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THE ASYMMETRIC EFFECTS OF THE CURRENT ACCOUNT BALANCE ON INFLATION: A NARDL APPROACH FOR TURKISH ECONOMY

Abstract

Purpose: We aim to highlight the asymmetric relationship between the current account balance and inflation via the nonlinear boundary test approach for the period 2002:01-2020:10. We analyze the Turkish economy because Turkey has started implementing a new economic policy, which mainly aims to control inflation by maintaining a current account surplus. As a result, the primary purpose of this research is to determine the influence of the current account balance on local inflation, as well as to assist in the formulation of appropriate economic policies to minimize any negative effects on the local economy.

Methodology: The nonlinear boundary test approach (NARDL) is used for the 2002:01-2021:10 data period due to the possibility of long-term nonlinear relations between the inflation rate and the current account balance.

Results: According to the analysis findings, there is a long-term cointegration relationship between variables. It is deduced that while there exists long-term asymmetry between the current account balance and inflation, the coefficients themselves are not statistically significant, and magnitudes are negligible. However, the effect of dollarization and the lagged values of the CPI on current inflation are statistically significant and substantial, which underpins the importance of inflation inertia, inflation expectations, and the pass-through effect.

Conclusion: With a view to stabilizing inflation, policymakers should prevent dollarization by taking the necessary measures.

Keywords: Current account balance, NARDL, asymmetric effect

1. Introduction

The movement of macroeconomic variables is dominated by the performance of the balance of payments (BOP) and all of its components. Changes and imbalances in the BOP items impact the economy's internal balance. The trade balance, for example, is one of the most critical components of the current account, which is an integral part of the BOP. International trade plays a vital role in most international economies through import and export activities. The commodities, labor, monetary, and financial markets are all affected by these activities.

Because of the impact of imported inflation on domestic price levels, an increase in the trade imbalance produced by growing imports might lead to higher domestic inflation. The current account has an impact on more than just the trade balance. Other aspects of the current account, such as current transfers and the balance of services, impact the local economy. Current transfers, primarily in the form of foreign aid and worker remittances, assist in providing the required liquidity to fund economic development plans and manufacturing projects and meet consumer wants, all of which contribute to economic growth.

In general, the current account deficit has two effects on prices: on the one hand, it reduces inflationary pressure by containing some of the excess demand through increased imports. On the other hand, it exacerbates inflationary risks by causing the local currency to depreciate. The final effect, however, is determined by which effect is stronger. Suppose the Marshall-Lerner condition, which is the absolute sum of a country's export and import demand greater than one, is satisfied. In that case, the indirect effect on the quantity of trade will exceed the direct impact of the country paying a higher price for its imports and receiving a lower price for its exports. In other words, if the condition holds, then when a country's currency depreciates (e.g., it takes fewer Turkish lira to buy a dollar), its balance of trade will improve. Turkey is a growing country with a free market economy. Because of its openness, the country is subject to external shocks. Turkey primarily relies on imports to support economic growth and export activities because raw materials, intermediate goods, and investment goods account for a large portion of imports. Turkey has also started implementing a new economic policy, which mainly aims to control inflation by maintaining the current account surplus. As a result, the primary purpose of this research is to determine the influence of the current account balance on local inflation and assist in the formulation of appropriate economic policies to minimize any negative effects on the local economy.

The main contribution of our paper relative to existing papers is that this is the first paper that studies the relationship between the current account balance and inflation via the NARDL model. The study also provides recommendations to policymakers about whether the economy achieves long-term price stability by maintaining the current account surplus.

The paper proceeds as follows. Section 2 briefly describes the relevant literature. Section 3 explains the theoretical framework and methodology. Section 4 describes the data and presents empirical analysis. Section 5 concludes the study with some policy implications.

2. Literature review

Researchers generally studied the components of the balance of payments or inflation separately. To the best of our knowledge, two papers combine these two components. In the first paper, Alawin and Oqaily (2017) discovered that the current account deficit positively impacts inflation for Jordan's economy in the short run. However, an increase in the current account deficit affects domestic inflation negatively in the long run. In the second paper, Akcay and Eratas (2011) analyzed the relationship between the current account deficit and inflation for Brasil, Russia, India, China, and Turkey for the period 1993-2011 by using a panel causality test. They concluded that the current account deficit and inflation are cointegrated in these countries, which means that they move together in the long run. They also found unidirectional causality from the current account deficit to inflation.

