to transitory changes in income. Finally, this classification permits and recognizes a certain level of heterogeneity in the preferences of the households (Gourinchas and Parker, 1999).

In figures 5 to 8 we observe first that among groups with incomplete basic and incomplete high school education there is a persistent pattern of expenditure above income and they evolve in a parallel fashion. The second group saves only after age 70. [17]

Figure 5
Incomplete Primary Education: Age Smooth Profiles (Fifth Order Polynomial)



[16] See Carroll and Summers (1991) for Canada, Denmark, Japan, Norway, UK and USA; Paxson (1996) for USA, UK, Taiwan and Thailand; and Deaton (1997) for Thailand, Taiwan and Ivory Coast.
[17] We show fifth order polynomials on age income and expenditure profiles because moving averages were noisy and conclusions don't differ between these smoothing techniques.

Figure 6
Incomplete High School Education: Age Smooth Profiles (Fifth Order Polynomial)

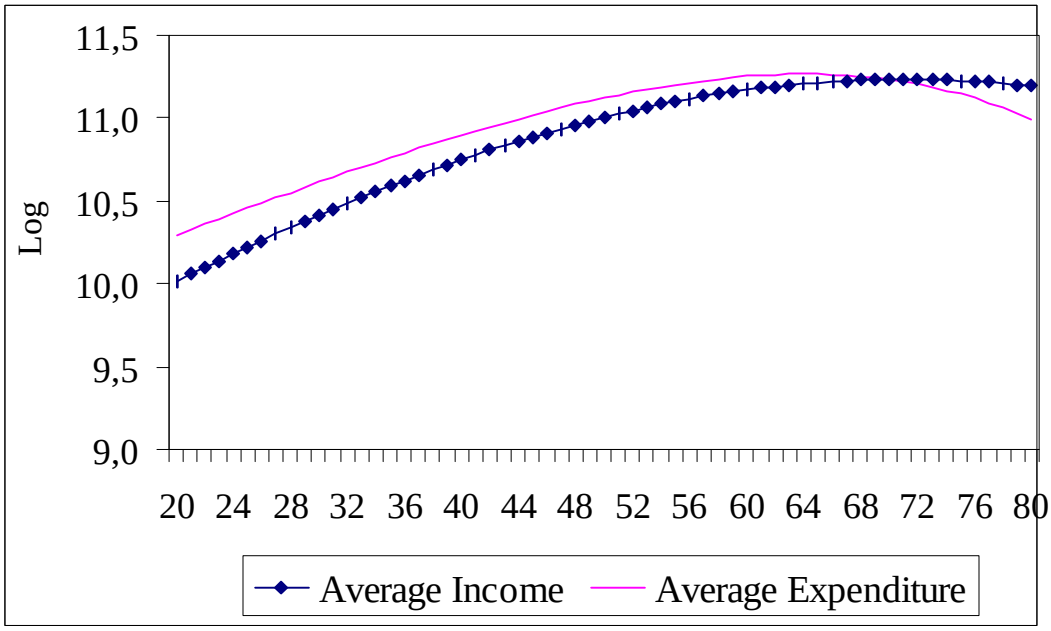


Figure 7
Complete High School Education: Age Smooth Profiles (Fifth Order Polynomial)

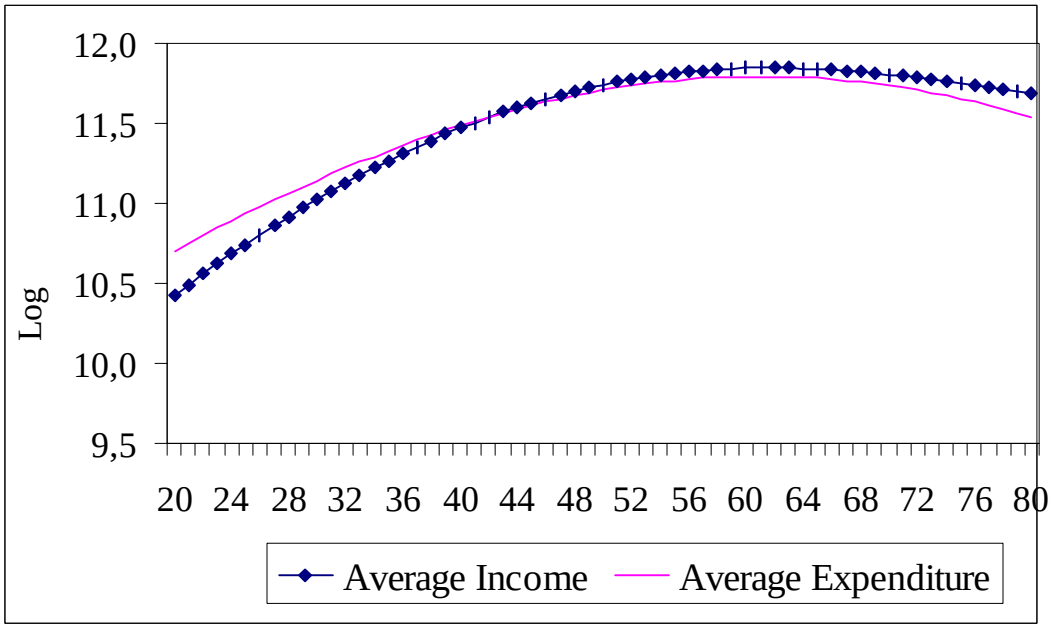
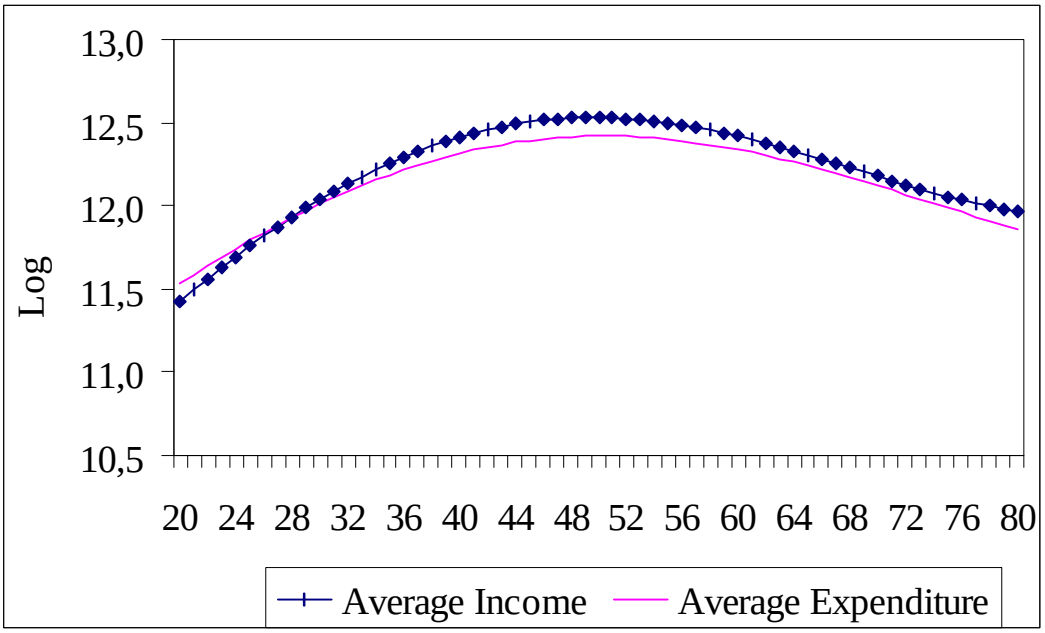


Figure 8
Superior Education: Age Smooth Profiles (Fifth Order Polynomial)



For groups with complete secondary and superior education a pattern closer to that predicted by the life cycle hypothesis is observed. In the first place, there is an early period of indebtedness - or not declared intergenerational transfers.[18] The period during which expenditure is greater than income is shorter for the superior education group.

