International Journal of Economics, Business and Management Research

Vol. 3, No. 08; 2019

ISSN: 2456-7760

ANALYSIS OF TURKEY'S INVESTMENT-SAVINGS RELATIONSHIP WITHIN FRAMEWORK OF THE FELDSTEIN-HORIOKA PARADOX: AN ARDL BOUND TEST APPROACH

Begüm Erdil Şahin[1]

[1]Istanbul Kültür University, Department of Economics, Basın Ekpres Caddesi No:11, 34303, Istanbul, Turkey

Abstract

Economic growth and development are based on investments which are funded by savings. Therefore, the presence of a relationship between savings and investments is important for the designation of economic policies. Feldstein-Horioka (1980) described the presence of a savings-investment relationship according to the degree of freedom of international capital movements. Hence, the presence of limitations on capital movements indicates a strong relationship between savings and investments while the contrary demonstrates that such relationship has weakened. In other words, in case of restriction of international capital movements in the economy of a country, this leads to a rise in the transformation rate of savings into investments. This study is conducted in order to designate the relationship between savings and investments in Turkey with an ARDL approach on the data relating to the period 1980-2015 within the framework of the Feldstein-Horioka Hypothesis. Augmented Dickey Fuller (ADF) and Phillips-Perron (PP) have been utilized as unit root tests and the co-integration relationship has been investigated with the ARDL Bound Test. Consequently, estimates relating to short and long-term coefficients have been included. Based on the findings obtained from the analysis, it has been concluded that there is a long-term relationship between savings and investments in Turkey and that the Feldstein-Horioka Hypothesis is applicable for the Turkish economy in the period analyzed.

Keywords: Saving, Investment, Turkish Economy, Economic Growth, Feldstein-Horioka Hypothesis, ARDL.

1. INTRODUCTION

Savings and investments constitute the most important macroeconomic factors impacting the development and growth of the economy of a country. Domestic savings, which compose the unconsumed part of income in an economy, are used for financing investments and thus economic growth. In a closed economy where there is no free capital flow, the domestic savings composed by the savings of the private and public sector correspond to the sum of the investments of the public and private sector. Whereas, in an outward-oriented economy, the equality between total domestic investments and domestic savings weaken due to foreign relations [1].

Capital flows have reached a significant level along with the acceleration of financial liberalization. Particularly post-1980 period has been scene to the removal of economic boundaries between countries and the implementation of policies aimed at facilitating free

Vol. 3, No. 08; 2019

ISSN: 2456-7760

circulation of foreign savings [2]. This has enabled countries to meet the foreign exchange required for achieving economic growth with foreign savings.

The study entitled "Domestic Saving and International Capital Flows", prepared by Feldstein and Horioka in 1980 on the investment-savings relationship, have contributed considerably to the literature in this field. In their study, Feldstein-Horioka (1980) have analyzed the relationship between savings and investments in 16 developed OECD countries for 1964-1970 period. They claimed in their analyses that international capital movements play a determining role and defended that in case of full capital mobility, the savings-investment relationship will either be weak or not exist at all and that in case of absence of capital mobility, the savings-investment relationship will be strong.

According to the findings obtained from the referred study, they reached the conclusion that the savings-investment relationship was high in 16 countries. Considering the fact that the rate of capital movements was high during the period in which the study was conducted, results fully contrary to the hypothesis developed by Feldstein-Horioka were obtained and this condition was named as "Feldstein-Horioka Puzzle". The results of studies conducted after Feldstein-Horioka made the validity of the hypothesis became debatable [3].

In Turkey, an outward-oriented economic policy was adopted with the stability program initiated in 1980. Within this scope, policies aimed at developing exports, designating prices at market conditions and liberalization began to be implemented [4]. This study analyses the investment-savings relationship in Turkey empirically by Bound Test approach, within the framework of the Feldstein-Horioka Paradox. Hence, the main theory on which the Feldstein-Horioka hypothesis is based is first described and consequently the studies conducted on this topic are included. The last section examines and evaluates the applicability of the hypothesis in terms of Turkey for the period 1980-2015.

2. THEORICAL APPROACH OF FELDSTEIN-HORIOKA

Feldstein and Horioka stated that there is no relationship between national savings and investments with the assumption of full capital mobility because investments are financed with international capital. On the contrary, they believed that in case international capital mobility is zero, there is a direct relationship between domestic savings and investments [5]. Based on this idea, Feldstein and Horioka (1980) analyzed the investment-savings relationship between 16 OECD countries with a cross section regression analysis for designating capital mobility with the data relating to the period 1960-1974. The relationship between investment and saving rates were estimated with the equation (1)[1].

$$(I / Y)_i = \alpha + \beta (S / Y)_i + \mu_i \qquad i= 1, \ldots, N \qquad (1)$$

The terms included into the model; (i) refers to each country, (I/Y) refers to the ratio of domestic investments to gross domestic product, (S/Y) refers to the ratio of domestic savings to gross domestic product, (α) refers to the constant term and (μ_i) refers to the error term. The

[1] The countries covered in this study: Australia, Austria, Belgium, Canada, Denmark, Finland, Germany, Greece, Ireland, Italy, Japan, Netherlands, New Zealand, Sweden, UK and USA.

