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Determinants of Domestic Savings in Turkey

Türkiye'deki Yurtiçi Tasarrufların Belirleyicileri

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ABSTRACT

Domestic savings are the most crucial sources of finance for sustainable economic growth and development. It is critical, especially for developing countries to identify the reasons behind the inefficiency of the domestic economy and the factors that determine the domestic savings. This study aims to determine the factors affecting domestic savings in Turkey over the period 1979-2017. Five independent variables consisting of monetary, financial and demographic aspects are utilized as determinants of domestic savings in Turkey in accordance with the international literature. Obtained results reveal that the GDP per capita and bank deposit interest rate have a positive impact on savings, and inflation and public spending have a negative impact on savings; whereas urbanization rate has no statistically significant effect on savings.

Keywords: Domestic Savings, Cointegration, Turkey

ÖZ

Sürdürülebilir ekonomik büyümenin ve kalkınmanın en önemli finansman kaynağı yurtiçi tasarruflardır. Özellikle gelişmekte olan ülkeler için yurtiçi tasarruflardaki yetersizliğin nedenlerinin ve yurtiçi tasarrufları belirleyen faktörlerin neler olduğunun ortaya konulması oldukça önemlidir. Bu çalışmada Türkiye'de 1979-2017 döneminde yurtiçi tasarrufları etkileyen değişkenlerin belirlenmesi amaçlanmıştır. Uluslararası literatüre uygun olarak Türkiye'de yurtiçi tasarrufların belirleyicileri olarak parasal, mali ve demografik değişkenlerden oluşan beş bağımsız değişken kullanılmıştır. Elde edilen sonuçlar; kişi başına GSYİH ve mevduat faiz oranının tasarrufları pozitif yönde, enflasyon ve kamu harcamalarının tasarrufları negatif yönde etkilediğini; kentleşme oranının ise tasarruflar üzerinde istatistiki olarak anlamlı bir etkisinin olmadığını göstermiştir.

Anahtar Kelimeler: Yurtiçi Tasarruflar, Eşbütünleşme, Türkiye

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1. Introduction

Maintaining economic growth and development and achieving a sustainable economic structure is vital for developed and especially developing countries. The fact that countries have different growth rates is often attributed to differences in the savings and investment rates among countries (Rodrik, 2000). The main sources for an economy to improve economically are the savings and the investments into which those savings are eventually converted. Savings, especially domestic savings, are the main source of finance for capital accumulation and investments. The higher level of domestic savings and additional capital stock stimulate the development of countries by ensuring the sustainability of long-term growth.

In case of inadequate domestic savings, current account deficits would arise, and the country would be exposed to external shocks since dependency on foreign savings is likely to increase for financing the production, and the sustainability of economic growth is jeopardized. Therefore, the determinants of domestic savings and the factors that can be effective in increasing domestic savings are among important research topics that attract the attention of many economists and policy-makers.

Changes in the level of savings, as one of the important factors determining the potential economic growth of a country, are closely related to all developed and developing countries. Insufficient savings rates impose the biggest obstacle to sustainable growth and development, especially in developing countries. For Turkey, in particular, sufficient levels of savings rates are crucial regarding financing investments in the long-run and sustainable growth. However, it is seen that domestic savings rates have been decreasing since the early 2000s in Turkey. The domestic saving rate, which was 18% of the gross domestic product in 2000, has decreased to 14% as of 2015. Increasing the level of domestic savings for achieving high and stable growth rates and reducing the foreign dependence are among the main objectives planned to be realized in the Tenth Development Plan (2014-2018) and this rate is expected to reach 19% by the end of the 2014-2018 period (Ministry of Development, 2013; Karagöl and Özcan, 2014).

This study focuses on determining the variables that affect domestic savings in Turkey over the period 1979-2017 using annual data and Kapetanios-Shin-Snell (KSS) (2006) cointegration test. The study consists of four sections including the introduction. In the second section, empirical studies in the literature investigating the factors that determine domestic savings are examined. The third section, in which the determinants of domestic savings in Turkey are analyzed, introduces the data, models, methods and analysis results of the study. The study is completed with the conclusion section.

2. Literature Review

Two hypotheses are often emphasized in the studies conducted on savings that are defined as the unconsumed parts of disposable income. The first one is known as “The Permanent Income Hypothesis,” which is first coined by Friedman (1957). Friedman dealt with income as a determinant of saving and constantly discriminated between

permanent – transitory components of income. According to the hypothesis, the individual makes consumptions commensurate with his/her permanent income, while his/her transitory income is saved. The second hypothesis is "The Life-Cycle Hypothesis" which is developed by Ando and Modigliani (1963). The hypothesis claims that individuals tend to spread out their consumptions and savings for retirement over their lifetimes by saving their earned income over the years. According to the hypothesis, the determinant of savings is the population's age structure as one of the demographic factors (Özcan et al., 2012).