From these age profiles (both for the whole sample, and by educational groups) two stylized facts emerge. First, there is an important degree of parallelism between income and consumption profiles, which is against the prediction of the LCH in which consumption would be independent of current income. In section IV we will explore an explanation for the "consumption/income parallelism". Second, older people do not dissave and – as we will see below- have a higher rate of saving. Even in the case of individuals with higher permanent income/educational attainment- who have saved early in life- saving remain positive after retirement. Both stylized facts are common in the international evidence and contradict the predictions of the LCH. Furthermore, the second stylized fact –positive saving of the elderly- can be due to the definition of income considered in this study, as we analyze in the next section.

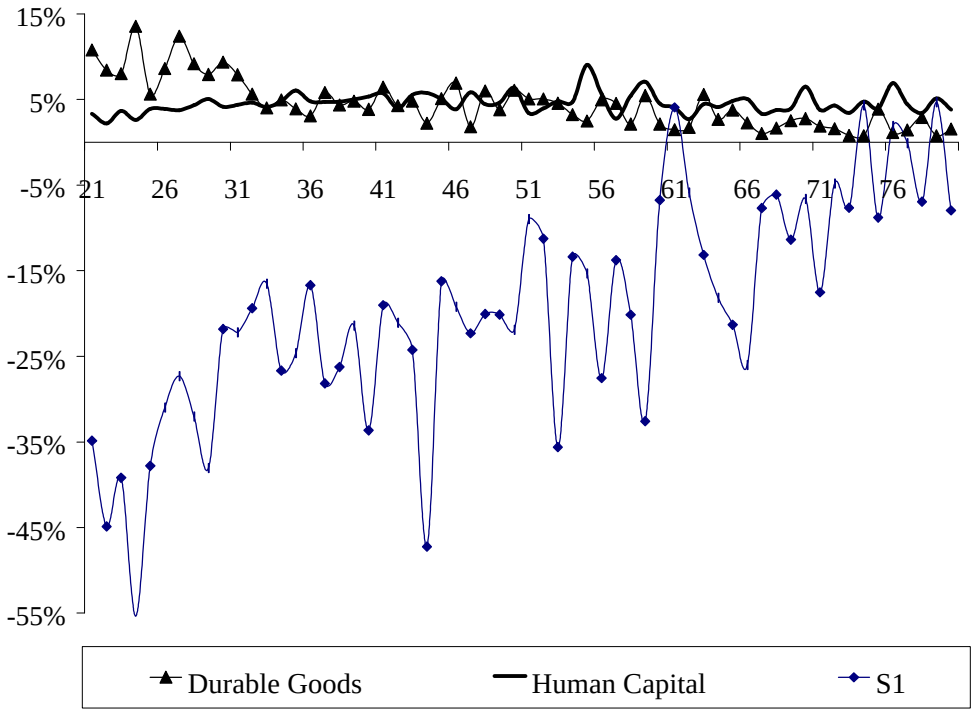
c). Profiles and other Definitions of Saving

Finally, in figure 9 the age profiles of the saving rates are shown. In general, we conclude that the saving S2 and S3 present an age pattern. Consumption in durable goods takes place early in life decreasing sharply up to age 35 and slowly decreasing after that age. Investment in human capital, on the other hand, takes place throughout lifetime (probably through different kind of goods in different ages, since we include in this category both education and health expenses). Actually, the partial correlation between the average rate of expenditure in durable goods by age and S1 by age is –0.8 (statistically significant), but the

[18] This aspect is quite common in the literature (see Gourinchas and Parker, 1999).

partial correlation between the human capital expenditures and S1 is –0.03 (statistically not different of 0)

Figure 9
Saving Rate Profiles by Type of Saving



It is necessary to highlight, however, that given the concentration of saving in higher income and higher education groups, those groups dominate the overall saving pattern. This last argument also reinforces the observed age pattern of S1, since these groups have easier access to credit.

IV.- Does the Life Cycle Hypothesis Hold?

In this section we study the parallelism between income and expenditure, observed in the Chilean case and in most of the international evidence. Several factors may produce this parallelism without inducing to a rejection of the LCH implications. In this study we plan to analyze three explanations: (i) the influence of demographics in the consumption profile; (ii) the fact that the pensions can not be considered income (transfer in a Pay-As-You-Go System), but a dissaving (because they would be a de-accumulation of an implicit debt from the government to the taxpayers); and (iii) the effect of liquidity constrains in the profiles analyzed (as much as our data allows).

a). Parallelism: Influence of Demographics in the Consumption Profile

On the one hand, parallelism can be a product of the confusion between age and cohort effects. With our data it is not possible to follow the same individuals along their lifetime as

would be ideal using panel data, but rather we describe the behavior at different ages of a cross-section of different individuals. It is likely that if the same people were followed along their lives, a pattern closer to that predicted by the life cycle hypothesis would emerge. In our case at most we will have access to two cross sections which will not allow us to study formally this situation. Nevertheless, when the complete database for the latest survey is available we will do some graphical analysis to see if this confusion between age and cohort effect plays some role in the observed parallelism. (See Annex 2 for a description of an explanation both for the parallelism based in differences between cohorts, and for the econometric techniques used to assess this point)

Now the influence of demographics on the consumption profile is considered. We correct the consumption profile of the 1988 survey by demographic characteristics of the households (number and ages of individuals). We see that the parallelism disappears with this correction but that the consumption profile still has a positive slope. We then propose some explanations for that increasing pattern of consumption.

The life cycle hypothesis predicts the behavior of an individual consumer; nevertheless, we observe total household consumption. For example, Attanasio and Browning (1995) find that a series of demographic variables affect the preferences of the families. Then the maximum of the uncorrected consumption profile may -for chance or causation - coincide with the "peak" of household income. In this section we correct for the size and composition of the household in order to analyze how individual consumption changes through the individual lifetime. Then, we compare it with the income profile to see if this correction breaks the parallelism.

It is also possible for consumption to remain constant but its composition between goods acquired in the market and goods made at home may change with time allocated to the labor market and, by consequence, with income (Ghez and Becker, 1975; and Baxter and Jermann, 1999 recently). In that case, observed consumption and income would move together without denying life cycle hypothesis predictions.

Consequently, it is usual in the literature to analyze if the size of the household - or the number of children- explains changes in consumption along the household lifetime. Diverse types of corrections are used. It is possible to correct expenditures for the effect of demographic variables estimated in regressions (Attanasio and Browning, 1995; Gourrinchas and Parker, 1999) or to correct the expenditure for the number of equivalent adults (Blundell et. al., 1994).

In this paper the two approaches are used. First the number of equivalent adults correction is used. Expenditure is divided for the number of equivalent adults in each moment. As first approach we have used the conversion of Ferreira and Litscheld (1998) to correct the profile of expenditures for equivalent adults.[19]

[19] The number of adult equivalents is given for the following formula:
AE=1.2+0.8*(N1+N2)+0.4*N3+0.3*N4.
where:
-AE : number of equivalent adults
-N1: number of additional adults

As shown in Figure 10, dividing consumption for the number equivalent adults eliminates the U-inverted shape of the consumption profile and, consequently, consumption fluctuates around a constant average. This is true both for total expenditure and for expenditure in non-durable goods. Additionally, it is observed that when eliminating the expenditure in durable goods, the expenditure curve flattens in some degree.

