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HOUSEHOLD CONSUMPTION EXPENDITURES IN PERU: A TEST FOR THE PERMANENT INCOME HYPOTHESIS

Halit YANIKKAYA[*]

Özet: Bu ampirik çalışmamızda, 1994 yılı Perulu üç binin üzerindeki aileye ait tüketici harcamaları verilerini kullanarak "daimi gelir hipotezini" test ettik Bir başka ifadeyle, hane reisinin yaşı, cinsiyeti, eğitim düzeyi, ailenin büyüklüğü, ailenin sahip olduğu likit ve likit olmayan varlıklar ve gelir gibi değişik tüketici karakteristiklerinin hane halkı tüketim harcamalarının üzerindeki etkilerini araştırdık. Her ne kadar ailenin serveti ve aile reisinin eğitim düzeyi ile ailenin tüketim harcamaları arasında istatistiksel olarak anlamlı bir ilişki var ise de aile reisinin yaşının tüketim üzerinde etkisi tespit edilememiştir. Tüketim harcamaları ile ailenin gelir seviyesi arasındaki zayıf korelasyon ise daimi gelir hipotezini destekler niteliktedir. Dolayısıyla bu çalışmanın sonuçları cari tüketim harcamalarının cari gelirler tarafından belirlendiği varsayımını desteklememektedir. Peru üzerindeki bu ampirik çalışmanın sonuçları literatür ile uyum halindedir.

Abstract: This paper examines how various characteristics of households such as age, education, gender of the household head, family size, assets, liquid assets, and income affect the patterns of the Peruvian household consumption expenditures in 1994. Our results show that while asset and education are negatively and significantly correlated with consumption levels, age of the household head is not significantly correlated. Since income has a statistically insignificant coefficient, our results provide some evidence for the permanent income hypothesis. Thus, the proposition that current consumption tracks current income can be questioned.

I. Introduction

This paper estimates how various characteristics of households such as assets, liquid assets, and income affect Peruvian household consumption expenditures. Ordinary least squares (OLS) technique is applied to the cross sectional Peruvian household consumption data from 1994. The regression results show that the value of assets owned by a family and education of the head of the household are negatively correlated with its consumption expenditures. Moreover, female household heads are likely to consume more than their male counterparts.

Since Keynes, the consumption literature has been dominated by two contending traditions. The first tradition, derived from Keynes, views consumption as a function of current income. The second one, postulated by Friedman (1957), views consumption as a function of wealth or permanent income, typically defined as average or expected income. The permanent

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income hypothesis implies that households behave as if they maximize a lifetime utility function subject only to the lifetime budget constraint without being constrained by imperfect capital markets.

The following three basic implications of the permanent income hypothesis postulated by Friedman (1957) differ from the Keynesian consumption theory.

- First, economic agents' planning horizons are longer than one year. This requires distinctions between permanent and transitory income and between permanent and transitory consumption.
- Permanent consumption is a proportional function of permanent income, the constant of proportionality depending on such factors as the age, occupation, and education of the head of the household.
- The marginal propensity to consume out of transitory income equals zero.

It is important to note that the proposition that the resources that a representative consumer allocates to consumption at any time will depend only on his permanent income and not at all on income accruing currently is common in both permanent income hypothesis and life-cycle hypothesis. The former differs from the latter primarily in that it models rational consumption and saving decisions under the simplifying assumption of indefinitely long life. Moreover, in the life cycle model, the concept of permanent income is replaced by that of "the value of lifetime resources, which is the present value of labor income and bequests received, if any". As discussed in Modigliani (1986) and Deaton (1992), there are also important differences of emphasis between the two models. The permanent income theory has always been more concerned with the dynamic behavior of consumption, particularly over the short term and in relation to income. Conversely, the life cycle model has mostly concerned itself more with the relationship between age, saving, and the creation of wealth.

Section 2 reviews some of the previous empirical studies on the permanent income hypothesis. Section 3 briefly presents the data and functional form estimated. The regression results are presented in Section 4. Section 5 concludes the paper.

II. Literature Survey

Until the early 1980s, most of the studies that tested the permanent income hypothesis used time series data and their test results are mixed. Later, studies turned to the use of panel data to test the permanent income hypothesis. The basic testing strategy common to these studies is to look at the relationship between current disposable income and changes in consumption from the current period to the next period. The permanent income hypothesis predicts no correlation between the current consumption and the current disposable income.

A statistically significant correlation between these two concepts would imply that households are liquidity constrained (Hayashi, 1985).

Hayashi (1985) and Jappelli and Pagano (1988) reported that high-saving households are not likely to be liquidity constrained by using a cross-section of United States and Italian households, respectively. They also argued that borrowing constraints are more crucial for young households in both countries. Furthermore, Jappelli and Pagano (1988) concluded that borrowing constraints are more severe in Italy than in the U.S, probably due to the differences in income levels in both countries. Using cross-sectional households data taken from the survey of family expenditure in Canada from 1969, Gerrard (1980) found that the marginal propensity to consume out of permanent income is significantly less than unity when estimated over occupational, educational, and locational groups, but insignificantly different from unity when estimated over age groups, family life-cycle groups, and family types.