Vol. 3, No. 08; 2019

ISSN: 2456-7760

measurement for international capital mobility in the model is designated with the help of (β) parameter obtained depending on the relationship between domestic savings and domestic investments. Thus, the coefficient β receives a value between 0 and 1 in the equation. If the coefficient is 0, this indicates that capital mobility is full and that domestic investments are financed with foreign investments. In case the coefficient β is at a value close to 1, this indicates that capital mobility is low because a major part of the growing savings in each country remains in that country [6]. From this respect, it is claimed in the study that as domestic investments will be financed only with domestic savings in a closed economy where capital mobility is low, to the contrary the parameter should be low in an open economy where capital mobility is high because domestic investments are financed both with domestic and foreign savings [1].

Feldstein and Horioka estimated in a model in which annual average data obtained from 16 OECD countries are utilized that the parameter (β) was between the values 0.85-0.95 for the period 1960-1974 and the sub-periods 1960-1964, 1965-1969 and 1970-1974 [7].

Contrary to the globalization and high capital movements experienced in the financial markets in developed countries, Feldstein and Horioka demonstrated that a major part of foreign investments was met with domestic savings, and that capital movements were very limited [6]. However, especially after the first half of 1970s, the implementations aimed at financial liberalizations increased as a result of the arrangements made in international financial markets. OECD countries should ensure that their capital mobility is high and that a major sensitivity is displayed not only to domestic savings but also to international savings in their domestic investments. Therefore, the results of this study conducted by Feldstein and Horioka are named as the “Feldstein-Horioka Puzzle" in literature [8].

According to the results of the Feldstein – Horioka study (1980), savings promotion policies impact the level of investments and thus influence economic growth in a positive way [9]. As domestic and foreign cost of borrowing will be high in case of a low level of capital mobility, domestic investments are financed with domestic savings [10].

Considering that capital markets were not developed during the period assessed and that globalization and deregulations grew as of 1970s, the result of the study was interpreted as low level of capital mobility. However, in the studies conducted consequently, this phenomenon was questioned due to high rate of this relationship and paved the way for the conduct of many studies and creation of a rich literature in this field [11].

3. LITERATURE

The empirical results of Feldstein-Horioka have been the subject of many studies. While some of the studies covering specific periods and specific countries have obtained results that support the Feldstein-Horioka Hypothesis, some studies reject the validity of this hypothesis. In the Table 1, the studies that were conducted to reveal the relationship between investment and savings in the framework of the Feldstein-Horioka hypothesis covering various countries (including Turkey) are listed. It can be obseved that the results vary as the periods and countries differ. In addition, the analysis methods being different in each study causes the results to differentiate.

There are many studies supporting the results of Feldstein and Horioka (1980) such as

Vol. 3, No. 08; 2019

ISSN: 2456-7760

Feldstein (1983), Murphy (1984), Tesar (1991), Cookley et al. (1996), Obstfeld and Rogoff (2001), Abbott and De Vita (2003), Narayan (2005), Yavuz (2005), Blanchard and Giavazzi (2002), Ho (2002), Di Iorio ve Fachin (2007), Arısoy (2013), Erataş et al. (2013), Petreska and Blazevski (2013), Ma and Li (2016).

Table 1. Studies Investigating Feldstein-Horioka Hypothesis

Autors and Year	Term	Method	β Coefficient
Feldstein and Horioka (1980) [6]	16 OECD Countries, 1960-1974	Cross-Section OLS	0.85 - 0.95
Feldstein (1983) [12]	17 OECD Countries, 1960-1979	Cross-Section OLS	0.79
Murphy (1984) [13]	17 OECD Countries, 1960-1980	Cross-Section OLS	0.90
Bayoumi (1990) [14]	10 Developed Countries, 1965-1986	Cross-Section OLS	0.97
Tesar (1991) [15]	23 OECD Countries, 1960-1986	Cross-Section OLS	0.84
Coakley et. al. (1996) [16]	23 OECD Countries, 1960-1992	Panel MG, GLS	0.73
Jansen (1996) [17]	23 OECD Countries, 1951-1991	ECM	0.57
Obstfeld ve Rogoff (2000) [18]	56 Developed and Developing Countries, 1990-1997	OLS	0.41-0.48 0.60-0.70
Ho (2002) [19]	20 OECD Countries, 1961-1997	DOLS, FMOLS	0.47-0.84
Blanchard and Giavazzi (2002) [20]	OECD and EU Countries 1975-2001	Panel OLS	0.14-0.58
Abbott and De Vita (2003) [21]	United Kingdom, 1955:Q1-1999:Q4	ARDL Approach	0.56
Coakley et al (2004) [22]	12 OECD, 1980–2000	Panel Regression	0.33

