DETERMINANTS OF THE CURRENT ACCOUNT BALANCE IN TURKEY: AN ARDL APPROACH

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ABSTRACT

The objective of this paper is to examine the theoretical and empirical linkage between current account deficits and a broad set of macroeconomic variables in Turkey. This paper employs the Auto Regressive Distributed Lag (ARDL) model to specify the determinants of the current account in Turkey between 1987 and 2009. Results indicate that inflation affects the current account balance positively, whereas growth, openness, oil prices, and appreciation of the real exchange rate cause the current account balance to deteriorate.After any shock, it takes four quarters for the current account balance to return to its long-run equilibrium level.

I. INTRODUCTION

The current account balance of an economy is an important indicator of its performance and has many significant roles in policymakers' analyses of economic growth and development. First, the current account balance is closely related to the level of the saving-investment ratio, which is one of the key factors for economic growth. Second, a country's current account balance mainly reflects the trade balance, which is the sum of domestic residents' transactions with the entire world in the markets for goods and services. Third, since the current account balance determines the evolution of a country's stock of net claims on the rest of the world, it represents the intertemporal decisions of that country's citizens. It also has implications for imbalances, especially in terms of accumulation of foreign debt that may not be sustainable. In this respect, the growing debt stock of a country matters because it requires trade surpluses in the future to pay it back. Consequently, economists are trying to explain the changes in the current account balances, to estimate their sustainable levels and look to cause required changes in the balance through policy actions (Aristovnik, 2007, p.1).

With the liberalization of many economies after the 1980s, differentiation of exchange rate regimes, technological improvements in the financial markets, and the globalization of the world, international capital flows have become more mobile and increased in magnitude. This has introduced new problems, such as more severe and frequent crises in developing countries. These crises have showed the need for a clear understanding of the factors underlying a country's current account position. Despite the relatively extensive body of theoretical literature on the subject, there are only a few studies that empirically analyze the effect of macroeconomic variables on the current account deficit. This lack of empirical evidence is surprising, given that the position of the current account is typically used as one of the main leading indicators for future behavior of an economy and is part of the everyday decision process of policymakers. The objective of this paper is to examine the theoretical and empirical linkage between current account deficits and a broad set of economic variables. Current account balance is associated with many components of the economy; hence, it has implications for economic growth, exchange rate, and competitiveness, as well as capital flows and some other macroeconomic variables.

The pattern of current account imbalances has received considerable attention in the economics literature for many years. However, the growth of current account deficits and financial crises in the last decades has caught the attention of policymakers and economists. Until recently, most empirical studies have dealt with the response of the current account balance to shocks in one specific determinant. A broad part of the literature consists of studies that specifically choose one structural parameter and analyze its effects on the current account: examples include demography in Kim and Lee (2008), inflation in Mansoorian and Mohsin (2005), inflation stabilization in Calvo (2007), interest rates in Boileau and Normandin (2003), exchange rate adjustments in Obstfeld and Rogoff (2005), exchange rate intervention in Mann (2004), terms of trade shocks in Kent and Cashin (2003), terms of trade shocks as Harberger-Laursen-Metzler effect in Obstfeld (1982), economic integration in Blanchard and Gravazzi (2002), financial development in Chinn and Ito (2007), capital mobility in Adalet and Eichengreen (2005) and Yan (2007), openness in Cavallo (2007), liberalization in Paulino (2007), and uncertainty in Ghosh and Ostry (1997).

Despite the great volume of work on the specific determinants of the current account, it is difficult to assess all of the factors jointly and compare their separate contributions. Thus, comprehensive empirical studies on the determinants of current account are quite scarce. An early attempt to provide a comprehensive cross-country study with a set of macroeconomic variables was performed by Debelle and Faruqee (1996). Following that, Calderon, Chong, and

Loayza (2000) with GMM, Chinn, and Prasad (2003) with OLS and FEM, Milesi-Ferretti and Razin (1998) with PROBIT and Özmen (2005) with OLS and GIVE have contributed to the literature by analyzing current account deficits in developing countries, Freund (2000) with OLS for high income countries, Gruber and Kamin (2007) with FEM for Asian countries, Kandil and Greene (2002) with VECM for the United States.

