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The determinants of households' savings during the recession: Evidence from Greece

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Abstract

This paper assesses empirically the relationship between socioeconomic factors and the level of households' savings in Greece during the financial crisis in Greece. Data were drawn from 800 responders through a field survey in 2012 using the random stratified sampling technique. The empirical analysis was based on the estimation of OLS, 2SLS and Tobit regression models using several kinds of regressor; namely: a) demographic characteristics, b) economic variables and c) psychological factors.
Results showed that income is the most significant variable for saving. Furthermore, marital status, educational level, type of employment and economic situation were estimated statistically significant parameters. Men were found to save more money than women. It was also found that consumers with higher educational qualifications save more, whereas married consumers save less money. Also, employers of the private sector used to save more money than other professional categories. This is inferred because their income had not decreased this period due to the fiscal measures. Finally, psychological parameters, such as consumers' feelings of inability to cover their expenses and pessimistic attitude about the future, influence the behaviour towards households' savings. Strong associations were found between demographic, socioeconomic and psychological parameters and consumer attitude in saving experimentation.

Keywords: *Consumer savings, disposable income, educational level, Greek crisis, pessimism, recession, family size*

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1. Introduction

In the last few years, the role of fiscal consolidation has been analyzed by several studies in the economic literature. These surveys have in particular tried to interpret whether economic restrictions on fiscal policy enhance or harm the various macroeconomic variables including investment, consumption and growth. In contrast, there is little consensus on the sign of the effects of demographic determinants and consumers' psychological alteration due to a severe recession. Thus, this paper tries to investigate the impact of socioeconomic determinants on private saving behavior within households in the context of an economic crisis.

The empirical evidence available shows that private savings are one of the most highlighted issues that researchers have tried to analyze. Consumers' decision to save depends on the level of income they receive during their life (Friedman, 1957). Fluctuations of earnings are linked to consumer uncertainty and during periods of high uncertainty savings rise (precautionary savings motive) (Berry and Williams, 2009; Browing, 1995; Furnham, 1985; Guariglia, 2001; Mody et al., 2012; Pericoli and Ventura, 2012). Other studies (Attanasio and Banks, 1998; Berry and Williams, 2009; Hondroyiannis, 2006; Johnwanish, 2009; Kasri and Kassim, 2009; Rodriguez and Meyee, 1988) have focused on the correlation between macroeconomic factors and private savings.

From a microeconomic perspective, several studies (Alves and Cardoso, 2011; Bersales and Mapa, 2006; Brata, 1999; Browing, 1995; Burney and Khan, 1992; Butelmann and Gallego, 2000; Denizer et al., 2000; Fasoranti, 2007, Furhman, 1985, 1999; Garcia et al., 2011; Guariglia, 2001; Harris et al., 1999; Horioka and Wan, 2007; Kraay, 2000; Lunt and Livingstone, 1991; Mody et al., 2012; Newman et al., 2008; Phipps and Woulley, 2008; Rehman et al., 2011; Rodriguez and Meyer, 1988) have been conducted on the issue of various determinants of savings such as socio-economic and demographic factors. Family income and education are the most important factors of household savings. Furthermore, place of residence, employment status, age, gender, the previous rates of savings and the expectations of future income seem to influence significantly the level of private savings.

The aim of this study is to investigate the determinants that effect consumers' saving behavior in this current period of financial crisis in Greece. The current economic crisis has led to a variation of consumer behavior; thus the empirical research of the capture of these psychological and demographic characteristics seems to be appropriate. For this purpose, we employed cross-section data from the largest Greek island, Crete and the capital city of country, Athens. During 2011, the Greek government in cooperation with the EU and Troika were taking new budgetary measures continuously, in order to achieve their targets. These measures influenced consumers' behavior and their savings, respectively.

In order to achieve its purpose, this paper proceeds as follows: Section 2 presents the methodological issues and the data used in the empirical analysis. Section 3 presents the empirical results, while the conclusions of the analysis, policy implications and limitations are discussed in Section 4.