Bolatoğlu (2005) [23]	Turkey, 1970-2003	ARDL Approach	0.52
Narayan (2005) [24]	Japan, 1960-1999	ARDL Approach	0.68
Yavuz (2005) [7]	Turkey, 1962-2003	Co-intergration	0.76
Di Iorio and Fachin (2007) [25]	12 EU Countries, 1960-2002	FMOLS	0.59-1.03
Georgopoulas and Hejazi (2009) [26]	62 Developed and Developing Countries, 1975-2004	Panel OLS, GLS	0.19- 0.37- 0.56
Murthy (2009) [27]	14 Latin America and Carribean Countries, 1960–2002	Panel Cointegration	0.48
Rao et. al. (2010) [28]	13 OECD Countries, 1960-2007	SGMM	0.46-0.50-0.57
Ayaydın and Baltacı (2012) [29]	BRICS, 1990-2011	GMM	0.796
Esen et. al. (2012) [30]	Turkey, 1975-2009	ARDL Approach	0.383
Mangır and Ertuğrul (2012) [31]	Turkey, 1980-2010	Boundary Test and Kalman Filter	0.74
Arısoy (2013) [32]	Turkey, 1962-2010	ARDL Approach, ECM	0.995
Erataş et. al. (2013) [33]	G-7 Countries, 1990–2012	Westerlund ECM	0.415
Göçer et. al. (2013) [34]	20 OECD Countries, 1980-2012	Panel CCE-CCEMG	0.27
Petreska and Blazevski (2013) [35]	Transition Economies (TE), South Eastern Europe (SEE), Central	Westerlund Co-integration Test	0.465-0.859

Vol. 3, No. 08; 2019

ISSN: 2456-7760

	Eastern Europe (CEE), Commonwealth of Independent States (CIS), 1991-2010		
Dursun and Abasız (2014) [36]	Turkey, 1968-2008	Single and Multi Refracting Co-integration	0.426
Mercan (2014) [11]	15 AB Countries and Turkey, 1970-2011	Panel CCE-CCEMG	0.288
Ma and Li (2016) [37]	22 Developed and Develoing Countries, 1960-2014	OLS	-0.34-0.85
Tunçsiper and Biçen (2016) [38]	7 Developing Countries, 1990-2014	SUR	0.37-1.36
Yalçınkaya and Hüseyni (2016) [1]	28 OECD Countries, 1980-2013	Westerlund Panel CCMGE	0.359
Demir and Cergibozan (2017) [39]	Turkey, 1962-1989 (annual) 1990Q1-2015Q3	ARDL, Markov Regime Switching Model	0,89 (1962-1989) 0,53 (1990-2015)

CCE: Common Corelated Effects Model, CCEMG: Common Correlated Effects Mean Group, DOLS: Dynamic Ordinary Least Squares, FMOLS: Fully Modified Ordinary Least Squares, GLS: Generalized Least Squares, GMM: Generalized Method of Moments, REM: Random Effects model, SGMM: System Generalized Method of Moments, OLS: Ordinary Least Squares.

The literature that examines the relations between domestic savings and investments within the framework of Feldstein and Horioka (1980) approach, concludes that hypothesis is no more observed in developed countries but still can be observed in developing countries. In other words, the Feldstein and Horioka Hypothesis are now closely related to the level of development of countries. In this respect, as the level of development of countries increases, capital mobility increases and the value of β parameter decreases and on the contrary as the development of countries decrease, capital mobility decreases and value of β parameter increases [1].

In Turkey, the obstacles that restrict foreign trade and capital flows were removed in 1980 and

Vol. 3, No. 08; 2019

ISSN: 2456-7760

1989 respectively and Turkey's economy has changed structurally in this period. Turkey, in this respect, has been an important research topic for the relationship between investment and savings from Feldstein-Horioka Hypothesis perspective. In this study, the Feldstein-Horioka Hypothesis has been evaluated for period after the liberalization process in Turkey and the validity of the hypothesis is tested via ARDL Bounds testing approach. In this way, a contribution to the literature for the solution of this paradox and evaluation of policies that support domestic savings depending on the existence of the relationship between investment and saving is aimed.

4. DATA AND METHODOLOGY

The investment-savings relationship in Turkey was analyzed by using the annual data pertaining to the period 1980-2015 within the framework of the Feldstein-Horioka Hypothesis in this study. The main hypothesis was formulated with the following equation:

$$\left(\frac{I}{Y}\right)_t = \alpha + \beta \left(\frac{S}{Y}\right)_t + u_t \quad (2)$$

In this equation, "I/Y" refers to the share of investments within the gross domestic product, "S/Y" refers to the share of savings within the gross domestic product, while "Y" refers to gross domestic product (GDP). Whereas the parameter "β" used in this equation is an indicator of how much the savings impact investments. According to Feldstein and Horioka (1980), in circumstances where capital movements are full, the coefficient "β", demonstrating the share of gross domestic savings within gross domestic product, is close to the value 0. In circumstances where there is no capital mobility, coefficient "β" will be close to 1. This is accepted as an indicator that the savings have been transformed into domestic investments and that there is no capital mobility. The variables relating to the share of investments and savings within gross domestic product have been retrieved from the database of Economic and Social Indicators of the Ministry of Development.