Specialized empirical studies on Turkey and its current account deficit problem began with a macroeconomic model-building paper by Eken (1990). Then, Yücel (2006) analyzed the determinants of the current account balance of Turkey with OLS, Erkılıç (2006) with OLS and VAR, and Akçay and Üçer (2006) with VAR. However, with the exception of Kandil and Greene (2002), all of the studies concerning the current account problems of Turkey or of other countries and regions in the world which dealt with the VAR analysis were only able to explain the effects of a few (generally two variables) macroeconomic variables on the current account. The first contribution of this paper is to analyze the current account problem in terms of a broad set of macroeconomic variables. Its second contribution is that the selection of variables was based on the special characteristics of the country being analyzed rather than on general theoretical arguments about the subject, which has not been done in the literature in general.

In the next section, theoretical arguments about the candidates for current account determinants for Turkey, together with the theories behind the variable selection, will be presented briefly. The third section consists of the data description, methodology, and empirical results, which are made up of bound test and ARDL analysis. The fourth and final section will present an evaluation of the current account position of Turkey and conclusions about possible determinants according to the empirical results.

II. THEORETICAL BACKGROUND

It is very difficult to assess all of the factors jointly and compare their separate contributions to the pattern of current account balances; no single theoretical model can capture the entire range of theoretical and empirical relationships, and there is no consensus about the pattern of current account dynamics (Gruber and Kamin, 2007). As Chinn and Prasad (2003, p. 48) affirm, "alternative theoretical models have different predictions about the factors determining current account balances and about the signs and magnitudes of the relationships between the current account fluctuations and these factors." Furthermore, determinants of the current account balance can vary from country to country, since countries have different characteristics, resources, economic structures, and economic policies according to their different needs. Thus, the specific characteristics of the economy being analyzed should be given more priority than standard econometric techniques in discovering the determinants of the current account balance. In this paper, the factors that contribute to the current account balance of Turkey will be determined by comparing the Turkish economy with those of some other regions in the world different aspects of which are similar to and different from Turkey. East Asian and Latin American countries were selected for comparison since they are especially known for their persistent current account surpluses and deficits, respectively. The figure below present annual data about current account balances for those regions in order to give insights about the structural similarities and differences between them.
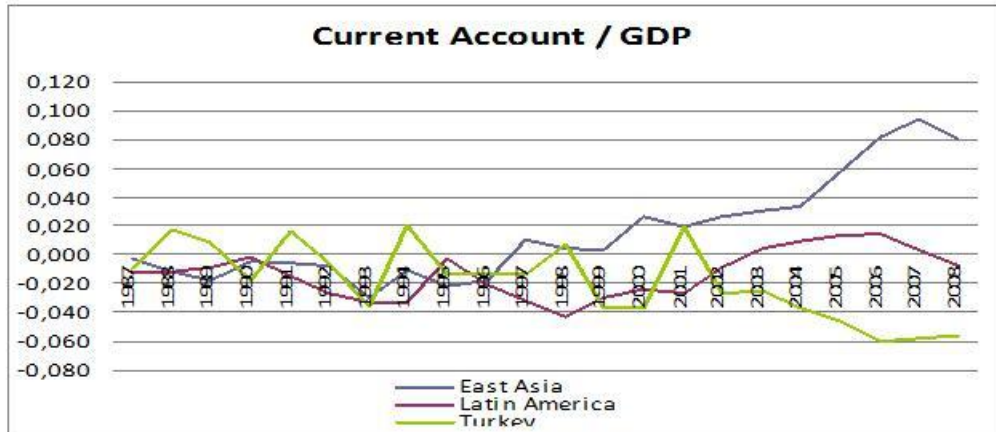
FIGURE 1. CURRENT ACCOUNT BALANCES OF TURKEY AND OTHER REGIONS

Source: World Bank; World Development Indicators and Global Development Finance

Since the 1980s, Turkey has implemented extensive trade liberalization programs either voluntarily or under pressure from international economic institutions—much like most Latin American countries. The purpose was to improve macroeconomic performance and especially to reach high growth rates with a better balance of payments. This is because neoclassical theory argues that opening up to international trade brings technology transfers and capital accumulation together with inflows, which are seen as a source of rapid growth for developing countries. However, it can be much easier for importers to respond to lower trade barriers than for domestic producers to switch resources from producing for home market to exports. According to the Economic Commission for Latin America and the Caribbean (ECLAC) framework, contrary to developed countries, for most developing countries income elasticity of imports is higher than income elasticity of exports. Thirlwall (1995) formalized this approach and applied it to a group of developing and developed countries to explain the differences in growth and balance of payment statistics. Vos, Taylor, and Barros (2002) proved this framework in their survey of balance of payment liberalization of some selected countries, showing that higher import propensities offset the growth impacts of export expansion for nearly all countries. Thus, it can be claimed that East Asia's export lead growth strategies cannot be implemented in all economies. This was especially what happened in Turkey. Together with growth, imports have increased much more than exports and trade balance, which deteriorated and then constrained growth. Hence, openness and growth may be appropriate candidates to explain the current account position of the Turkish economy.

