A Time Series Analysis of the Determinants of Private Savings in Turkey

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Abstract

Private savings rate declined from an average of 23 percent of gross domestic income in the 1990s to an average of 16 percent in the 2000s in Turkey. There is a negative relationship between private and public savings rate especially for the period of 1985-1993 and 2000-2010 leading to Ricardian equivalence that the increase in public savings crowds out private savings, which results in unchanged domestic savings. Turkey also has a decreasing trend in domestic savings, hence there should be some other important determinants leading to decreasing private savings. The aim of this paper is to analyze the determinants of private savings in Turkey to evaluate which determinants have the outmost importance for private savings and to advise policy changes in order to increase private savings to have sustainable growth in Turkey. IV/GMM Time Series Estimation is carried out for the period between 1985 and 2010 for Turkey

Keywords: *IV/GMM, Private Saving, Shadow Economy, Sustainable Growth, Turkey.*

Introduction

Private savings rate declined from an average of 23 percent of gross domestic income in the 1990s to an average of 16 percent in the 2000s. As shown in Figure 1., there is a negative relationship between private and public savings rate especially for the period of 1985-1993 and 2000-2010 leading to Ricardian equivalence that the increase in public savings crowds

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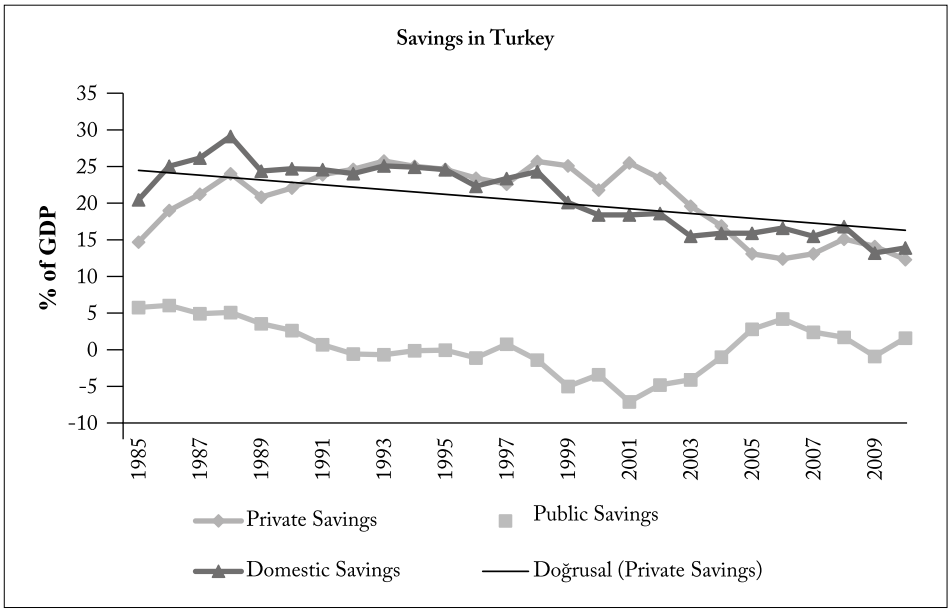
out private savings which results in unchanged domestic savings. But Turkey also has a decreasing trend in domestic savings, hence there should be some other important determinants leading to decreasing private savings.

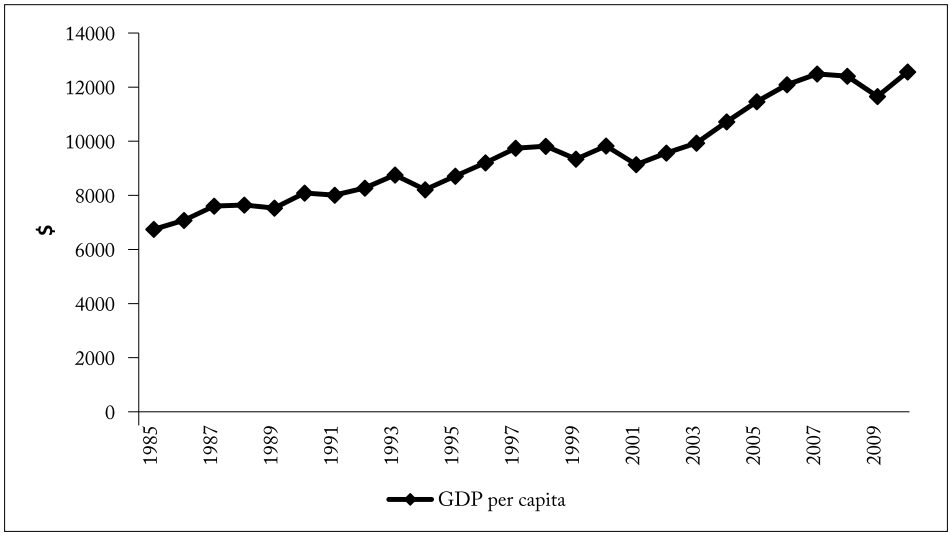
Figure 1: Domestic, Private and Public Savings Rate in Turkey