2. Methodological issues and data

The research provides insights into the determinants that affect consumers' attitude towards private saving. The empirical analysis is based on a cross-sectional data set. We carried out an extensive survey of 800 consumers using a random stratified sampling technique. The selection of these areas was based on the fact that Athens is the biggest urban area of Greece while Crete the biggest island (rural area) of the country. Initially, the empirical results were based on OLS estimator. However, the large proportions of zero savings in our sample mandate a more appropriate treatment for censoring of the dependent variable. In this study, the system of savings is estimated with a way to accommodate censoring to improve the statistical efficiency of our parameter estimates. Thus, marginal effects of probabilities (E[y=1|x]), conditional levels (E[y|x,y>0]) and unconditional levels (E[y|x]) are calculated to facilitate interpretation of the effects of independent variables. The savings function is explained as:

$$S_i=f(X_1, X_2,\ldots..,X_n).$$

Where ***Si*** is the quantitative dependent variable while $X_1,X_2,\ldots.,X_n$ are the regressors. Econometric analysis enables us to measure the impact of each variable on the total amount of consumers' savings. Three subsets of independent variables are used in this empirical analysis, namely: Demographic characteristics, economic variables and psychological factors.

Therefore, we employed the following expanded specification for a consumer's ability to save:

$$lnsave11=b_0+b_1lnmincome+b_2gender+b_3educaei+b_4married+b_5prsector+b_6dlnsave+b_7help+ b_8efinabpay+b_9pryearb+b_{10}efhighcost+b_{11}unempl+u_i$$

where *lnsave11* is a quantitative variable indicating the average monthly savings per person, *lnmincome* is the natural logarithm of consumers' monthly income; *gender* is a dummy variable accounting for 1 if the respondent is male; *educaei* is a dummy variable accounting for 1 if the respondent has completed at least undergraduate studies and 0 otherwise; *married* is a dummy variable accounting for 1 if the respondent is married and 0 otherwise; *prsector* is a dummy variable accounting for 1 if the respondent is working to the private sector and 0 otherwise; *dlnsave* is a quantitative variable indicating the saving rates of the previous years; *help* is a dummy variable accounting for 1 if the respondent has asked for financial help by a relative or by a public organization and 0 otherwise; *efinabpay* is a dummy variable accounting for 1 if the respondent has stated that, given the economic situation, difficulty in financing costs affects his consumer behavior and 0 otherwise; *pryearb* is a dummy variable accounting for 1 if the respondent suggested that the financial year 2010 was less favorable than what s/he expected and 0 otherwise; *efhighcost* is a dummy variable accounting for 1 if the respondent has stated that, given the economic situation, the high cost of borrowing affects her/his behavior and 0 otherwise; *unempl* is a dummy variable accounting for 1 if the respondent has stated that either s/he or one other member in their households is unemployed and 0 otherwise; and *u* is the disturbance term.

The empirical results of the equation are presented in section 3 of this study. **Table 1** summarizes the expected sign for b_i coefficients of equation.

Table 1

Expected sign of the variables specified in the empirical analysis.

Independent variables	Expected sign	Independent variables	Expected sign
gender	+/-	dlnsave	+
educaei	+/-	help	-
married	+/-	efinabpay	-
lnmincome	+	pryearb	-
prsector	+/-	efhighcost	+
unempl	-		

In particular, it is assumed that higher income groups are more able to save more. The expected sign for the previous experience in savings is positive. So, consumers who had positive saving rates in previous economic years are expected to save more at the current time. Moreover, the sign for variables "*help*", *"efinabpay"* and *"pryearb"* which are linked to the consumer's financial situation is negative. There is a relation between the variables, and the consumers' economic and psychological situation. In general, according to previous studies it is difficult to predict the impact of demographic characteristics on the decision to save more. In the next section, the results of the model are presented.

3. Results

In this section we present the results of the statistical and econometric analysis to estimate the profile of a "saver" person. As "saver persons" we define those people who can save extra for several reasons.