Figure 10
Profiles: Equivalent Adults Correction

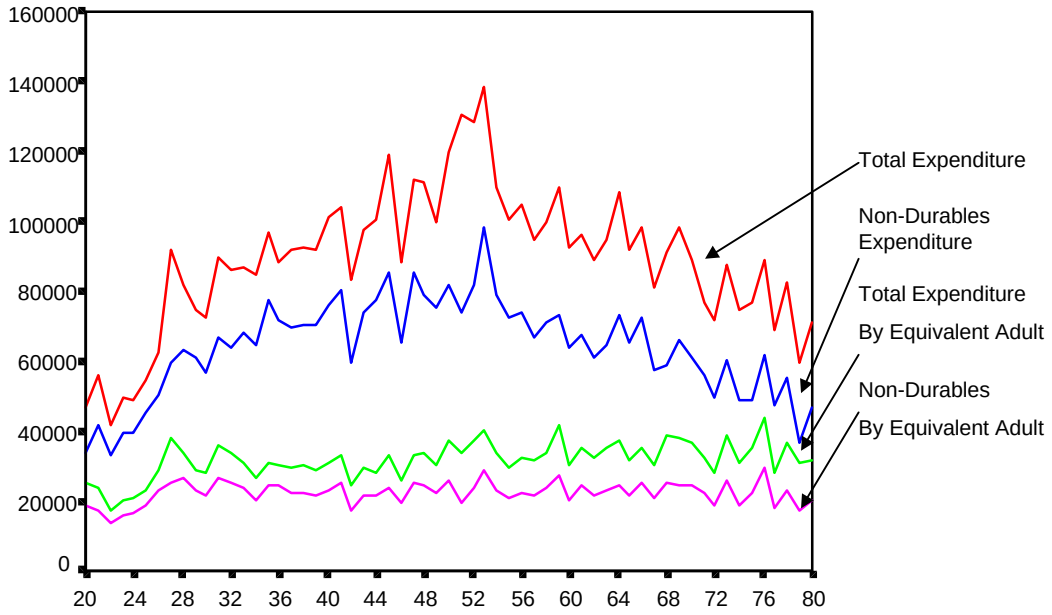


Figure 10 may lead as to conclude that, to a great extent, the parallelism between income and expenditure is due to demographic factors. A similar result is found in Attanasio and Browning (1995) and in Blundell et al. (1994) after incorporating corrections for demographic factors. Nevertheless, Gourrinchas and Parker (1997) criticize those corrections since demographic variables may be capturing age effects as well, since age of the head of the household and the household composition may be highly correlated.[20] They propose a new correction and find that in spite of it, consumption maintains a U-inverted shape. Following Gourinchas and Parker we run regressions for consumption including the

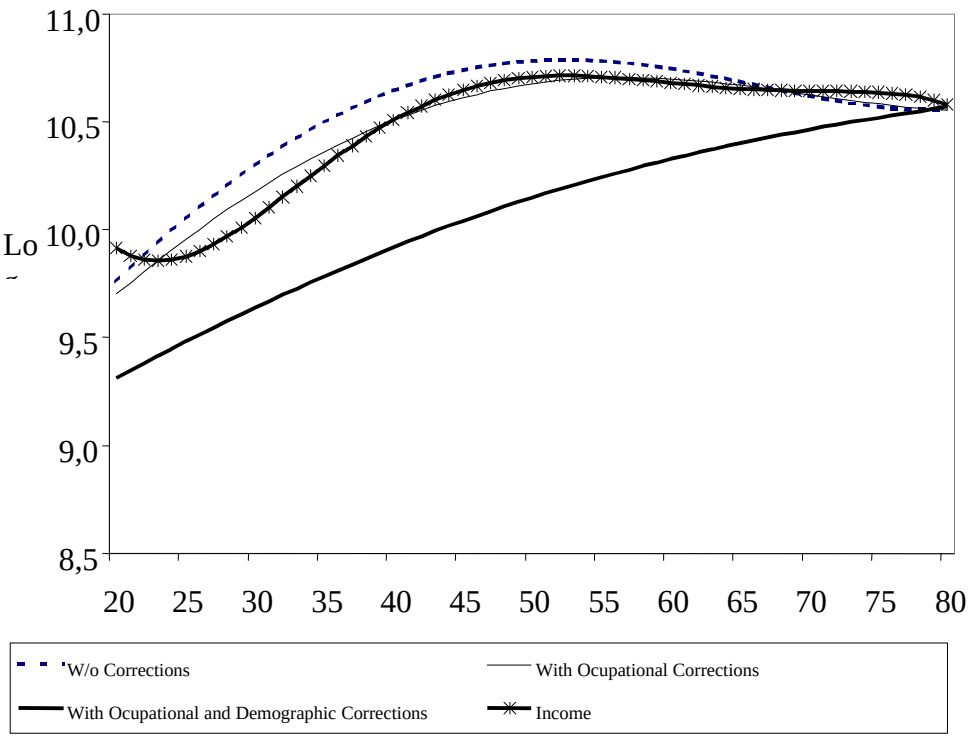
-N2: number of children between 11 and 15 years
-N3: number of children of between 5 and 10 years.
-N4: the number of children between 0 and 4 years.
Implicit in that formula are two factors, the fact that the age of each member of the family implies a different scale of necessities in relation to an adult member and that there are important economies of scale as family grows.

[20] It is important to note that Gourinchas and Parker (1999) argue the true correlation is between demographic variables and precautionary saving, and this last variable is correlated with the age.

age of the household with and without demographic and occupational corrections (See Annex 3). In figure 11a to 11d we plot consumption profiles obtained from those regressions for different levels of educational attainment. In this figures it is possible to see that the correction for occupational variables[21] flattens the consumption profile slightly. Adding the correction for equivalent adults breaks the parallelism between income and expenditure (except for the incomplete high school group). So we may conclude that the parallelism is a consequence of the demographic cycle within the household and not a proof against the life cycle hypothesis. Nevertheless, if children are considered consumption we are not able to rule out the parallelism.

