Determinants of current account balance: Evidence from Türkiye

Cari Dengenin Belirleyicileri: Türkiye Örneği

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Öz

Tüm hükümetler ve politikacılar tarafından önemsenen cari işlemler dengesi, bir ülkenin genel ekonomik yapısının, enflasyon, döviz kurları, istihdam gibi farklı dinamiklerini etkileyebilecek en kritik makro ekonomik göstergelerden biridir. Literatürde cari işlemler dengesinin belirleyicileri konusunda fikir birliğine varılamamıştır. Öte yandan çoğu çalışma sadece sektörel ya da sadece makro gösterge temelli belirleyicilere odaklanmıştır. Hem sektörel hem de makro belirleyicileri bir modelde toplama motivasyonu ile teorik modelde bağımsız değişkenler; "enflasyon", "doğrudan yabancı yatırımlar", "ihracatın ithalatı karşılama oranı", "büyüme" ve "turizm gelirleri" olarak belirlenmiştir. Tüm değişkenlere ait verilerin bir arada temin edilebildiği dönem olması gerekçesiyle 2008-2019 dönemi için çalışma gerçekleştirilmiş, yetersiz veri adedi sorunun aşılabilmesi için ise aylık veri kullanıl ve "ARDL"- Otoregresif Dağıtılmış Gecikme Modeli, tercih edilmiştir. Çalışmanın sonuçlarına göre belirlenen tüm bağımsız değişkenler ve cari işlemler dengesi arasında istatistiki olarak anlamlı ve uzun vadeli ilişkinin varlığı kanıtlanmıştır. Elde edilen bulgular, cari işlemler dengesi ile modelin 'turizm geliri', 'döviz kuru', 'enflasyon', 'büyüme' ve ' ihracatın ithalatı karşılama oranı' tüm bağımsız değişkenler arasında uzun dönemde ve istatistiksel olarak anlamlı bir ilişki olduğunu göstermiştir. Elde edilen sonuca göre bağımsız değişkenlerdeki %1 oranındaki artışların cari denge üzerindeki etkileri şu şekilde belirlenmiştir: net turizm geliri/GSYİH %1,35'lik artışa, DYY %0,88'lik artışa, enflasyon %0,48'lik artışa, ihracatın ithalatı karşılama oranı %0,32'lik büyüme %0.047'lik artışa, döviz kuru artışındaki %1'lik artış ise cari işlemler dengesinde %0.89'luk düşüşe neden olmaktadır. Cari denge belirleyicilerinin, her ülkenin kendi dinamiklerine göre farklılık göstereceği açıktır. Araştırmamızda kurulan modelin, cari denge belirleyicilerinin Türkiye özelinde hem makro veriler hem de sektörel verilerin bir kombinasyonunu içermesi açısından literatüre katkı sunduğu düşünülmektedir.

Determinants of current account balance: Evidence from Türkiye

Abstract

Current account balance, which is followed by all governments and policymakers, is one of the most critical macroeconomic indicators that can affect all dynamics of a country's general economic environment from different aspects, such as inflation, foreign exchange rates and employment. There is not any consensus on the determinative factors of the CAB-Current account balance in the literature. Actually, the fact that there isn't any consensus on the determinative factors of the CAB can be accepted as a natural result of

the different structures of each country. Most worldwide studies have focused on just sectoral or just macro indicator-based determinants. With the motivation of taking both sectoral and macroeconomic conditional effects on the current account balance, the theoretical model was set as CAB as the dependent variable and 'inflation', 'foreign direct investments', 'export to import ratio', 'tourism income', and 'growth' as independent variables. The reason behind choosing tourism as the only sector is the compensation power of the tourism sector on the foreign trade deficit. With the data available for all variables, the time span of this paper was 2008-2019 by using the "ARDL" bounds methodology. The findings showed that there was a long-run and statistically significant positive relationship between the CAB and all independent variables of the model where just foreign exchange appreciation has a negative effect. It is thought that the model established in our research contributes to the literature in terms of including a combination of both macro data and sectoral data on the determinants of the current balance in Turkey.

Keywords: current account balance, Tourism, FDI, Inflation, Growth, "ARDL"
JEL Code: F14, F40, F62

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Introduction

Current account balance is one of the most important part of the balance of payments. With the increasing globalization tendencies, especially after the 1980s, there have been important accelerations in the world trade volume, which makes the current balance, where imports and exports are accounted for, much more important. CAB-current account balance has many and important effects on the economy. Although a persistent and large CAD-Current account deficit is not the only factor of economic crisis, it is accepted as an early warning indicator (Krugman, 1979). The CAD is the function of progressive investment and saving decisions that are driven by the expectations of several factors such as growth, government spending, interest rates and productivity (Sachs, 1981; Obstfeld & Rogoff, 1995, 1996). In order to provide internal and external balance throughout the country, governments set goals for three main items and aim to achieve these goals. In particular, they take full employment and price stability into consideration for internal, and CAB for external balance (Telatar, 2011, p.1) The chronic CAD may cause inflation, a decrease in economic growth, and an increase in unemployment rates, due to devaluation effect. On the other hand, there are some researchers who concluded that ongoing CAD-Current Account Deficit may also cause an economic crisis. It is also crucial to analyze the area which leads to the CAD- Current account deficit is transferred. Technology transfers or imports that are used for value-added products production, will end with profitable domestic and foreign sales and this will eliminate the adverse effect of the CAD in the middle and long-term period. One other one that should be focused on is the finance techniques of CAD for analyzing the permanent adverse effects of CAD (Yılmaz et al. 2021).