There follows a summary of some of the studies that have analyzed these two components separately:

Hepsağ (2009) analyzed the relationship between inflation and unemployment in Turkey for the short and long term using the data for the period 2000Q1-2007Q3 by employing the boundary test method. They discovered a relationship between inflation and unemployment in the short run, but there is a cointegration relationship between these two variables in the long run. Based on this result, they stated that in the short run, past inflation rates, not unemployment, have an effect on inflation in the current period. In contrast, unemployment impacts current inflation in the long run.

Karacor et al. (2009) analyzed the relationship between inflation and growth in Turkey using quarterly data for the period 1990-2005 by employing cointegration and causality tests. At the end of the study, they highlighted a negative relationship between inflation and growth in Turkey.

Dugru (2020) investigated the interaction between the current deficit and the budget deficit for the period 2009Q1:2020Q2 in Turkey. To that end, she applied cointegration analysis and the bound test based on the Autoregressive Distributed Lag Model (ARDL) approach. As a result of the study, she came to the conclusion that the direction of the relationship between two variables is negative in the long term and positive in the short term.

Çeştepe et al. (2014) examined the causality between current deficits and foreign debts in the period 1980-2013 via the Granger causality test. They found that there is bidirectional causality between current deficits and foreign debt.

Afsal et al. (2018) studied the relationship between inflation and nominal interest rates for the Turkish economy in the period of 2004:01-2018:05 via the nonlinear boundary test approach (NARDL). They found that a long-term asymmetric cointegration relationship exists between variables. Although inflation and nominal interest rates have a symmetrical relationship in the short run, they have an asymmetric relationship in the long run.

3. Methodology

The most frequently used cointegration tests in the literature are the two-stage Engle-Granger method (Engle & Granger, 1987) based on the error term and the systems approach based on Johansen (1988) and the Johansen and Juselius (1990) method. For these methods to be applied, all variables in the model should not be stationary at the level, which is denoted by I(0), but in their first difference (Pesaran et al., 2001). The inability to apply the cointegration method to series with different cointegration degrees is eliminated by the ARDL method developed by Pesaran and Shin (1995) and Pesaran et al. (2001). The advantage of this approach is to investigate whether there is a cointegration relationship between the variables, regardless of the degree of integration. In addition, the bound test provides robust results for small or limited sample sets.

Shin et al. (2014) developed the ARDL model further and introduced the NARDL model to the literature by considering the asymmetrical relationships. The NARDL approach is a new modeling approach to detect nonlinear relationships by highlighting the short- and long-term asymmetries between the relevant variables. This approach emphasizes short- and long-term asymmetrical relationships between variables and determines the effects of negative and positive changes in the explanatory variables on the dependent variable.

The linear ARDL cointegration model developed by Pesaran and Shin (1999) and Pesaran et al. (2001) is generally defined follows:

$$\Phi(L)y_t = \alpha_0 + \alpha_1 w_t + \beta'(L)x_{it} + u_t \,, \tag{1}$$

where $\Phi(L) = 1 - \sum_{i=1}^{\infty} \phi L^i$ and $\beta(L) = \sum_{k=1}^{\infty} \beta_k L^k$, (L) is the lag operator, w_t is a vector containing deterministic variables such as seasonal dummies, trend, or other exogenous variables with constant lag.