Deaton (1992) argued that survey data from many least developed countries (LDCs) often indicate that households, particularly poor households, spend more than they earn. For many LDCs, household surveys show the bottom 50-80% of the income distribution apparently dissaving, and this is so common that it is hard to attribute it to the surveys having been collected only in years of abnormally low income.

The test of the permanent income hypothesis for developing countries has not attracted very much attention since it is easy to argue against the validity of this hypothesis in developing countries due to the absence of well-developed markets for consumer credit. The studies that tested the permanent income hypothesis for developing countries reported the mixed results. For example, Musgrove (1979) found results in favor of the permanent income hypothesis for urban Latin America such as Colombia, Ecuador, and Peru. On the one hand, the estimates of the marginal propensity to consume out of permanent income for Colombia and Ecuador are similar, but that for Peru is obviously lower than those of the other two countries. Since income levels are very much comparable in these three countries, there is no reason why the marginal propensity to consume out of permanent income should differ. On the other hand, the estimates of the marginal propensity to consume out of permanent income for Colombia and Ecuador are indistinguishable from the current marginal propensity to consume even though marginal propensity to consume out of permanent income for Peru is clearly higher. This is not surprising since that there was much more transitory income variation in Peru due to higher inflation. More importantly, Musgrove concluded that the average elasticity of consumption with respect to permanent income is clearly less that one for the countries considered in his study.

Furthermore, Wolpin (1982) and Chow (1985) found no empirical evidence to reject the permanent income hypothesis in India and China,

respectively. Paxson (1992) reported that all extra income due to rainfall is saved rather than consumed by Thai farm households, providing support for a strong version of permanent income hypothesis. However, these results do not support the hypothesis that all permanent income is consumed. Deaton (1992) found evidence against the permanent income hypothesis for Thailand and Cote d'Ivorie. Finally, Payne and Zuehlke (1989) concluded that the rational expectations-permanent income hypothesis for developing economies such as Brazil, India, South Korea, Mexico, Hungary, Poland, China, and Yugoslavia has not been valid.

Finally, Hall (1978) and Flavin (1981) tested the implications of the permanent income hypothesis through investigating the unpredictability of aggregate consumption growth and reported mixed results. Hall (1978) found no relationship between consumption and lagged income conditional on lagged consumption, which could be considered as evidence for the permanent income hypothesis. Whereas, Flavin (1981) estimated a positive link between the change in consumption and the lagged change in income. Given that the autoregression for income showed that the change in income was also positively predicted by the last period's change in income, so called "the excess sensitivity" of consumption was regarded that consumption responded to predictable changes in income. Thus, her results indicated the failure of the permanent income hypothesis.

III. The Model and Data

The cross-sectional data used in this paper came from the 1994 Peruvian Living Standards Measurement Survey (ENNIV94) conducted by the World Bank. The survey collected detailed information for income, consumption, the value of a large number of various categories of assets, as well as for socioeconomic characteristics of Peruvian households for one year, 1994. The variables utilized in the analysis are as follows:

Y = 1994 gross income rather than disposable income due to lack of data on taxes,

CON = 1994 total consumption expenditures,

ASSET = total market value of financial and physical assets,

LIQ = amount of liquid assets, defined as demand deposits, plus saving accounts, bonds and common stocks,

HOUSE = market value of houses at the beginning of 1994 (HOUSE = 0 for nonhomeowners),

AGE = age of the household head,

FSZ = family size,

EDC = education of the household head,

GEN = sex of the household head.

The sample means, standard deviation of the variables listed above are reported in Table 1.

Table 1:
Sample Statistics

Variable	# of Obs.	Mean	Std. Dev.
CON	3624	$4.126,12	4.016
ASSET	3530	$4.332,36	11.747
Y	3624	$5.036,54	5.749,57
LIQ	3621	$439,65	13.151,19
HOUSE	2922	$2.236.951	9.852.343
FSZ	3624	5,32	2,38
AGE	3624	47,75	14,79
EDC*	3126	6,04	3,93
GEN**	3624	1,16	0,37

* 1 and 15 indicate first grade and college graduates, respectively.

** Male =1 and Female = 2.

IV. Empirical Results

In the subsequent analysis, the following twenty-five explanatory variables are included in the estimates. A constant, AGE, AGE**2, FSZ, EDC, EDC**2 GEN, ASSET, ASSET*AGE, ASSET*(AGE**2), ASSET*FSZ, ASSET*EDC, ASSET*(EDC**2), ASSET*GEN, Y, Y*AGE, Y*(AGE**2), Y*FSZ, Y*EDC, Y*(ECD**2), Y*GEN, Y**2, LIQ, ASSET**2, and HOUSE. Squared terms in ASSET and Y are included in the estimated equation in order to account for possible differences in the consumption behavior of low and high-income households. The reason for including HOUSE is to treat homeowners and nonhomeowners symmetrically.

Parameters for a simple model (no interaction terms) and a model with interaction terms estimates were obtained from applying OLS to the equation below:

$$CON_i = \beta x_i` + \varepsilon_i, \qquad i = 1,...,n. \qquad (1)$$

When we estimate the simple model with OLS, we reach the following equation. The numbers in the parentheses are the t-ratios.

