Household Savings in Turkey: Evidence From Microdata*

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Abstract: Since 2000 in Turkey, there has been a great growth the share of the household savings in private savings. Although there are exist huge literature related to determinants of saving rate rely on macro level data, these studies have limitation on reflect of household saving behavior because of omitting heterogenities among households. For this reason, determining the effect of heterogenity of households on saving behavior has great importance for representing main factors behind on households' saving behavior. The main purpose of this study is to investigate the demographic determinants of household savings and examine the effect of these differences on saving rates in Turkey the period between 2003-2012 using Household Budget Surveys (HBS) providing by TURKSTAT. In this context, the research methodology consist of two-stage (i) modeling and analysis the determinants of savings using OLS method, (ii) examining the year effects via pooled OLS which allows to control for heteroscedasticity. According the findings revealed that method, demographics differences such as householder's age, gender, education level, and household size have notable role on explain saving behavior of households.

Keywords: Household savings, Demographics, Heterogenity, Turkey

JEL Classification: D14, J10, C50

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1. Introduction

In developing countries, most of studies which aim to identify the determinants of savings ignore the demographic and economic differences of economics actors such as government, households, and firms because of using macro level data in their analyses. However, the determinants of saving behaviors have been analyzed as empirically with increasing accessibility of micro level data.

Browning and Lusardi (1996) emphasize that demographic and economic heterogeneity among households is an important factor to determine saving behavior of household and they expect that household savings behavior will be more understandable when micro level data becomes more accessible.

In micro level data based studies, age, education, income, household size, gender, location are used as a standard set of observable variables in order to determine the effect of heterogeneity of household on savings (Burney and Khan, 1992; Gibson and Scobie, 2001; Guariglia and Kim, 2004; Foley and Pyle, 2005; Orbeta, 2006; Szekely and Attanasio, 2000; Chamon and Prasad, 2008).

Furthermore there is also various studies state that several variables, having an effect on household saving behavior, should be used beside the standard variables while analyzing the effect of household heterogeneity on savings. Chang (1994) examines the determinants of saving behavior of American households for the period of 1983-1986 and he finds that household saving rates change with some demographic factors such as education, ethnicity, gender, marital status, home ownership. Chang (1994) also explains that more educated, young, white, white-collar workers, married people have higher saving rates than the others for the corresponding years. Finally he says that households with higher income are more likely to have higher saving rates.

Kulilov et. al. (2007) identify the determinants of household savings using Estonian household budget survey data for the period 2002-2005 .They recommend adding an extended demographic variables set in the model in order to measure difference between the saving behavior of household . In their study, they use standard variables, generally using to test household heterogeneity in related literature, such as household size, age, ethnicity, car ownership, gender, and location. They conclude that car ownership has a negative impact on savings, age is statistically significant, and education has negative effect on savings rates, and households with female household head more likely to save more money.

When it comes to Turkey, there are few studies have been investigated the determinants of private savings with micro data. The main reason of this, micro level data has become available in Turkey since 2002 with gathering annually data through

household budget survey by Turkstat. Another reason of this, existing studies are able to examine this issue with short-term data due to lack of long-term data set.

Rıjckeghem & Üçer (2009) analyze the determinants and patterns of private savings in Turkey using macro level data for the period 1998-2004 and using 2004 and 2005 HBS data set provided by TURKSTAT. They find that income is most efficient demographic variable among others and it has a positive and statistically significant effect on household saving rates. Moreover, they conclude that age of household head is inefficient, household size and education level have negative and significant effect, location and being extended family have positive but statistically insignificant effect , social security ownership, having public sector workers in household and home ownership positive, high for 2004 and low for 2005, and significant effect on saving rates.

Yılmazer (2009) analyzes the relationship between household saving rates and household characteristics applying probit model with SCF data, was collected by Fikret Adaman, Mehmet Kaytaz and Tansel Yilmazer in 2008. In the study, income, age, education, region, working status, gender, marital status, household size are considered as demographic and economic variables. The objectives of this study is that middle aged (40-60) people more likely to save money and there is no significant relationship between education and savings. He also observes that urban households have higher saving rates than rural households. Finally the study provides that saving rates positively related to household size and statistically unrelated to marital status and gender.

Ceritoğlu (2013) examines the effect of labor income risk on household saving behavior using the method of pooled OLS and pooled tobit model with HBS data set for the period between 2003 and 2009. In the study income, age, urban or rural area, gender, home ownership, education and social security are considered as household demographic variables. According the empirical results of the study, while there is a positive relationship between saving rates and income, urban or rural area, and home ownership; age, numbers of children, and gender do not have a statistically significant impact on saving rates. In addition, Ceritoğlu (2013) finds that household head without a social security, in especially lower income households, has lower saving rate unlike most expectations.