Asymmetric cointegration regression, which is used in this study and based on Schorderet (2003) and Shin et al. (2014), is defined as follows:

$$y = \beta^+ x_t^+ + \beta^- x_t^- + u_t \,, \tag{2}$$

where y and x are scalar I(1) variables, β^t and β^- are long-term parameters, and x is decomposed as $x_t = x_0 + x_t^+$, where x_t^+ and x_t^- are the partial sum processes of positive and negative changes in x:

$$x_t^+ = \sum_{j=1}^{t} \Delta x_j^+ = \sum_{j=1}^{t} \max(\Delta x_j, 0), x_t^- = \sum_{j=1}^{t} \Delta x_j^- = \sum_{j=1}^{t} \min(\Delta x_j, 0) \tag{3}$$

When equation (2) is associated with the ARDL(p, q) model, the following asymmetric error correction model (AECM) is obtained:

$$\Delta y_t = \rho y_{t-1} + \theta^+ x_{t-1}^+ + \theta^- x_{t-1}^- + \sum_{j=1}^{p-1} \varphi \Delta y_{t-j}$$
$$+ \sum_{j=0}^{q} \left(\pi_j^+ \Delta x_{t-j}^+ + \pi_j^- \Delta x_{t-j}^-\right) + e_{t,}$$

$$j=1\ldots p \,, \tag{4}$$

where $\theta^+ = -\rho\beta^+$ and $\theta^- = -\rho\beta^-, \pi_t^+ = -\beta^+\varphi_i + \psi_{2i}, \pi_t^- = -\beta^-\varphi_i + \psi_{2i}$.

In equations (3) and (4), "t" indicates time, "i" indicates the delay of the series, and "j" indicates for which period the cumulative total is taken. Although the NARDL method, which considers the asymmetric cointegration relationship, is not used when the variables are I(2), it allows cointegration analysis regardless of whether the variables are I(0) and I(1), as in the ARDL approach (Shin et al., 2014). Therefore, in the first stage, stationarity analyses are performed for the variables in the model, and it is decided to what degree the variables are integrated. After the stationarity tests, the following stages are followed briefly in the NARDL cointegration approach. First, equation (4) is estimated by the least squares method. Later, the null hypothesis stating $\rho=\theta^{+}=\theta^{-}=0$ is tested via the F-test developed by Pesaran et al. (2001) and Shin et al. (2014). In this way, it is investigated whether there is a long-term relationship between the levels of y_t, x_t^+ and x_t^-. In the next step, long-term symmetry, which is ($\theta=\theta^{+}=\theta^{-}$), and short-term symmetry, which is $\pi_i^+ = \pi_i^-$ for all i or $\sum_{i=0}^{q} \pi_i^+ = \sum_{i=0}^{q} \pi_i^-$, are tested using the Wald test. Suppose it is concluded that symmetry does not exist between y_t, x_t^+ and x_t^-. In that case, by using equation (4) in the last step, the asymmetric dynamic multiplier effects of a one-unit change in x_t^+ and x_t^- on the dependent variable y are obtained via the following equations:

$$m_h^+ = \sum_{j=0}^{h} \frac{\partial y_{t-j}}{\partial x_t^+}, m_h^- = \sum_{j=0}^{h} \frac{\partial y_{t-j}}{\partial x_t^-}, \text{h} = 0,1,2\ldots$$

4. Empirical application

4.1 Model and data set

The empirical model used in this paper is determined based on the existing models examining the effect of the current account balance on the inflation rate. In addition to the current account balance, control variables such as the real effective exchange and the dollarization rate are also added to the model.

Before moving on to the NARDL model, the cointegration relationship between the variables can be shown with the linear model below:

$$CPI_t = \beta_0 + \beta_1 CAD_t + \beta_2 DOL_t + \beta_3 RER_t + \varepsilon_t,$$

where ε_t denotes the error term of the model, CPI_t represents inflation, CAD_t is the current account balance, D_t is the dollarization rate, and RER_t is the CPI-based real effective exchange rate. In the model, while β_0 shows the constant, β_1, β_2 and β_3 represent the coefficients for the current account deficit, the dollarization rate and the real effective exchange rate, respectively.

In this study, monthly time series for Turkey are used for the period 2002:12-2021:10. The variables include the inflation rate, the current account balance, the real effective exchange rate (RER), and the dollarization rate. The annual rate of change of the Consumer Price Index (CPI) is used for the inflation rate. The CPI-based real effective exchange rate is used for the exchange rate (RER), and the share of FX deposits in total deposits is used for the dollarization rate. All data were taken from the Central Bank of Turkey - Electronic Data Distribution System (EVDS).