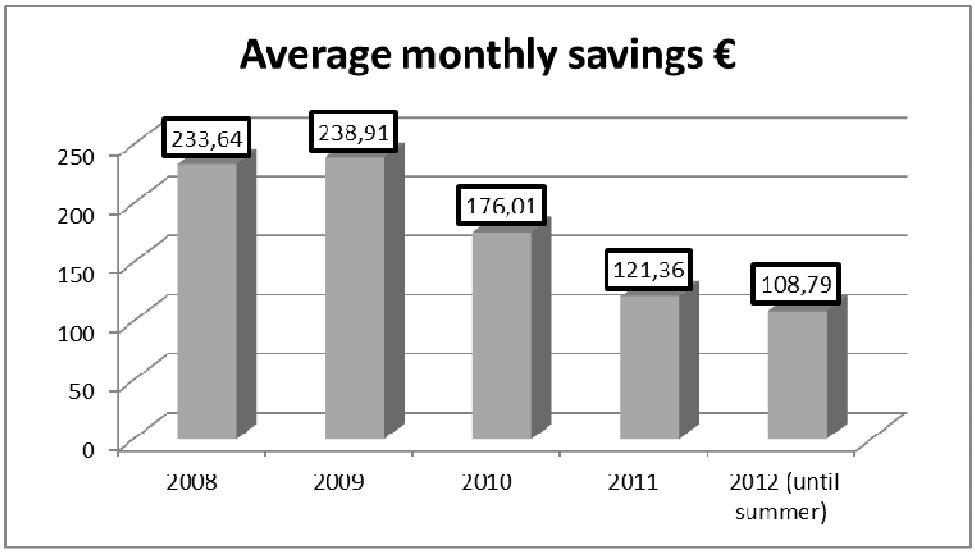
3.1 Descriptive statistics

From the sample of 800 consumers in question, 46.4% are male. As far as the educational level is concerned, 53.3% have received a higher degree of education. 34.1% are married while 32.4% are working in the private sector. Furthermore, the average level of consumers' monthly income was €886.48. 62.8% indicate that the previous economic year was characterized as a very bad economic year for them while 45.9% denoted that their income does not satisfy their needs. Finally, 22.2% believe that the high cost of borrowing affects its consuming behavior while 50% of the sample declared that there is one unemployed person in their household.

Savings, according to the respondents' answers, was decreasing over time and especially during the current period of financial crisis in which it has declined drastically. These results can be seen in **Figure 1**.

It is worth noting that while consumers used to save €233.64 per month in 2008 and €238.91 during 2009, after the outburst of the financial economic crisis there has been a huge reduction in consumers' monthly savings. Empirical studies suggest that this phenomenon is similar to international trends. More specifically, the monthly savings of consumers were €176.01 during 2010 and €121.36 during 2011 when there is a continuous negative trend on private savings as fiscal measures started to be implemented by the government (the period until the summer of 2012).

Figure 1. Consumers' average monthly savings



3.2 OLS and Tobit Analysis

OLS and ML estimations give reliable results, testing at the same time the validity of the key assumptions of normality and homoskedasticity. For the ordinary linear regression model, these tests are based on OLS residuals while generalized residuals for censored regression provide the key component for generating test statistics for testing the null hypotheses of normality and Heteroskedasticity. More specifically, the Tobit model (censored regression model) is designed to estimate linear relationships between variables when there is left censoring in the dependent variable. The regression of interest is specified as an unobserved latent variable, y*:

$$y_i^* = x_i'b + e_i$$

Where $e_i \sim N(0,s^2)$ while x_i denotes the (Kx1) vector of exogenous and fully observed regressors. In our analysis, the leading case of censoring is that in which the data are left-censored only and L=0. Furthermore, equations were tested for the existence of the assumptions of normality and heteroskedasticity while the analysis of left-censored data provides consistent estimates under the weaker assumption that the error e is independent and identically distributed and symmetrically distributed (Cameron and Trivedi, 2009).This is also the reason why our quantitative regressors are expressed in logs.