Cointegration tests are used to analyze the long-term relationship between variables. In the literature, cointegration tests such as Engle-Granger (1987) and Johansen (1988) are frequently used to determine this relationship. However, in these tests, variables should be integrated to the same degree [40]- [41]. In this respect, this limitation which is an important obstacle in practice was removed by Pesaran et al. (2001)'s ARDL approach. This approach also allows demonstration of relationship between different degrees of variables [42].

There are some advantages of the ARDL model. Firstly, the variables being stationary I (0) at the level or stationary I (1) in the first difference does not interfere with the application of the Boundary Test. Another advantage is that it uses the unrestricted error correction model, resulting in statistically more reliable results even in studies with fewer observations compared

Vol. 3, No. 08; 2019

ISSN: 2456-7760

with other cointegration tests. The most important feature of the error correction model is that it provides information about short and long term dynamics between variables [43].

In order to determine whether there is a cointegration relationship in the model, first the appropriate delay length should be determined. Information criteria (Akaike and Schwarz) are used for this purpose. After determining the appropriate lag length, the model is estimated with the least squares method. The following hypothesis is then tested to examine the cointegration relationship in the ARDL model:

H_0: $\delta_1 = \delta_2 = \delta_3 = \delta_4 = 0$ (No cointegration exists) (3)

H_1: $\delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq 0$ (Cointegration exists) (4)

In the test of these hypotheses, an F statistic is calculated by the Wald test [42]. This F statistics is compared with the asymptotically derived significance levels in Pesaran, Shin and Smith's (2001) studies. In this study, the lower and upper values of the variables were determined according to being I (0) and I (1). If the calculated F statistic is smaller than the lower limit, the null hypothesis will not be rejected and it will be concluded that there is no cointegration between the variables. If the calculated F statistic is greater than the upper limit, the null hypothesis will be rejected and it will be concluded that there is a cointegration between the variables. In the other case, if the calculated F statistic remains between the lower and upper limit values, then the calculated F statistic value will be in the region of instability and no interpretation can be made as to whether there is cointegration between the variables. The error term is used for cointegration within the area of F statistics instability [30].

If the long-term relationship between the variables is determined by the Boundary Test, the long-term coefficients estimation is initiated. After determining the coefficients for the long-term relationship, the diagnostic tests of the model are examined and it is decided whether the selected model is suitable or not. In addition, CUSUM and CUSUM-Q tests can be used for the stability of the variables in the ARDL model. The error correction model is used to determine the short-term relationship between the variables [44].

5. EMPIRICAL RESULTS

In this analysis, the potential long-term relationship will be assessed between investments and savings provided in equation (1) based on the Feldstein-Horioka approach (1980). Prior to the designation of the potential relationship between variables, the stability of the variables was first examined in the study. The Augmented Dickey-Fuller (ADF) and Phillips and Perron (PP) unit root tests were utilized for this purpose providing the results presented below in Table 2.

Vol. 3, No. 08; 2019

ISSN: 2456-7760

Table 2. ADF and PP Test Results

Variables	ADF Level (Fixed)		ADF First Difference	
	Test Statistics	Probability	Test Statistics	Probability
I/Y	-3.371638	0.0190	-7.656615	0.0000
S/Y	-1.598826	0.4726	-6.100505	0.0000
Variables	PP Level (Fixed)		PP First Difference	
	Test Statistics	Probability	Test Statistics	Probability
I/Y	-3.367612	0.0192	-8.787382	0.0000
S/Y	-1.630599	0.4567	-6.081030	0.0000

Test Critical Values: 1% (-3.63), 5% (-2.95), 10% (-2.61).

It may be observed in the assessment of Table 2 demonstrating the unit root test results that according to the ADF and PP tests, the series (I/Y) and (S/Y) showing the ratio of the investments and savings to the GDP is not equally fixed. This reveals that all these unit root tests are fixed when the first difference is taken in the all the variables to be used in this model.

The ARDL Bound Test approach, developed by Pesaran et al. (2001) were used for determining the long-term relationship between the variables in the study. It is not mandatory in this approach to have all variables fixed at the same level. Their unit root tests are checked only by condition that the variables are fixed at a secondary degree. Furthermore, this approach provides the opportunity to make a simultaneous estimate of long and short-term parameters pertaining to the model and provides better results in the estimates based on small samples [32].

The first phase of the ARDL model involves the designation of the lag length. Different lag combinations are tested for this purpose and the model providing the lowest value according to the information criteria for this purpose. Eviews 10 program was utilized and the ARDL (2,2) model was selected as the suitable model according to the Akaike Information Criteria (AIC). The estimate results relating to this model are presented in Table 3.