4.2 NARDL exercise

The study starts with performing unit root tests of the variables. After detection of the fact that the variables are stationary at their first differences, the cointegration test was carried out with the ARDL method. The most commonly used methods for testing the stationarity level of series in practice is the Augmented Dickey Fuller (ADF) test (Dickey & Fuller, 1981). In addition to ADF, the Zivot-Andrews (ZA) (Zivot & Andrews, 1992) structural break unit root test was also applied, which considers structural breaks in the series.

In the null hypothesis of the ADF and ZA tests, it is argued that the series contains the unit root as opposed to the alternative hypothesis that the series is stationary.

When the ADF and ZA unit root test results in Table 1 are examined, it is seen that the other variables, except for the Current Account Balance (CAB) variable, are not stationary at the level and contain a unit root. However, it is found that Dollarization (DOL), Inflation (CPI), and Real Effective Exchange Rate (RER) variables become stationary when first-order differences are taken into account. According to the ADF test results, all variables are stationary in I(1). Since the extended Dickey-Fuller test ignores structural breaks, the Zivot-Andrews test is also applied. According to the ZA unit root test, only the CAB variable is stationary at the level similar to the ADF test. Although the other variables are not stationary at the level, all variables are stationary when their first difference is taken into account. In addition, according to the ZA structural break unit root test, the structural break dates of the CAB, DOL, CPI, and RER variables are 2018m06, 2007m05, 2016m08, and 2006m07, respectively. The feature of the NARDL method used in the study is that it allows examining whether there is a cointegration relationship between variables with different degrees of integration (except I(2)) without considering the degrees of stationarity of the variables. According to the ADF and ZA unit root test results, the NARDL method can be applied. The reason is that while the CAB variable is stationary at the level, the other variables become stationary when their first difference is taken into account.

Table 1 ADF and ZA unit root test results

Variables	ADF test statistics		ZA test statistics		Structural break dates	Result
	Level values	First difference values	Level values	First difference values		
INFLATION	4.93	-4.85	-1.55	-6.93	2016m08	I(1)
	$t_{1\%}$=-3.47	$t_{1\%}$=-3.47	$t_{1\%}$=-4.94	$t_{1\%}$=-4.94		
	$t_{5\%}$=-2.87	$t_{5\%}$=-2.87	$t_{5\%}$=-4.44	$t_{5\%}$=-4.44		
	$t_{10\%}$=-2.57	$t_{10\%}$=-2.57	$t_{10\%}$=-4.19	$t_{10\%}$=-4.19		
CURRENT ACCOUNT BALANCE	-3.65	-3.18	-5.67	-9.14	2018m06	I(0)
	$t_{\%1}$=-3.47	$t_{\%1}$=-3.47	$t_{1\%}$=-4.94	$t_{1\%}$=-4.94		
	$t_{\%5}$=-2.87	$t_{\%5}$=-2.87	$t_{5\%}$=-4.44	$t_{5\%}$=-4.44		
	$t_{10\%}$=-2.57	$t_{10\%}$=-2.57	$t_{10\%}$=-4.19	$t_{10\%}$=-4.19		
DOLLARIZATION	-1.35	-12.3	-3.33	-9.2	2007m05	I(1)
	$t_{1\%}$=-3.47	$t_{1\%}$=-3.47	$t_{1\%}$=-4.94	$t_{1\%}$=-4.94		
	$t_{5\%}$=-2.87	$t_{5\%}$=-2.87	$t_{5\%}$=-4.44	$t_{5\%}$=-4.44		
	$t_{10\%}$=-2.57	$t_{10\%}$=-2.57	$t_{10\%}$=-4.19	$t_{10\%}$=-4.19		
REEL EFFECTIVE EXCHANGE RATE	-0.47	-11.68	-3.75	-8.33	2006m07	I(1)
	$t_{1\%}$=-3.47	$t_{1\%}$=-3.47	$t_{1\%}$=-4.94	$t_{1\%}$=-4.94		
	$t_{5\%}$=-2.87	$t_{5\%}$=-2.87	$t_{5\%}$=-4.44	$t_{5\%}$=-4.44		
	$t_{10\%}$=-2.57	$t_{10\%}$=-2.57	$t_{10\%}$=-4.19	$t_{10\%}$=-4.19		