The CAD is a chronic problem for Turkey and the structural problems causing the CAD such as import-dependent production structure, very few exporter numbers, and low

high-technology export levels are the ones that make the problem consistent. In addition to all these facts, financing methods of the deficit with mostly from central bank reserves instead of portfolio investments and foreign direct investments leads to a more dangerous economic outlook. With these facts, the fact the analysis aimed to investigate Turkey-specific determinants of "current account balance", including both sectoral and macro-economic indicators. Tourism income is selected as the sectoral independent variable because of its strong compensating effect on current account and foreign trade deficit (Table 1).

The research contains Turkey's CAB structure as the second part after the introduction. Then selected research from literature takes place as the third part. For the fourth part, the monthly data between 2008-2018 was used to examine the existence of the cointegration relationship between "current account balance" and "tourism income", "foreign exchange rate", "exports to import ratio" "growth", "inflation" and "foreign direct investments" in order to put more effective solutions for CAD problem. This research it is aimed to set a model includes that both sectoral and macroeconomic indicators as the determinants of the CAD for Turkey for the first time. And the "ARDL" method is applied. For the last part the sixth one, conclusions, and suggestions are given.

Current Account Deficit Structure of Turkey

When the CAB is taken into consideration specifically for Turkey, it is observed that Turkey has had many economic crises, especially after economic liberalization and the CAD is a chronic problem for Turkey for many years. The economic liberalization with the year 1980, and with the capital account liberalization decision, which can be accepted as a milestone, Turkey applied the policy of growing with imports. The decision that was taken in 1989 has been accepted as a premature decision because of the lack of the needed fiscal and monetary infrastructure (Yılmaz, 2019). With this fact, the country has had a current account surplus only during crisis periods. During all crisis periods, the Turkish Lira devaluated and with the effects of devaluation, export increased, and imports decreased. As can be observed from Figure 1, except a few crisis years, Turkey has had a chronicle CAD. When the thirty-one-year period between 1990-2020 is evaluated, it is seen that the country has a current account surplus for only 6 years: 1988, 1991, 1994, 1998, 2001, and 2019, and it has a constant CAD. The CAD may not cause a crucial problem for the countries which can direct the imported goods for production or technological investments. And also the way how the deficit is financed is another important point.

Figure 1: current account balance/GDP (%) -Turkey

Source: World Development Indicators: https://data.worldbank.org/indicator/BN.CAB.XOKA.GD.ZS?locations=TR

When the structure of Turkey's CAD as the latest and the current structure, was analyzed as of 2020, it has been observed that, the net imports of mineral fuel which worth 49.9 billion USD of the foreign trade deficit accounts for 48.5% of the foreign trade deficit and 65.9% of the CAD, net imports of precious or semi-precious stones, accounts for 39.9% of the foreign trade deficit and 54.2% of the CAD, and the net imports of boilers accounts for 17% of the foreign trade deficit and 23.2% of the CAD (Ministry of Commerce, 2021). For the next step, the most important issue is to analyze the usage areas of the first CAD creating product group mineral fuel. And it is striking that just 26% of the usage area of natural gas, which is one of the most important items of mineral fuel is for production in the industrial sector (EPDK, 2019). If the current account creator product group leads to an increase in production, it will not lead to a chronicle deficit, because the increase in production will carry a potential for an increase in export. After examining the product groups with the highest impact at the point of CAD and their potential to be used in production, the investment rates of the country, the resource and high technology product export levels transferred to research and development will also be analyzed in order to determine whether they are invested in areas that can eliminate the negative effects of the given deficit. According to the data available from the World Bank, Turkey's ratio of non-financial investments to gross domestic product for the 2008-2016 period is higher than the world's average. Especially for the years 2014, 2015 and 2016, Turkey's results are 1.6%, 2.2% and 4.4% which are higher than the world average; 1.3%, 1.2% and 1.3% (World Bank, 2021). Though the non-financial investments of Turkey are higher than the world's average, the area that the investments are realized should be another point to be taken into consideration: Although the share of R&D expenses in GDP for Turkey has increased from 5 per thousand in 2000 to 1% as of 2017, it is still well below the OECD average of 2.5% and the world average of 2.1%. The top five product groups with revealed comparative advantage (RCA) include a meal, floor coverings, stone, sand and gravel, birds' egg, sanitary plumbing, and heating fixtures. As we see, all product groups are away from high value-added, high technology products. As of 2017, Turkey's high technology product exports/total export ratio is 2.5%, whereas the world average is 16.1%. Information and communication technology (ICT) product exports within total export is 1.3% for Turkey, whereas the world average is 11.3%. Although the share of industry sector seems 83%, there are two major facts that should be considered. The first fact is there is a concentration on exports of vehicles other than railway or tramway rolling stones, parts thereof; 15.7% of total exports and most of the producers and