Vol. 3, No. 08; 2019

ISSN: 2456-7760

Table 3. Estimated Results of ARDL (2, 2) Model

Variables	Coefficients	t-Statistics	Probability Value
D(I/Y) (-1)	-0.381466	-2.109959	0.0443*
D(I/Y) (-2)	-0.330742	-1.903699	0.0677
D(S/Y)	0.560313	3.352103	0.0024*
D(S/Y)(-1)	-0.028675	-0.154730	0.8782
D(S/Y)(-2)	0.232478	1.391228	0.1755
C	0.014551	0.040026	0.9684
Diagnostic Test Results			
Breusch-Godfrey LM	0.1546 (0.8576)		
Jarque-Bera	3.8705 (0.1443)		
Breusch-Pagan	1.875442 (0.1319)		

Note: * A significance level of 5%. Dependent variable is I/Y. The values in parenthesis are probability values

The assessment of the diagnostic tests of the model estimated with the ARDL method indicates that there is no deterministic and stochastic problem. The test results show that there is no autocorrelation between the Breusch-Godfrey LM test series, that the error term of the Jarque-Bera test is normally distributed, while the Breusch-Pagan heteroskedasticity test shows that there is no problem of heteroskedasticity in the model.

The presence of the relationship between variables is tested with the Bound Test after this phase. It is possible to designate this relationship regardless of whether there is the variables are I(0), I(1) or mutually cointegrated [45].

Vol. 3, No. 08; 2019

ISSN: 2456-7760

Table 4. Bound Test Results

k *	F Statistics	Critical Values at a Significance Level of 5%		Critical Values at a Significance Level of 10%	
		I(0)	I(1)	I(0)	I(1)
1	11.63467	3.62	4.16	3.02	3.51

* Demonstrates the independent variable number in equation k. Critical values have been obtained from Table CI (iv) in Peseran et al. (2001).

As shown in Table 4, it has been determined that there is a cointegration relationship between the series, as the calculated F statistics surpasses Pesaran's upper critical value. As cointegration relationship has been identified between the series, the estimate will be made with the ARDL (Autoregressive Distribution Lag) model to designate the long and short-term relationship

Table 5. Estimated Results of the Long-Term Coefficients of ARDL (2, 2) Model

Variables	Coefficient	t-Statistics	Probability Value
D(S/Y)	0.446275	2.859680	0.0081
C	0.008498	0.040034	0.9684

The long-term coefficient shown in Table 5 demonstrates that there is a positive relationship between savings and investments. These results reveal that the Feldstein-Horioka Hypothesis applies for the evaluated period. In other words, the relationship between savings and investments weaken in parallel with the long-term increase in international capital movements.

Table 6. The Error Correction Model Results

Variables	Coefficient	t-Statistics	Probability Value
D(D(I/Y)(-1))	0.330742	1.977127	0.0583
D(D(S/Y))	0.560313	4.146703	0.0003
D(D(S/Y)(-1))	-0.232478	-1.705659	0.0996
CointEq(-1)*	-1.712209	-6.122865	0.0000

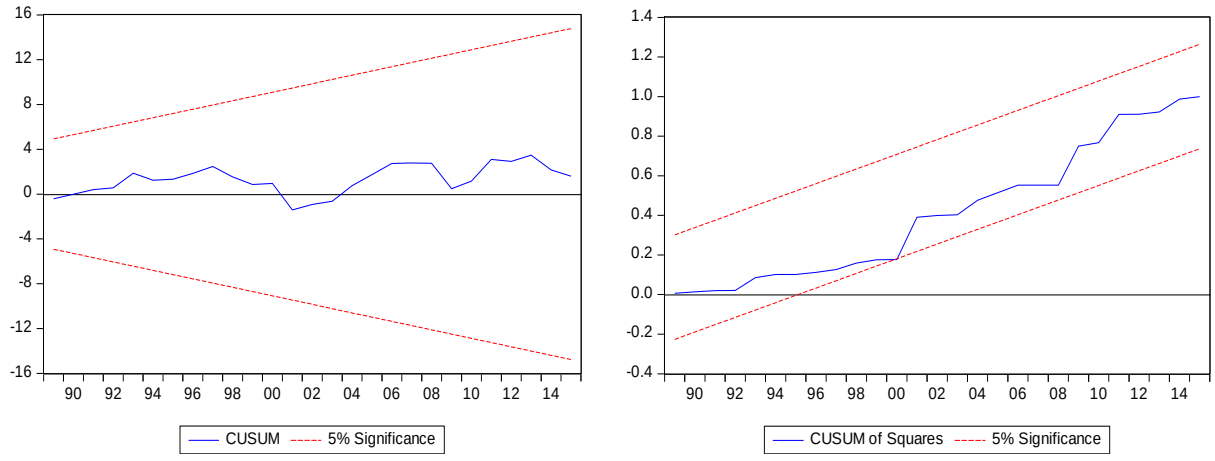
Vol. 3, No. 08; 2019

ISSN: 2456-7760

The short-term results based on the error correction model are shown in Table 6. Thus, the coefficient of the error correction variable has been designated as (-1.7122). As described by Narayan and Smyth (2006) in their studies, the fact that error correction variable coefficient was greater than 1 reflects that the system is balanced upon fluctuating. This fluctuation is reduced every time and re-balanced in the long term. In other words, it shows that the unbalances occurring in the short-term in this model will be eliminated in the long term. Moreover, the error correction coefficient is statistically negatively marked and significant as expected [46]-[47].