A reasonable assumption of development theories is that, given a certain level of technical progress and the way available resources are allocated, the higher the savings and investment rates, the higher the economic growth. However, given developing countries' shortage of savings, foreign savings in the form of credit facilities and investments would be an excellent way of promoting such development. Thus, one growth strategy offered to developing countries can be the growth of foreign savings and opening a capital account strategy, since it is seen as natural for capital-rich countries to transfer their capital to capital-poor countries. Furthermore, foreign savings received by a country will automatically be transformed into productive investment. However, national income identity reveals that the current account can be defined as saving minus investment, hence it can be expected theoretically that increase in the investment level leads to a current account deficit. As a result, a relatively appreciated level of real exchange rate

and permanent current account deficits would be normal and advisable conditions for developing countries, provided that they were sufficiently moderate and did not lead to a balance of payment crisis. Nevertheless, as Bresser-Pereira and Gala (2009) found, this policy and the resulting exchange rate overvaluation have shown that capital inflows increased the consumption and foreign indebtedness, but not investment, in developing countries. Moreover, if an increase in investment is directed to the less productive sectors in which the return from that investment is lower than the cost of borrowing, or directed heavily to nontradable sectors which do not induce foreign exchange revenue, it will significantly impede the country's external debt repayments.

Whereas East Asian countries have used capital inflows mostly for investment in tradable sectors, in Turkey and Latin America those inflows and resulting exchange rate overvaluation have caused increased consumption (along with decreased savings) and current account deficits. Cross country empirical works support this fact that current account deficits are mainly due to fall in saving rather than increase in investment. Fall in savings are reflected in increasing consumption and import demand resulting with current account deficits. Freund (2000), by analyzing 25 industrial countries in terms of current account reversals, points out that decrease in the saving rate is one of the important reasons for the deterioration of the current account balance. Ülengin and Yentürk (2001) provided evidence for this argument in their analysis of the impact of foreign savings on aggregate spending categories in Turkey.

Real exchange rate contributes to the determination of prices for tradable goods. Depreciation in the local currency immediately increases the trade bill for predetermined imports and decreases the foreign exchange revenue which causes current account deficit. As the time passes, decrease in the value of the home currency in terms of others stimulates the volume of exports according to the law of demand. This worsening of the current account immediately after real currency depreciation and beginning to improve later, is called a J curve hypothesis. Nevertheless, the change in the export revenue and the import receipt depend on the elasticities. When the sum of import demand and export supply elasticities are greater than unity in absolute terms, i.e. Marshall-Lerner condition holds, depreciation of the real exchange rate improves the current account. High and persistent inflation also brought about increased savings due to the uncertainty of the macroeconomic environment and resulting lack of monetary credibility. In such an environment, people do not make many investments and tend increase their savings as a precaution, leading to a lower current account deficit. Hence, it can be concluded that investment and savings rates together with real exchange rates and inflation rates can serve as determinants of the current account in Turkey.

Turkey is an emerging country with a growing economy, and is challenged by a growing demand for energy. Turkey's energy consumption has grown and will continue to grow along with its economy. Balat (2009) states that more than 70 percent of energy use is imported since energy consumption is high, but domestic energy reserves and their production levels are low. Total primary energy production met only about one quarter of the total primary energy demand in recent years. Interestingly, Akçay and Üçer (2008) calculated that the non-energy current account balance has averaged almost zero for the last ten years. Since oil has the biggest share in total primary energy consumption, oil prices are a good candidate for the determinant of Turkey's current account position.

III. DATA AND METHODOLOGY

A. Data

Data were obtained from the Central Bank of the Republic of Turkey, the Turkish Statistical Institute, the Energy Information Administration, and the World Bank. Turkish lira values of all the variables are used. Variables in which the values are obtained as US dollar are transformed to Turkish lira by using the monthly averages of the exchange rate of the Central Bank of the Republic of Turkey, which are current account balance and oil prices. The frequency of the data is quarterly between 1987:4 and 2009:4. Since the observations for gross domestic product were only obtained for each quarter in the period, other high frequency variables have been transformed to the quarterly data. There are definitions and some summary statistics about the variables in the tables below.