Source: The Turkish Statistical Institute and the Central Bank of the Republic of Turkey - Electronic Data Delivery System

To have a robust and reliable estimate, the test of endogeneity is conducted by using the methodology proposed by Clive Granger. The Granger causality test, which forms the basis of causality analysis, is defined as x is the Granger cause of y if the history of a random x variable provides a relatively better prediction of the future of a random y variable. The first condition to apply this test is to have a stationary time series. To test the null hypothesis that x does not Granger-cause y, one first finds the proper lagged values of y to include in a univariate autoregression of y:

$$y_t = a_0 + a_1 y_{t-1} + a_2 y_{t-2} + \cdots + a_m y_{t-m} + \epsilon_t.$$

Next, autoregression is augmented by including the lagged values of x:

$$y_t = a_0 + a_1 y_{t-1} + a_2 y_{t-2} + \cdots + a_m y_{t-m} + b_1 x_{t-1} + b_2 x_{t-2} + \cdots + b_p x_{t-m} + \epsilon_t,$$

where y and x denote the first difference of the current account balance and inflation, respectively. If all lagged values of x that are individually significant according to their t-statistics provided that collectively they add explanatory power to regression according to an F-test, then one holds all lagged values of x in regression. The null hypothesis that x does not Granger-cause y is accepted if and only if no lagged values of x are retained in regression. This methodology is applied to our data. First, the proper lag length is determined from an unrestricted VAR model, whose result is displayed in the Appendix, with the help of the Akaike information criterion, and it is chosen as 6. The results regarding Granger causality are presented in Table 2. The Granger causality test results indicate that the null hypothesis that inflation does not Granger-cause the current account balance can not be rejected. These results provide evidence that the current account balance is exogenous and no causal connection is present from inflation to the current account balance.

Table 2 Granger-causality test results

Dependent Variable: D(CURRENT ACCOUNT BALANCE)	F-test	df	Prob.
D(CPI)	6.19	6	0.40
D(REAL EFFECTIVE EXCHANGE RATE)	4.58	6	0.59
D(DOLLARIZATION)	9.49	6	0.14

Source: The Turkish Statistical Institute and the Central Bank of the Republic of Turkey - Electronic Data Delivery System

Thus, to determine the cointegration relationship between the series that are stationary when the first difference is taken into account, the cointegration test is performed via the following unrestricted error correction model with three different independent variables. The results are presented in Table 3.

$$\Delta CPI_t = \alpha_0 + \sum_{i=1}^{p} b_i \Delta CPI_{t-i} + \sum_{i=0}^{p} b_i \Delta CAD_{t-i} + \sum_{i=0}^{q} c_i \Delta DOL_t + \sum_{i=0}^{q} c_i \Delta RER_t + \phi_1 CPI_{t-1} + \phi_2 CAD_{t-1} + \phi_3 DOL_{t-1} + \phi_4 RER_{t-1} + e_t \quad (5)$$

According to the linear ARDL model estimation result in Table 3, since the F-value is below the upper critical limit value of Pesaran et al. (2001) in 1% and 5% levels, the null hypothesis that there is cointegration between the dependent avariable and the estimators can not be rejected.

Table 3 ARDL and NARDL model cointegration test results

Dependent Variable	F statistics	Asymptotic Critical Values				Result
		1%		5%		
		I(0)	I(1)	I(0)	I(1)	
Linear ARDL (4,0,0,4) Model	$F_{PSS\text{-}ARDL}$= 8.910	3.74	5.06	2.86	4.01	Cointegration exists
NARDL Model	$F_{PSS\text{-}NARDL}$= 5.490					Cointegration exists

Source: The Turkish Statistical Institute and the Central Bank of the Republic of Turkey - Electronic Data Delivery System