In order for the relationship resulting from the analysis to be economically acceptable, it is necessary for the parameters to be consistent in time. Thus, the consistency of the estimated coefficients has been tested with the CUSUM and CUSUM-Q methods. The CUSUM test is based on the cumulative sum of the error terms obtained from the recursive estimates. In case the graph of this sum, obtained by increasing the number of observations starting from the smallest number, remains within the band drawn for five-percent significance level, it is accepted that the coefficients are stable. The CUSUM-Q test, based on the sum of the square of the error terms, is calculated in a similar manner. Graph 1 includes the results of the CUSUM and CUSUM-Q conducted for testing the stability of the estimated model, that is whether there are any structural changes [32].

Graph 1. CUSUM and CUSUM-Q Test Results



As shown in Graph 1, it is understood that the parameters of the model estimated according to the results of both tests remain within the band drawn for five percent significance level and that the model was consistent during the period of estimation.

Vol. 3, No. 08; 2019

ISSN: 2456-7760

6. CONCLUSION

Savings provide an important resource to the governments in terms of financing investments. In case of a high savings investments ratio, the production capacity of the country increases and the economic growth process is positively affected. Moreover, increasing investments in the economy are effective in solving other macroeconomic problems. Therefore, the determination of the saving and investment relationship is important for the selection of appropriate economic policies in order to ensure sustainability in economic growth and development.

The rapid globalization experienced in the financial markets, especially in developed countries after the 1970s, has facilitated the financing of investments from international markets. The effect of liberalization in financial markets on investments and savings was investigated by Feldstein and Horioka (1980) firstly for 16 developed OECD countries covering the period 1960-1974. Feldstein and Horioka (1980) stated that increases in domestic savings would increase domestic investments in countries with low capital mobility and that the relationship between domestic savings and domestic investments would decrease in countries with high capital mobility. The question of the amount of investments being related with domestic savings has become subject to review for many studies.

In this study, the relationship between investments and savings in the 1980-2015 period were analyzed for Turkey's economy by ARDL approach within the framework of the Feldstein-Horioka hypothesis. According to the results of the model, there is a positive relationship between savings and investments in the long run. Accordingly, it can be stated that the Feldstein-Horioka hypothesis applies to Turkish economy.

One of the most important problems of Turkey and other developing countries is the inadequate level of savings required to finance investments. Many developing countries are trying to overcome the insufficient domestic savings in financing domestic investments problem by foreign capital flows. It is thought that the relationship between domestic savings and domestic investments will weaken as capital mobility increases among countries. However, the model results according to Feldstein-Horioka approach shows that there is not a complete capital mobility in Turkey. These findings suggest that there is a partial capital mobility in Turkey. Therefore, in Turkey, policy measures to increase domestic savings will have the power to influence domestic investments. At the same time, increasing the share of foreign savings will also contribute positively to the economic growth and development process of the country.

References

[1] Ö. Yalçınkaya and İ. Hüseyni, “Tasarruf-Yatırım İlişkisi: Feldstein-Horioka Hipotezinin OECD Ülkeleri Açısından Değerlendirilmesi (1980-2013)”, Dokuz Eylül Üniversitesi İktisadi İdari Bilimler Fakültesi Dergisi, 31 (1), pp.343-366, 2016.

[2] S. Yapraklı, “Türkiye'de Doğrudan Yabancı Yatırımların Ekonomik Belirleyicileri Üzerine Ekonometrik Bir Analiz”, Dokuz Eylül Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 21(2), pp.23-48, 2006.

Vol. 3, No. 08; 2019

ISSN: 2456-7760

[3] Ş. Karabulut, R. Ekinci and O. Tüzün, "Feldstein - Horioka Hipotezinin Türkiye'de Kamusal ve Özel Tasarruf - Yatırım Dengesi Açısından Analizi", International Journal of Public Finance, 2 (2), pp.176-195, 2017.

[4] A. E. Çağlar and E. Yavuz, "Türkiye'de Yatırım-Tasarruf İlişkisinin Feldstein-Horioka Paradoksu Çerçevesinde Analizi: Farklı Tipte Eşbütünleşme Yaklaşımları", Pamukkale Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 31, pp.143-152, 2018.

[5] J. Coakley, F. Kulasi and R. Smith, "The Feldstein Horioka Puzzle and Capital Mobility: A Review", International Journal of Finance and Economics, 3, pp.169-188, 1998.