TABLE 1 – DEFINITIONS OF THE VARIABLES

CA	Ratio of Current Account to GDP
GROWTH	Real Gross Domestic Product Growth Rate
INV	Ratio of Gross Capital Formation to GDP
SAV	Ratio of Saving to GDP
OPEN	Ratio of Exports and Imports to GDP
OIL	Growth of Brent Oil Prices in Europe
INF	Consumer Price Index Growth Rate (1978 based)
REER	Reel Effective Exchange Rate

Source: authors' calculation

TABLE 2 – DESCRIPTIVE STATISTICS FOR THE VARIABLES

	Mean	Median	Max.	Min.	Std. Dev	Skewness	Kurtosis	Jarque-Bera	Obs.
CA	-0,024	-0,023	0,053	-0,125	0,040	-0,272	2,689	1,455	89
GROWTH	0,017	-0,048	0,352	-0,249	0,178	0,207	1,507	8,903	89
INV	0,222	0,225	0,284	0,121	0,037	-0,516	2,943	3,954	89
SAV	0,191	0,188	0,346	0,105	0,041	0,704	4,288	13,509	89
OPEN	0,513	0,529	0,816	0,258	0,148	-0,020	1,923	4,310	89
OIL	0,037	0,024	1,311	-0,589	0,216	2,091	15,62	656,15	89
INF	0,106	0,114	0,419	-0,013	0,075	0,768	4,819	21,016	89
REER	1,266	1,189	1,920	0,850	0,274	0,625	2,375	7,250	89

Source: authors' calculation

B. Methodology and empirical results

First, all of the variables were adjusted seasonally using the X12 additive method. Seasonally adjusted components were used in the analyses. Then, the variables were checked for stationarity by using the Augmented Dickey-Fuller (ADF), Phillips-Perron (PP), Dickey-Fuller Generalized Least Square (DF GLS) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests. According to the test results, CA, GROWTH, OIL, and INF are stationary. INV, OPEN, and REER could become stationary after taking their first differences; SAV could become stationary once detrended. The test results are summarized in Table 3 below.

TABLE 3 – UNIT ROOT TEST STATISTICS FOR THE VARIABLES

	ADF		PP		DF GLS		KPSS	
	Trend and Intercept	Intercept	Trend and intercept	Intercept	Trend and intercept	Intercept	Trend and intercept	Intercept
CA	-4.20***	-2.94**	-4.41***	-3.04**	-3.26**	-2.79***	0.15°°	0.82°°°
GROWTH	-11.6***	-11.6***	-11.6***	-11.6***	-10.6***	-10.1***	0.03	0.07
INV	-2.14	-2.06	-2.05	-2.10	-2.09	-1.14	0.13°	0.45°
SAV	-4.05**	-2.14	-3.90**	-2.20	-3.19**	-1.09	0.08	0.88°°°
OPEN	-3.20*	-0.49	-3.04	-0.21	-2.68	0.23	0.07	1.12°°°
OIL	-9.84***	-9.86***	-9.90***	-9.92***	-9.89***	-9.54***	0.03	0.08
INF	-3.61**	-2.17	-7.12***	-4.14***	-3.65***	-1.28	0.22°°°	1.08°°°
REER	-3.29*	-1.49	-3.29*	-1.36	-3.26**	-0.80	0.22°°°	1.01°°°
ΔINV	-7.95***	-7.98***	-7.97***	-8.01***	-7.15***	-5.60***	0.05	0.10
DT(SAV)	-5.73***	-5.77***	-5.71***	-5.75***	-5.21***	-3.24***	0.03	0.03
ΔOPEN	-7.25***	-7.11***	-9.40***	-9.19***	-8.56***	-7.74***	0.06	0.11
ΔREER	-10.3***	-10.3***	-11.0***	-11.0***	-10.3***	-10.1***	0.03	0.04

* ، ** and *** denotes the rejection of the null hypothesis of unit root at 10% , 5% and 1% levels.
° ، °° and °°° denotes the rejection of the null hypothesis of stationary at 10% , 5% and 1% levels.
Δ denotes the first difference, DT denotes detrended.
Source: authors' calculation