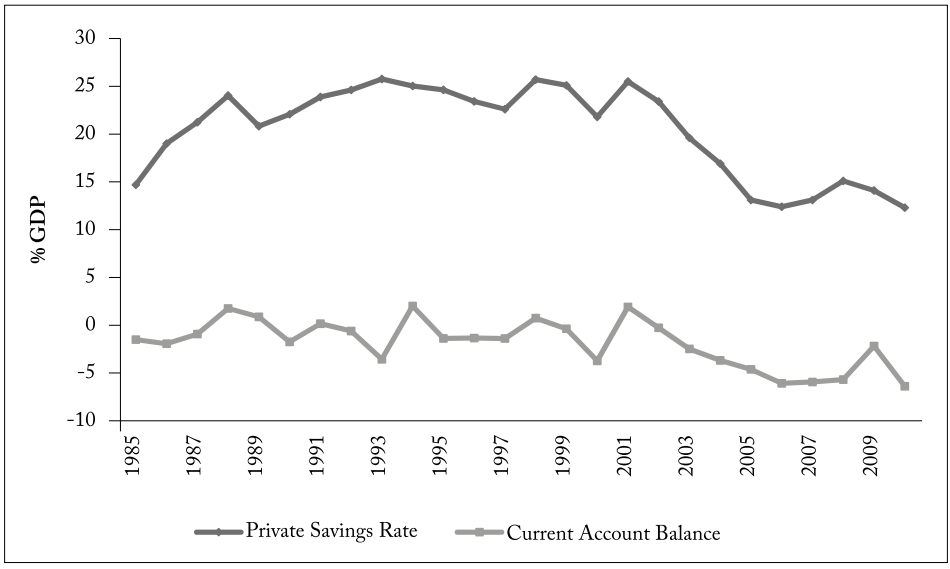


Source: Author's own calculations.

There are two main arguments in the literature related to the effects of low private savings on Turkey's growth prospects. First, private savings finances investments, and consequently the growth since there is a positive relationship between savings and growth. Second, low private savings increase dependence on foreign financing, fueling a rise in the external current account deficit and as a result jeopardizing the sustainability of the growth. Dependence on foreign savings has exposed Turkey to the risk of capital reversal with its attendant adverse impact on economic growth. As a result, increasing private savings is critical for promoting sustainability of the growth in Turkey (World Bank Report, 2011, p.ii).

Figure 2: GDP per capita, Private Savings Rate and Current Account Balance in Turkey





Source: Author's own calculations.

As shown in Figure 2, main trend is decreasing private savings accompanied by increasing budget deficit for income per capita growth in Turkey, especially after 2001. Hence, according to previous argument in World Bank Report (2011), depending on foreign savings in the form of increasing budget deficits leads to unsustainable growth in Turkey especially after 2001. According to Üçer, Turkey should grow faster than the current trend with

access to this much foreign savings as a result of financial globalization. If Turkey's private savings rate were at least at the level of 1990s, it would grow faster with this great amount of foreign borrowings (Carroll et al., 2008). He also refers to the conclusion of Rajanet al. (1998) that countries depending less on foreign finances have much higher growth rates.

Hence the aim of this paper is to analyze the determinants of private savings in Turkey to evaluate which determinants have the outmost importance for private savings and to advise policy changes in order to increase private savings to have sustainable growth in Turkey.

According to Carroll et al. (2008), there are three approaches in the literature that try to understand the saving behaviors. The micro salt-water approach argues that individual households face a lot of different kinds of risks and heterogeneity is the crucial part of understanding households' saving behaviors. Main criticism to salt-water approach is that it tends to sort of ignore the big macro-economic events that affect all households like shocks to aggregate interest rates or shocks or growth shocks. The macro fresh-water approach starts with the macro-economic circumstances and a representative agent model who has a global view of everything that is going on the economy and is choosing aggregate consumption and hence savings optimally. Main criticism to fresh-water approach is that it rules out risk and heterogeneity factors as they do not change the behavior of economic agents in deciding their savings and consumption. The last one is tide-water approach which merges salt-water and fresh-water approach in a macro-economic framework, but takes the differences across households very seriously. In this approach, the distribution of income matters in the sense that the marginal consumption of poor households is greater than rich households which imply that marginal savings of rich household is greater than poor households.

This study uses tide-water approach in order to explain the saving behavior of private agents in the Turkish economy.