[6] M. Feldstein and C. Horioka, "Domestic Saving and International Capital Flows", Economic Journal, 90, pp. 314-329, 1980.

[7] N. Yavuz, "Feldstein-Horioka Yaklaşımına Göre Türkiye'de Tasarruf Yatırım İlişkisi ve Hata Düzeltme Analizi (1962-2003)", Maliye Araştırma Merkezi Konferansları, 47, pp.107-123, 2005.

[8] Ö. Koçbulut and H. Altıntaş, "İkiz Açıklar ve Feldstein-Horioka Hipotezi: OECD Ülkeleri Üzerine Yatay Kesit Bağımlılığı Altında Yapısal Kırılmalı Panel Eşbütünleşme Analizi", Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 48, pp.145-174, 2016.

[9] B. Güriş, "Türkiye'de Feldstein-Horioka Hipotezinin Geçerliliğinin Sınanması: ARDL Eşik Değerli Koentegrasyon Testi", Trakya Üniversitesi İktisadi ve İdari Bilimler Fakültesi E-Dergi, 2(2), pp.47-55, 2013.

[10] D. Ghosh and S. Dutt, "International Capital Mobility and the Feldstein – Horioka Puzzle: An Empirical Examination for The G5 Nations", Southwestern Economic Review, 38, pp.27-36, 2011.

[11] M. Mercan, "Feldstein-Horioka Hipotezinin AB-15 ve Türkiye Ekonomisi için Sınanması: Yatay Kesit Bağımlılığı Altında Yapısal Kırılmalı Dinamik Panel Veri Analizi", Ege Academic Review, 14(2), pp.231-245, 2014.

[12] M. Feldstein, "Domestic Saving and International Capital Movements in the Long Run and the Short Run", NBER Working Paper Series, Paper No: 947, 1983.

[13] R. G. Murphy, "Capital Mobility and The Relationship Between Saving and Investment Rates in OECD Countries", Journal of International Money and Finance, 3 (3), pp.327-342, 1984.

[14] T. Bayoumi, "Saving-Investment Correlations: Immobile Capital, Government Policy, or Endogenous Behavior?", Staff Papers-International Monetary Fund, pp.360-387, 1990.

[15] L.L. Tesar, "Savings, Investment and International Capital Flows" Journal of International Economics, 31(1), pp.55-78, 1991.

[16] J. Coakley, F. Kulasi and R. Smith, "Current Account Solvency and the Feldstein--Horioka Puzzle", The Economic Journal, 106 (436), pp.620–627, 1996.

[17] W. J. Jansen, "Estimating Saving-Investment Correlations: Evidence for OECD Countries Based on an Error Correction Model", Journal of International Money and Finance, 15(5), pp.749-781, 1996.

[18] M. Obstfeld and K. Rogoff, "The Six Major Puzzles in International Macroeconomics: Is There a Common Cause?", NBER Macroeconomics Annual 15. MIT Press., pp.339-412, 2000.

