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The Relationship between Current Account Balance and Types of Credits: An Application on Selected OECD Countries

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Abstract
While in literature that the current account deficit to GDP ratio exceeds the level 4-5 is considered as a leading indicator of crisis in economies, solution proposals to this issue is of vital importance in terms of countries. By the reason of increasing purchasing power, the rise in credits has a serious impact on the increase of the current account deficit without ignoring the importance of other factors. Within this scope, in the study, the relationship between current account balance and the credits to firms, households and government has been estimated by using PMGE and MGE in 26 selected OECD countries for the years between 2005Q1 and 2015Q2. The findings obtained showed that while the credits given to households and firms have a negative impact on the current account balance in short-run, the credits to firms and government have positive effect on it in long-run.

Keywords: Current Account Balance, Credits, Panel ARDL Analysis
JEL Classification Codes: C23, E51, F37.

Kredi Türleri ile Cari İşlemler Dengesi Arasındaki İlişki: Seçilmiş OECD Ülkeleri Üzerine Bir Uygulama

Öz
Literatürde cari açığın GSYH'ye oranının %4-5 düzeyini aşması ekonomilerde kriz öncü göstergesi olarak kabul edilirken, bu soruna ilişkin çözüm önerileri de ülkeler açısından kritik önem taşımaktadır. Cari açığın artmasında diğer faktörlerin önemini göz ardı etmeksizin, artan kredilerin alım gücünün artmasına yol açması nedeniyle ciddi bir etkisi vardır. Bu kapsamda çalışmada; 2005Ç1-2015Ç2 yılları arasında 26 seçilmiş OECD ülkesinde; özel sektöre, hanehalklarına ve kamuya verilen krediler ile cari işlemler dengesi arasındaki ilişki PMGE ve MGE kullanılarak tahmin edilmiştir. Elde edilen bulgular; kısa dönemde firmalara ve hanehalklarına verilen kredilerin cari denge üzerinde negatif, uzun dönemde firmalara ve kamuya verilen kredilerin ise cari denge üzerinde pozitif bir etkiye sahip olduğuna işaret etmektedir.

Anahtar Kelimeler: Cari İşlemler Dengesi, Krediler, Panel ARDL Analizi
JEL Sınıflandırma Kodları: C23, E51, F37.

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1. Introduction

World trade has been booming in the consequence of the factors such as globalization phenomenon, production increase via high technology and market seeking for these products, developments in logistic and transportations, economic integrations, the efforts of international organizations. This rise in either trade of goods and services or financial transactions have brought about some chronic problems to countries. Especially, the countries, being not able to finance its investments from internal resources, having not enough productive capacity, not manufacturing the products with high value added and not to sell these products to foreign markets, have faced with financial difficulties as a result of their inability to obtain sufficient foreign currency earnings in the long- term. At the same time, the resulting difficulties have weakened the economies of these countries and make them vulnerable to balance sheet imbalances in the case of any crisis that may occur in the global system. This has turned the attention of either policy makers and academicians or investors and the other economic units, having commercial relationship with these countries, to the balance sheet. As in the literature these imbalances in the long term are accounted for high growth rates not supported by domestic savings, the changes in productivity, the exchange rate regime, the overvaluation of the domestic currency and global cyclical factors; the formation of these imbalances in the short-term are explained by factors such as short-term capital movements, the extensive use of certain raw materials in the production and sudden increase in the prices of these raw materials procured from abroad, domestic loans, bad weather conditions, flooding and drought etc. (Seyidoglu, 2015, 356-360).

While balance of payments demonstrates the economic relations of the residents of a country in a given period with the residents of other country; movements, composition and changes of this balance sheet are indicative to macroeconomic stability of countries. Particularly, the current account item in this balance sheet is a critical to the stability of the balance of payments. As this item consists of the trade of goods and services and unilateral transfers, the current deficit is defined as this item's giving negative value. The countries, such as Turkey, where current account balance is giving negative continuously, compensate this deficit with the surplus in the capital account or turn to policies reducing this deficit in short-term.

In this study, we estimated the relationship between the credits to firms, households and government and current account balance by using panel data methods (Pooled Mean Group Estimator-PMGE) and Mean Group Estimator-MGE) for the period 2005Q1-2015Q2 in 26 selected OECD countries.

