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Determinants of Savings in The Middle East Countries

Ortadoğu Ülkelerinde Tasarrufların Belirleyicileri

Abstract

This study analyzes determinants of savings in the Middle East countries, using the panel data method. It examines the impact of data for 8 independent variables on Gross Saving Rate, relating to the 2000-2013 period in thirteen Middle East countries. Results show that income, money supply and government expenditures impact savings negatively whereas young population and inflation influence savings in a positive way. Old population, urban population and rural population have no significant effect on savings.

Jel Codes: C33, E2, F49

Keywords: middle east, savings, panel data

Introduction

Gross Domestic Saving incorporates three saving sub-groups. The first is Private Saving. Private Saving is measured by subtracting consumption expenditures from disposable income. It represents current output made by the household sector to purchase new capital. The household sector includes individuals and families, pension funds, life insurance, trust funds, not-for-profit organizations, and un-incorporated businesses (Gale et al., 1999:185-186). The second sub-group consists of Public Savings. Public Savings is acquired by subtracting public sector revenues from public sector expenditures. This variable gives information about the size of resources that can be used

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in national investment. Theoretically, increase in public savings influences national savings, national investments and finally economic growth (Kriekhaus, 2002: 1697, 1698). The third sub-group is called Corporate Saving. Corporate saving can be defined as retained profit of a company for use as fixed asset and working capital. Corporate saving is a main financial resource for the company. Determinants of corporate saving include profit after tax, cash flow, lagged profit, lagged dividend, investment demand, flow of net debt, cost of debt or interest, etc (Mahapatra and Biswal, 2007: 16, 37).

Keynesian approach recognizes investment as an instrument to income generation. It does not address to the fact that investment may increase productive capacity. Considering this dual structure of investments, investments can increase both productive capacity and income. This provides necessary conditions for economic growth (Domar, 1946:139). When there is stable economic growth, instability is caused by the saving tendency on the one hand; imbalance among growth of labor, discovery of natural resources and technological progress on the other (Domar, 1946:144). Domar's approach suggests savings as an important determinant of growth. Solow asserts that the saving tendency gives information about how much current output would be saved and invested, and hereby about future capital accumulation. Thereby increase in capital accumulation gives rise to the level of output, i.e. to the growth (Solow, 1956: 68).

In the literature of economic growth, saving has an important role as a determinant of growth. This is because the saving level of a country is much more important than capital movement for investments and thus economic growth there. In this perspective, there are numerous studies conducted on determinants of savings. These studies are divided into two groups in the sense that they analyze individual countries or group of countries. It is observed that the studies used time-series or panel data analysis methods.

Studies on individual countries for determinants of savings include those for Turkey (Ozcan et al., 2003; Düzgün, 2009), Lebanon (Hamadi et al., 2011), India (Athukorala and Sen, 2003; Agrawal et al., 2010), China (Horioka and Wan, 2007), Thailand (Jongwanich, 2010), Malaysia (Yong et al., 2008) and Colombia (Cardenas and Escobar, 1998). Studies on groups of countries include those for the EU countries (Hondroyannis, 2006), Asian countries (Faruqee and Husain, 1998; Thanoon and Baharumshah, 2005; Bhandari et al., 2007), developed and developing country groups (Edwards, 1995; Masson et al., 1998; Loayza et al., 2000; Schmidt-Hebbel and Servén, 2000; Sarantis and Stewart, 2001), developed country groups (Paul, 2004; Kirsanova and Sefton, 2007), developing country groups (Hess, 2010).

This study is intended for analyzing how particular economic variables influence savings in the Middle East countries. The study used panel data analysis on the period from 2000 to 2013 using data of Egypt, Iran, Iraq, Turkey, Saudi Arabia, United Arab Emirates, Israel, Lebanon, Jordan, Oman, Kuwait, Qatar and Bahrain.

1. Literature

Hondroyiannis (2006), performed a panel cointegration in his practice on 13 EU countries. According to the results, changes in the dependency rate and the dependency rate of the elderly¹, budget limitation of the government, increase in real disposable income, real interest rates and inflation influence private savings in a positive way, while liquidity constraint has a negative impact on savings (Hondroyiannis, 2006: 565).

Bhandari et al. (2007), examined the determinants of private savings in five East Asian countries (Bangladesh, India, Nepal, Pakistan and Sri Lanka). They conducted an econometric analysis through the panel data method (Bhandari et al. 2007: 207). Government expenditures and past savings have a negative impact on private savings. On the other hand, financial development and increase in per capita income influence private savings in a positive way. Rate of dependency, localization level and real interest rates appear to have no important impact on private savings in these countries (Bhandari et al., 2007: 216).