Vol. 3, No. 08; 2019

ISSN: 2456-7760

[19] T. W. Ho, "The Feldstein-Horioka Puzzle Revisited", Journal of International Money and Finance, 21(4), pp.555-564, 2002.
[20] O. Blanchard and F. Giavazzi, "Current Account Deficits in the Euro Area: The End of The Feldstein-Horioka Puzzle?", Brookings Papers on Economic Activity, 2002(2), pp.147-209, 2002.
[21] A. J. Abbott and G. De Vita, "Another Piece in The Feldstein-Horioka Puzzle", Scottish Journal of Political Economy, 50(1), pp.69-89, 2003.
[22] J. Coakley, A. M. Fuertes and F. Spagnolo, "Is The Feldstein-Horioka Puzzle History?", The Manchester School, 72(5), pp.569-590, 2004.
[23] N. Bolatoğlu, "Türkiye'de Yurtiçi Yatırım ve Yurtiçi Tasarruf Oranları Arasındaki İlişki", Ekonomik Yaklasim, 16(56), pp.19-32, 2005.
[24] P. K. Narayan, "The Relationship Between Saving and Investment for Japan", Japan and The World Economy, 17(3), pp.293-309, 2005.
[25] F. Di Iorio and S. Fachin, "Testing for Breaks in Cointegrated Panels-With an Application to The Feldstein-Horioka Puzzle", Economics, 1(2007-14), pp.1-24, 2007.
[26] G. Georgopoulos and W. Hejazi, "The Feldstein-Horioka Puzzle Revisited: Is the Home-Bias Much Less?", International Review of Economics & Finance, 18(2), pp.341-350, 2009.
[27] N. R. V. Murthy, "The Feldstein–Horioka Puzzle in Latin American and Caribbean Countries: a Panel Cointegration Analysis", Journal of Economics and Finance, 33(2), pp.176-188, 2009.
[28] B. B. Rao, A. Tamazian and S. Kumar, "Systems GMM Estimates of the Feldstein-Horioka Puzzle for The OECD Countries and Tests for Structural Breaks", Economic Modelling, 27(5), pp.1269-1273, 2010.
[29] H. Ayaydın and N. Baltacı, "Finansal Açıklık, Sermaye Hareketliliği, Tasarruf ve Yatırım İlişkisi: BRICS Ülkeleri Örneği", Gazi Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 14(2), pp.51-74, 2012.
[30] E. Esen, S. Yıldırım and S. F. Kostakoğlu, "Feldstein-Horioka Hipotezinin Türkiye Ekonomisi İçin Sınanması: ARDL Modeli Uygulaması", Eskişehir Osmangazi Üniversitesi İktisadi ve İdari Bilimler Dergisi, 7(1), pp.252-261, 2012.
[31] F. Mangır and H. M. Ertuğrul, "Sermaye Hareketliliği, Tasarruf ve Yatırım İlişkisi: Türkiye Örneği", İktisat İşletme Finans, 27(317), pp.61-87, 2012.
[32] İ. Arısoy, "Türkiye'de Yatırım, Tasarruf ve Sermaye Akışkanlığının Analizi", Çukurova Üniversitesi İktisadi ve İdari Bilimler Dergisi, 14(1), pp.69-80, 2013.
[33] F. Erataş, H. Başcı Nur and M. Özçalık, "Feldstein-Horioka Bilmecesinin Gelişmiş Ülke Ekonomileri Açısından Değerlendirilmesi: Panel Veri Analizi", Çankırı Karatekin Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 3(2), pp.18-33, 2013.
[34] İ. Göçer, S. Alataş and O. Peker, "Yatırım-Tasarruf İlişkisi: OECD Ülkeleri İçin Yeni Nesil Panel Eşbütünleşme Analizi", Dumlupınar Üniversitesi Sosyal Bilimler Dergisi, EYİ Özel Sayı, pp.59-78, 2013.
[35] D. Petreska and N. Mojsoska-Blazevsk, "The Feldsteın-Horıoka Puzzle And Transıtıon Economıes", Economıc Annals, 58(197), pp.23-45, 2013.

Vol. 3, No. 08; 2019

ISSN: 2456-7760

[36] G. Dursun and T. Abasız, "Feldstein-Horioka Puzzle in Turkey", Doğuş Üniversitesi Dergisi, 15(1), pp.45-63, 2014.
[37] W. Ma and H. Li, "Time-Varying Saving-Investment Relationship and The Feldstein-Horioka Puzzle", Economic Modelling, 53, pp.166-178, 2016.
[38] B. Tunçsiper and Ö. F. Biçen, "Feldstein-Horioka Hipotezinin Görünürde İlişkisiz Regresyon Yöntemiyle Analizi: Gelişen Ekonomiler (E7) Üzerine Bir İnceleme", Sosyal Ekonomik Araştırmalar Dergisi, 31, pp.348-362, 2016.
[39] C. Demir and R. Cergibozan, "Türkiye Ekonomisi İçin Feldstein-Horioka Hipotezinin Geçerliliği: Eşbütünleşme ve Markov Rejim Değişim Yaklaşımı", Ege Academic Review, 17(1), pp.89-103, 2017.
[40] R. F. Engle and C. W. J. Granger, "Cointegration and Error Correction: Representation, Estimation and Testing", Econometrica, 55(2), pp.251–76, 1987.
[41] S. Johansen, "Statistical Analysis of Cointegration Vectors", Journal of Economics Dynamic and Control, 12(2-3), pp.231–254, 1988.
[42] M. H. Pesaran, Y. Shin and R. J. Smith, "Bounds Testing Approaches to The Analysis of Level Relationships", Journal of Applied Econometrics,16(3), pp.289-326, 2001.
[43] S. Narayan and P. K. Narayan, "Determinats of Demand of Fiji's Exports: An Empirical Investigation", The Developing Economics, XLII-1, pp.95-112, 2004.
[44] V. Akel and S. Gazel, "Döviz Kurları ile BIST Sanayi Endeksi Arasındaki Eşbütünleşme İlişkisi: Bir ARDL Sınır Testi Yaklaşımı", Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 44, pp.23-41, 2014.
[45] G. De Vita and A. Abbott, "Are Saving and Investment Cointegrated? An ARDL Bounds Testing Approach", Economics Letters, 77, pp.293-299, 2002.
[46] P. K. Narayan and Smyth, "What Determines Migration Flows From Low-Income to High-Income Countries? An Empirical Investigation of Fiji-US Migration 1972–2001", Contemporary Economic Policy, 24(2), pp.332– 342, 2006.
[47] E. Karagöl, E. Erbaykal and H. M. Ertuğrul, "Türkiye'de Ekonomik Büyüme ile Elektrik Tüketimi İlişkisi Sınır Testi Yaklaşımı", Doğuş Üniversitesi Dergisi, 8 (1), pp.72-80, 2007.