exporters are foreign firms, such as Ford, Toyota, Tofaş (Fiat), Renault and Mercedes. This means that profits may have a tendency to be transferred abroad and there is always a risk of these firms would shift their operations to another country and the second one is; are these foreign firms' productions can be accepted as exports of Turkey. There is one more important issue that affects CAB negatively. According to the latest research of Akat, 2019, 44% of export inputs are coming from import (Akat, 2019). Hence, when exports increase, imports increase automatically. And the last point that I want to mention is there are just 83.000 exporters out of 4 million companies, and the 13 exporter company, with above 1 billion $ exports, accounts for 17.7% of total exports of Turkey as of 2018.

Table 1: The Compensation Effect of Tourism Income on Current Account and Foreign Trade Deficit-Turkey

Year	Tourism Income	current account balance	Foreign Trade Balance	Tour. Inc/CA	Tour. Inc./For. Trd.
2001	10.451	3.760	-3.282	278%	-318%
2002	12.421	-626	-6.404	-1984%	-194%
2003	13.855	-7.554	-13.411	-183%	-103%
2004	17.077	-14.198	-22.438	-120%	-76%
2005	20.322	-20.980	-32.936	-97%	-62%
2006	18.594	-31.161	-40.894	-60%	-45%
2007	20.943	-36.946	-46.831	-57%	-45%
2008	25.415	-39.425	-52.917	-64%	-48%
2009	25.064	-11.360	-24.762	-221%	-101%
2010	24.931	-44.620	-56.325	-56%	-44%
2011	28.116	-74.402	-89.160	-38%	-32%
2012	29.007	-47.960	-65.367	-60%	-44%
2013	32.309	-55.856	-81.885	-58%	-39%
2014	34.306	-38.851	-66.572	-88%	-52%
2015	31.465	-27.314	-49.009	-115%	-64%
2016	22.107	-27.038	-39.923	-82%	-55%
2017	26.284	-40.810	-58.575	-64%	-45%
2018	29.513	-21.744	-40.726	-136%	-72%
2019	34.520	5.315	-16.751	649%	-206%

Source:https://www.tcmb.gov.tr/wps/wcm/connect/TR/TCMB+TR/Main+Menu/Istatistikler/Odemeler+Dengesi+ve+Ilgili+Istatistikler/Odemeler+Dengesi+Istatistikleri/

Literature

Under the effects of its stated importance and alteration of the structure of CAB in many countries, many researchers work on the current account balance. There is not a consensus on the indicators of the CAB in the literature yet. The literature review has been made with a technique that takes researches on Turkey's determinants and foreign

countries' determinants separately. The researches on foreign countries are as follows: Calderon et.al. (2000) have defined growth rate, private and public savings, the terms of trade, real interest rate, and the extent of the balance of payments control as candidates for CAD. They have used GMM (Generalized Method of Moments) for 44 developing countries. According to the results they concluded that CAD is persistent in developing countries, an increase in domestic product levels causes an increase in the deficit, an increase in saving levels causes a decrease in CAD, increase in terms of trade has a positive effect on the deficit, for industrial economies higher growth rates causes decreases in the deficit and higher interest rates in the developing economies also reduces the deficit level. Chinn and Prasad (2003) have concluded that government budget balance and initial stocks of net foreign assets have a positive impact on CAB and the level of openness has a negative impact on CAB for developing countries. Mohammadi (2004) examined the impacts of fiscal policy on CAB for 63 countries with a time span of 1975-1998, and used real exchange rate, money stock growth, government expenditures and government budget surplus as independent variables. He concluded that government budget surplus and CAB had a long-run positive relationship. Morsy (2004) has searched the determinant of CAB for 24 oil-producing countries with the time span of 1970-2009. He got fiscal balance, real GDP per capita growth, population growth old-age dependency ratio, youth dependency ratio, oil production growth rate and oil reserves as independent variables. According to the results, fiscal balance, age dependency, oil balance, economic growth and oil wealth had a long-run relationship with current account balance. Chinn and Ito (2008) have found out that fiscal factors such as government budget balance might be as important as excess savings. Mwangi (2015) has concluded that budget deficit and growth cause an increase in CAD by using VECM-Vector Error Correction Model for Kenya. Banyad and Aneja (2017) have examined the cointegration relationship between CAD and inflation, foreign exchange (FX) rates, and budget deficit and have concluded that there are cointegration relationships between mentioned variables and CAD. Rasheed et al. (2019) searched the long-run relationship and the tourism, fiscal balance and foreign exchange rate for the period 1976-2015 using the cointegration test for Pakistan. They have concluded that all mentioned variables had a significant and positive impact on the current account balance.

Literature on the CAD of Turkey is given in a table (Table 2).