Loayza et al. (2000) conducted an empirical study on political and non-political factors behind the differences of savings among countries. Using time-series of 150 countries, a panel data analysis was performed. Their results show that private savings increase with the growth of per capita real income. This impact of income on private savings is higher in developed countries compared to developing ones. Level of dependency has a negative impact on private savings. Prudence caused by inflation influences private savings in a positive way. Financial policies are an instrument with moderate impact on increasing the national savings. Impact of financial liberalization is negative on private savings (Loayza et al., 2000: 180).

Masson et al. (1998), analyzed potential determinants of private saving behaviors. The study used data of 21 developed and 40 developing countries. Estimations were made using time-series and cross-section methods. Demographics and growth are significant determinants of private savings. Interest rates and trade have positive but moderate impact on private savings. In countries where per capita income is lower than that of the USA, increases in GDP per capita provides for the growth of savings while in countries where per capita income is higher, it causes savings to reduce (Masson et al., 1998: 483).

Paul (2004), examined determinants of savings in four countries (Canada, Japan, USA and UK). The study used time-series analysis. In addition to the other independent variables available in literature, real exchange rate was included in the analysis as a new

¹ Results on demographic variables were in contrast with the life-cycle hypothesis. Hondroyiannis explains it with the prudent behavior caused by the increase in fertility and in dependency of the elderly.

independent variable. Borrowing constraint rates, current account balance, real interest rates, macroeconomic stability, level of dependency and real exchange rates are significant determinants of saving. It appears that differences in purchasing power parity explain the differences in saving rates (Paul, 2004).

Faruqee and Husain (1998), analyzed long-term determinants of private savings in Indonesia, Malaysia, Singapore and Thailand. Increase in the rate of private savings for these countries was very remarkable. The study used cointegration analysis. In addition to presenting the determinants of saving in these countries, the study also examined common experiences for strong saving performances among them. According to the results, demographic changes and increases in per capita income have an impact on regional saving trends (Faruqee and Husain, 1998).

Schmidt-Hebbel and Serven (2000), investigated in their empirical study the relation between distribution of income and total savings. According to the theory of consumption, disequilibrium in the distribution of income positively and directly influences household savings in most cases. On the other hand, political economic theories assert that it has indirect and negative impacts on total savings because of company investments and public saving. This study suggested new empirical results between the distribution of income and total savings, based on a new and developed distribution income database that encompasses industrialized and developing countries. According to the results obtained using alternative criteria of income distribution and saving, cross-section and panel data economic specifications, disequilibrium in income distribution has no systematic effect on total savings (Schmidt-Hebbel and Serven, 2000).

Hess (2010), established two models using cross-section data of 52 countries for 2001-2006. Adjusted net saving rate and gross national saving rate are used as dependent variables. As independent variables, both models used human development index, rate of increase in per capita income, demographic structure (share of 15-64 aged individuals in total population), financial depth (ratio of M1 money supply to national income) and natural resource export. The variables of human development index, demographic structure, share of natural resources in export and financial development bring an impact on net savings. Demographic structure and increase in per capita income are effective variables on gross national savings (Hess, 2010: 595, 596, 603).

Sarantis and Stewart (2001), used panel cointegration method in their study on determinants of private saving rates in the OECD countries. The data set encompassed the period of 1955-1994 for 20 OECD countries. Dependency and pension rate, income growth rate, ratio of public surplus/debt to GDP and liquidity constraint were used as independent variables. Results of the analysis show that demographic factors and credit constraints have significant impact on private savings. Public surplus affects private savings positively in eight OECD countries. Accordingly, public deficits can be said to trigger consumption and reduce private savings (Sarantis and Stewart, 2001: 25, 36, 37).

Edwards (1995), conducted a panel data analysis on determinants of savings in the world economy, using data of 36 countries for the period of 1970-1992. The results obtained showed that growth in per capita income was a significant determinant of both private and public savings. Social security practices of governments impacts private savings in a negative way. In countries with political instability, public savings are at low levels. In the case that public savings are high, private savings are crowded out. High-level foreign savings are associated with low-level domestic private and public savings. Financial development is an important determinant of private savings. Impacts of borrowing constraints on the savings of countries vary.