CON = -1076.63 + 21.34*AGE + 118.6*FSZ + 153.68*EDC + 413.85*GEN
         (4.81)   (8.49)   (8.07)   (15.27)   (4.39)
      + 0.008*ASSET + 0.332*LIQ + 0.39*Y - 434.3*HOUSE.
         (2.79)   (3.62)   (42.51)   (6.11)

The regression results show that all the explanatory variables have the expected signs and they are statistically significant at the conventional levels. The simple model estimates, however, give us a low R^2-ratio, 0.52. We, then, estimate the model with interaction terms and report the estimated results in Table 2. On the one hand, it does not raise R^2-ratio substantially (0.59). On the other hand, this model has the F-test value of 411.225, which implies that the null hypothesis that all the coefficients of the interaction terms are zero can be rejected. It is important to note that the regression results in Table 2 show that the estimated coefficients of the AGE and AGE**2 are not statistically significant. Consumption is expected to depend upon age to a large extent if households are trying to smooth their consumption expenditures. However, other variables that involve AGE have coefficients whose t-ratios are over two in absolute value. The HOUSE coefficient picks up the negative sign and it is statistically significant. It is

Table 2:
OLS Estimates: Model with Interaction Terms

Variable	1	AGE	AGE**2	FSZ	EDC	EDC**2	GEN
1	-149,38	-6,23	0,086	107,62	-10,93	5,72	614,23
	(0.27)	(0,3)	(0,45)	(4,76)	(0,23)	(1,63)	(4,41)
ASSET	-0,15	0,0054	-0,00005	-0,002	0,005	-0,0003	0,029
	(4,12)	(3,66)	(0,36)	(2,49)	(2,09)	(1,48)	(3,47)
Y	0,17	0,013	-0,0001	-0,004	0,039	-0,0019	-0,076
	(1,64)	(3,39)	(2,81)	(1,16)	(4,1)	(2,95)	(3,15)
LIQ	0,23						
	(2,75)						
ASSET**2	-0,00005						
	(3,57)						
Y**2	-8E-06						
	(19,05)						
HOUSE	-338,31						
	(5,1)						

* The numbers in the parentheses are the t-ratios.
* The point estimate of coefficient of ASSET, for example, is -0.15 which is the (2,1) element of the matrix. The point estimate of the coefficient of Y*(AGE)**2 is -0.0001.

not, however, surprising to have the negative coefficient because owning a house is another form of saving or accumulating assets, which leads to decrease in the current consumption.

The significant negative sign for the ASSET coefficient is surprising. Hayashi (1985) argued that the negative ASSET coefficient might be due to transitory consumption since positively serially correlated transitory income is likely to be negatively correlated with ASSET. As expected, FSZ has the significant and positive coefficient. GEN has the significantly positive coefficient, which indicates that female household heads tend to consume more than male household heads. It is important to note that although income has a highly significant and positive estimated coefficient in the simple model, it has an insignificant coefficient in the extended model, which may be due to the correlation between income and ASSET and LIQ. It is worth mentioning that EDC has the negative and significant coefficient. The reason might be due to educated people having more incentive and more opportunity to save than less educated people. Since Peru had experienced hyper-inflation lately (from the late 1980s to the early 1990s), more educated people might have better understanding of income variations due to high inflation and save more to smooth their future consumption. Moreover, since education is a form of wealth whose possession might lead people to vary their saving in other forms. These results are not inconsistent with Hayashi's (1985) results for the United States.

The marginal propensities to consume are 0.17 and 0.39 from the model with interaction terms and the simple model, respectively. There are at least two reasons to explain these low ratios. First reason might be that gross incomes of households are used to estimate consumption equation rather than disposable income due to the lack of data on taxes. The other reason might be due to the hyperinflation that Peruvian households experienced lately. The World Bank data show that Peru had 1250% inflation rates during the time period of 1984 through 1993. Even in the year of 1994, Peru had double-digit inflation figures. It is expected to be that very high transitory income variations in Peru due to higher inflation, causes the very low marginal propensity to consume. These results are generally consistent with Musgrove's results that considered Peru in late 1960's.

Conclusions

This paper investigates how consumption expenditures are affected by various explanatory variables such as age, education, gender of the household head, family size, assets and liquid assets owned by families and income of households. Our regression results indicate that both the values of assets owned by families and education of the household heads have negative and significant coefficients. Age and its square have insignificant coefficients. The proposition that current consumption tracks current income closely can be questioned since income has a statistically insignificant coefficient when the

interaction terms are included. In other words, our results imply that there is not a close relationship between the observed patterns of current consumption and current income. Thus, insignificant estimated coefficient for income levels presents considerable evidence in support of the permanent income hypothesis. Furthermore, statistically insignificant coefficients for age variables can also be considered evidence for the permanent income hypothesis, too. Moreover, marginal propensities to consume from the both models indicate that households that have experienced high inflation tend to consume less and save more due to large income variations or, at least, since they might suspect that higher levels of inflation in the near future is a strong possibility to consider.

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