Although the ARDL model can be used to analyze the relationship between the current account balance and inflation, we opted for using the NARDL model developed by Shin et al. (2014) because it allows the analysis of the short-run and long-run asymmetric response of each of the CAD, DOL, and RER to the CPI. With this methodology, the positive and negative partial sums of the exogenous variable *CPI*, which are InCPI_t^+ and lnCPI_j^-, are decomposed as increases and decreases and are obtained using the following equation:

$$CPI_t^+ = \sum_{j=1}^{t} \Delta CPI_j^+ = \sum_{j=1}^{t} \max(\Delta CPI_j, 0) \text{ and } CPI_t^- = \sum_{j=1}^{t} \Delta CPI_j^- = \sum_{j=1}^{t} \min(\Delta CPI_j, 0). \quad (6)$$

Extending the linear ECM model shown in equation (5) by adding short-term and long-term asymmetries, the following NARDL model, which is developed by Shin et al. (2014), is obtained.

$$\Delta CPI_t = c_0 + \rho CPI_{t-1} + \theta_1^+ CAD_{t-1}^+ + \theta_1^- CAD_{t-1}^- + \phi DOL_{t-1} + \psi RER_t + \sum_{i=1}^{p-1} \varphi_i \Delta CPI_{t-i} + \sum_{i=0}^{q} \pi_{1,i}^+ \Delta CAD_{t-i}^+ + \sum_{i=0}^{q} \pi_{1,i}^- \Delta CAD_{t-i}^- + \sum_{i=0}^{q} \phi_i \Delta DOL_{t-i} + \sum_{i=0}^{q} \psi_i \Delta RER_{t-i} + t + e_t \quad (7)$$

The + and – superscripts shown in equation (7) indicate positive and negative partial sums calculated by the decomposition method in equation (6). Equation (7) tests the existence of the cointegration relationship between CPI and the positive and negative elements of CAD, DOL, and RER. In other words, equation (7) shows the existence of asymmetries both in the short run and in the long run, or only in the long run or short run. Equation (7) also corrects for the weak endogeneity of any nonstationary explanatory variable, and ensures that the choice of an appropriate lag structure will free the model from any residual correlation (Olowofeso et al., 2021). The existence of a long-term cointegration relationship applied to this model is determined by testing the null hypothesis that the lagged level coefficients of the variables are collectively equal to zero. In other words, the null hypothesis stating that the coefficients in front of the CPI_t, CAD_t^+, CAD_t^-, DOL_t and RER_t variables are equal to zero $(\rho = \theta_1^+ = \theta_1^- = \phi = \psi = 0)$ is tested with the F-test. The first row in equation (7), which is used to evaluate the bound test, highlights the long-term relationship. The second line contains the lags of the asymmetric CAD terms in the first difference, which tests short-run asymmetry. Short-term asymmetry is tested in both strong and weak form. Short-run asymmetry in strong form is investigated by testing the null hypothesis that the coefficients of both positive and negative factors coming from the lags are exactly equal. In short, the null hypothesis stating that $\pi_{1,i}^+ = \pi_{1,i}^-$ is tested for CAD in all *i*. Short-run asymmetry in weak form is investigated by testing the null hypothesis that the sum of the positive factor coefficients from all lags is equal to the sum of negative factor coefficients. The null hypothesis for CAD in weak form is in the following form:

$$\sum_{i=0}^{p} \pi_{1,i}^+ = \sum_{i=0}^{p} \pi_{1,i}^-$$

By estimating the NARDL model, which is equation (7), the asymmetric dynamic multiplier effects (long-run coefficients) of a one-unit change in CAD_t^+ and CAD_t^- on the dependent variable CPI_t are obtained by means of the equations defined below.

$$L_h^+ = \sum_{j=0}^{h} \frac{\partial CPI_{t-j}}{\partial CAD_t^+}, L_h^- = \sum_{j=0}^{h} \frac{\partial CPI_{t-j}}{\partial CAD_t^-}, \text{and } h = 0,1,2 \ldots$$

Then, with the help of the Wald test, the existence of the asymmetric effect is investigated with the null hypothesis that L_h^t and L_h^- are equal to each other for CAD. Rejecting the null hypothesis indicates the presence of an asymmetric effect in the long run.

As a result of the cointegration test applied to the NARDL model in equation (7), the hypothesis that the lagged level coefficients of the variables are all zero is rejected as the F-statistic value is above the asymptotic critical values. Thus the existence of a long-term cointegration relationship between the examined variables is statistically obtained.