Determinants of Private Savings in Turkey

In this study, there is no structural model of saving is used, instead an empirical tide-water approach in the reduced form model for savings is used to analyze several potential determinants of savings proposed by different theories.

Inertia: The Lag of Private Savings Rate

Savings rate generally contain inertia; they are serially correlated, even after controlling some other factors. Hence, lag of private savings rate should be included as a determinant of private savings rate implying that factors that affect private savings rate will have larger long-term impacts than short-term ones (Özcan et al., 2003). Inertia in saving rates can arise from lagged effects of the explanatory variables on saving or saving inertia which can arise directly from consumption habits and even from consumption smoothing (Loayza et al., 2000).

Government Policy Variables

Public Savings Rate

According to the Keynesian model, higher domestic savings will result from a temporary reduction in public savings. Hence, the decrease in public savings increases private savings (Özcan et al., 2003).

According to Ricardian equivalence, an increase in public savings would have no effect on domestic savings, since it would have an equal decline in private savings (Özcan et al., 2003). Thus, Ricardian equivalence suggests that increase in public savings crowds out private savings.

Social Security Expenditures

According to the life-cycle model, when the benefits to be received from the social security system are high, savings will tend to decline, primarily via the weakened motive for retirement and precautionary savings (Özcan et al., 2003).

Income Variables

Income

According to subsistence-consumption theories, countries with higher income levels tend to have a higher saving rate. So, a lower level of income is associated with a higher marginal propensity to consume at the household level and it implies that low saving rates at the national level. As the level of per capita income increases in an economy, the possibilities for savings increase (Matur et al., 2012).

According to life-cycle approach, aggregate savings will increase in response to an increase in income growth through an increase in the savings of active workers relative to the dissaving of people out of the labor force. According to the permanent income hypothesis, increased growth would imply higher anticipated future income, which would urge people not to save against future earnings (Özcan et al., 2003). Empirical analysis will determine the actual outcome of these conflicting effects for Turkey.

Many studies in the literature have confirmed that there is indeed a virtuous circle going from higher growth to higher savings and to even higher growth (Özcan et al., 2003).

Income Distribution

The distribution of income matters in the sense that the marginal consumption of poor households is greater than rich households which imply that marginal saving of rich household is greater than poor households (Carroll et al., 2008).

Hence, the study differentiates from Özcan et al.(2003) and Matur et al. (2012) by considering the effect of income distribution on private savings in Turkey.

Uncertainty Variables

The variables capturing the effects of uncertainty about the future bear on saving rates primarily due to their impacts on precautionary savings (Özcan et al., 2003).

Shadow Economy

In the literature, there is no study yet which has investigated the relationship between shadow economy and private savings. The impact of shadow economy may be positive or negative, even insignificant in the case of cancelling out both categories leading to positive or negative impacts.

The positive impact of shadow economy is due to the following factors. First is the positive indirect effect of shadow economy on private savings through per capita growth. Increase in the size of informal economy increases the size of formal economy which results in growth of income

per capita. The increase in per capita income leads to higher private savings in the economy according to life-cycle approach. Second, the income generated in informal economy should be invested in formal economy by using financial instruments which leads to higher private savings in this economic environment. Third, the startup firms start operating in informal economies may decide to shift into formal economy in order to evade payment for taxes and social security expenses of workers when the size or profit of these firms increase or the burden of the probability of detection by government officials exceeds the benefit of operating businesses in the informal economy.

Political Instability

Decrease in political stability proxies by government stability index from ICRG (2010) creates an uncertain economic environment for agents, where it would be expected to act positively on private savings.

Macroeconomic Uncertainty

Macroeconomic uncertainty proxies by the inflation rate, is expected to have a positive impact on private savings, since people in such environment would try to hedge risks by increasing their savings (Özcan et al., 2003).

Crises Dummy

In order to control the exogenous effects of economic crises, a crises dummy which takes value of 1 for the years of economic crises (1985, 1994, 1998, 1999, 2000, 2001, and 2008) is taken into account. The main reason is not to measure the impact of economic crises on private saving behavior in Turkey, rather to control the effect of exogenous shocks to Turkish economy.

External Variables

Terms of Trade

Positive shocks, in terms of trade, increase the savings through the positive effect on wealth and income (Özcan et al., 2003).

Current Account Balance

Increase in the current account deficit as in the form of increasing foreign savings is met by a partial decline in private savings, as external savings may tend to act as a substitute to domestic private savings (Özcan et al., 2003).

Current account deficit are used in many empirical studies as proxies for the relaxation of foreign borrowing constraints. A relaxation of foreign borrowing constraints, which means decreasing current account balance, leads to a decrease in private savings. Hence, there is a positive relationship expected between current account balance and private savings (Loayza et al., 2000).