In this section, a Vector Error Correction (VEC) setup was employed and an Auto Regressive Distributed Lag (ARDL) bounds testing approach was used both to specify the determinants of the current account empirically and to decide whether the empirical results support the theoretical findings in the former section about the current account behavior of the Turkish economy. An ARDL representation of the model is shown in Equation 1.

$$\Delta ca_t = c + \alpha_{1i} \sum_{i=1}^{n} \Delta ca_{t-i} + \alpha_{2i} \sum_{i=0}^{n} \Delta growth_{t-i} + \alpha_{3i} \sum_{i=0}^{n} \Delta inv_{t-i} + \alpha_{4i} \sum_{i=0}^{n} \Delta sav_{t-i}$$

$$+\alpha_{5i} \sum_{i=0}^{n} \Delta open_{t-i} + \alpha_{6i} \sum_{i=0}^{n} \Delta oil_{t-i} + \alpha_{7i} \sum_{i=0}^{n} \Delta inf_{t-i} + \alpha_{8i} \sum_{i=0}^{n} \Delta reer_{t-i}$$

$$+\delta_1 \begin{pmatrix} ca_{t-1} - \beta_1 growth_{t-1} - \beta_2 inv_{t-1} - \beta_3 sav_{t-1} - \beta_4 open_{t-1} - \beta_5 oil_{t-1} \\ -\beta_6 inf_{t-1} - \beta_7 reer_{t-1} \end{pmatrix} + \varepsilon_t$$

(1)

This representation allows us to analyze both the long-run equilibrium and the short-run adjustment phase. It starts with conventional unit root tests and continues with a Johansen (1988) cointegration test, if all of the variables are integrated of the same order. However, it can be seen from the above results that the variables in the empirical analysis are not integrated of same order. CA, GROWTH, OIL and INF are integrated of order zero (I(0)), whereas SAV, INV, OPEN and REER are integrated of order one (I(1)). Since it would be misleading to employ the Johansen cointegration test in this case, the ARDL bounds test proposed by Pesaran, Smith, and Shin (2001) was used.The choice of this test was based on the following considerations. First, unlike most of the conventional multivariate cointegration procedures, which are valid for large sample sizes, the bounds test is suitable for a study with a small sample size. Second, the bounds test does not impose restrictive assumptions that all of the variables under study must be integrated of the same order. Its asymptotic distribution for the F statistic is non-standard under the null hypothesis of no cointegration relationship between the examined variables, irrespective of whether the explanatory variables are purely I(0), I(1), or mutually cointegrated. Hence, the order of integration is no longer a sensitive issue and estimation can continue without performing the unit root tests. Since the error correction term in the ARDL does not have any restriction, the ARDL is actually an Unrestricted Error Correction Model:

$$\Delta ca_t = c + \alpha_{1i} \sum_{i=1}^{n} \Delta ca_{t-i} + \alpha_{2i} \sum_{i=0}^{n} \Delta growth_{t-i} + \alpha_{3i} \sum_{i=0}^{n} \Delta inv_{t-i} + \alpha_{4i} \sum_{i=0}^{n} \Delta sav_{t-i}$$

$$+\alpha_{5i} \sum_{i=0}^{n} \Delta open_{t-i} + \alpha_{6i} \sum_{i=0}^{n} \Delta oil_{t-i} + \alpha_{7i} \sum_{i=0}^{n} \Delta inf_{t-i} + \alpha_{8i} \sum_{i=0}^{n} \Delta reer_{t-i}$$

(2)

$$+\gamma_1 ca_{t-1} + \gamma_2 growth_{t-1} + \gamma_3 inv_{t-1} + \gamma_4 sav_{t-1} + \gamma_5 open_{t-1}$$
$$+\gamma_6 oil_{t-1} + \gamma_7 inf_{t-1} + \gamma_8 reer_{t-1} + \varepsilon_t$$