Table 2: Determinant Candidates of CAB for Turkey

Researcher	Independent Variables	Method	Results
Gülbahar (2008)	Tourism income	Descriptive analysis	Tourism sector has the highest compensating degree among all other service sectors.
Çamurdan et al. (2009)	Real GDP growth rate, Degree of trade openness, National currency crisis index,	VAR	Real GDP growth rate, , degree of trade openness and real USA GDP growth rate, export-import coverage

	Export-import coverage rate, Foreign income growth, Real exchange rate, and interest differentials, Financial deepening		rate are determinants of current account balance.
Erdoğan & Bozkurt (2009)	FDI, Export to import ratio, FX rate, Inflation, Crude oil prices	MGARCH	Export to import ratio and crude oil prices are the strongest determinants of current account balance.
Oktar (2012)	Terms of trade	Cointegration	Cointegration relationship between terms of trade and current account balance.
Doğan and Bayraç (2014)	Public spending	Johansen Cointegration and Granger Causality	Two-way causality relationship between CABand net cash flow.
Bayar et al. (2014)	Crude oil price, FX rate, Inflation, Growth, FDI, Government debt stock, Portfolio investments	Granger Causality Test	78% of change in CAB has arising from foreign direct investments, portfolio investments, central governmental debt stock and crude oil prices.
Atış ve Saygılı (2014)	Loans/total assets, growth, Government debt stock, Terms of trade, Money supply, FX rate, Interest rate	Granger Causality Test	Growth rate and terms of trade are the most significant determinants.
Selçuk et al. (2015)	GDP, Real exchange rate, Tariff rate on import, Trade balance	OLS	There is a negative relationship between trade liberalization and foreign trade balance. There isn't any significant relationship between CAB and trade liberalization.
Yurdakul and Cevher (2015)	GDP, Growth rate, Openness, Real effective exchange rate, FDI, Energy import	Granger Causality Test	Real effective exchange rate has the highest effect on the CAD. It is followed by growth rate, energy import and openness.
Özadamar (2016)	Foreign trade balance, Gross domestic product, International term of trade, Domestic interest	"ARDL"	Real foreign exchange rate did not have a significant impact, but foreign trade volumes, international term of trade and GDP have a

	rates		positive and significant effect on the current account balance.
Canbay and Mercan (2017)	Defense spending	Vector Error Correction Model	There is a negative relationship between defense spending and current account balance
Uçak (2017)	Economic growth	Granger Causality	There is a causality relationship from real GDP towards the current account balance.
Saçık, Akar & Gülmez (2019)	Tourism	Granger Causality	Two-way causality relationship between tourism income and current account balance.

As can be followed from Table 2 for Turkey, the researchers mostly searched for limited determinant or impact factor candidates of the current account balance. The contribution of this paper to the literature is by taking wide-ranged and both sectoral and macroeconomic determinants of CAB together in the same model. The tourism sector is selected as the independent variable of sectoral determinant with the reason for its compensating property of the CAD of Turkey for years.

Data and Methodology

Data

This study focused on the years between 2008-2019 with monthly data as the time span of this research because of the availability of the data and working with 144 observations. The factors that were assumed to determine CAB were set as independent variables that can be followed in Table 3. For the data proportioned to GDP, GDP was quarterly obtained and converted into the monthly form using Eviews. GDP data were gathered from the Turkish Statistical Institute and it is seasonally adjusted. All other data were gathered monthly from their original sources mentioned in Table 3. For foreign exchange, the Central Bank of Turkey USD/TL, buying rates were used (50% of total foreign trade volumes of Turkey is in USD as of 2018). For X/M (Export to Import ratio), export and import volumes were gathered first and then the ratio was calculated. The descriptive statistics are presented in Table 4. Though there are some values that are above the borders of normality hence the observation number is 144 which is above 30, we neglect this point.

Table 3: Data Details

Abbreviation	Data	Sources
CA	Current account balance/GDP	Central Bank of Turkey

Tourism	Tourism Sector Income/GDP	Central Bank of Turkey
X/M	Exports to Imports Ratio	Central Bank of Turkey
FDI	Foreign Direct Investment/GDP	Central Bank of Turkey
FX	USD Central Bank Buying Exchange Rate	Central Bank of Turkey
Inflation	Inflation	Turkish Statistical Institute
Growth	Industrial Production Index	Turkish Statistical Institute

Table 4. "Descriptive Statistics"

	CA	Tourism	X/M	FDI	FX	Inflation	Growth
"Mean"	-3.962	2.932	75.219	-1.199	107.759	0.775	90.760
"Std. Dev"	3.529	0.700	10.244	0.916	14,863	0.949	19.439
"Min."	-13.17	0.231	56.043	-4.894	68.65	-1.44	50.454
"Max."	7.133	4.204	107.298	1.354	136.47	6.3	130.167
"Skewness"	0.506	0.688	0.335	-0.944	-0.832	1.507	-0.003
"Kurtosis"	3.591	2.523	2.799	5.518	3.030	9.871	2.051
"Jarque-Bera"	8.180	12.643	2.917	59.044	16.507	335.42	5.358
Obs.	144	144	144	144	144	144	144

Theoretical Model

The analysis is made to determine the subsistence of the cointegration relationship between CAB and, "tourism income", "foreign exchange rate", "exports to import ratio" "growth", "inflation" and "foreign direct investments". Details about the data can be followed in Table 3.