Financial Variables

These variables are expected to be especially relevant for a developing country like Turkey, which is still undergoing a liberalization process (Özcan et al., 2003).

Financial Sector Development and Borrowing Constraints

Financial market development or financial depth is proxied by the degree of monetization of the economy by the M2/GNP ratio, where M2 represents money plus quasi-money (Özcan et al., 2003). We expect a negative relationship between financial market development and private savings rate.

As the financial sector develops, the liquidity and borrowing constraints faced by agents in the economy are relaxed. It becomes easier to use external finance in order to shift resources between different periods. Hence, an increase is expected in the relative size of credits that represents the relaxation of the borrowing constraints to have a negative impact on savings (Matur et al., 2012).

Real Interest Rate

An increase in the real interest rate reduces the present value of future income flows and therefore has a negative impact on savings as income effect. It also increases the net return on savings and makes savings more attractive today by leading to a postponement of consumption, and has a positive impact on savings as substitution effect. Hence, the net impact of real interest rate, which is determined by the relative strength of these two opposing effects, is an empirical question that the study will address (Matur et al., 2012).

Demographic Variables

Age Structure of the Population

The age structure of the population is an important factor for savings, because people seek to smooth out consumption over their lifetime by saving when they expect future income to be low and by dissaving when they anticipate it to be high. According to Modigliani (1970), young and old people who are out of the labor force dissave either against future earnings. Economy agents will have negative savings when they are either young and have very low income or old and retired; and they will have positive savings during their productive years. Hence, the age distribution of the population affects private savings in a way that when the share of the working population relative to that of retired people increases, saving is likely to increase (Özcan et al., 2003). So, we expect the impact of young and old dependency ratios to be negative.

Urbanization Ratio

Increased urbanization ratio proxied by the percentage of the population living in urban areas reduces the need for precautionary savings (Özcan et al., 2003). Hence, we expect a negative relationship between urbanization ratio and private savings rate.

Empirical Analysis

Econometric Theory: IV/GMM Estimation Model Structure

The equation to be estimated in matrix notation is:

$$y = X \beta + u$$

The matrix of regressors X is n*K, where n is the number of observations. Some of the regressors are endogenous, so that $E(X_t u_t) \neq 0$. We partition the set of regressors into $[X_1 X_2]$, with K_1regressors X_1 assumed as endogenous and $K_2 = (K - K_1)$ remaining regressors X_2 assumed exogenous, gives us:

$$y = [X_1 X_2] [\beta_{1,} \beta_{2,}]' + u$$

The set of instrumental variables is Z and is n*L. This is the full set of variables that are assumed to be exogenous, i.e., $E(Z_t u_t)=0$. We parti-

tion the instruments into $[Z_1\ Z_2]$, where L1 instruments Z_1 are excluded instruments and the remaining $L_2 = (L - L_1)$ instruments $Z_2=X_2$ are included instruments / exogenous regressors:

Regressors $X = [X_1\ X_2] = [X_1\ Z_2]$ = [Endogenous Exogenous]
Instruments $Z = [Z_1\ Z_2]$ = [Excluded Included]

The order condition for identification of the equation is $L \geq K$ implying that there must be at least as many excluded instruments (L_1) as there are endogenous regressors (K_1) as Z_2 is common to both lists. (Baum et al., 2007)

Data and Variables

The study covers the period between 1985 and 2010 in order to analyze the potential determinants of private savings rate in Turkey. See Appendix 2 for the sources of data.

Table 1: Summary Statistics

DependentVariable	# of Obs.	Mean	Std. Dev.	Min	Max
prsr	26	20.382	4.764	12.300	25.759
IndpendentVariables					
pusr	26	0.460	3.490	-7.100	6.051
lngpc	26	9.141	0.183	8.817	9.439
gini	26	41.570	1.369	38.950	43.570
shad	26	33.832	3.930	27.450	40.460
cdum	26	0.269	0.452	0	1
psi	26	64.904	17.957	33.333	91.667
cab	26	-1.858	2.498	-6.379	2.013
rir	26	1.497	0.735	0.692	3.381
odr	26	7.505	0.985	6.225	8.833
ydr	26	51.791	8.833	38.967	66.712
urr	26	62.821	4.912	52.448	70.487
tot	26	104.027	8.756	91.157	120.408
bcon	26	21.128	7.337	14.521	44.207
infr	26	49.247	34.107	5.294	137.965
sse	26	7.802	2.843	3.135	12.817
fmd	26	35.430	9.031	23.740	56.123

Source: Author's own calculations.