The bounds test is a Wald Test (or F test) in which the joint significance of γ coefficients for lagged variables is tested with F statistics calculated under the null. The distribution of the test statistics under the null is non-standard, in which critical values depend on the order of integration of variables involved. Thus, rather than using standard critical F statistic values, the upper (for I(1)) and lower (for I(0)) bounds of the F statistics presented by Peseran et. al. (2001)

are used. For a given significance level of ɣ, if the F statistic falls outside the critical bound, a conclusive inference can be made without considering the order of integration of the underlying regressors. If the F-statistic is lower than the lower critical bound, then the null hypothesis of no cointegration is accepted. If the F-statistic is higher than the upper critical bound, then the null hypothesis of no cointegration is rejected. In cases where the F statistic falls inside the lower and upper bounds, a conclusive inference cannot be made. As a first step in the ARDL model, the hypothesis below was tested for Equation 2:

$$H_0 : \gamma_1 = \gamma_2 = \gamma_3 = \gamma_4 = \gamma_5 = \gamma_6 = \gamma_7 = \gamma_8 = 0$$

$$H_1 : at\ least\ one\ of\ them\ is\ not\ zero$$

TABLE 4 – RESULTS FOR THE BOUNDS TEST FOR COINTEGRATION

k	N	F statistic	Upper (%1)	Lower (%1)	Upper (%5)	Lower (%5)	Decision
1	7	5.76	2.96	4.26	2.32	3.50	Cointegration

k is the lag length, n is the number of variables in the equation other than lags of dependent variable.
Source: authors' calculation

Testing for cointegration by using Equation 2 requires deciding the optimal lag length first. SIC and HQ select the optimal lag length as one, although AIC selects five. There is no autocorrelation in the residual term for the first four lags. Hence, optimal lag length was selected as one. The results of the test according to the one-lag model are given in Table 4. The hypothesis of no long-run relationship is rejected with both 5 and 1 percent significance levels since the F statistic is above the upper bound levels.

After ensuring the cointegration between the series, the next step is to determine the optimal lag length for ARDL model. Following the literature, AIC (Akaike Information Criterion) is used and the lag lengths of the model for long run equilibrium were determined as ARDL (5,2,3,0,0,2,0,2).

$$ca_t = c + \alpha_{1i} \sum_{i=1}^{5} ca_{t-i} + \alpha_{2i} \sum_{i=0}^{2} growth_{t-i} + \alpha_{3i} \sum_{i=0}^{3} inv_{t-i} + \alpha_{4i} \sum_{i=0}^{0} sav_{t-i}$$

$$+\alpha_{5i} \sum_{i=0}^{0} open_{t-i} + \alpha_{6i} \sum_{i=0}^{2} oil_{t-i} + \alpha_{7i} \sum_{i=0}^{0} inf_{t-i}\ \alpha_{8i} \sum_{i=0}^{2} reer_{t-i} + \varepsilon_t$$

$$(3)$$

Resulting long run relationship is rearranged in which obtained from the estimation of equation 3 with Ordinary Least Square (OLS) as;

$$ca_t = -0,301 growth - 0,223 inv - 0,005 sav - 0,035 open$$

$$-0,034 oil + 0,185 inf - 0,049 reer$$

$$(4)$$

The impacts of the GDP growth rate, investment, openness, oil prices, and real exchange rate on the current account balance are negative, whereas the impact of inflation is positive, as expected theoretically. However, the impact of saving is not in line with theoretical arguments.

Next, short-run relationships were estimated by OLS using Equation 5 below. An ARDL (2,0,1,0,0,1,3,2) specification is used in which AIC is minimized.

$$\Delta ca_t = c + \alpha_{1i} \sum_{i=1}^{2} \Delta ca_{t-i} + \alpha_{2i} \sum_{i=0}^{0} \Delta growth_{t-i} + \alpha_{3i} \sum_{i=0}^{1} \Delta inv_{t-i} + \alpha_{4i} \sum_{i=0}^{0} \Delta sav_{t-i}$$

$$(5)$$

$$+\alpha_{5i} \sum_{i=0}^{0} \Delta open_{t-i} + \alpha_{6i} \sum_{i=0}^{1} \Delta oil_{t-i} + \alpha_{7i} \sum_{i=0}^{3} \Delta inf_{t-i} + \alpha_{8i} \sum_{i=0}^{2} \Delta reer_{t-i} + \delta_1 ECT_{t-1} + \varepsilon_t$$

As the results indicate, when the current account balance deviates from its long-run equilibrium level as a response to any shock in the explaining variables, it returns to the equilibrium level quite quickly. The coefficient (λ_1) of the lagged Error Correction Term (ECT$_{t-1}$) is -0.231; that is obtained from the relationship found above. This means that after any shock, it takes four periods for the current account balance to return to its long-run equilibrium level.