The Akaike informaion criterion is applied to select the most suitable ARDL model, and the following (Table 4) NARDL model is obtained.

Table 4 Short- and long-term NARDL results

Dependent Variable: ΔCPI_t				
Variables	**Coefficient**	**Standard error**	**t-statistics**	**Probability value**
C	1.342	5.196	0.258	0.797
ΔCPI_{t-1}	0.313***	0.070	4.502	0.000
ΔCPI_{t-2}	-0.265***	0.067	-3.936	0.000
ΔCPI_{t-3}	0.197***	0.065	3.033	0.002
CPI_{t-1}	0.013**	0.006	2.116	0.035
ΔDOL	0.018	0.149	0.120	0.904
ΔDOL_{t-1}	0.710***	0.145	4.895	0.000
ΔDOL_{t-2}	0.363**	0.152	2.375	0.019
ΔDOL_{t-3}	-0.253*	0.153	-1.655	0.099
DOL_{t-1}	0.012	0.049	0.249	0.803
RER_{t-1}	-0.021	0.030	-0.703	0.483
CAB^-	4.97E-05	8.06E-05	0.617	0.538
CAB^+	7.21E-05	7.95E-05	0.907	0.366
ΔCAB^+	0.000**	0.000	2.415	0.016
		t-statistics	**Probability value**	
$Wald_{LR,CAB}$		2.383**	0.0181	
$Wald_{SR,CAB}$		-	-	
Diagnostic statistics				
R^2				0.56
Adj. R^2				0.53
F_{PSS}				5.49
AIC				4.28
SIC				4.50
Log likelihood				-457.39
Durbin-Watson Stat				1.87
JB				0.61
BG				3.57
White				1.02
Ramsey-Reset				0.78

***,**,* marks indicate significance at the 1%, 5% and 10% level, respectively. F stat shows the value of f statistics developed by Pesaran et al. (2001) for k=4. JB, BG, White and Ramsey-Reset tests show the Jarque-Bera normality test, the Breusch-Godfrey autocorrelation test, the White heteroscedasticity test and the Ramsey-Reset model specification error test, respectively.

Source: The Turkish Statistical Institute and the Central Bank of the Republic of Turkey - Electronic Data Delivery System

When the short-term and long-term NARDL results in Table 4 are examined, while long-term asymmetry exists between the current account balance and inflation according to Wald test results, the coefficients themselves are not statistically significant. On the other hand, the lagged effects of the CPI are all statistically significant and pretty much impact the current value positively. It provides evidence that inflation inertia plays an essential role in explaining the change in the price level. In addition to inertia, expectations about future inflation levels are influenced mainly by the present and past level inflation. Dollarization also portraits the same characteristics with the CPI, except magnitudes. Dollarization impacts inflation more substantially relative to the CPI. Dollarization has lagging effects on the inflation rate due to the existing stocks. After they run out, the firms start to raise their prices due to the pass-through effect.

When the results regarding the other variable in the study are analyzed, a long-term relationship is found to exist between the real effective exchange rate and inflation. However, the coefficient of the real effective exchange rate is statistically insignificant.

5. *Conclusion*

This paper aims to highlight the relationship between inflation and the current account balance. It is concluded that although there exists long-term asymmetry between the current account balance and inflation, the effect of the current account balance on inflation is not statistically significant and notable. When the main reasons behind the improvement in the current account balance are investigated, it was found that they stem from a decline in gold and energy imports. Since productivity increase can not be achieved during the production process, the effect of the current account balance on inflation is negligible. On the other hand, the lagged effects of the CPI and dollarization are sizeable and statistically significant. Due to inflation inertia and expectations, the lagged effects of the CPI have a considerable impact on current inflation. The transmission mechanism of dollarization to inflation can be explained via the pass-through effect. Firms change their prices more quickly in a dollarized economic environment, where depreciation of a local currency is seen as permanent. Therefore, dollarization leads to a higher pass-through effect from exchange rates to prices via disrupting the pricing behavior of firms. With a view to stabilizing inflation, policymakers should prevent dollarization via the following measures.