Aktas et al. (2010) analyze the determinants of household saving behavior with different saving definitions applying by OLS method on 2002-2008 HBS data sets. In addition, they used pooled OLS method in order to control year effect and deal with heteroscedasticity problem. The authors set an extended saving model by including income and wealth effect in general model. In the study, education, and household type as household demographic variables; working sector type and the share of pension in total household income as proxy variables for income and wealth effect; car ownership, homeownership and working status of household head as dummy variables are used to introduce determinants of household saving behavior. The main findings obtained from the study are that education is a major determinant of savings and savings rates are higher in households with average education level and high female labor force participation rate. Furthermore, according to empirical results, dummy variables, representing the effect of income and wealth on saving rates, are statistically significant to explain of saving rates.

Şengür & Taban (2016), aim to identify the determinants of household savings in their study. In the study, logistic regression model is used with “Household Budget Survey” (HBS) data provided by TURKSTAT for the period between 2002 and 2013 .As a results of the study, having a home, having more than ten thousand Turkish liras annual disposable income, and having higher education level are positively correlated with household savings. In contrast, household sizes, car ownership, working status and rural households are negatively correlated with savings.

2. Data

The data used in this study is “Household Budget Survey Micro Data Set (HBS) 2003-2012" presented by Turkey Statistical Institute (TURKSTAT). HBS obtains by applying to households, which are randomly selected from specific region and with a limited constant number specified for the year, in every each month between January 1 to December 31 for corresponding year (TURKSTAT). For this reason, HBS has repeated cross sectional data characteristics unlike panel data. Variables related to data for the period 2003-2012 are defined by utilizing from HBS as follows:

Saving rates: The general definition of saving (S) is the difference between income (Y) and

consumption. Based on this definition, saving rates (s) is calculated as a ratio of the difference between household disposable income and consumption expenditure on household disposable income.

$$S = \frac{(Y-C)}{Y} \quad (1)$$

Household disposable income, personal disposable income is defined as the total amount of in-kind income and monetary income which is including revenue generating household members' income earned from their jobs, capital and property (wages, profits, interest, rent) income, and transfer receipts such as pensions, widows and orphans pensions and payments to elderly people, scholarships. Total household disposable income is total amount of annual disposable personal income of each individual in household.

Household consumption expenditure, the value of goods and services which are bought by household in order to supply their need of the consumption, consumption of the products produced by households, good and services obtained from working household members' office , the expenditures on goods of household members in order to buy gift or support someone are considered as household consumption expenditure.

Household Characteristics: Head of household is a person that not only responsible to manage household's income and expenditures, he or she has also ability of giving a decision about legal, social and economic issues for the benefit of every single household.

Table1: Definition of Variables

Variables	Definition of Variables
Age	Age of household head (over 20 years and over 65 years with 5 years group)
Gender	Dummy variable takes 1 if household head is a Female, Otherwise 0.
Marital Status	Dummy variable takes 0 if household head is Single, Otherwise 0.
Education Level (Squared)	If head of household Not literate the dummy variable takes 0 Literacy but is not finished elementary school or equivalent it takes 1 The junior high school or middle vocational graduates it takes 2, High school or vocational or technical high school graduates it takes 3, 2-3 year college or four-year colleges are a graduate or masters or doctoral graduates it takes 4
Working Status	Dummy variable takes 1 if head of household employed, otherwise 0.
Household Type	Dummy Set for HH Type 0.Childless nuclear family 1.Nuclear family with one children 2.Nuclear family with two children 3.Nuclear family with three or more than children, 4.Extended Family
OECD Household Equivalence Scale	It is a household size calculated by considering the coefficients 1 for the first adult in the household, 0.5 for individuals aged 14 and over, 0.3 for less than 14 years old individuals.
Urban/Rural	Dummy variable takes 1 if household located in the city (settlements with a population 20 001 and more than) Otherwise 0.
Social Security Ownership	Dummy variables takes 0 if at least one of households has a Social Security, Otherwise 1.
Car Ownership	Dummy variable takes 1 if there is at least one car in the household, Otherwise 0.

Source: It is standardized by authors using HBS data set provided by TURKSTAT

Demographic characteristics of the household head are important variables reflecting the household savings behavior. Variables related to household head and households and their definitions are presented in Table 1.