IV. CONCLUSION

According to the results of the ARDL model, the impacts of growth, inflation, and investment are higher than the other variables. The effects of savings, openness, oil prices, and real exchange rate are not significant and are so small in magnitude that the impact of savings in particular can be considered negligible. Nevertheless, the effect of savings on the current account balance seems to conflict with the theory as being negative in this framework. According to the estimates, when the growth rate of the economy increases by 10 percent, the current account deficit–to–GDP ratio increases 3 percent. When the investment rate increases 10 percent, the ratio increases 2.2 percent. When the savings rate increases 10 percent, the ratio increases 0.05 percent. When the openness rate increases 10 percent, the ratio increases 0.35 percent. When oil prices increase 10 percent, the ratio increases 0.34 percent. When the inflation rate increases 10 percent, the ratio decreases 1.8 percent, and when the real exchange rate increases 10 percent, the ratio increases 0.49 percent. Evaluation of the coefficient of the Error Correction Term gives insights about the speed of adjustment mechanism; -0.231 means that any deviation in the current account balance is eliminated almost in a year.

The results regarding the impact of investment on the current account in the long-run equation justify the theoretical evaluations made about the variable. It can be argued that an increase in investment worsens the current account in the first instance, but if the investment is directed to the most profitable and tradable sectors, it may improve the current account balance in the future. It is an indicator for the sustainability of the deficits through increasing productive capacity and future income. A negative coefficient of the long-run relationship between investment and current account balance demonstrates that investment decisions in Turkey are not being made according to profitability or sustainability criteria and are far from being rational. This can be explained by the investment attitudes of the households and institutions in Turkey. The private sector prefers mostly the risky investment projects because of the high interest rates; it only invests in the projects that offer a higher rate of return than the interest rates with high risk. In addition, most government investments disregard profitability criteria and consider the voting potential of the investment sector or district. Hence, investment that is directed to the

less productive or nontradable sectors cannot contribute much to the recovery of the current account balance in the long run.

In addition to investment, growth is another very influential negative factor on the current account balance in the long run. This result validates the theory about the structural condition of the Turkish economy which states that growth depends on imports. As the economy grows imports increase more than exports, which results in a current account deficit—since the income elasticity of imports (2.24) is higher than the income elasticity of export (1.99) for Turkey as a developing country (Akal 2010). At the end of the 1980s, when the policy of decreasing costs by wages to obtain comparative advantage came to an end and high tax rates were imposed in all categories of production, imports emerged as a way of decreasing costs, since importing most of the intermediate product was cheaper than domestic production. While imports were growing faster than GDP, the share of industrial production in Turkey's GDP decreased, especially for the last decade. As imports were substituted for domestic production, growth became highly dependent on imports. Hence, the Turkish economy has to endure the current account deficits caused by imports in order to grow.

Inflation emerges as the only factor that influences the current account positively; it has significant impacts on both savings and investment decisions made by households and firms. Since the period under analysis in the Turkish economy was known for its high and persistent inflation rates, the considerable effect of inflation is not surprising. People make investment and savings decisions according to the expected high and long-lasting inflation rates.

The impact of openness on the current account balance seems to be limited. However, the openness rate of the Turkish economy rose sharply during the period of our analysis, even while the country had large current account deficits. This may seem like a contradiction, but it can be argued that openness affects the current account only indirectly. Openness is defined as the totality of import and export rates to the GDP. Only one part of the increase in the openness rate deteriorates the current account: imports. The difference in the growth rates of imports and exports affects the current account negatively. Even though the increase in the imports rate is more than the exports, the difference between them may not be enough for openness to worsen the current account balance. Oil prices and real exchange rate have common features in that both of them contribute to the price formation of tradable goods. Since prices can be considered important at the time trade is realized, they do not seem to have long term effects on the current account balance.