Thanoon and Baharumshah (2005), examined the saving behavior of East Asian countries. The analysis evaluated the data in three different periods, including 1970-2000, 1970-1995 and 1995-2000. The reason for using the last two periods was to define the effect of financial crisis on empirical results. This ensures that rapid increase of savings and the shrinking tendency in savings during a crisis can be explained (Thanoon and Baharumshah, 2005: 259).

Because of not sufficient data, the study used total savings instead of private and public sector savings. Unit root test and cointegration tests were conducted (Thanoon and Baharumshah, 2005: 262). The results obtained showed that financial crises impacted savings and determinants of savings not only in the short term but also in the long run. Secondly, foreign (external) savings brought a negative impact on domestic saving rates. Empirical results show that interest rates had little negative impact on savings, which was significant in terms of standard significance. Demographic factors were effective on long term saving rates. Economic growth and export positively affects long term saving rates during the pre-crisis period. There was no finding related to negative effect of economic stagnation due to crisis on short- and long-term saving rates (Thanoon and Baharumshah, 2005: 262).

2. Theoretical Framework

Impact of Income

Economic theory states that large part of savings is closely associated with income. Accordingly, individuals with higher incomes save more than those with lower incomes. High-income earners have also tendency for consuming more. However, the individual gains less marginal utility from each additional consumption. Since it is less costly to make saving than to consume in this process, individuals tend towards making more savings (Yong et al., 2008: 52). This is also similar for countries (Ozcan et al., 2003:1408). Countries with high income tend to make more saving. In his life-cycle hypothesis, Modigliani (1966) associated total saving behavior with income. According to Modigliani, high growth rates are a result of the increase in population or efficiency. Increase in growth gives rise to total income of workers compared to non-workers, and then to total

savings are rising. Based on these approaches, savings can be associated positively with the growth of income.

Demographic Factors

According to the life-cycles theory (Modigliani, 1966), age composition of population is influential on private savings. The higher the rate of individuals at the working age in a society, the more likely the individuals would tend to make savings to use during the period of retirement. When workers get retired, they would start to use their savings in order to maintain their previous level of consumption. This will reduce the level of savings. Another demographic variable is the level of urbanization. In his study, Edwards (1995: 27) established a negative association between urbanization and savings. Loayza et al., (2000: 174) determined that individuals in rural areas made more saving with prudence, and the level of saving reduced with the increase of urbanization. Bhandari et al. (2007: 216) suggested in their study on South Asian countries that the level of urbanization had no significant impact on savings.

Impact of Inflation

Inflation may influence savings from different aspects. High inflation rates cause nominal interest rates to rise, which paves the way for increasing individuals' incomes and thus savings. In addition, high inflation creates uncertainty, which may reduce savings (Masson et al.1998: 488). Inflation rate is characterized as an indicator of macroeconomic uncertainty. During the periods of high inflation, individuals tend to make savings to avoid from risks brought by economic uncertainty (Ozcan et al., 2003: 1409; Jongwanich, 2010: 968; Agrawal et al., 2010: 278).

Impact of Money Supply (M2)

It is observed that several studies used M2/GNP variable to measure financial depth (Edwards, 1995; Loayza et al., 2000; Ozcan et al., 2003; Thanoon and Baharumshah, 2005; Bhandari et al., 2007). According to the life-cycles model, financial development has a negative impact on savings because it can increase opportunities for consumption (Masson et al., 1998: 488).

Government Expenditures

Changing public expenditures is an important financial instrument for its impact on macroeconomics. Financial policy practices in the form of changing tax rates or public expenditures may directly influence private savings with crowd-out effect as they affected public savings, or may influence private savings with an expectation of future income availability (Bhandari et al., 2007: 208). According to the Ricardo equivalence hypothesis, private sector's savings will increase when public sector's savings decrease. This will create a balance at the national level of saving, which will not change (Barro, 1974). So it can be said that there is a negative relation between public expenditures and savings.

3. Data and Methodology

Data used in this study to analyze the determinants of savings in the Middle East countries were obtained from the World Bank Database. Dependent variables included Gross Domestic Saving as a percentage of GDP (*S*) while independent variables included annual percentage Gross Domestic Product growth (*GDP*), annual percentage Urban Population Growth (*URB*), annual percentage Rural Population Growth (*RRL*), GDP Deflator (annual %) (*INF*), M2 as a percentage of GDP (*M2*), Government Expenditure as a percentage of GDP (*GOV*), Population ages 15-64 as a percentage of total population (*PY*), Population ages 65 and above as a percentage of total population (*PO*).