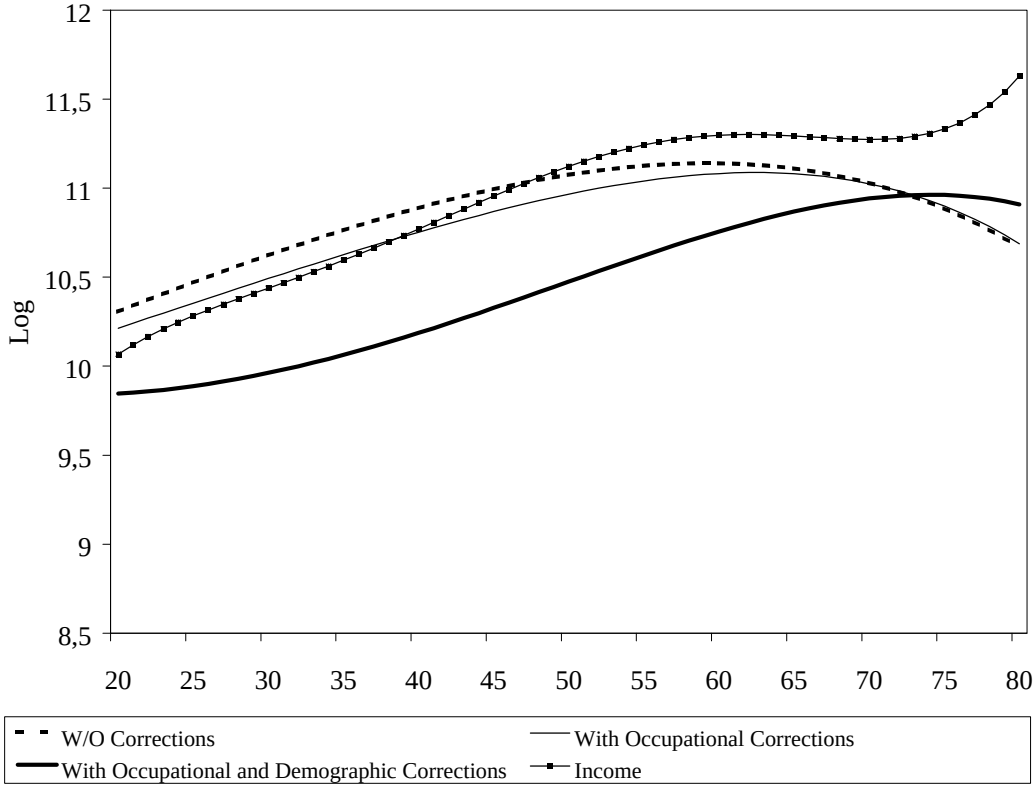
Correcting for demographic variables, though, does not produce a flat consumption profile but one with positive slope. Although this is not contradictory with an intertemporal optimization model and might be simply reflecting a set of preferences in which consumption at later ages is more highly valued (The Keynes (1936)'s "improvement motive" or in modern literature "habit formation"), other explanations also fit this fact. For example, an interest rate above the subjective rate of time preference,[22] liquidity constraints or a buffer stock motive which lead people to save in early ages as to build a stock of savings to protect themselves from income fluctuations. As a concrete example, one form of liquidity constraint is the impossibility to borrow against future pensions.

Figure 11
Profiles: Occupational and Equivalent Adults Correction using Regressions
(a) Incomplete Primary Education

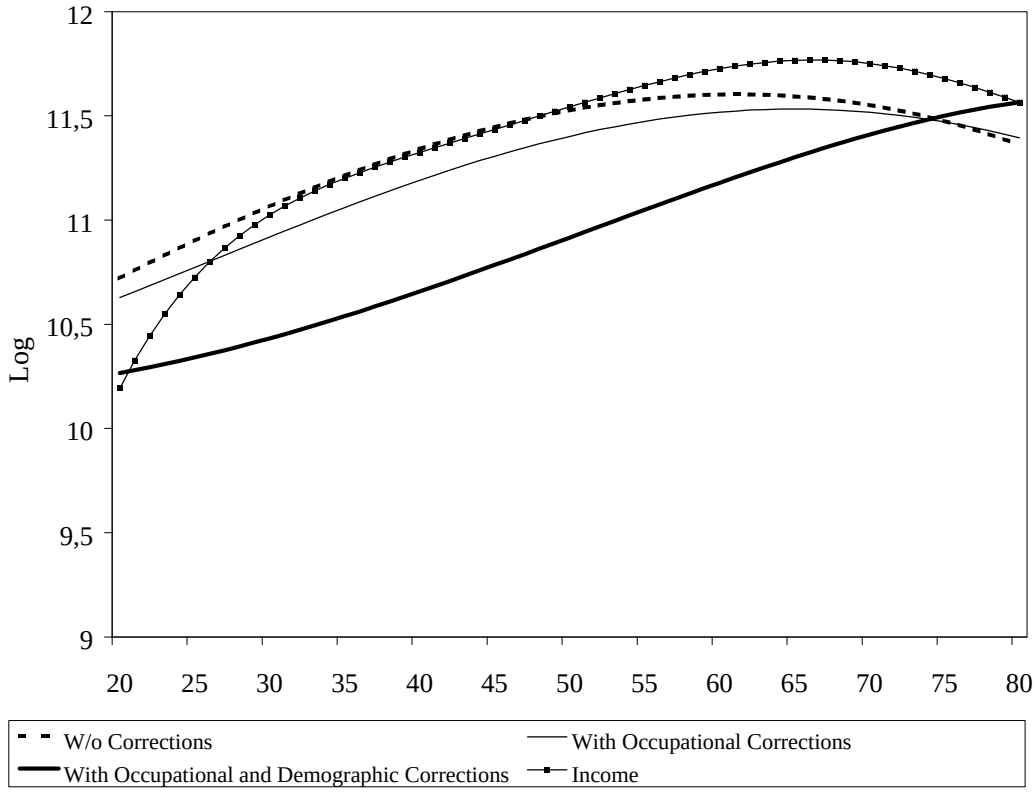


[21] Dummies whether the head of the household works, the spouse works, and the sex of the head of household.
[22] This is likely in a growing economy where real interest rate is high because it equals the rate of growth.

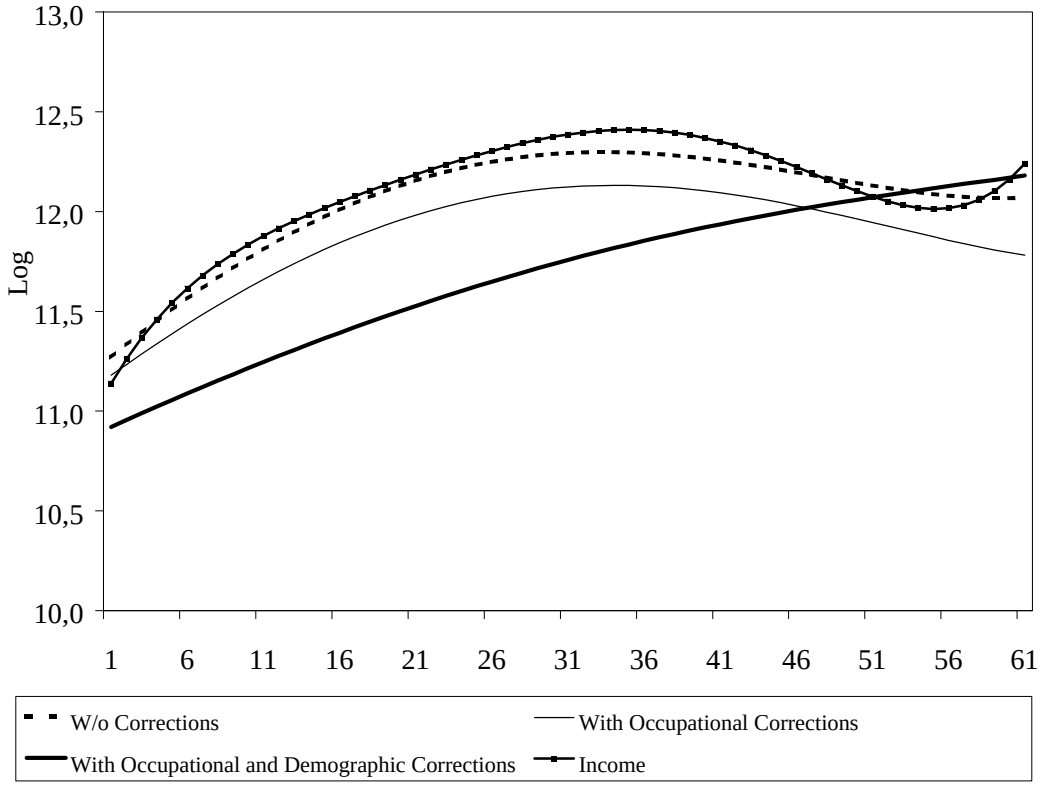
(b) Incomplete High School Education



(c) Complete High School Education



(d) Superior Education



b). Positive saving in the Elderly: Are Pensions Income?