First, they should increase the attractiveness of the domestic currency. To do this, they should take successful initiatives and prudential regulations such as holding reserve requirements for FX deposits in a local currency, imposing higher reserve requirements on FX deposits, recompensating the reserve requirement on local currency deposits at a higher rate than for FX deposits, and providing a nominal interest rate over inflation for local currency instruments to avoid the purchasing power loss denoting a positive real interest rate. Second, building a monetary and fiscal policy framework based on credible communication of future actions can help strengthen the attractiveness of the domestic currency through the expectations channel. Third, actions conducive to the use of foreign currencies instead of the local currency should be avoided and government borrowings and savings mostly in the local currency should be encouraged. Fourth, mitigating foreign exchange volatility and making it easier to predict the foreign exchange level in futures and forward contracts would attract foreign investors to make foreign direct investment and portfolio investment.

As to the way forward, several tasks can be envisaged. First, data set enlargement in terms of country and time dimension should be worked to reach out to more generalized results. Second, the dollarization rate should be added to the model as an explanatory variable in future works regarding inflation forecasting models.

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Appendix A

Table A1 VAR Results*

	D(CPI)		D(REER)		D(CAB)		D(DOL)	
D(CPI(-1))	0.54	7.48	0.14	1.52	-43.9	-0.83	-0.08	-2.46
D(CPI(-2))	-0.30	-3.76	-0.15	-1.39	-68.3	-1.14	0.04	1.03
D(CPI(-3))	0.41	4.93	0.09	0.81	27.1	0.44	-0.04	-1.14
D(CPI(-4))	-0.18	-2.21	-0.19	-1.75	74.7	1.23	0.08	2.14
D(CPI(-5))	0.29	3.56	0.02	0.21	8.83	0.14	-0.02	-0.68
D(CPI(-6))	0.05	0.79	0.00	0.07	5.49	0.10	0.07	2.17
D(REER(-1))	-0.07	-1.29	0.25	3.31	-62.5	-1.46	-0.02	-0.83
D(REER(-2))	0.02	0.40	-0.27	-3.38	-33.5	-0.76	-0.03	-1.35
D(REER(-3))	-0.00	-0.14	0.05	0.67	-33.7	-0.73	0.01	0.34
D(REER(-4))	-0.02	-0.41	-0.06	-0.74	22.01	0.48	-0.05	-1.88
D(REER(-5))	-0.00	-0.14	-0.07	-0.94	-25.1	-0.57	0.00	0.26
D(REER(-6))	0.06	1.21	0.12	1.67	23.06	0.55	-0.05	-2.21
D(CAB(-1))	-0.00	-0.95	-0.00	-0.60	-0.26	-3.57	0.00	0.52
D(CAB(-2))	0.00	1.85	-0.00	-0.27	-0.13	-1.83	0.00	0.41
D(CAB (-3))	0.00	1.10	0.00	0.33	-0.06	-0.83	0.00	0.39
D(CAB(-4))	0.00	0.01	0.00	0.72	-0.12	-1.65	-0.00	-0.63
D(CAB(-5))	-0.00	-1.13	0.00	1.47	-0.16	-2.14	-0.00	-1.14
D(CAB(-6))	0.00	0.53	0.00	1.11	0.05	0.83	0.00	0.99
D(DOL(-1))	0.70	4.23	-0.69	-3.14	-72.1	-0.59	0.13	1.75
D(DOL(-2))	0.17	0.99	0.19	0.84	59.3	0.46	-0.00	-0.04
D(DOL(-3))	-0.19	-1.15	0.16	0.73	198.2	1.57	0.05	0.63
D(DOL(-4))	0.01	0.09	0.10	0.43	-131.5	-1.03	-0.21	-2.61
D(DOL(-5))	0.22	1.30	0.01	0.06	254.5	1.99	0.03	0.42
D(DOL(-6))	-0.27	-1.56	0.60	2.58	18.9	0.14	-0.12	-1.56
C	0.45	2.07	-0.02	-0.09	-6.53	-0.04	-0.07	-0.75

* The first and second column in the cells denote each variable coefficients and resulting t-statistics, respectively.

Source: The Turkish Statistical Institute and the Central Bank of the Republic of Turkey - Electronic Data Delivery System