The study goes as follows: In the second section, under the title of theoretical background, we are addressing current account balance and the approaches aimed at explaining it, then, we are briefly referring to the developments in the current account of the countries in the scope of this study. Right after that, by dealing

with type of credits, we are giving place to the developments of these credits on basis of countries. In this section, finally, we are addressing the transmission channels from types of credits to current account balance. In the third section, we are presenting literature review where theoretical and practical work, having been made before, took place. In the fourth section, we are focusing on method and data set. After the fourth section where the findings obtained are analyzed, we are completing the study with conclusion and evaluation.

2. The Approaches to Current Account Balance: Theoretical Background

The current account defined as the sum of net exports of goods and services and unrequited transfers balances can be derived via the national income accounts, as well. The latter shows the mainly relationship between current account balance and capital flows, and can be calculated with the help of difference between private savings minus private investments and government spending's minus tax revenues.

There are different approaches in explaining current account balance. We can briefly group them into the four basic approaches including Keynesian, monetarists, intertemporal and flexibility approach to balance of payment. Generally, all of them give different answers to the question "what could be macroeconomic policy to be in effective in the balance of payments of a country" (Utkulu, 2001). According to the flexibility approach put forward in the period when the capital markets were not effective, external deficits can only be resolved through devaluation by the reason of the fact that demand elasticity of both exports and imports is low and production capacity is limited (Uygur, 2012, p. 3). As for monetarist approach based on J.J. Koopmans's work, external surpluses emerge because of excessive money demand growth not meet by monetary authorities and the external deficits arise from excessive increase in the money supply (Rabin, 1982, p. 1). Keynesian approach in which revenue and expenditures are seen as a determinant of current account deficit proposes to balance out possible current account imbalances with fiscal policy (Duasa, 2004, p. 11). Finally, in intertemporal approach, the current account balance is the function of current income, permanent income, current consumption, permanent consumption, current public expenditures and permanent public expenditures. In this approach, supposing that the households have more net foreign assets compared to the previous period, current surplus turns out. The fact that current income is above permanent income causes households, wishing to flatten of their consumption over time, to use this surplus in the outsources providing with interest yield. At same way, the fact that investment and public expenditures are above their permanent value is in long run in negatively effective on current account balance (Sandalcılar and Altıner 2014, p. 32).

2.1. The Importance of Current Account Balance and a Glance at Current Account Balances of the Countries

Movements in the current account are an important indicator for policy makers in terms of reflecting the economic performance of countries. For example, the fact that current account balance to GDP ratio is above approximately 4-5 percent is considered as a leading indicator to crisis. From different point of view, while showing savings-investment ratio, this balance provides important information relating to the role of financial stability and private savings on economy (Kılıc, 2015, p. 1). At the same time, by reflecting the difference between export and import, it demonstrates periodical magnitude of the transactions between domestic residents and outside world. On the other side, it also expresses assets and liabilities to other countries, and shows intertemporal choices of the residents in a country and abroad (Aristovnik, 2008, p. 24-25).

The current account also offers information about the competitive structure of the balance of a country. For instance, a country importing more than it exports can be considered to be relatively less competitive in international markets. Especially, in those among European Union member countries, which are non-competitive in foreign markets, the balance of payments deficits could not be overcome through increases in exchange rate depending on the use of fixed exchange rates and thus the imbalances that may occur in external payments are more damaging to the country's economy. Another important point to take into consideration carefully in this regard is how these deficits are financed. In case a country having this deficit is attractive to direct foreign investment, without the need of a change on exchange rate, these deficits can be funded by the help of direct foreign investment. But, the capital coming to country in this way buys assets and thus the ownership of a larger proportion of the assets in the country passes into the hands of foreigners. If these deficits are funded more short-term capital, in case of any crisis, it causes to a deepening of the crisis by outflowing. Therefore, these deficits' being permanent points to financial fragility of those countries (Pettinger, 2013).