Observing the previous figure, it is interesting to interpret the factors that affect this saving behavior. Therefore, several remarkable results are obtained from the empirical estimations using linear and maximum likelihood procedure respectively. **Table 2** summarizes the empirical results of the above estimators. Statistically insignificant variables are omitted from the initial model. All the estimated coefficients of the explanatory variables presented in this model have the expected sign and are statistically considerable.

As expected, per capita income has positive effects on the level of savings, on probabilities of saving, on conditional and unconditional levels at 1% level of significance (Abdelkhalen et al., 2009; Bersales and Mapas, 2006; Brata, 1999; Browing, 1995; Denizer et al., 2000; Furnham, 1999; Garcia et al., 2011; Lindqvist, 1981; Lunt and Livingstone, 1991; Rehman

et al., 2011). Results argue that 1% increase in income tends to raise consumers' savings by about 0.163%. MPS equals 0.163 indicating that 16.3% per portion of total income is saved each month on average during 2011 (it is close enough to the average monthly savings from the descriptive results). Based on Tobit analysis, it can be seen that the magnitude of coefficient is lower indicating that the marginal effect for income on the expected level of savings given that the individual has not been censored is equal to 0.136. What is more, it is observed that an increase in the individuals' income raises the probability of saving by 3.6 percentage points.

Table 2

Estimated linear regression of consumers' amount of savings (column 2) and marginal effects of explanatory variables on probabilities, conditional levels and unconditional levels (columns 3,4,5).

Variables	OLS	Prob.	Cond. level	Unond. level
logmincome	0.163***	0.036***	0.136***	0.183***
	(0.0309)	(0.008)	(0.030)	(0.040)
gender	0.344**	0.055	0.208	0.281
	(0.167)	(0.035)	(0.133)	(0.180)
educaei	0.555***	0.097***	0.365***	0.491***
	(0.171)	(0.036)	(0.135)	(0.182)
married	-0.556***	-0.137***	-0.506***	-0.673***
	(00187)	0.038)	(0.139)	(0.181)
prsector	0.407**	0.079**	0.303**	0.413**
	(0.195)	(0.038)	(0.150)	(0.206)
dlnsave	0.415***	0.092***	0.347***	0.469***
	(0.028)	(0.011)	(0.041)	0.056)
help	-1.116***	-0.208***	-0.789***	-1.057***
	(0.172)	(0.035)	(0.136)	(0.180)
efinabpay	-0.722***	-0.143***	-0.542***	-0.729***
	(0.173)	(0.037)	(0.139)	(0.187)
pryearb	-0.748***	-0.121***	-0.470***	-0.640***
	(0.172)	(0.035)	(0.140)	(0.192)
efhighcost	1.031***	0.200***	0.836***	1.159***
	(0.213)	(0.041)	(0.192)	(0.271)
unempl	-0.483***	-0.116***	-0.439***	-0.593***
	(0.170)	(0.345)	(0.132)	(0.178)
constant	2.386***	-	-	-
	(0.261)			
Obs.	747	747	747	747

****, ** and * indicate significance levels at 1%, 5% and 10% respectively.*
Asymptotic robust – heteroskedasticity standard errors in parentheses.
431 left-censored observations.

The effects of gender are fairly scant. Indeed, while it is estimated that males have higher levels of savings, maximum likelihood estimator indicates the insignificance of this variable. There are a lot of mixed reasons to believe that within a household the members have different preferences concerning savings, as there are differences in life expectancy and in predictions concerning households' members' preferences and portfolio choice (Wuwals et al., 2004). However the sign of the regressor remains same. This finding agrees with several previous studies (Brata, 1999; Denizer et al., 2000; Guariglia, 2001; Lunt and Livingstone, 1991). The level of education was expected to exert positive impact on consumers' saving behavior. That is largely confirmed by our results. More educated

consumers save higher proportion of their income. Highly educated consumers also have higher probability to save by 9.7 percentage points (Alves and Cardoso, 2011; Bersales and mappa, 2006).