The Chilean microeconomic data –as well as other microeconomic data used to analyze household saving – include as income pensions received by retired individuals (see, for example, papers in Poterba 1994, Carroll y Samwick 1997, Szekely 1998, Coronado 1998). If pensions are governmental transfers it is correct to consider them income from the individual point of view. But, if the pensions are a deaccumulation of an implicit or explicit asset (debt) of the pensioners (of the government), then pensions are not income, they are a dissaving. The point is very controversial; on the one hand, there is the literature of the effect of pensions in the whole economy that consider the pensions a deaccumulation of an implicit (explicit) asset in a Pay-As-You-Go (Fully Funded) system of Social Security. And on the other hand, there is the above-mentioned literature of household saving which considers pensions (both public and private) as income. We regard the point controversial, and a more detailed analysis of this point is beyond the objectives of this paper. Then, in this section we have an eclectic approach and we show the profiles subtracting pensions from income.

In Figure 12 we show weighted saving rate by age group, and then subtract from it the category of transfers, which in our data includes pensions, as well as other private or public transfers. Unfortunately, we cannot isolate the exact amount for pensions in the data.[23]

[23] However, in the graph is possible to infer no-pension transfers are a relatively constant up to the age of retire.

Weighted saving rates represent the contribution of each age group to aggregate saving and, in that sense, is more relevant for the comparison with macro data than simple average or median rates. Figure 12 show a strong increase in saving rate for retired people, but when we subtract transfers the opposite is true with an important increase in dissaving at those ages.

Figure 12
Saving excluding Transfers as Income, 1988

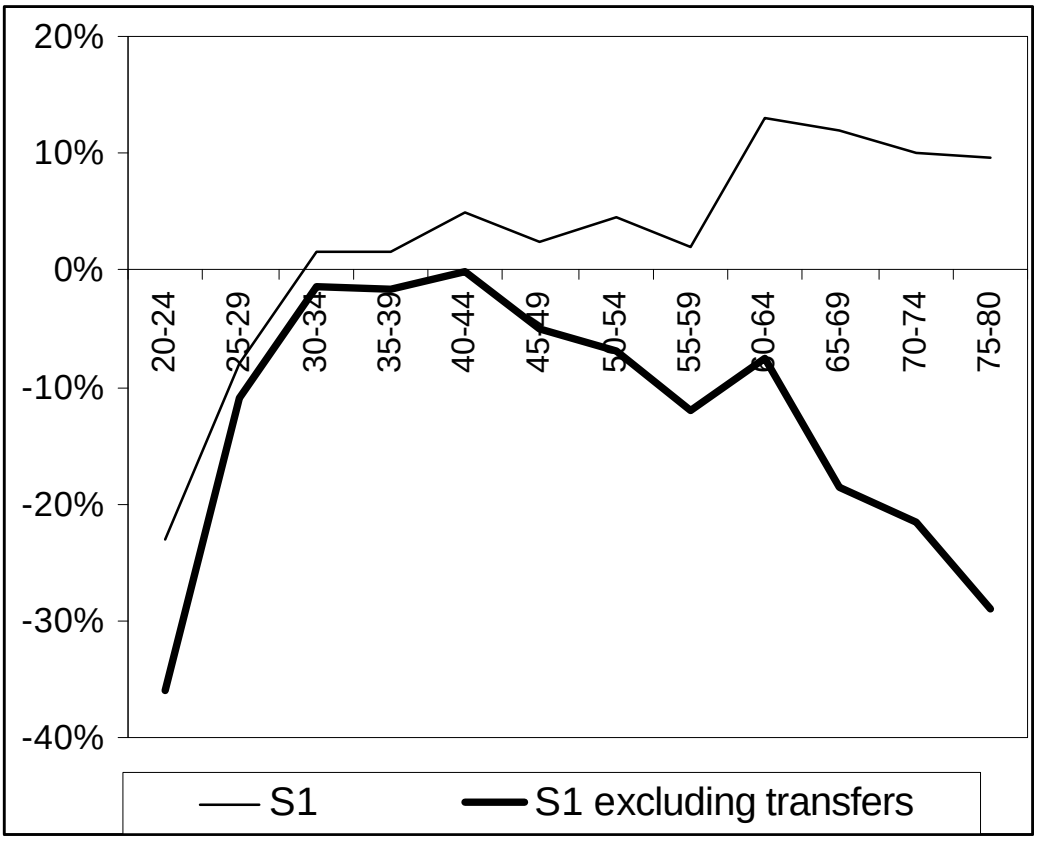


Figure 12 tells us a story in which saving for the elderly is increasingly negative and the corresponding dissaving is covered by pensions accumulated in the past. This fact would tell us that when pensions are not considered income the saving behavior is closer to theory predictions.[24] Still, we observe that consumption is lower than "total income" (income plus pensions), i.e., the do not spend all the resources available to them. Börsch-Supan (1994) proposes an explanation for this fact. It would not be possible to borrow against pension income and, due to health and other limitations, the elderly cannot spend their pensions. In this sense, the saving of the elderly would not be an intertemporal optimal decision but a forced one. An alternative explanation is that older people save for precautionary reasons, mainly to cover eventual increases in medical expenses. Finally, this fact could be explained by the inheritance motive.

[24] The corrected saving profile would be even more hump-shaped if we add the contributions to social security done by individuals during their working years. This information though, is not available and would have to be computed based on salaries and assumptions about the type pension system to which the individual contributes.

c). Liquidity Constrains

It would be interesting to know how credit constraints differ among households and evolve through time. Credit constraints have a strong link to intertemporal allocation of consumption and, hence, to saving behavior.[25] Better access to credit would allow an intertemporal allocation of consumption closer to the optimal and, probably, closer to what the theory predicts.

The microeconomic data allow us to do some exploration on the issue. Unfortunately, we usually do not observe access to credit but –with some luck- actual debt levels. Furthermore, the public data bases for Household Budget Surveys do not include the level of debt of each household but only report on the financial expenses due to different types of debt: department stores, financial institutions: loans and use of credit cards and mortgage loans**.** Additionally, there were some changes in the methodology used to account for financial expenses. To explain those differences it is important to explain how the financial expenses are calculated. Financial expenditures due to department stores debt correspond only to expenses made in the "reference period"; on the other hand, financial expenses related to credit cards are based on the actual bill, hence they may correspond to expenses done prior to the reference period. In the first survey, the reference period for expenditures was 3 months, while in the second this period was only 1.5-2 months. These differences do not allow us to make comparisons between surveys or between different types of financial expenditures. Therefore, we center the analysis in comparisons between quintiles.

The analysis will focus on the lower income quintiles which we would expect to be more exposed to financial constraints since credit to those groups is riskier.

In order to simplify the analysis we add the financial expenses of all types of debt. Later on we will pay some attention to the distribution of financial expenses by type of debt. In Table 7, we show information on the share of each quintile in the volume of financial expenses and in the number of household with financial expenses.

We can see that the two lowest quintiles are underrepresented both as a percentage of the total number of families in debt and in their share in the value of financial expenses considering their share in income shown in Table 1. This under-representation does not improve in the decade covered by these two surveys.