Unit Root Analysis

Table 2: Unit Root Tests

Variable	Case	ADF	KPSS	Variable	Case	ADF	KPSS
		T-Stat	LM-Stat			T-Stat	LM-Stat
Prsr	Constant	-0.949	0.372*	**odr**	Constant	1.614	0.725**
		(0.755)				(0.999)	
	Constant and Trend	-2.632	0.187**		Constant and Trend	-1.792	0.107
		(0.271)				(0.672)	
Pusr	Constant	-1.874	0.280	**psi**	Constant	-2.132	0.432*
		(0.338)				(0.235)	
	Constant and Trend	0.968	0.156**		Constant and Trend	-3.236	0.087
		(1.000)				(0.101)	
Lngpc	Constant	-0.865	0.736**	**rir**	Constant	-1.988	0.465**
		(0.782)				(0.289)	
	Constant and Trend	-3.337*	0.067		Constant and Trend	-2.320	0.159**
		(0.086)				(0.408)	
Bcon	Constant	1.506	0.397*	**shad**	Constant	-0.497	0.754***
		(0.999)				(0.876)	
	Constant and Trend	0.441	0.146**		Constant and Trend	-2.849	0.134*
		(0.998)				(0.196)	
Cab	Constant	-0.698	0.498**	**sse**	Constant	-0.641	0.747***
		(0.828)				(0.844)	
	Constant and Trend	-4.128**	0.168**		Constant and Trend	-3.692**	0.081
		(0.017)				(0.045)	
Fsd	Constant	0.510	0.708**	**tot**	Constant	0.390	0.581**
		(0.984)				(0.977)	
	Constant and Trend	-2.829	0.110		Constant and Trend	-3.557*	0.176**
		(0.201)				(0.059)	
Gini	Constant	-3.322**	0.403*	**urr**	Constant	-0.367	0.754***
		(0.026)				(0.900)	
	Constant and Trend	-4.088**	0.069		Constant and Trend	-3.612**	0.159**
		(0.020)				(0.050)	
Infr	Constant	-1.602	0.406*	**ydr**	Constant	-2.644*	0.755***
		(0.467)				(0.100)	
	Constant and Trend	-2.348	0.170**		Constant and Trend	-4.202**	0.186**
		(0.395)				(0.016)	

Notes: The values in parenthesis are p-values for ADF test. ***, **,* corresponds to the 1, 5 and 10 % significance levels for both ADF and KPSS tests.

According to the unit root tests, all of the variables are stationary at least for one case especially for KPSS test. So, we conclude that all variables are I(0). Hence, no differencing is required in reduced from estimation.

Empirical Model

Main Model:

$$Prsr_t = \beta_0\, prsr_{t-1} + \beta_1 pusr_t + \beta_2 lngpc_t + \beta_3 gini_t + \beta_4 shad_t + \beta_5 cdum_t + \beta_6 psi_t + \beta_7 cab_t + u_t$$

The main model measures the impact of inertia, crowding out effect, public policy variable of public savings, income inequality, shadow economy, exogenous shocks of economic crises, current account deficit and political instability on the dependent variable of private savings in each following model with additional control variables.

Model 1:

$$Prsr_t = \beta_0\, prsr_{t-1} + \beta_1 pusr_t + \beta_2 lngpc_t + \beta_3 gini_t + \beta_4 shad_t + \beta_5 cdum_t + \beta_6 psi_t + \beta_7 cab_t + \beta_8\, sse_t + \beta_9 bcon_t + u_t$$

Model 2:

$$Prsr_t = \beta_0\, prsr_{t-1} + \beta_1 pusr_t + \beta_2 lngpc_t + \beta_3 gini_t + \beta_4 shad_t + \beta_5 cdum_t + \beta_6 psi_t + \beta_7 cab_t + \beta_8\, sse_t + \beta_9 fmd_t + u_t$$

Model 3:

$$Prsr_t = \beta_0\, prsr_{t-1} + \beta_1 pusr_t + \beta_2 lngpc_t + \beta_3 gini_t + \beta_4 shad_t + \beta_5 cdum_t + \beta_6 psi_t + \beta_7 cab_t + \beta_8\, rir_t + \beta_9 tot_t + u_t$$

Model 4:

$$Prsr_t = \beta_0\, prsr_{t-1} + \beta_1 pusr_t + \beta_2 lngpc_t + \beta_3 gini_t + \beta_4 shad_t + \beta_5 cdum_t + \beta_6 psi_t + \beta_7 cab_t + \beta_8\, infr_t + u_t$$

Model 5-7:

$$Prsr_t = \beta_0\, prsr_{t-1} + \beta_1 pusr_t + \beta_2 lngpc_t + \beta_3 gini_t + \beta_4 shad_t + \beta_5 cdum_t + \beta_6 psi_t + \beta_7 cab_t + \beta_8\, rir_t + \beta_9\, dem_t + u_t$$

Dem corresponds to odr in Model 5, ydr in Model 6 and urr in Model 7 in order to measure the impact of demographic variables on private savings.