The model was set as below equation 1:

$$CA = \alpha + \beta 0 Tourism + \beta 1 X/M + \beta 2 FDI + \beta 3 FX + \beta 4 Growth + \beta 6 Inflation + vt$$

(1)

Under this model, six hypotheses were developed:

H_1: There is a positive and long-run relationship between CAB/GDP and tourism income/GDP.

H_2:: There is a positive and long-run relationship between CAB/GDP and export to import ratio.

H_3: There is a positive and long-run relationship between CAB/GDP and foreign direct investments/GDP.

H_4: There is a positive and long-run relationship between CAB/GDP and inflation.

H_5:There is a positive and long-run relationship between CAB/GDP and foreign exchange rates.

H_6: There is a positive and long-run relationship between CAB/GDP and growth.

Methodology

This research paper is on Turkey, all methods are based on time series. To examine the stationary of the variables, "Augmented Dickey Fuller" (ADF) and "Phillip Perron" (PP) unit root tests were applied. After determining the stationary level of variables, apply "ARDL" (Autoregressive Distributed Lag Model) cointegration model was applied because of its technical infrastructure which gives the opportunity to make the analysis with different stationary level I(0) and I(1) of variables. Two different "ARDL" model was applied: The first model was with VAR lag order selection and the other model was with auto-lag selection. After analyzing both short-run and long run results of "ARDL" models, at the end for examining the stability of the "ARDL" models, CUSUM and CUSUM Q tests which were developed by Borensztein et al. (1998) were applied.

"ARDL" approach exhibited by Pesaran et al. (1996), Pesaran and Shin (1995) and Pesaran et al. (2001), is preferred to be applied for analyzing the long-term relation between dependent and independent variables. The primarily reason behind this choice is the availability of working with variables which are stationary at different levels of I(0) and I(I). First of all, the existence of cointegration between variables examined via using bounds testing approach of Pesaran et al. (2001), then after getting the result of an existence of cointegration, short-run and long-run parameters are estimated by "ARDL" approach of Pesaran and Shin (1999).

Distributed autoregressive models-"ARDL" also provide opportunity to work with both lagged series of independent variables and dependent variables (Johnston & Dinardo, 1997:246). The "ARDL" bounds test has three steps. At the first step F statistics is used for determination of the existence of the long-term relationship between the variables. The second step is the estimation of the cointegration. And the last step is gathering the results for the short-term prediction (Çetin et al., 2014: 255).

The traditional "ARDL" model is specified as;

$$Yt = \alpha oi + \sum_{j=1}^{p}(\delta iyt - 1) + \sum_{j=1}^{q} \beta iXt - i + uit$$

(2)

In the model, α is constant, δ and β are coefficients, p and q are lag lengths; u is the vector of the error terms. The model allows both regressors and regress and have different integrated orders (Özdemir, 2019: 6).

The formulation for short run and long run "ARDL" estimation of the model is;

$$CA = c + \alpha \sum_{i=1}^{1} CAt - i + \beta 0 \sum_{i=1}^{1} Tourism\ t - i + \beta 1 \sum_{i=1}^{5} FDI\ t - i +$$
$$\beta 2 \sum_{i=1}^{1} XM\ t - i + \beta 3 \sum_{i=1}^{2} FX\ t - i + \beta 4 \sum_{i=1}^{0} Inf\ t - i + \beta 5 \sum_{i=1}^{4} Growtht - i + vt$$

(3)

Findings and Discussions

Unit Root Tests

Unit root tests are applied to define the analyses the stationary of the data sets that are used in the analysis. The stationarity defines that a data set's mean, variance and auto variance do not change by time. Performing analysis with non-stationary data may causes fake regression (Granger & Newbold, 1974). A model with a high R^2 may mean

parameters are statistically significant but this may because of variables change in the same direction randomly, and this does not mean that these variables have a significant relationship.

Table 5: ADF-PP Unit Root Test Results

	ADF			PP		
Variables	**"Level Intercept and Trend"**	**First Difference "Intercept and Trend"**	**Decision**	**Level "Intercept and Trend"**	**First Difference "Intercept and Trend"**	**Decision n**
CA	-5.055605	-14.75895	Level	-5.055605	-20.47390	Level
	(-3.441552)	(-3.441777)		(-3.441552)	(-3.441777)	
TOURISM	-1.116202	-10.52537	1.Differ	-4.399719	-9.961685	Level
	(-3.444487)	(-3.442712)		(-3.441552)	(-3.441777)	
X/M	-4.655761	-16.09186	Level	-4.589305	-19.33745	Level
	(3.441777)	(-3.444756)		(-3.441777)	(-3.442006)	
Inflation	-7.657378	-9.534682	Level	-9.250440	-48.74170	Level
	(-3.442238)	(-3.441777)		(-3.441552)	(-3.441777)	
FX	-2.166956	-14.44598	1. Differ	-1.785156	-16.83073	1. Differ
	(-3.441777)	(-3.442006		(-3.44177)	(-3.442006)	
Growth	-2.955024	-4.190882	1. Differ	-9.466766	-41.00725	Level
	(-3.445030)	(-3.445030)		(-3.441777)	(-.442006)4	

* The Table 3 is organized according to 5% significance level and Schwarz criteria.