[25] Several studies have estimated, using various techniques, the share of constrained consumption in Chile and in other developed and developing countries. Namely in the case of Chile, Corbo and Schmidt-Hebbel (1991) estimated this share in 60% for the period 1968-88; Schmidt-Hebbel and Servén (1996) 45% for the 1963-1991 period; Villagómez (1997) 46% for the 1970-1989 period; and Bandiera et al. (1999) 55% for the 1970-1995 period. More recently Schmidt-Hebbel and Servén (2000) found a share of constrained consumption of 25% for the 1986-1997 period. The summary of this results is that although there is evidence of liquidity constrains, these constrains seem to have diminished in the time.

Table 7
Financial Expenses, by Income Quintiles

	Q1	Q2	Q3	Q4	Q5	TOTAL
Share of the Quintile in Total Financial Expenses						
1988	2.8	6.1	9.3	21.4	60.5	100
1996-7	2.5	6.1	9.7	17.8	63.8	100
Share of the Quintile in Total Number of Households with Financial Expenses						
1988	13.4	19.0	21.6	23.8	22.3	100
1996-7	9.1	16.7	20.6	24.9	28.6	100

The conclusion is confirmed in the Table 8; we can see the poorest quintiles have less access to the majority of the sources of financing compare to their share in income (except the less related to the financial sector, the financing of the Department Stores).

Table 8
Share of each quintile in Financial Expenses, by Type of Debt

1988	Q1	Q2	Q3	Q4	Q5	TOTAL
Department Stores	6.5	13.9	23.9	40.4	15.2	100
Financial Loan	1.1	3.2	8.0	20.6	67.1	100
Credit Card	0.0	0.7	1.6	17.0	80.6	100
Mortgage	2.7	5.9	8.2	19.7	63.6	100
1996-7						
Department Stores	6.1	12.2	18.5	26.9	36.3	100
Financial Loan	0.6	4.1	8.2	18.9	68.2	100
Credit Card	0.8	2.2	6.8	19.4	70.8	100
Mortgage	2.3	5.1	7.2	13.5	71.9	100

Along with the unchanged shares in total debt of the poorest groups we have independent information on aggregate financial consumer credit which has increased from 1.3% of GDP in 1988 to over 6%of GDP in 1996 (see Butelmann and Landerretche, 1998). These facts lead us to expect consumption profiles for the period 1996-7 to be closer to the predictions of the LCH than those obtained from the 1988 survey.[26] In other words, we expect consumption profiles to be more independent of income profiles.

V.- Saving of the Elderly and Compatibility between Macro and Micro Studies

The Chilean evidence analyzed in this paper, as well as the international microeconomic evidence, show that older household do not dissave after retirement. This evidence appears to contradict not only the life cycle hypothesis but the macroeconomic evidence as well. For example, Loayza et al. (1999) obtain a negative and significant parameter for the

[26] Recall that the required data to build consumption profiles for the period 1996-7 is not still available.

proportion of older people in the population in their regressions estimating the determinants of both private and national saving. If older people save a higher percentage of their income – as shown in the microeconomic data-- a high old dependency ratio should increase the rate of overall saving.

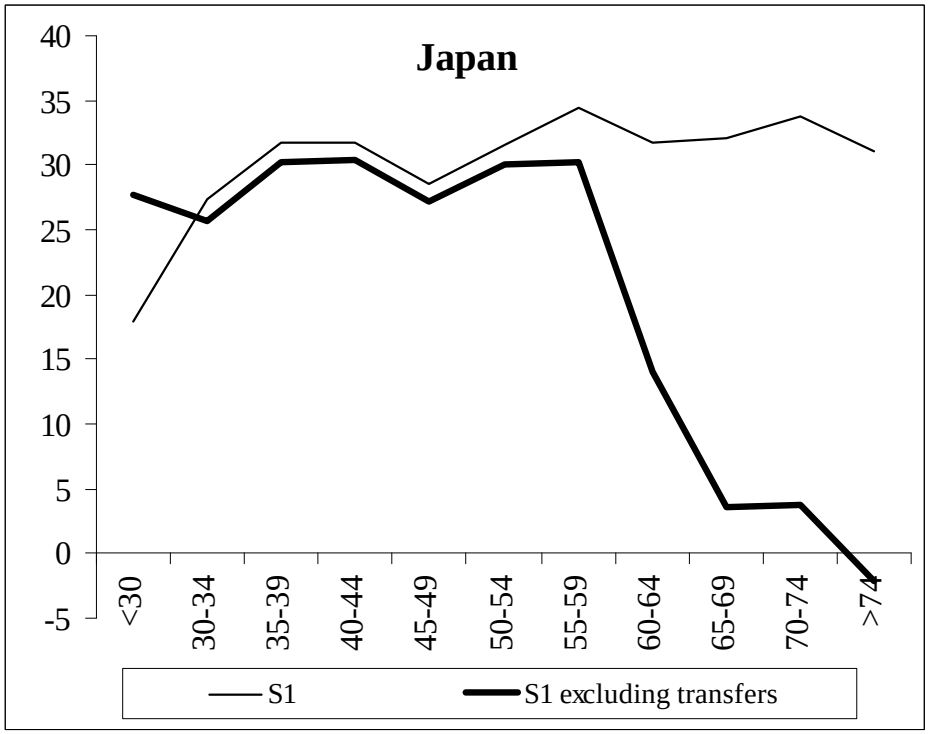
In this section we present a set of explanations for this contradictory findings. The explanations have to do with the definition of income in the microeconomic data as well as with the sample of individuals included in the old population in this type of analysis. Furthermore, Weil (1994) proposes an explanation based on interactions between generations as younger generations will reduce saving if they expect to receive bequest from the saving elderly.

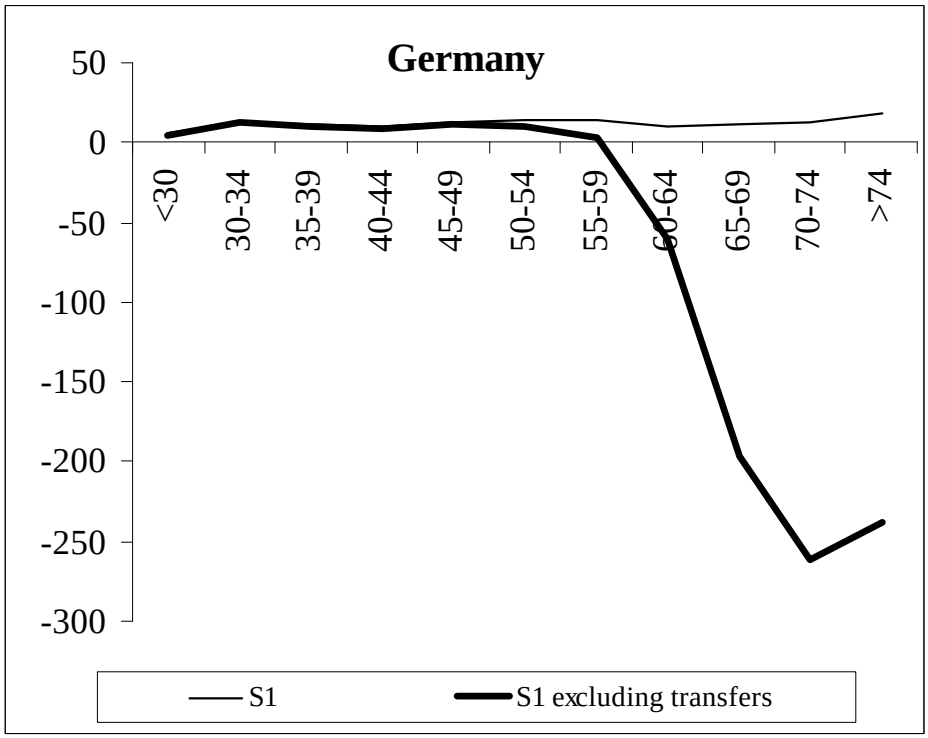
The right explanation for this contradiction will depend on what incompatibility we want to explain, since not all of the macro studies on saving use the same definition of aggregate saving. Some of them use national saving or private saving and few use personal saving, being the latter closer to household saving in the microeconomic data.