Table 3: IV / GMM Estimation Results

Dependent Variable: prsr							
Independent Variables	**MODELS**						
	1	2	3	4	5	6	7
prsr(-1)	0.171***	0.217***	0.209**	0.082*	0.286***	0.264***	0.220*
	(0.051)	(0.060)	(0.093)	(0.046)	(0.054)	(0.053)	(0.121)
Pusr	-0.981***	-0.801***	-0.587***	-0.853***	-0.571***	-0.503***	-0.613***
	(0.107)	(0.119)	(0.079)	(0.060)	(0.082)	(0.091)	(0.093)
Lngpc	2.594***	3.818**	1.508**	1.111**	5.426***	2.746***	13.500***
	(0.730)	(1.591)	(0.523)	(0.476)	(0.859)	(0.634)	(3.771)
Gini	-0.615***	-0.931***	-0.767***	-0.613***	-0.748***	-0.792***	-0.831***
	(0.099)	(0.132)	(0.119)	(0.097)	(0.074)	(0.067)	(0.203)
Shad	0.731***	0.764***	0.663***	0.973***	0.439***	0.076	0.101
	(0.123)	(0.227)	(0.088)	(0.049)	(0.134)	(0.264)	(0.361)
Cdum	-0.065	-0.594	-0.041	-0.524	-0.588	-0.855	-0.798
	(0.359)	(0.444)	(0.412)	(0.409)	(0.440)	(0.566)	(0.543)
Psi	0.038***	0.027*	-0.003	-0.001	0.027***	0.029***	0.003
	(0.012)	(0.015)	(0.007)	(0.007)	(0.007)	(0.009)	(0.008)
Cab	0.318**	0.396**	0.326**	0.083	0.450***	0.447**	0.561**
	(0.104)	(0.169)	(0.130)	(0.154)	(0.145)	(0.195)	(0.205)
Rir			-0.624*		-0.694**	-0.786**	-1.020
			(0.353)		(0.249)	(0.271)	(0.587)
Odr					-2.408***		
					(0.582)		
Ydr						0.411***	
						(0.123)	
Urr							-1.159**
							(0.419)
Tot			0.134***				
			(0.028)				
Bcon	0.135***						
	(0.031)						
İnfr				0.042***			
				(0.005)			
Sse	-1.223***	-1.001***					
	(0.114)	(0.207)					
Fmd		0.049					
		(0.055)					
R-squared	0.98	0.98	0.97	0.98	0.97	0.97	0.97
Prob(J-statistic)	0.74	0.65	0.76	0.77	0.75	0.72	0.67
Durbin-Watson Stat	2.75	2.57	2.44	2.66	2.59	2.59	2.34

Notes: The values in parenthesis are standard errors. ***, **, * corresponds to the 1, 5 and 10 % significance levels. Endogenous variables are instrumented by their lags as prsr(-2 to -5), pusr(-1 to -5), lngpc(-1 to -5), cab(-1 to -5) tot(-1 to -5). All other variables are assumed as exogenous.

Estimation Results

Inertia

According to the estimation results, there is a robust significant positive relationship between level and lag of private savings rate reflecting inertia or persistency in private savings rate, which means that factors that affect private savings rate will have long-term larger impacts than short-term ones. This result, even smaller in the magnitude of the coefficient, is consistent with both Özcan et al. (2003) and Loayza et al. (2000). Public Policy Variables

There is a robust significant negative relationship between public savings rate and private savings rate presenting the evidence of Ricardian equivalence in the sense that public savings crowds out private savings even there is a decline in domestic savings rate.

There is a robust significant negative relationship between social security expenditures and private savings rate in parallel to our expectations. The result supports the life-cycle model, when the benefits to be received from the social security system are high, savings will tend to decline, primarily via the weakened motive for retirement and precautionary savings.

Income Variables

There is a robust significant positive relationship between natural logarithm of GDP per capita and private savings rate supporting subsistence-consumption theories in which countries with higher income levels. Because the countries with higher income levels tend to have a higher savings rate since a higher level of income is associated with a less marginal propensity to consume at the household level and it implies that high private savings rate at the national level. If one considers the increase in income per capita as growth, the estimation results will dominate life-cycle hypothesis instead of permanent income hypothesis since aggregate savings will increase in response to an increase in income growth through an increase in the savings of active workers relative to the dissaving of people out of the labor force (life-cycle hypothesis). Instead, increased growth would imply higher anticipated future income, which would urge people to dissave against future earnings (permanent income hypothesis) It also

supports the argument in the literature that there is indeed a virtuous circle going from higher growth to higher savings and to even higher growth.