3. Methodology

In this study, the factors influencing saving behavior is analyzed for the period 2003- 2012 using the OLS method, one of the repeated cross sectional data analysis, since the data does not have properties of panel data. The model which is established for estimation of households saving rates is presented in equation (2).

$$S = \beta_0 + \beta_1 \sum A_{head} + \beta_2 DG_{head} + \\ +\beta_3 DMS_{head} + \beta_4 E_{head} + \beta_5 \sum T_{hh} + \beta_6 HS_{hh} + \\ \beta_7 DL_{hh} + \beta_8 DSS_{hh} + \beta_9 DC_{hh} + \varepsilon \qquad (2)$$

In the model, S is a dependent variable which is representing household saving rates; socio-economic variables related both household head and household are located on the right side of the model as independent variables. The socio-economic variables related to household head are age dummy set(A_{head}), gender dummy variable(DG_{head}), marital status dummy set(DMS_{head}), education level dummy variable(E_{head}), respectively. In addition, the socio-economic variables related to household are located in the model as household type dummy set(T_{hh}), household size(HS_{hh}), location dummy variable(DC_{hh}).

Moreover, corresponding model is analyzed with pooled OLS method in order to control year effect and deal with heteroscedasticity. The results of the empirical analysis revealed the pooled OLS method is parallel with the simple OLS method results. Because of obtaining almost same results, pooled OLS findings will not present in the next section. However, pooled OLS results could be available upon request from authors.

3.1. Descriptive Statistics and Empirical Results

In this section, descriptive statistics for the data is presented in Table 2. When look at the trends of saving rates changing by years, it can be said that as a result of influencing average saving rates by outliers and having a right skewed distribution, median values become more stable. Therefore the median values are able to reflect more clear pattern of saving rates.

In addition, while saving rates was around 10 to 13 percent before 2008 global crisis, after that saving rates decreased to 5-7 percent. This situation shows that a structural breakdown occurs with the sharp declining in saving rates. The lowest saving rate with 5.7 percent was in 2010; on the other hand the highest saving rate with 13.6 percent was in 2004.

According to relationship between age of household head and saving rate, saving rate increase with 30-35 age group, it decrease until the age group of 50-55, and after that it increase again. It implies that there is a hump shape relationship between age and saving rates. Moreover, when one of the household members has a social security, saving rates take higher value for each year.

Furthermore, households with heads have a job have higher saving rates during the survey term except for 2010 and 2012. In addition, saving rates of rural households are higher than urban households. This situation can be explained with the reality of having rural households' high consumption level of their own product.

The coefficients of household type variable present that nuclear families without children have higher saving rates than nuclear family with children. On the other hand, saving rates decrease when number of children increases. Additionally, extended families have higher saving rates than nuclear families because of having extended families more employers. We can also see that with below average household size families' saving rates greater than others because of having them low young and elderly dependency.

Finally as we can see from Table 2, there is a positive correlation between saving rates and education level. It means saving rates increase with education level and the highest saving rate value is for households with graduated from a college or above household head.