APPENDIX:

TABLE A1: LAG LENGTH SELECTION FOR BOUND TEST IN EQUATION 2

K	1	2	3	4	5
Serial Correlation LM test (prob.)	0.64*	0.54*	0.31*	0.59*	0.05
AIC	-5.424	-5.435	-5.444	-5.332	-5.456**
SIC	-4.744**	-4.522	-4.294	-3.885	-3.824
HQ	-5.150**	-5.067	-4.981	-4.750	-4.800

* denotes rejection of the hypothesis of no serial correlation in the residual term with 5 level of significance.
**denotes optimal lag length selected by that criteria
Source: authors' calculation

TABLE A2: LONG RUN COEFFICIENTS (EQUATION 3)

Variable	Coefficient	Std. Error	P value
Constant	0.060	0.049	0.225
CA(-1)	0.401	0.117	0.001
CA(-2)	-0.091	0.111	0.417
CA(-3)	0.181	0.110	0.105
CA(-4)	-0.119	0.117	0.315
CA(-5)	-0.028	0.099	0.778
GROWTH	-0.034	0.060	0.566
GROWTH(-1)	-0.110	0.054	0.047
GROWTH(-2)	-0.051	0.053	0.333
INV	-0.208	0.173	0.234
INV(-1)	-0.206	0.238	0.390
INV(-2)	0.115	0.254	0.652
INV(-3)	0.152	0.187	0.419
SAV	-0.003	0.112	0.976
OPEN	-0.023	0.020	0.261
OIL	0.007	0.010	0.431
OIL(-1)	-0.001	0.009	0.858
OIL(-2)	-0.027	0.009	0.003
INF	0.121	0.050	0.020
REER	-0.044	0.020	0.037
REER(-1)	-0.035	0.026	0.172
REER(-2)	0.049	0.022	0.031

Source: authors' calculation

TABLE A3: DIOGNASTIC CHECKS FOR THE LONG RUN ESTIMATION

TEST	Statistic	Probability
Breusch-Godfrey Serial Correlation LM Test	0.460	0.632
ARCH Test	0.244	0.622
White Heteroskedasticity Test	1.464	0.124
Jarque-Bera	3.076	0.214
Ramsey RESET Test	0.910	0.343
R Squared	0.872	
Akaike	-5.355	

Source: authors' calculation

TABLE A4: SHORT RUN COEFFICIENTS (EQUATION 5)

Variable	Coefficient	Std. Error	P value
Constant	0.023	0.006	0.001
D(CA(-1))	-0.075	0.105	0.477
D(CA(-2))	-0.181	0.099	0.072
D(GROWTH)	-0.001	0.038	0.975
D(INV)	-0.006	0.169	0.969
D(INV(-1))	-0.286	0.159	0.076
D(SAV)	-0.013	0.131	0.920
D(OPEN)	-0.191	0.079	0.018
D(OIL)	0.014	0.007	0.066
D(OIL(-1))	0.020	0.007	0.009
D(INF)	0.179	0.048	0.000
D(INF(-1))	0.032	0.065	0.615
D(INF(-2))	0.006	0.056	0.905
D(INF(-3))	-0.015	0.039	0.697
D(REER)	-0.067	0.021	0.002
D(REER(-1))	-0.078	0.024	0.002
D(REER(-2))	-0.005	0.024	0.812
ECT(-1)	-0.231	0.073	0.002

Source: authors' calculation

TABLE A5: DIOGNASTIC CHECKS FOR THE SHORT RUN ESTIMATION (EQUATION 5)

TEST	Statistic	Probability
Breusch-Godfrey Serial Correlation LM Test	1.290	0.282
ARCH Test	0.788	0.377
White Heteroskedasticity Test	0.669	0.820
Jarque-Bera	3.735	0.154
Ramsey RESET Test	5.935	0.017
R Squared	0.595	
Akaike	-5.284	

Source: authors' calculation

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ODREDNICE BILANCE TEKUĆEG RAČUNA U TURSKOJ: ARDL PRISTUP

Sažetak: Cilj ovog rada je istražiti teorijske i empirijske poveznice između deficita tekućeg računa i velikog broja makroekonomskih varijabli u Turskoj. Rad koristi model Autoregresijskog distribuiranog pomaka (ARDL) za specifikaciju odrednica tekućeg računa u Turskoj od 1987. do 2009. Odabir skupa objašnjavajućih varijabli motiviran je postojećim debatama o ponašanju tekućeg računa, pod uvjetom da postoji stabilna bazna struktura koja tekući račun povezuje s tim makroekonomskim varijablama. Rezultati ukazuju na to da inflacija pozitivno utječe na bilancu tekućeg računa, dok rast, otvorenost, cijene nafte i aprecijacija realne tečajne stope uzrokuju pogoršanje bilance tekućeg računa. Nakon bilo kojeg šoka potrebna su četiri kvartala da se bilanca tekućeg računa vrati na nivo dugoročne stabilnosti.

Ključne riječi: tekući račun, bilanca plaćanja, ARDL, granični test.