The counterfeit regression result may be faced if the variables of the model, $y_t = \alpha + \beta x_1 + \upsilon t$, have a common trend although there isn't any real relationship between the variables (Favero, 1999:46). In order not to face with such a problem, unit root tests such as PP-Philip Perron and ADF-Augmented Dickey Fuller tests were applied for all variables of the model, However, it is possible to ignore structural changes reduce the power of stationary tests.

After examining the stationary status of variables by unit root estimations (Table 4), it was concluded that all variables were stationary at levels I(0) and I(I). With these results, it was decided to apply "ARDL" cointegration model.

ARDL

As can be followed from Table 6, the calculated F-statistics was 10.98 and was above the insignificant upper bound; 4.48. With these results, it was concluded that there was cointegration for the model. After gathering this result, we can employ the bound test of "ARDL" approach

Table 6: ""ARDL" Bound Testing" Results

Model	Optimal Lag*	F Statistics**	Bound Test Critical Values	
			Lower	Upper
F(TOURISM, FININS, FDI, XM, FX, INF, GROWTH, INSUR)	1, 1, 1, 2, 3, 2	10.98	3.17	4.48

* Automatic selection choice is used for lag calculations
**Analysis is tabulated according to 1% significance level.

After the bound test robustness and diagnostic tests were applied. The existence of a specification error is examined, by using "Ramsey Reset Test" and it is concluded that there isn't a specification error related to the model (Table 7). Then by "Breusch-Godfrey" Serial Correlation LM Test existence of autocorrelation is examined and the results showed that there isn't any autocorrelation problem (Table 7).

Table 7: Diognastic Checks

Test	Statistic	Probability
"Breusch-Godfrey" Serial Correlation LM Test	0.073	0.929
"Ramsey Reset Test"	3.268	0.073

The F-statistic is 10.98577, which is higher than the upper bound I(1) (Table 8) implying that even in the case of an extended "ARDL" model, the relationship between CAD and all independent variables at the highest level of significance. With this result, it is concluded that there is long-run co-movement among the variables so that it is decided to apply the bound test of the "ARDL" approach as the next step.

Table 8: Extended "ARDL" Bound Testing

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	10.98577	10%	1.99	2.94
K	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99

Table 9: Long-Run Estimates of the "ARDL"

Variable	Coefficient	Std. Error
CAGDP(-1)	0.360534	0.085049
TOURISMGDP	1.399741	0.097947
TOURISMGDP(-1)	-0.535753	0.141615
XM	0.306705	0.014381
XM(-1)	-0.100072	0.028305
USD_FX	-3.632083	0.399894
USD_FX(-1)	2.347297	0.517203
USD_FX(-2)	0.710172	0.369821
FDIGDP	0.270265	0.087353
FDIGDP(-1)	-0.057672	0.092361
FDIGDP(-2)	0.181114	0.087749
FDIGDP(-3)	0.168376	0.089429
INFLATION	0.309372	0.094359
INDPRODINDEX	-0.042289	0.010043
INDPRODINDEX(-1)	0.039322	0.010382
INDPRODINDEX(-2)	0.033454	0.010906
C	-21.31732	3.155661
"R-squared"	0.946170	
"Adjusted R-squared"	0.939224	
"Akaike info criterion"	2.687014	
"Schwarz criterion"	3.042538	
"Durbin-Watson stat"	1.952699	
"F-statistic"	136.2215	
Prob (F-statistic)	0.00000	

Long-Run Coefficients

After reviewing long run coefficients (Table 9), it is concluded that 'tourism income', 'export to import ratio' 'foreign exchange rates', 'inflation' 'FDI' and 'growth'; all independent variables have statistically significant and long-run impact on CAB and with this results all hypothesis; H_1, H_2, H_3, H_4, H_5 and H_6 were accepted

For the variables that have significant impact on CAB are detailed below as follows:

According to the results for Turkey, 1% in Tourism Income/GDP ratio causes 1.35% increase in CA/GDP ratio (Table 10). The result is parallel to our expectations and the literature. Turkey has had CAD for 131 months out of 144 chosen period which is 91% of all. For the 131 months with CAD, 258.5 billion USD total tourism income has compensated, 444.9 billion of total CAD which is 58% of all deficit.