Table 2: Descriptive Statistics

Years		**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Saving Rate											
Mean		7,8%	7,6%	4,1%	3,2%	5,8%	-.8%	-.3%	-.7%	.2%	.9%
Median		12,7%	13,6%	1.6%	1.1%	11,4%	6,0%	6,5%	5,7%	7,3%	7,0%
D20		16,2%	1.4%	13,7%	16,2%	1.2%	13,0%	3,7%	1.3%	7,3%	5,0%
D25		12,8%	9,8%	9,8%	8,9%	11,3%	5,9%	6,1%	6,8%	7,7%	6,5%
D30		13,4%	1.4%	8,7%	12,4%	11,5%	7,0%	6,8%	7,1%	8,1%	7,0%
D35		13,1%	14,0%	9,8%	9,1%	11,2%	4,7%	6,4%	2,9%	6,0%	7,9%
D40		12,4%	15,2%	1.8%	12,5%	11,1%	6,4%	5,7%	5,2%	6,5%	5,2%
D45		11,9%	13,6%	11,1%	9,7%	1.9%	5,2%	7,7%	5,2%	1.2%	5,2%
D50		13,3%	15,7%	11,1%	1.1%	11,3%	5,8%	7,9%	6,4%	5,4%	8,7%
D55		12,3%	13,5%	9,9%	1.2%	13,2%	8,8%	4,7%	6,3%	6,8%	8,2%
D60		11,7%	13,5%	12,9%	5,5%	1.0%	2,7%	7,3%	5,7%	5,2%	9,7%
D65		13,0%	13,3%	11,1%	8,6%	11,9%	6,6%	7,3%	5,8%	8,5%	7,7%
Social Security	**0**	8,7%	8,3%	7,9%	6,9%	5,8%	-1,0%	3,2%	2,0%	4,3%	5,8%
	1	14,3%	14,9%	11,1%	1.8%	11,9%	7,6%	6,9%	6,0%	7,5%	7,2%
Gender	**0**	11,5%	12,6%	8,3%	9,9%	9,3%	5,6%	6,3%	1.3%	9,0%	9,8%
	1	12,9%	13,8%	1.8%	1.2%	11,6%	6,1%	6,6%	4,9%	6,9%	6,6%
Working Status	**0**	1.7%	13,2%	9,5%	8,5%	8,9%	5,8%	5,2%	6,4%	6,9%	7,8%
	1	13,7%	13,9%	1.9%	11,0%	12,3%	6,1%	7,1%	5,3%	7,3%	6,8%
Martial Status	**0**	13,2%	13,9%	11,8%	12,3%	11,4%	8,8%	8,0%	11,0%	9,0%	9,6%
	1	12,7%	13,6%	1.4%	9,9%	11,4%	5,7%	6,3%	4,6%	6,9%	6,6%
Auto	**0**	11,6%	12,6%	9,8%	1.1%	11,2%	5,0%	6,4%	6,3%	8,5%	8,1%
	1	16,2%	17,4%	12,4%	1.2%	12,2%	8,7%	6,7%	3,3%	4,2%	5,8%
Urban	**0**	15,0%	13,9%	12,3%	1.9%	12,7%	7,0%	6,9%	5,8%	8,9%	8,5%
	1	11,8%	13,5%	9,8%	9,9%	1.9%	5,7%	6,4%	5,6%	6,7%	6,5%
Household Type											
Dhht0		15,8%	16,3%	13,1%	12,4%	13,8%	7,1%	6,6%	5,1%	7,5%	9,8%
Dhht1		13,3%	15,2%	9,9%	1.7%	12,0%	5,7%	7,1%	6,9%	7,9%	8,6%
Dhht2		11,6%	13,0%	9,9%	1.0%	11,1%	2,6%	6,0%	2,7%	4,7%	4,8%
Dhht3		8,7%	9,3%	5,1%	6,2%	7,0%	2,6%	.1%	-.2%	.3%	.6%
Dhht4		16,8%	15,3%	14,3%	11,8%	12,6%	12,4%	11,6%	8,3%	13,3%	9,2%
Education Type											
Edu0		1.5%	6,6%	6,1%	8,3%	6,3%	5,4%	4,4%	8,3%	8,4%	11,2%
Edu1		11,5%	13,5%	1.2%	9,1%	11,1%	4,4%	4,7%	4,1%	6,5%	5,6%
Edu2		1.9%	12,8%	9,9%	8,6%	9,7%	3,8%	6,2%	3,0%	5,6%	4,4%
Edu3		14,1%	14,3%	1.6%	12,9%	12,1%	6,3%	6,9%	4,1%	5,1%	6,4%
Edu4		2.6%	19,1%	16,4%	18,6%	18,4%	16,9%	16,9%	14,5%	13,8%	15,3%
HHS Below mean		14,3%	14,7%	11,1%	11,9%	12,1%	7,0%	7,4%	8,2%	7,8%	8,9%
HHS Above mean		11,7%	11,1%	9,4%	9,6%	1.9%	5,4%	5,2%	4,1%	5,9%	4,9%

Source: Own calculation based on HBS data

Table 3 presents the estimated regression coefficients of the model established for identifying of the determinants of household savings. The life cycle hypothesis, which is basically defined as individuals earn and save more money when they are young and dis-save or solve savings when they are retired, claims that there is a strength theoretically relationship between age and saving rates. However, based on our empirical results this linkage appears quite weak and this finding consists with the studies of Rijckeghem and Üçer (2009) and Aktaş et al (2010). It is concluded that extended families have statistically significant and positive savings rates in 2003, 2008, 2009 and 2012 with interpreting of the household type dummy variable. In the study, the finding of nuclear families without children are more likely to save money is in a parallel with the studies in the literature. Because of having of extended families a greater number of incomes generating individuals and some advantages provided by scale economies, it can be argued that they save more money.

The level of education is one of the most important determinants of household savings rate. There is a strong positive and statistically significant relationship between savings rates and level of education for entire years. However, due to the

positive correlation between education and income and wealth the coefficients may be upward-biased.