i symbolizes country and *t* symbolizes time; *i*=1-13 countries and *t*=2000-2013 (14 years). In this study the analysis was made with the unbalanced panel dataset. In this set, the number of data set and years are not equal for each country. The model was established as in Equation 1, based on the theoretical framework and empirical studies in literature.

$$S_{it} = \beta_0 + \beta_1 GDP_{it} + \beta_2 PY_{it} - \beta_3 PO_{it} - \beta_4 URB_{it} + \beta_5 RRL_{it} + \beta_6 INF_{it} - \beta_7 M2_{it} - \beta_8 GOV_{it} + u_{it} \quad (1)$$

4. Process of Analysis

If all observations are homogenous pooled OLS model can be used in panel data analysis. However if observations contain unit and/or time effects, it can be appropriate to use fixed effects or random effects models (Yerdelen Tatoğlu, 2012: 163-164). So, likelihood ratio (LR) test was used for the model in order to determine whether there are unit and time effects. In LR test, it is examined whether standard error of unit effects is equal to zero ($H_0: \sigma_\mu = 0$). Additionally, LR test is also used to examine whether standard error of time effects is equal to zero ($H_0: \sigma_\lambda = 0$) (Yerdelen Tatoğlu, 2012: 170). If unit and time effects are not determined in LR test, pooled OLS model can be used. However if unit and/or time effects are determined in test results, it can be concluded that the model is one sided or two sided.

Table 1: LR Test

	Unit Effect	Time Effect
χ^2	293.95	0.00
<i>prob.</i>	0.0000	1.0000

According to the results of LR test, there is an only unit effect in the model. For this reason, the model is one sided. Hausman specification test is used to determine whether unit effects are fixed or random.

According to Hausman test, if there is no correlation between error components (u_i) and explanatory variables (x_{kit}), both fixed effects and random effects estimators are appropriate. However, if there is correlation between error components and explanatory variables, random effects estimator is inappropriate. In Hausman test, null hypothesis is set up in the way that there is no correlation between error components and explanatory variables (Hill et al., 2011: 559). It can be said that random effects are appropriate when there is not a correlation between u_i and x_{kit} , and fixed effects are appropriate when there is a correlation between u_i and x_{kit} (Gujarati, 2003: 650).

Table 2: Hausman Test

χ^2	9.40
<i>prob.</i>	0.3096

According to the results of Hausman test, it is decided that unit effects are random. Accordingly, analysis is made in accordance with one sided random effects model.

Then, models were examined in terms of basic assumptions. One of these assumptions is constant variance (homoscedasticity) assumption. According to constant variance assumption, while unit values of explanatory variables change, variance of error term remains fixed. If this assumption does not occur, model includes heteroscedasticity (Wooldridge, 2012: 93). Levene, Brown and Forsythe test was used to examine this assumption.

Table 3: Test for Heteroscedasticity

Levene, Brown and Forsythe Test		
$W_0=4.4480414$	$df(12, 138)$	<i>prob.</i> 0.0003
$W_{50}=2.7545285$	$df(12, 138)$	<i>prob.</i> 0.0081
$W_{10}=3.8901374$	$df(12, 138)$	<i>prob.</i> 0.0006

When test statistics of Levene, Brown and Forsythe (W_0, W_{50}, W_{10}) are compared to the Snedecor F table with (12, 138) degree of freedom, $H_0 =$ Variance of units are equal hypothesis is rejected. Heteroskedasticity exists.

According to autocorrelation assumption, there is no correlation between error terms of independent variables (Wooldridge, 2012:353). If this assumption does not occur, it means that there is correlation between error terms of independent variables. Durbin-Watson test of Bhargava, Franzini and Narendranthan test and Baltagi-Wu LBI test is used to examine this assumption. Because values obtained for both tests are less than 2, it can be said that there was auto-correlation in the model of random effects.

Table 4: Test for Autocorrelation

Modified Bhargava et al. Durbin-Watson Test	Baltagi-Wu LBI Test
1.1171923	1.3530945

Another assumption is about correlation between units. In studies such as domestic and regional economies, neighborhood effects can show spill-over in themselves. In such cases, correlations have spatial view rather than temporal view (Greene, 2012: 389). This assumption is tested through Pesaran test. According to the Pesaran test statistics and probability values, there is no correlation among units.

Table 5: Test for Correlation Between Units

Pesaran Test	
<i>Cross sectional indep.</i> 0.532	<i>prob.</i> 0.5947

According to the results of analysis, there are heteroscedasticity and autocorrelation in the model. In order to solve these problems, standard errors which are resistant to deviations from assumptions were produced by using method of Arrelano, Froot and Rogers.

