LIFE-CYCLE SAVING BEHAVIOR IN MEXICO
(Extended abstract)

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Introduction

For decades, research has emphasized in the effect of the population change in the economic development. It is known that people's economic behavior and needs vary at different stages of life; so, changes in a country's age structure can have significant effects on its economic performance. The young require intensive investment in health and education, prime-age adults supply labor and savings, and the aged require health care and retirement income. When the relative size of each of these groups in a population changes, so does the relative intensity of these economic behaviors (Bloom et al.). In this context, it is relevant saving behavior. Saving contributes to economic growth by freeing up resources that can be employed to raise the productive capacity of the economy by increasing the amount of capital (Mason 1988).

Several empirical studies based on the analysis of aggregate cross-national data estimates the consumption, income and saving age profiles. For example, Mejía (2008) estimated consumption, labor income and life cycle deficit using the methodology the NTA. On the other hand, Deaton and Paxson (1993 and 2000) employ a different empirical strategy. Since, the life cycle is a longitudinal concept, referring to the passage through life on an individual or a generation. The authors proposed to use a pseudo–panel or synthetic panel and estimate age profiles of consumption, income and saving.

I selected the pseudo–panel strategy, I am not looking across ages for the same household or same cohort of households, but at the experience at different ages of different groups of households, whose members where born at different dates and has had quite different lifetime experiences of earnings and consumption. Without controlling for these other variables, many of which are likely to affect the level and shape of the age profiles, we cannot isolate the pure effect of saving. This document describes the life-cycle saving patterns of Mexican households by decomposing age, cohort and period effects.

Estimating a life-cycle saving model in a pseudo–panel or synthetic panel

The technique was proposed by Browning, Deaton and Irish (1985) and it relies on the construction of n groups or cohorts, each with a fixed membership that remains the same throughout the entire period of observation. Thus, it is possible to follow the average behavior of variables related to these cohorts.

In this paper each cohort consists of those households whose heads[1] were born in the same five years period. I eliminate from the sample all households headed by individuals younger than age 21 or older than age 79, which mitigates problems associated with the effects of changing headship, differential migration and mortality by age group. Thus, cohort one is composed by household heads that were born between 1920 and 1924, cohort two by those that were born between 1925 and 1929, and so on until 11 cohort. In this form it is possible to follow the behavior of groups of homes through time, since the first cohort will have a mean age of 72 years old in 1994, year in which the first survey taken, and 74 years old during the next survey in 1996. The cohort definition, age in 1994 and 2008, and cell size are shown in Table 1.

I analyze saving over the life cycle by using the approach of Deaton and Paxson (1993 and 2000). The saving rate is defined as:

[1] The household head is defined as the person recognized as the head by the household members.

$$s_{ct} = \alpha_c + A\beta + C\gamma + Y\delta + X\varphi + u_{ct}$$

where s_{ct} is a vector column of the average saving rates corresponding to each cohort in each period. A, C and Y are matrices of age, cohort and period dummies. β, γ and δ are the corresponding age, cohort and period effects on saving rates, and u_{ct} is the error term.

However, the identity age = period (year) – cohort (year of birth), implies that all three effects cannot be identified in a linear model. A number of "solutions" to this identification problem have been offered in the literature (Mason and Fienberg, 1985), all of which assume restrictions on the specification of the general model, usually by imposing some sort of functional form assumption on the way the three effects enter. I use a normalization provided by Deaton (1997), which makes the year effects orthogonal to a time trend, so that all growth is attributed to age and cohort effects:

$$d_t^* = d_t - [(t-1)d_2 - (t-2)d_1] \qquad t = 3, \dots, T$$

where d_t is the usual year dummy, equal to 1 if the year is t and 0 otherwise.

In the regression, the saving rate is regressed on age, cohort and period dummies, and on the average numbers of workers and children (0-14), the last two being included to make allowance for the differential consumption requirements of adults and children.

Data and variables

The data I use come from Encuesta Nacional de Ingresos y Gastos de los Hogares (ENIGH) conducted by Instituto Nacional de Estadística y Geografía (INEGI). This survey, conducted each two years between 12 806 and 29 468 households, size of the survey varies from year to year. It has national representation for urban and rural areas. Data is on demographic and socio-economic variables, and detailed information about income and expenditures of each household. I use these cross–sectional data between 1994 and 2008.

The main variable is the saving rates. Saving is defined as the difference between households disposable income and non–durables consumption, the saving rates is the ratio of saving to household disposable income. Disposable income is defined after taxes, includes monetary and non–monetary. Non–durables consumption excludes all components of expenditure that have an element of durability and includes monetary and non–monetary. Income and consumption are deflected using the National Index of Prices and Consumption, 2002.

Life cycle patterns (Findings)

Figure 1 plots mean household disposable income, against the age of the household head. Households income shows clearly the standard inverse–U shape, rising until the head reaches age 57. The period effects are clearly seen, with income falling for all cohorts over the 1994-1996 periods, for peso crisis. I realized the distinction between different types of expenditures: non–durables consumption and durables consumption. Household non–durables consumption, it is very closely relates to disposable income. Additionally I plot mean household saving rates; the first impression one gets from this picture is of substantial amount of noise in the estimated average saving rates. However, a fairly pronounced hump is quite evident even in this graph.