Having a one of household members with social security in household is another important determinant of household savings rate. Although households with members do not have a social security are expected to have higher saving rates as a result of precautionary motivation, our findings claim that households with social security members more like to save money. Having these type households' low health expenditures ratio *(if ss=1 ise 18%,, if ss=0 20%)* could be the main reason of this.

Table 3 shows that there is a positive correlation between working status and saving rates. If households head has employed during the survey term, this type households have higher saving rates than households with unemployed household head. Since, they are more likely to save during the term of being employed with precautionary motivation in order to stable their living standard for their unemployment period.

Based on our empirical results, it can be argued that marital status is also another important determinant of saving rates. Households with married households head save less than unmarried. Marital status (MS) dummy variable was found as statistically significant for almost every year. It is considered that the married individuals have higher saving rates as a result of having their higher young and elderly dependency ratio compared to single individuals.

Finally considering the significance of the model, it is observed that coefficient of determination (R2) is quite low for every each year. Although low R2 could be evaluated as an indicator for remaining of available data insufficient to explain saving behavior, estimated coefficients are robust and consistent.

Table 3: Regression Results for Determinants of Household Saving (2003-2012)

Years	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
D20	-	-.02	.01	.08	-.03	-	-	-	-	-.02
D25	-.04*	-.05*	-.03	.02	-	-.10**	.06	-.01	.05	-
D30	-.05*	-.05**	-.02	.05**	.01	-.06	.07	-.01	.04	-.01
D35	-.04*	.01	-.03	.01	.01	-.09*	.06	-.01	.05	.01
D40	-.04*	-.01	-.01	.06**	.01	-.09*	.05	-.02	.04	-.01
D45	-.05**	-.04	-.01	.03	.01	-.09*	.07	-.02	.07	.01
D50	-.05**	.01	.01	.05**	.01	-.09*	.09*	-.02	.03	.01
D55	-.05*	-.03	-.03	.03	.03	-.05	.04	.01	.04	.01
D60	-.05**	-	-	-	.01	-.11**	.08	.01	.03	.03
D65	-.05**	-.03	-.02	.01	.01	-.09*	.07	-.01	.04	.01
Dhht1	.05	-.03	.04	-.02	-.03	.05**	.06***	.01	.03	.09***
Dhht2	.04	-.07***	.03	-.04*	-.03	.01	.07***	-.02	-.01	.04**
Dhht3	.01	-.08***	-.04	-.09***	-.07	-	-	-.05	-.07*	-
Dhht4	.10***	-	.08	.02	.01	.07***	.08***	.01	.04	.12***
Dhht5	.08**	-.01	.06	-	-.01	.11***	.12***	.04	.06	.10***
Gender	.04**	.02	.08***	.07***	.01	.01	.02	-.03	-.02	-.02
Edu^2	.01***	.01***	.01*	.01***	.01***	.01***	.01***	.01***	.01***	.01***
SS	.07***	.07***	.03**	.03	.06***	.12***	.03	.05***	.03	.02
MS	-,05***	.02	-.09***	-.09***	-.05*	-.04	-.05**	-.05**	.01	-.03
WS	.05***	.04***	.04***	.06***	.05***	.02	.02**	.02	.01	.01
Auto	.01	.04***	.01	-.02*	-.02	-.01	-.02**	-.06***	-.08***	-.01
HHS	.01**	.01	.01	.01	.01	.02*	-.01	.01	.02**	.01
Urban	-.04***	.01	-.01	.01	-.02	-.04***	.01	.01	-.02**	-.03***
cons	-.03	.01	-.04	-.06	.03	-.09	-.15**	.01	-.11*	-.07
Obs	25110	8310	8213	8338	8320	8299	9696	9795	9599	9737
R^2	.023	.022	.014	.020	.019	.034	.019	.023	.023	.013

Source: Own calculations.

4. Conclusion and Discussion

This study aims to identify the determinants of savings and explain the relationship between these determinants and saving rate in Turkey. The main results of the empirical analysis present that education is the most important determinant of saving behavior and age has no significant effect on saving rates. Although this study concluded with statistically significant coefficients results, like parallel with the previous studies, obtaining low R squared value could be an evidence of existence there are still some significant omitted variables explaining saving behavior for Turkey. In this context, including to the model households ancestor's saving behavior variable, one of the social-economic variables and cannot obtain from HBS, might be helpful to increase the significance of the model. This suggestion should be test in future studies.

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