The coefficient of export to import ratio shows that a 1% increase in XM Ratio increases the CA/GDP ratio by 0.32%, the results are as expected: Increase in exports, decrease in imports or both, causes export to import ratio increase and this has a positive and statistically significant impact on CA/GDP ratio (Table 10). For Turkey, there is a defect about export to import ratio; it is the share of imports in exports; for years, there is a myth

about this ratio is 70%. Akat (2019) has renewed the analysis on this and has tried to express that 70% is too high. He has used the recent inward processing license permissions and calculated that import in export percentage was 44% at 2018 (Akat, 2019). It may be concluded that with a ratio of 44% import share in exports, it is not easy to create a current accountsurplus.

For an economy, normally increase in foreign exchange rates causes an increase in exports; hence, this causes an increase in the current account balance. However, according to the "ARDL" results of the paper, 1% increase in FX rates caused 0.89% decrease in CA/GDP ratio (Table 10). This may be due to an increase in GDP due to over-depreciated domestic currency policy. In the literature, there are also studies that have concluded that an increase in FX rates causes decrease in CAB (details can be followed from literature part of this paper).

After 1980s, with economic liberalization, Turkey implied opening up the economy policy. From days until today, imports have been over exports; thus, foreign trade deficit was always a fact that required to struggle against. Turkey's growth policy has been dependent on imports (Insel & Kayıkçı, 2013) According to the results of "ARDL", increase in 100% in growth causes 4.7% increase in CA/GDP ratio (Table 10).

Turkey's economy is known with high and persistent inflation for years. It was not an unexpected result for us that according to "ARDL" results, inflation and CAB have a significant relationship. Inflation is a very important factor that have an impact on investments and savings; hence, 1% increase in inflation causes 0.48% increase in CA/GDP ratio (Table 10).

Foreign direct investment is located in the 'Finance Account' part of the balance of payments, but it is not a main part of current account balance. In the literature, there is not any consensus on the effects of FDI on CAB although some researchers found out a positive and significant relationship between FDI and CA balance and some researchers could not find any long-run relationship. According to the results of "ARDL", increase in 1% in FDI cause 0.88% increase in CA/GDP ratio (Table 10).

Table 10: Long-Run Coefficients for "ARDL"

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TOURISMGDP	1.351110	0.093464	14.45596	0.0000
XM	0.323134	0.021983	14.69922	0.0000
USD_FX	-0.898585	0.265779	-3.380951	0.0010
FDIGDP	0.878989	0.233195	3.769324	0.0003
INFLATION	0.483798	0.170825	2.832117	0.0054
INDPRODINDEX	0.047675	0.014971	3.184517	0.0018
C	-33.33614	2.176833	-15.31405	0.0000

EC = CAGDP - (1.3511*TOURISM + 0.3231*XM -0.8986*FX +
0.8790*FDI+0.4838*INF+0.0477GROWTH - 3.3361

The final step of "ARDL" is error correction form. ECt-1 coefficient explains how long will it take for CAB to return to its equilibrium point after any shock in the economy.

According to the results, if any deviation occurs from the long run equilibrium, it will take 1.36 period for CAB to return to the equilibrium (Table 11).

Table 11: The Error Correction Form for "ARDL"

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-17.36553	3.565953	-4.869814	0.0000
@TREND	0.057921	0.016628	3.483405	0.0007
D(TOURISMGDP)	1.357784	0.108060	12.56513	0.0000
D(FDIGDP)	0.187804	0.098481	1.907012	0.0590
D(FDIGDP(-1))	-0.030402	0.180264	-0.168654	0.8664
D(FDIGDP(-2))	0.104521	0.167074	0.625595	0.5328
D(FDIGDP(-3))	0.231858	0.135195	1.714993	0.0891
D(FDIGDP(-4))	0.225731	0.096030	2.350642	0.0205
D(XM)	0.309805	0.014847	20.86606	0.0000
D(USD_FX)	-3.418513	0.402520	-8.492770	0.0000
D(USD_FX(-1))	-0.529529	0.369635	-1.432570	0.1547
GROWTH	-0.060703	0.011805	-5.142279	0.0000
GROWTH (-1))	0.018271	0.018682	0.978039	0.3301
GROWTH (-2))	0.036826	0.015227	2.418507	0.0172
GROWTH(-3))	0.020205	0.012126	1.666255	0.0984
CointEq(-1)*	-0.733299	0.074517	-9.840676	0.0000
R-squared	0.899049			
Akaike info criterion	2.587723			
Schwarz criterion	2.796855			
Durbin-Watson stat.	1.952699			