While I use smoothing techniques to present age, period and cohort effects, these can never be disentangled without additional information or restrictions from period effects, because of the exact linear relationship linking age, year and year of birth. I need to estimate a life-cycle model. To determine whether or not the age, cohort and period effects are jointly statistically significant I perform the Wald test statics. It suggests that age, cohort and period are statistically significant in saving rate equations.

Although the age effects are in general statistically significant, it is important to remark that in the saving rate equation only age (45-49) until age (75-79) parameters are

significant and with an not expected positive sign indicating that saving rate is significantly increasing in the last part of the life-cycle. Thus, the effects of age structure on saving are not coherent with the life-cycle interpretation of the data. In particular, there is no evidence of dissaving among the old; indeed, the saving rate increases with age at least up to 79 (Figure 2). It is possible that age selectivity is responsible for this finding, and that the potential dissevers are those who have already exhausted their assets, are living with their children, or are dead. While it seems impossible to rule out such an explanation, the lack of saving among the elderly is a common finding in other countries.

Turning to the cohort effects, the statistical significance of the estimated cohort parameters are in line with the increase in saving of recent birth cohorts indicating that in Mexico the younger cohorts tend to save more than the older ones.

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Appendix

Table 1. Cohort Definition and Cell Size

Cohort	Year of birth	Period	Age in 1994	Age in 2008	Total
1	1920-1924	1994 - 2002	72		2 995
2	1925-1929	1994 - 2008	67		4 159
3	1930-1934	1994 - 2008	62	76	6 565
4	1935-1939	1994 - 2008	57	71	7 691
5	1940-1944	1994 - 2008	52	66	9 747
6	1945-1949	1994 - 2008	47	61	11 443
7	1950-1954	1994 - 2008	42	56	14 059
8	1955-1959	1994 - 2008	37	51	15 711
9	1960-1964	1994 - 2008	32	46	17 685
10	1965-1969	1994 - 2008	27	41	17 004
11	1970-1974	1994 - 2008	22	36	14 518

Source: National Survey of Incomes and Expenditures of Households, INEGI.

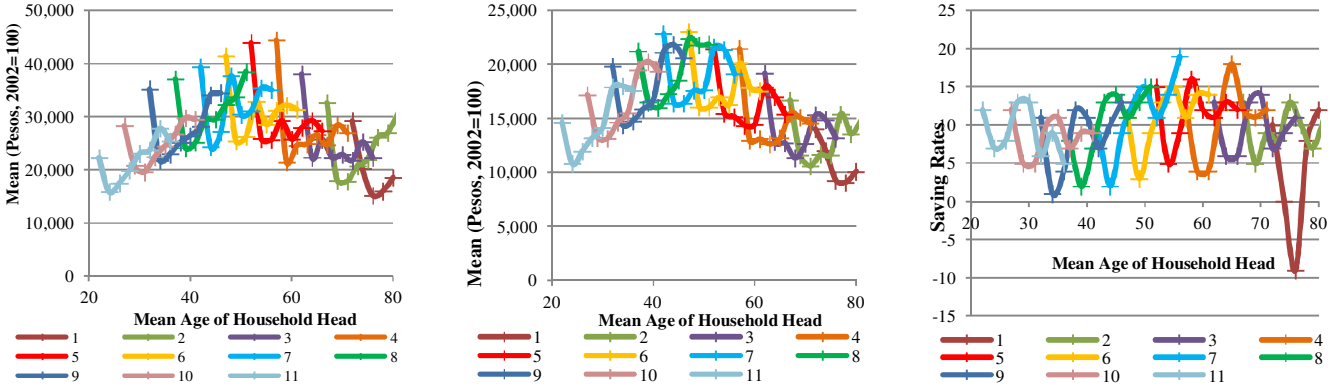
Table 2. Estimated Coefficients

Variable	Coef.	Std. Err.
Age(25-29)	0.01	0.02
Age(30-34)	0.01	0.04
Age(35-39)	0.01	0.04
Age(40-44)	0.03	0.03
Age(45-49)	0.06**	0.03
Age(50-54)	0.08*	0.03

Age(55-59)	0.11*	0.03
Age(60-64)	0.11*	0.03
Age(65-69)	0.12*	0.04
Age(70-74)	0.13*	0.04
Age(75-79)	0.13*	0.04
Cohort(1925-1929)	0.05*	0.01
Cohort(1930-1934)	0.06*	0.02
Cohort(1935-1939)	0.07*	0.02
Cohort(1940-1944)	0.09*	0.02
Cohort(1945-1949)	0.10*	0.02
Cohort(1950-1954)	0.13*	0.03
Cohort(1955-1959)	0.15*	0.03
Cohort(1960-1964)	0.15*	0.03
Cohort(1965-1969)	0.16*	0.04
Cohort(1970-1974)	0.17*	0.04
Period(1998)	-0.04*	0.01
Period(2000)	0.03	0.01
Period(2002)	0.04	0.01
Period(2004)	-0.01	0.01
Period(2006)	-0.03	0.02
Period(2008)	0.02	0.01
Workers	0.02	0.01
Child(0-4)	-0.04	0.03
Constant	-0.12**	0.06

Asterisks indicate levels of significance: * 0.01, **0.05 and *** 0.10.
Note: Observations are weighted by the standard error of the estimated cell means

Figure 1. Household Disposable Income, Non–Durables Consumption and Saving Rates



Source: National Survey of Incomes and Expenditures of Households, INEGI.

Figure 2. Age, Cohort and Period Decomposition of Saving Rates