Marital status is one more significant factor that affects saving behavior of consumers. More specifically, marital status was found to be negatively and significantly correlated with the total amount of savings in a household. They are less likely to be able to save and they also have lower probability of saving by 13.7 percentage points than other categories (Harris et al., 1999; Rehman et al., 2010). The coefficient of consumers' occupation type (private employee) exhibits a significant positive sign in the savings equations. Private employees save more. Furthermore, as it can be seen from the results, they have higher possibility of saving by 7.9%than other categories of employment. It can be explained from the fact that during 2011 there were not many fiscal economic measures that had negative impact on private employee's incomes. That confirms that the most negative influences by the fiscal policy which is applied by political parties were on public sector.

Our results identify also a significantly positive relationship between previous saving rates and current consumers' savings. In particular, a direct relationship was found between the previous rates of savings and current consumers' savings (Lunt and Livingstone, 1991). The results suggest that consumers who used to save more in previous financial years are also more likely to save more in current period. In addition, they have higher possibility to save than consumers who had lower rates of savings previous years. On the other hand, consumers who have asked financial help by relatives or by a public organization are less likely to save. They also have lower probability in order to have positive savings by 20 percentage points. Liabilities exhibit a significant negative coefficient in the saving equation, too. Our results show a significantly inverse relationship between liabilities and savings (Rehman et al., 2011). Consumers who are not able to repay their liabilities save less. What is more, financial situation has influence on savings. Consumers who stated that the previous financial year was worse than they expected expressing simultaneously a pessimistic attitude are also less likely to save (Guariglia, 2001; Newman et al., 2008).

Borrowing is an alternative way of investing. Generally, an increase in credit supply is expected to reduce saving rates (Mody et al., 2012). However, if consumers, who could borrow, believe that interest rates are higher than they expect (asymmetric information), they may decide not to invest, so they save more. It is an index of economic uncertainty. Based on our results, it is noted that consumers who believe that the cost of borrowing is high, they have higher possibility of saving by 20 percentage points. Furthermore, households with at least one unemployed consumer within household save less. It is obvious that when there are unemployed member within a family there exists a dramatic reduction in household's income. Simultaneously, it can be seen that there is not only a decrease in private savings but there exists a decrease in the probabilities to save. In particular, households with at least one unemployed member have lower probability of saving by 11.6%.

4. Discussion and Conclusions

In this paper, we tried to analyze the determinants of consumer savings. Our empirical results suggested that savings are dependent on income. This result is intuitive and supported by previous research. Furthermore, it was estimated that private saving is affected positively by education level but inversely by marital status, while men tend to save more than women. A very important and statistically positive significant variable is prior

savings rates. Moreover, this study showed the importance of consumers' attitude on their financial situation. Firstly, consumers who believe that the previous financial year was worse than they expected, save less. Secondly, consumers who stated that they cannot repay part of their liabilities saved less, too. Thirdly, consumers who had asked for financial help from a relative or a public organization in order to satisfy their needs had fewer savings. One further but also original result was the evidence that consumers saved in order to self-insure against uncertainty of an increase in the cost of borrowing. Our findings revealed that in accordance with this hypothesis, it had a positive and significant effect on consumers' saving decisions. So, we concluded that a significant precautionary component exists in saving behavior.

A key question is why analyzing consumers' saving attitude matters. It matters because private saving is directly related to achieving fiscal development goals. Private saving is a negative consumption while private consumption is the largest component of GDP. Within this context, there are several implications. Particularly, it is high of interest to indicate that both socioeconomic characteristics and financial condition are the parameters that can lead the consumers to take or shift their economic decisions in their life. However, these decisions play a very important role in economic and political cycles. The present analysis confirms that these factors are active during an economic depression and so governments should take these characteristics into consideration when taking severe fiscal measures. The results are crucial for policy making because the identification of sustainable consumption patterns is key to achieving sustainable economic growth.

However, this paper is not without its limitations. For instance, there are many alternative subcategories of uncertainty. For example, health risk, income risk, longevity risk, default risk might play a significant role in determining consumers' saving behavior. These types of uncertainty need further investigation using data from Greece. Turning, finally, to directions for further research, there are a number of determinants that could not be considered in this analysis due to data limitations, and we hope to be able to incorporate these factors in our future research.

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