There is a robust significant negative relationship between income inequality and private savings rate in contrast to our expectations. Our expectations were based on the argument that the distribution of income matters in the sense that the marginal consumption of poor households is greater than rich households, which imply that marginal savings of rich household is greater than the savings of poor households. The reason of this contrast is the increasing inequality in Turkey between 1985 and 2010 due to the deterioration in the income level of relatively poor households rather than progress in the income level of relatively rich households.

Uncertainty Variables

There is a significant positive relationship between shadow economy and private savings rate in five out of seven models, which may be taken as robust. The reason is that the positive indirect effect of shadow economy through growth on private savings dominates the negative direct effect of shadow economy on private savings by shifting savings from formal to informal economy. There is a significant positive relationship between political stability index and private savings rate in four out of seven models in contrast to our expectations. This might occur because of the decrease in political stability, which leads to uncertain economic environment for agents and does not encourage the private savings. The government instability occasionally leads to domestic economic crises in Turkey, because the economic environment in Turkey is very sensitive to political instabilities especially in times of coalition governments, which leads to job-losses and closing down of firms, resulting in decrease in income levels of households. There is a significant positive relationship between inflation rate and private savings rate in parallel to our expectations. The result supports to our initial argument that macroeconomic uncertainty proxies by the inflation rate, is expected to have a positive impact on private savings, since people in such an environment would try to hedge risk by increasing their savings.

External Variables

There is a significant positive relationship between terms of trade and private savings rate in parallel to our expectations. Hence, this result supports the argument that positive shocks, in terms of trade, increase savings through the positive effect on wealth and income.

There is a robust significant positive relationship between the current account balance and private savings rate in parallel to our expectations. Since increase in the current account deficit as in the form of increasing foreign savings is met by a partial decline in private savings, hence the external savings may tend to act as a substitute to domestic private savings.

Financial Variables

There is a significant negative relationship between real interest rate and private savings rate in three out of four models, which may be taken as robust. This result favors the domination of income effect on substitution effect since an increase in the real interest rate reduces the present value of future income flows and therefore has a negative impact on savings instead it increases the net return on savings and makes savings more attractive today by leading to a postponement of consumption and has a positive impact on savings.

There is an insignificant relationship between financial market development and private savings rate. In addition, there is a significant positive relationship between borrowing constraint and private savings rate. Both of them are opposed to our expectations. It may be argued that Turkish households do not take the progress of financial instruments and derivatives into account while deciding on their savings, but only consider their future income and consumption levels. According to the result of second estimation, it seems that Turkish households save more when their ability to borrow from financial organizations or banks is constrained. They finance their future consumptions directly from their current income, which increases their current savings.

Demographic Variables

There is a significant negative relationship between old dependency ratio and private savings rate as we expected. The results supports the argu-

ment that the age distribution of the population affects private savings in a way that when the share of the working population relative to that of the number of retired people decreases, saving is likely to decrease.

There is a positive significant relationship between young dependency ratio and private savings rate in contrast to our expectations. But, the result is more realistic since the population under fifteen years old live with their parents and it is probable that their consumption burden to their parents is relatively smaller compared to the increase in the savings of their parents in order to finance their future education expenses.

There is a significant negative relationship between urbanization rate and private savings rate as we expected. The result supports the argument that increased urbanization ratio reduces the need for precautionary savings (Özcan et al., 2003).

Policy Implications

Government should decrease public savings especially by reducing taxes in order to increase private savings rate. By this policy, the crowding out effect of public savings will be less severe and firms operating in the shadow economy may decide to be registered under formal economy due to tax-cuts in order to avoid risk, which in turn increases the private savings.

Another impact of this policy will occur in the next year since reduced public savings increase private savings this year, which in turn increases private savings in the next year due to the inertia of private savings rate.

According to the estimation results, government should decrease social security expenditures in order to motivate people to increase their precautionary savings and to save for their retirement.

Since increases in income per capita leads to higher private savings according to the subsistence-consumption theories and since the coefficient of income per capita is the highest, Turkish government should not impose any income tax in order not to decrease the income level of households.

The government should redistribute wealth from rich to poor in order to increase private savings rate, because the deterioration effect of income distribution on poor households is relatively larger than the rectifying effect on rich households in Turkey.

Since we have found negative impact of current account deficit and positive impact of terms of trade on private savings rate, Turkish government should evade from any restrictions on international trade as in the form of quotas, tariffs, etc. in order to increase the private savings to have sustained growth in the long-run as a sole purpose.