a). Income definitions

As it was discussed in the last section, it is not clear if pensions are income or dissaving from the household's point of view. As a matter of fact, in the case of private pension plans it is necessary to deduct pensions from income for the retired and to add the contributions to the pension fund to the income of the working individuals. Bosworth et al. (1991) adjusts age specific saving rates by adding employer pension plan contributions and corresponding interest earnings to the income of working groups and by excluding pension benefits (not social security benefits) of retired groups income. The age profile of saving changes substantially for cross-sections in 1972-73 and 1982-85. Specifically, saving rate of people over 64 declines from 14,9 to 1,8% in the first sample and from 11,5 to –3,9% in the second. This finding is present in other studies. For example, see figure 13, if we subtract the pensions from income, the profiles in the case of Germany and Japan change substantially, and the positive saving rates observed at the elderly diminish dramatically (in the case of Germany, this rate is significantly negative)

Figure 13
Japan and Germany:
Saving Rate Profiles: With and Without Pensions as an Income





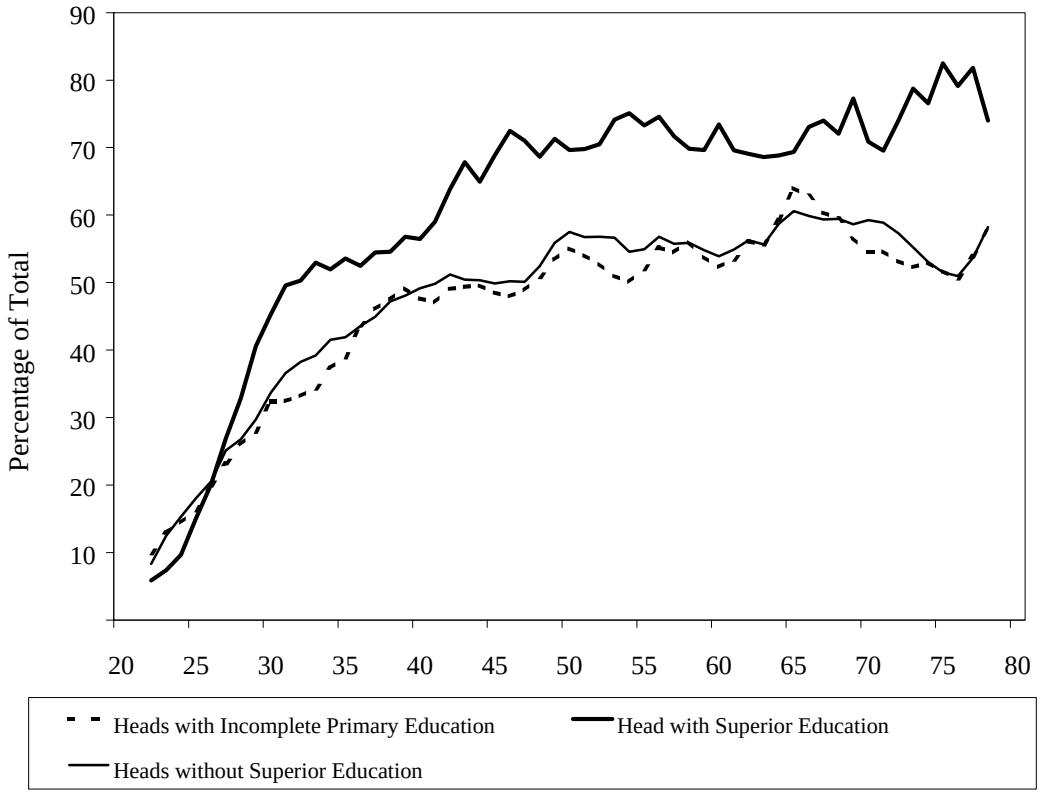
Source: Poterba (1994) and author's calculation

b. Who is old?

In the microeconomic data, saving rates for each age group are computed according the age of the head of household. Therefore, the older household saving rate consider only older people who head their household and ignore the behavior of institutionalized individuals or of the elderly living in households headed by younger individuals. Again this selectivity contributes to the discrepancy between microeconomic and macroeconomic data-both when analyzing national as well as private saving-, since in the latter all individuals above a certain age are included in the older group. As a matter of fact, in Loayza et al. (1999) the negative effect of the variable "old dependency ratio" is much higher and significant in LDC than in the OECD, where older people are more likely to live on their own.

Figure 14 shows preliminary results on these lines. Higher educational groups have a higher probability of being heads of household and the difference between educational groups increases with age (especially after 62 years). If we add to that evidence the fact that people with lower education are likely to have shorter life expectancy, we can conclude that as we move to older groups the percentage of richer –in terms of permanent income-- head of household increases. As it was shown above, the more educated people have higher rates of saving, so as the group ages it saving rate will increase due to the above explained selectivity.

Figure 14
Percentage of Head Household of Total, by Age and Educational Level



c). Interactions between generations

Weil (1994) states that an age specific saving rate does not represent the influence of that age group in the overall personal saving rate since there are interactions between age groups. Among the possible interactions he tests empirically the influence of expected bequests on the consumption behavior of younger generations. He finds a positive and significant effect using PSID. Furthermore, this effect is close –but not close enough-to the effect needed to solve the divergence between macro and micro data.

Weil concludes that age specific saving rate are not useful to forecast changes in saving due to demographic changes since as demographics changes take place age specific saving rates will be affected. For example, as population ages there are fewer children to share their parents' bequest and there are fewer incentives for the younger generation to save. On the other hand, it is not possible to test theories on individual behavior using macro data since it captures both the individual saving behavior and its interactions with other individual saving decisions. In this sense, the fact that older people save is not contradictory with them having a negative effect in total saving.

We have discussed alternative explanations for the contradictory effect of the elderly population in saving found in the macro versus the micro studies. We are yet to discuss why do the elderly save and to what extent this high rate of saving contradicts the theory. One explanation for this increase is the existence of a bequest motive. This motive will show in the data with increasing strength due to the selectivity process discussed above.

VII.- Concluding remarks

Household saving behavior at a micro level in Chile has not been analyzed in recent decades. This attempt is important because microeconomic analysis of saving will allow to get a better understanding of the variables driving saving and to make better predictions on the future saving behavior as income, demographic variables, credit market conditions and other social and economic characteristics evolve.

We have learned that income and permanent characteristics as education are important determinants of household saving rate. Furthermore, there is a clear age pattern for saving and although at a first stage of analysis the predictions of the life cycle hypothesis do not seem to hold, demographics corrections change this preliminary conclusion. Furthermore, when pensions are not considered income the old age saving is similar to the predicted by the LCH. Finally, the finding that household financial expenses have different behavior in different groups, can point to differences in the access to credit. This element may contribute to the fact the household with more educated head behave closer to the predictions of the LCH.