Many distinct factors that would affect savings are taken into consideration in the latter studies conducted on the determinants of savings in different countries over different periods following those hypotheses which explained saving behaviors. These factors include income, wealth, income distribution, growth, real interest rate, inflation rate, public policy variables, external debt, terms of trade, financial variables (financial development and deepening, ease of access to credit), demographic variables (age dependency ratios, life expectancy, urbanization), and the social security system (Agrawal et al., 2009; Athukorala and Sen, 2004; Doshi, 1994; Özcan et al., 2012). While some of these variables have positive impacts on savings, others negatively affect them, whereas the remaining have no impact on savings. Table 1 presents some of the studies conducted on the determinants of savings and their basic findings in the chronological order.

Table 1: Selected Literature Review

Author(s) (Year)	Country Sample	Period	Method	Findings
Narayan and Saud (2005)	Oman	1977-2003	Autoregressive distributed lag (ARDL) model	It is concluded that the current account deficit, urbanization rate, and money supply affect national savings in the long-run.

Table 1: Continued

Tony (2008)	India	1975-2006	Ordinary least squares (OLS)	Domestic savings are affected positively by per capita growth rate, financial development and real interest rate in long-run and by inflation rate both in the short- and long-run; while the budget deficit and the current account deficit affect domestic savings negatively.
Agrawal et al. (2009)	India, Pakistan, Bangladesh, Sri Lanka, Nepal	1960-2005	Error correction mechanism (ECM), Dynamic OLS	In the countries under examination, savings are explained by income level, access to the banks, foreign savings rates and dependency ratio.
Shrestha (2010)	Nepal	1974-2005	ECM	The determinants of private savings include real income, real public savings, real foreign savings, real interest rates, and age dependency ratio.

Table 1: Continued

Yaraşır and Yılmaz (2011)	20 OECD countries	1999-2007	Dynamic panel data analysis	The obtained results indicate that private loans, previous year's saving rates, current account balance, and inflation increase private savings; while public savings and age dependency ratios decrease private savings.
Matur et al. (2012)	Turkey	1980-2008	OLS	The private saving rate is negatively related to the public savings rate, per capita income growth rate, the share of loans to the private sector in GDP and the old-age dependency ratio; while it is positively related to per capita income, inflation and real interest rate.

Table 1: Continued

Özcan et al. (2012)	Turkey	1975-2008	OLS	Inflation, income level, real interest rate, loans, trade scarcity, youth dependency ratio, urbanization rate, economic crisis, and political instability increase savings; whereas financial borrowing, economic growth, current account deficit, old-age dependency ratio, and life expectancy decrease savings.
Ayalew (2013)	Ethiopia	1970-2011	ARDL bounds testing, ECM	Domestic savings have been determined by income, budget deficit and the inflation rate in the short- and long-run.
Larbi (2013)	Ghana	1970-2010	Phillips and Ouliaris cointegration	In the study, it is concluded that financial liberalization, per capita growth rate and inflation increase private savings.

Table 1: Continued

Chaudhry et al. (2014)	Pakistan	1972-2010	ARDL bounds testing, ECM	Bank deposit interest rates and public expenditures both affect domestic savings positively in both the short- and long-run. M2 money supply reduces domestic savings in the long-run while the inflation rate increases it in the short-run.
Imoughele and Ismaila (2014)	Nigeria	1981-2012	Cointegration, ECM	It is concluded that per capita income, inflation rate, terms of trade and financial deepening are important determinants of private savings.
Ahmad (2015)	Pakistan	1972-2012	Cointegration, Vector error correction mechanism (VECM), Toda Yamamoto Granger causality test	Private savings are affected by per capita GDP and financial development in the short-run; while inflation rate, dependency ratio, exchange rate, and financial development affect savings in the long-run.

Table 1: Continued

Arıç (2015)	13 Middle East countries	2000-2013	Panel data analysis	The results indicate that the old-age, urban and rural populations do not affect savings; whereas young population and inflation affect savings positively; while income, money supply, and government spending affect savings negatively.
Kolasa and Liberda (2015)	Poland	1995-2011 1999:1-2012:4	Panel data analysis, OLS	It is concluded that financial deepening process has the most impact on both private and household savings rates.

Table 1: Continued

Akram and Akram (2016)	Pakistan	1973-2013	ARDL	It is concluded that age dependency ratio, foreign savings, and inflation rate decrease national, public and private savings; while economic growth and financial development increase them. In addition, it is concluded that the interest rates increase the public savings and they have no significant effect on national and private savings.
Doker et al. (2016)	20 transition economies	1993-2013	Panel data analysis	It is determined that demographic factors and per capita income are important determinants of savings.
Şahin (2016)	Turkey	1975-2014	ARDL	It is concluded that domestic savings are increased by the interest rate on deposits, the rate of urbanization and the per capita growth rate; while it is decreased by the inflation rate in the long-run.

Table 1: Continued

Tunay (2017)	23 developed and developing countries	1995-2015	Dynamic panel data analysis	The results indicated that the long-term interest rates and net public wealth are the main determinants of household savings.
Abasimi and Martin (2018)	4 West African countries	1997-2016	ARDL	GDP and per capita income increase savings in both the short- and long run; whereas real interest rates increase savings only in the long-run; while age dependency ratio decreases the savings.
Otiwu et al. (2018)	Nigeria	1981-2015	VECM	The main determinants of private domestic savings are the level of per capita income and the ease of financial access.