Stability Tests

CUSUM-Cumulative sum of consecutive error terms in Figure 2 and CUSUMQ tests in Figure 3 (Brown, Durbin & Evans, 1975) are used to investigate the stability of the coefficients of the long-term model. CUSUM is used to investigate whether the error terms are within the 95% confidence interval and CUSUMQ is used to investigate if the squares of the cumulative error terms are within the desired limits (Çetin et al., 2014: 257). The plot of Cusum statistics remains within the critical bounds; thus, results show that there is no structural break. Although for some months in 2016, 2017, and 2018, Cusum Q statistics do not remain within the critical bound with minor excess, it is not preferred to use a dummy in the model due to the Cusum test and also the graphs of all variables did not signalize any structural breaks.
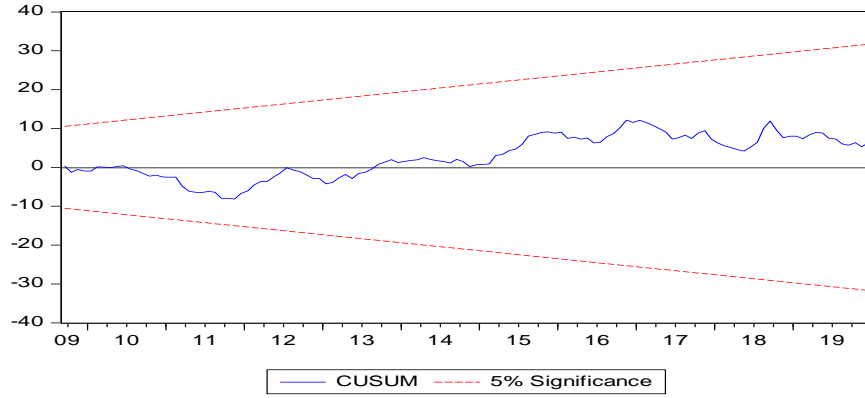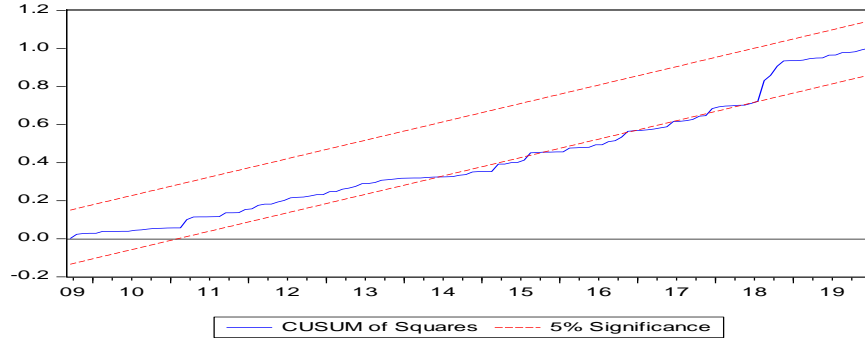
Figure 2: CUSUM

Figure 3: CUSUM Q

Conclusion

CAD has always been a problem for Turkey's economy for long years. The years of current account surplus are the ones of the economic crisis with mostly the effect of devaluation. Based on this fact, many Turkish researchers have studied on the current account balance. On the other hand, in the literature, both for Turkey and other countries, there is not a consensus on the macro-economic indicators of the current account balance. The differences in the composition of the GDP structure of the countries may cause these indefinite results. For the next step, a series of studies on countries with similar GDP composition will be useful to put forth a certain set of macroeconomic indicators.

For Turkey, tourism income is a compensating factor for the CAD for years. With the main motivation of taking both sectoral and macro-economic indicators of the CAB in the same model tourism income, FX rate, inflation, growth, and foreign direct investment were determined as independent variables. According to the results of "ARDL", parallel to the dynamics of Turkey, tourism influences CAB in a positive direction and with the highest coefficient in the model; 1% increase in the tourism income/GDP ratio, there occurs 1.36% increase in the CA/GDP ratio. Tourism income has the highest impact on current account balance; which is followed by FX rates and foreign direct investments.

"ARDL" results for independent variables other than tourism income, the candidate indicators, which are growth, inflation, foreign exchange and export to import ratio, and

foreign direct investments, have statistically significant impacts on current account balance: An increase of 100% in growth cause 5% decrease in CA/GDP ratio, 1% increase in FX rates causes 0.89% decrease in CA/GDP ratio, 1% increase in inflation cause 0.48% increase in CA/GDP ratio, 1% increase in X/M ratio causes 0.32% increase and 1% increase in FDI causes 0.88% increase in CA/GDP ratio.

With these results, it is concluded that the factors that affect the CAD are parallel with the literature in terms of the directions of the effects. But this research is the first one that sets a model that includes both sectoral and macroeconomic indicators as the determinative factors of the CAD for Turkey. And this point is the one that values added to the literature. The next step for the research about current account determinative factors may be, grouping countries according to their GDP composition and comparing different country groups' determinants.

By taking empirical results and the effects of COVID-19 into consideration, the necessity is obvious for Turkey to strategize in a broader and more detailed manner concerning the CAB issue. Concentration on product groups, the very limited number of exporters (83.000 exporters out of 4 million companies), the dependence of exports on imports, and very little value-added product concentration, low level of high-tech product exports seem to be the most essential points that should be prioritized. The policymakers may begin with defining the producers that produce the products which have relatively comparative advantages and allocating some resources for setting educational, organizational, and financial infrastructure for supporting these. At the same time exporting high-technology products will be another crucial solution for Turkey. Although the 11th Development Plan includes articles on technological development, following up this issue very strictly be very important for Turkey.

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