Since we have found positive impact of political stability on private savings rate even with insignificant crises dummy, government should constitute sound and safe economic environment with well-established governance institutions. Establishment of this kind of institutions is especially important in time of economic crises for sustaining high level of private savings in the economy leading to sustainable growth.

Since there is a negative impact of old dependency ratio on private savings rate, increasing retirement age is a valid policy instrument.

Significant negative relationship between urbanization rate and private savings rate suggest that there is a need of well-planned immigration policies since unplanned immigration to the urban areas lead to the decrease in private savings rate of households in Turkey due to the decreasing need for precautionary savings.

Conclusion

Main trend in the Turkish economy is decreasing private savings accompanied by increasing current account deficit for income per capita growth, especially after 2001. Hence, depending on foreign savings in the form of increasing current account deficits leads to unsustainable growth in Turkey.

According to the tide-water approach, a time series estimation of GMM provides significant positive coefficients for the impact of lag of private savings rate, income per capita, shadow economy, political stability, terms of trade, borrowing constraints, young dependency ratio, significant negative coefficients for the impact of public savings rate, income distribution, current account deficit, real interest rate, old dependency ratio and urbanization rate.

As suggested by the policy, Turkish government should reduce taxes, evade income tax and any form of restrictions on international trade, de-

crease social security expenditures, redistribute wealth from rich to poor, establish good governance institutions, decrease immigration from urban to rural areas by well-planned immigration policies in order to increase the private savings to have sustainable growth in the long-run as a sole purpose. Increasing retirement age is also a valid policy instrument in order to achieve this purpose.

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Appendix 1

Private and public saving rate are calculated as in the following formulas in Turkish Ministry of Development. (Uygur, 2012)

- Public Savings = Disposable Public Income – Public Consumption Expenditu
- Disposable Public Income = Tax Revenues + Other Public Revenues – Net Transfers to the Private and External Sectors
  Public Savings Rate = Public Savings / GDP
- Private Savings = Disposable Private Income – Private Consumption Expenditures
- Disposable Private Income = GNP – Disposable Public Income
- GNP = Disposable Public Income + Disposable Private Income

  Private Savings Rate = Private Savings / GDP

Variable	Proxy	Resource
prsr, pusr	See Appendix 1	T.R. Ministry of Development Statistics (2013)
		http://www.mod.gov.tr/en/SitePages/mod_easi.aspx
sse	Social security expenditures (% of GDP)	OECD Social Security Expenditure Database (2013)
		http://www.oecd.org/els/soc/socialexpendituredatabasesocx.htm
lngpc	GDP per capita, PPP (constant 2005 international $)	World Bank Development Indicators (2013)
		http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.KD
gini	Gini Index	World Bank Development Indicators (2013)
		http://data.worldbank.org/indicator/SI.POV.GINI
fmd	Broad Money (% of GDP)	World Bank Development Indicators (2013)
		http://data.worldbank.org/indicator/FM.LBL.BMNY.GD.ZS
bcon	Domestic credit to private sector (% of GDP)	World Bank Development Indicators (2013)
		http://data.worldbank.org/indicator/FS.AST.PRVT.GD.ZS
rir	Saving Deposits Interest Rates/Inflation, GDP deflator (annual %)	T.R. Ministry of Development Statistics (2013) World Bank Development Indicators (2013)
		http://www.mod.gov.tr/en/SitePages/mod_easi.aspx
		http://data.worldbank.org/indicator/NY.GDP.DEFL.KD.ZG
odr	Age dependency ratio, old (% of working-agepopulation)	World Bank Development Indicators (2013)
		http://data.worldbank.org/indicator/SP.POP.DPND.OL
ydr	Age dependency ratio, young (% of working-agepopulation)	World Bank Development Indicators (2013)
		http://data.worldbank.org/indicator/SP.POP.DPND.YG
urr	Urban population (% of total)	World Bank Development Indicators (2013)
		http://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS
infr	Inflation, GDP deflator (annual %)	World Bank Development Indicators (2013)
		http://data.worldbank.org/indicator/NY.GDP.DEFL.KD.ZG
psi	Government Stability Index	ICRG Database (2010)
tot	Net barterterms of trade index (2000=100)	World Bank Development Indicators (2013)
		http://data.worldbank.org/indicator/TT.PRI.MRCH.XD.WD
cab	Current account balance (% of GDP)	World Bank Development Indicators (2013)
		http://data.worldbank.org/indicator/BN.CAB.XOKA.GD.ZS
shad	Shadow economy (% of GDP)	Elgin and Öztunalı (2012)
		http://www.econ.boun.edu.tr/public_html/RePEc/pdf/201205.pdf