3. Data, Model, Econometric Methodology, and Empirical Results

In this section, information about dataset and the model is provided first, and then empirical results are presented by explaining the econometric method used in the study.

3.1. Data and Model

In the study, the annual data regarding determinants of domestic savings in Turkey over the period 1979-2017 are utilized. The summary of the variables is shown in Table

Table 2: Summarized Information on the Variables

Variable	Description	Sources
NSAV	Gross Domestic Savings (% GDP)	World Bank
DR	Bank Deposit Interest Rate (%)	World Bank
INF	Inflation Rate (%)	World Bank
UP	Urbanization Rate (Urban Population Growth Rate) (%)	World Bank
GDP	Per Capita GDP Growth Rate (%)	World Bank
GE	Government Final Consumption Expenditures (%GDP)	World Bank

The model consisting of financial and demographic factors to be used for estimating the factors that determine domestic savings in Turkey is shown in Equation 1 below.

$$NSAV_t = \alpha_0 + \alpha_1 DR_t + \alpha_2 INF_t + \alpha_3 UP_t + \alpha_4 GDP_t + \alpha_5 GE_t + u_t \quad (1)$$

3.2. Econometric Methodology and Empirical Results

Stationarity properties of the series are examined with Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. The unit root test results in Table 3 indicate that all of the variables included in the analysis are not stationary at the level but are stationary after the first difference [I (1)] is taken.

Table 3: Unit Root Test Results

At Level	ADF		PP	
	Constant	*Constant and Trend*	*Constant*	*Constant and Trend*
NSAV	-2.229	-6.633	-2.024	-2.538
DR	-1.587	-2.376	-1.689	-2.351
INF	-0.844	-0.973	-1.752	-2.433
UP	-2.165	-3.286	-1.257	-2.537
GDP	-.1.249	-1.209	-2.094	-2.152
GE	-1.044	-3.071	-1.214	-3.110
1st Diff.	ADF		PP	
	Constant	*Constant and Trend*	*Constant*	*Constant and Trend*
NSAV	-6.412	-6.873	-8.624	-8.540
DR	-7.350	-7.938	-7.228	-7.761
INF	-3.756	-3.589	-8.797	-8.668
UP	-6.708	-6.181	-3.964	-3.998
GDP	-4.710	-4.612	-17.071	-17.588
GE	-4.347	-4.478	-5.862	-5.851

Once the series is determined as [I(1)], KSS cointegration test would be performed to detect the long-term relationship among them. Prior to performing the KSS

cointegration test, the series are first demeaned and/or detrended, and the optimal lag length is determined using t significance method introduced by Schwert[1].

The null hypothesis of the KSS cointegration test is that there is no long-term relationship among the variables; while the alternative hypothesis is that there is a long non-linear relationship among variables. The KSS cointegration test results are shown in Table 4.

Table 4: KSS Cointegration Test Results

Variable	t Statistic	Prob.
U(-1)^3	-6.614	0.000
D(u(-1))	1.216	0.023

The null hypothesis is rejected, and the existence of a long-term relationship among the variables is accepted since the t statistic value of the variable U(-1)^3 (-6.614) is higher than the critical values. Once the long-run relationship among the variables included in the analysis is determined, the estimate of the long-run coefficients would be determined using the Fully Modified OLS (FMOLS) method.

FMOLS estimation results are shown in Table 5.

Table 5: FMOLS Estimate Results

Variable	Coefficient	Prob.
DR	0.09	0.004
INF	-0.03	0.09
UP	0.66	0.24
GDP	0.26	0.009
GE	-1.31	0.001

Table 5 indicates that the coefficients of the urbanization rate variable are statistically significant. Accordingly, domestic savings are influenced positively by GDP and DR; whereas negatively by INF and GE. A 1% increase in GDP and DR raise domestic savings by 0.26% and 0.09%, respectively; while a 1% increase in INF and GE diminish domestic savings by 0.03% and 1.31%, respectively.

4. Conclusion

Savings, especially domestic savings are considered as one of the major sources of finance for sustainable economic growth and development. Therefore, determining the determinants of domestic savings and the factors that can be effective in increasing domestic savings are extremely important for countries. Thus, the determinants of domestic savings over the period 1979-2017 in Turkey are tried to be determined using the annual data in this study. For this purpose, in accordance with the literature, five

[1] As calculated by the formula 12*((39/100)^0.25)), the maximum lag length is determined as 9.

variables are used which include monetary, financial and demographic factors that can affect an individual country's domestic savings. The unit root test results indicate that the series is difference stationary [I (1)]. The KSS cointegration test is used to analyze the long-run relationships among these variables, which are the first-order stationary. As a result of the performed analysis, it is concluded that there is a long-run relationship between the series and the coefficients of the long-run relationship between the variables are estimated by FMOLS method. Accordingly, domestic savings are affected positively by GDP and DR; and negatively by INF and GE.

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