When other definitions of saving are considered, such as human capital and durable goods, we find that these types of saving are important for all quintiles, that they have a distinct age pattern and in some groups they totally compensate the negative saving rate of the conventional definition, especially for the latest survey.

More definite conclusions on saving behavior and the effect of different socioeconomic variables will be obtained when the complete database for the 1996-7 survey is available.

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Annex 1
Description of goods considered in categories of durable consumption and investment in human capital:

Durable goods[27]
* Furniture
* Decoration
* Textile and home accessories
* Appliances
* China
* Computer
* Acquisition of vehicles
* Equipment and accessories
* Musical instruments
* Motor boats, boats and motors outside of overboard
* Camping, hunting and fishing equipment,
* Photographic cameras and accessories
* Typewriter, microscope, drill.

Investment in Human Capital:

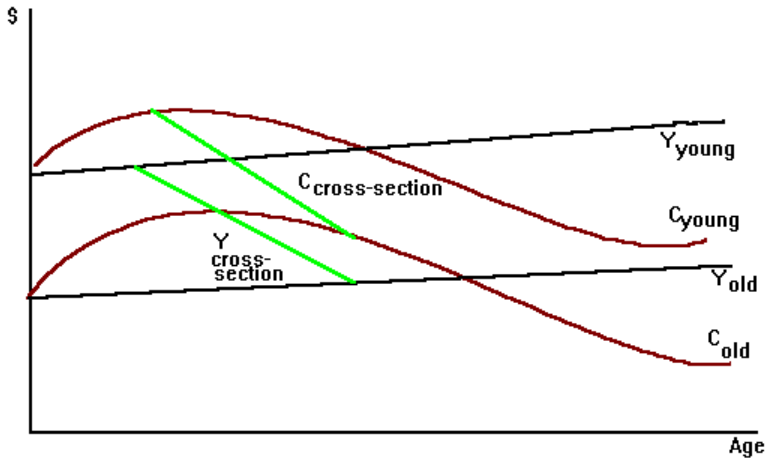
* Medical products
* Apparatuses and equipment
* Professional health services
* Hospital care
* Insurance
* Encyclopedias and dictionaries
* Teaching.

[27] This definition does not consider articles that may be more durable than those included; for example, suitcases can last more than a computer. Also there is a bias to include the most expensive articles as durables, for example, a boat and camping equipment are included but a tennis racket or a soccer ball excluded.

Annex 2
Parallelism: Age and Cohort Effects in Life-Cycle Behavior

it is possible that individuals or cohorts behave as it would be predicted in the life cycle hypothesis (In fact, as it is observed in figure A1). But if we observe them in a moment in the time (cross-section) they will nevertheless present parallelism between the income and consumption. This is due to the fact that there is growth in the wealth of different generations and, therefore, on average, both consumption and income of the younger generation will be higher to those of the older cohorts.

Figure A1
Age and Cohort Effects in Life-Cycle Behavior



However, to solve this situation, synthetic cohorts techniques have been used forming "quasi-panels" with multiple cross-sections taken in different points in time which allow following groups of similar households (see Attanasio and Banks (1998) for a description of that methodology). The literature based on these techniques, nevertheless, does not find evidence in favor of the predictions of the life cycle hypothesis (see Attanasio and Banks (1998) for results and references in that line).

Annex 3

Regressions: Consumption Profiles, and Occupational and Demographic Corrections

	Dependent Variable: Log of Expenditure			Dependent Variable: Log of Income
Variable	**(1)**	**(2)**	**(3)**	**(4)**
Age	0.4	-0.2	-0.3	-1.1
	(9.2)	(4.4)	(6.7)	(23.1)
Age^2	1.9e-2	1.0e-2	1.3e-2	4.8e-2
	(10.8)	(6.0)	(7.8)	(24.2)
Age^3	-3.9E-4	-2.2e-4	-2.7e-4	-9.8e-4
	(10.7)	(6.1)	(8.0)	(23.7)
Age^4	3.6E-6	2.0e-6	2.7e-6	9.4e-2
	(9.9)	(5.5)	(7.9)	(22.6)
Age^5	-1.3e-8	-6.8e-9	-1.0e-8	-3.4e-8
	(8.8)	(4.8)	(7.7)	(23.4)
Age*DIHS	0.8	0.6	0.9	1.7
	(14.3)	(9.8)	(16.7)	(26.4)
Age^2*DIHS	-4.0e-2	-2.9e-2	-4.4e-2	-7.7e-2
	(16.2)	(12.0)	(19.1)	(27.5)
Age^3*DIHS	9.3e-4	7.2e-4	1.0e-3	1.7e-3
	(17.6)	(13.8)	(20.8)	(28.1)
Age^4*DIHS	-1.0e-5	-8.1e-6	-1.1e-5	-1.8e-5
	(18.5)	(15.0)	(22.1)	(28.2)
Age^5*DIHS	4.2e-8	3.4e-8	4.8e-8	7.0e-8
	(18.9)	(15.8)	(22.9)	(28.0)
Age*DCHS	0.6	0.4	0.8	1.9
	(10.4)	(6.3)	(14.3)	(29.7)
Age^2*DCHS	-2.5e-2	-1.5e-2	-3.4e-2	-8.0e-2
	(10.0)	(6.1)	(14.1)	(28.0)
Age^3*DCHS	4.9e-4	2.9e-4	6.9e-4	1.6e-3
	(9.1)	(5.4)	(13.4)	(26.0)
Age^4*DCHS	-4.4e-6	-2.5	-6.6e-6	-1.5e-5
	(7.8)	(4.5)	(12.5)	(23.7)
Age^5*DCHS	1.4e-8	7.4e-9	2.4e-8	5.4e-8
	(6.4)	(3.3)	(11.3)	(21.4)
Age*DS	0.2	-0.3	0.1	2.2
	(2.7)	(4.6)	(1.9)	(25.8)
Age^2*DS	-1.1e-2	1.1e-2	-8.8e-3	-9.6e-2
	(3.2)	(3.5)	(2.8)	(25.8)
Age^3*DS	2.6e-4	-1.7e-4	2.4e-4	2.0e-3
	(3.7)	(2.5)	(3.7)	(25.6)
Age^4*DS	-3.0e-6	1.0e-6	-3.0e-6	-2.1e-5
	(4.2)	(1.5)	(4.4)	(25.3)
Age^5*DS	1.3e-8	-1.6e-9	1.4e-8	8.2e-8
	(4.5)	(0.6)	(5.0)	(25.0)
DIHS	-5.3	-3.0	-6.0	-13.2
	(11.1)	(6.4)	(13.1)	(24.2)
DCHS	-4.3	-2.2	-5.8	-16.6
	(8.7)	(4.5)	(12.3)	(29.5)
DS	0.2	5.1	1.0	-16.9
	(0.3)	(8.1)	(1.7)	(23.2)
Head Works	-	0.1	0.1	-
		(58.0)	(73.4)	
Wife Works	-	0.2	0.1	-
		(93.8)	(83.9)	
Woman Head	-	-0.2	-2.2e-2	-
		(93.7)	(13.4)	
Log (Equivalent Adult)	-	-	0.5	-
			(284.7)	
R^2	**38.4%**	**40.2%**	**44.7%**	**39.3%**

Dummies: DIHS: Incomplete High School; DCHS: Complete High School; DS: Superior Education. Base case: Incomplete Primary Education. T-Statistics in parenthesis. Constant not reported.

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