5. Analysis Results

According to the results of analysis, there are heteroscedasticity and autocorrelation problems in the model. In order to solve these problems, standard errors which are resistant to deviations from assumptions were produced by using method of Arrelano, Froot and Rogers Estimator.

Table 6: Analysis Results

Explanatory Variables	Coef.	z-statistics	p-value
<i>GDP</i>	-0.11587	-2.43	0.015*
<i>PY</i>	0.65030	3.45	0.001*
<i>PO</i>	-2.43186	-1.40	0.162
<i>URB</i>	-0.24568	-0.99	0.320
<i>RRL</i>	-0.02560	-0.08	0.940
<i>INF</i>	0.06458	1.93	0.054**
<i>M2</i>	-0.13936	-2.83	0.005*
<i>GOV</i>	-1.18312	-2.71	0.007*
<i>Cons.</i>	28.5527	1.22	0.223
<i>Wald χ^2</i>	662.80		
<i>Prob.</i>	(0.0000)		

Not: (*) significant at %1 level, (**) significant at %5 level.

According to the results of analysis, coefficient of *GDP* (Gross Domestic Product) variable which represent income and its effect on savings is negative in contrast with the theory. 1% increase in *GDP* causes 0.11% decrease in growth. Effect of Population ages 15-64 as a percentage of total population (*PY*) variable on savings is positive in accordance with theoretical expectations. 1% increase in *PY* brings about 0.65% increase in savings. Population ages 65 and above as a percentage of total population (*PO*), annual percentage Urban Population Growth (*URB*) and annual percentage Rural Population Growth (*RRL*) variables affects savings statistically insignificant. GDP Deflator (annual %) (*INF*) variable on savings is positive in accordance with theoretical expectations. 1% increase in *INF* brings about 0.06% increase in savings. *M2* as a percentage of GDP (*M2*) variable on savings is negative in accordance with theoretical expectations. 1% increase in *M2* brings about 0.13% decrease in savings. Government Expenditure as a percentage of GDP (*GOV*) variable on savings is negative in accordance with theoretical expectations. 1% increase in *GOV* brings about 1.18% decrease in savings. Also, Wald Test statistics is significant.

Conclusion

Analyzing determinants of savings in the Middle East countries, this study uses the panel data method. It examines the impact of data for 8 independent variables on Gross Saving Rate, relating to the 2000-2013 period in 13 Middle East countries.

Results obtained showed that there was a negative relation between the level of income and savings. This is not consistent with theoretical expectations. However, as Schmidt-Hebbel and Serven (2000) stated, this result is possible, considering that disequilibrium in income distribution causes a negative impact on savings. A negative relation was found between money supply and savings. This is consistent with the expectation that expansion of money supply would increase opportunities for consumption, and thus impact savings in a negative way. It was determined that government expenditures had negative effect on savings. This is consistent with the theoretical expectations. This is because, according to the Ricardo equivalence hypothesis, private sector's savings will increase when public sector's savings decrease.

The association between the level of young population and savings were positive as expected. As a matter of fact, the life-cycles theory (Modigliani, 1966) claims that the higher the rate of individuals at the working age in a society, the more likely this individuals would tend to make saving in order to make expenditures during retirement period, which means the level of saving would increase. Impact of inflation on savings was positive as expected theoretically. During the periods of high inflation, individuals would increase savings in order to avoid economic uncertainty.

It was concluded that old population, urban population and rural population had no significant effect on savings in Middle East Countries.

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ORTADOĐU ÜLKELERİNDE TASARRUFLARIN BELİRLEYİCİLERİ

Kıvanç Halil ARIÇ*

Özet

Orta Dođu ülkelerinin tasarruflarının belirleyicilerinin analiz edildiđi bu çalışmada panel veri yöntemi kullanılmıştır. On üç Orta Dođu ülkesi için 2000-2013 dönemine ilişkin 8 bağımsız deđişkene ait verilerin tasarruflar üzerine olan etkileri incelenmiştir. Ulaşılan sonuçlara göre gelir, para arzı ve hükümet harcamaları tasarrufları negatif yönde etkilerken, genç nüfus ve enflasyon tasarrufları pozitif yönde etkilemektedir. Yaşlı nüfus, kentsel nüfus ve kırsal nüfusun, tasarruflar üzerinde anlamlı bir etkisi yoktur.

Jel Kodları: C33, E2, F49

Anahtar Kelimeler: ortadođu, tasarruflar, panel veri

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