Figure 1 shows the current account balance changes in countries related in the period examined in this study. In the figure, the dark areas represent the current account balance to GDP ratio in the range of ± 5 %. On examining the period up to the 2008 crisis, it is seen that many of the countries related were faced with the problem of the current account deficit. Especially in the period before 2008 crisis; while the current account deficit position of countries like Australia, Greece, Hungary, Ireland, Poland, Portugal, Spain, Turkey and the US were negatively above 5% of GDP, these ratios in Germany, Luxembourg, Netherlands, Norway, Sweden and Switzerland were above the +5% level. The position of the countries as lender and borrower in the European region are offset with each other. To set an example, the current account surpluses of Germany and Netherlands balance

the current account deficit of Italy, Spain and other euro zone countries. In this regard, it is thought that the deficits and surpluses in this region are closely linked to intense cross-border trade and financial linkages. In particular, Germany and France are mediating a large amount of financial flows between European Union member countries and non-member neighboring countries in this region (European Commission, 2012, 12).

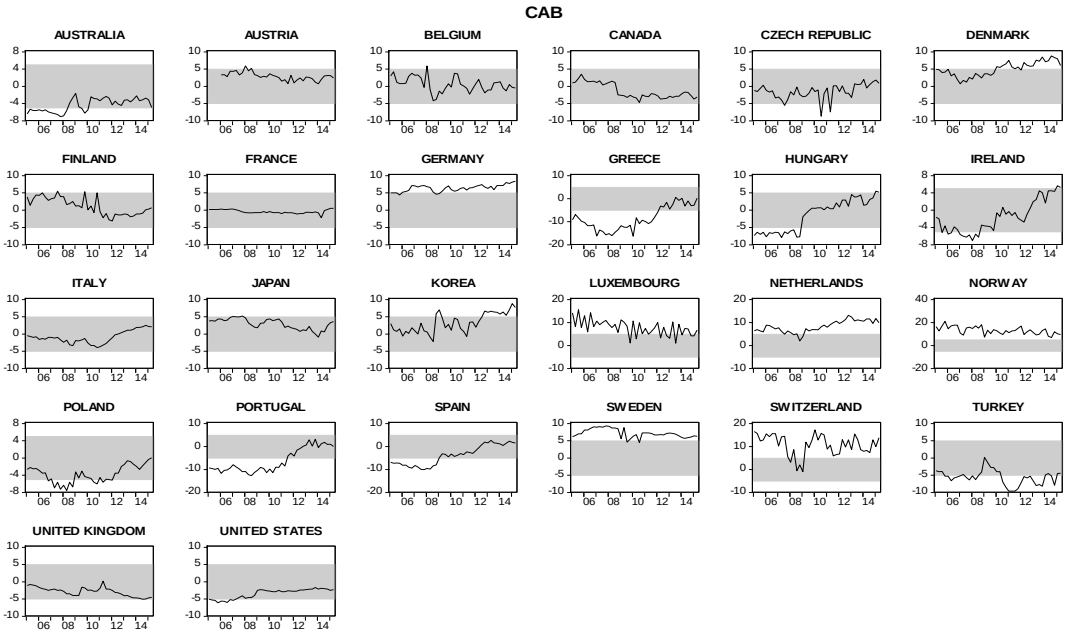


Figure 1: Current Account Balance to GDP Ratio (%)

Source : http://stats.oecd.org/. Date Accessed: 12.02.2016. **CAB:** Current Account Balance

The crisis has had different effects on the countries, depending on their economic structure. With the onset of the crisis, the surpluses of the economies with export-oriented growth decrease accordingly as a result of a reduction in world GDP, whereas the deficits in countries with production structure depending on important dependent decrease through the constriction in the demand for imported goods.

2.2. Credits, Types and Developments

Credits are a critical to economic activities to be sustained. As households mostly use credits in purchasing housing and flattening their consumption, firms utilized from it in financing investment. For policy-makers, notably, in terms of being effective on the transmission mechanism of monetary policy, the borrowing of the private sector and the size of credits received by it are an important determinant of financial stability (BIS, 2013, p. 65). When it comes to the public or government credits, especially after the 2008 crisis, it has become another notable magnitude taken into consideration with the discussions of sustainability of this debt.

In this study, we used the classifications made by Bank for International Settlements (BIS) in defining the type of credits, as seen in Figure 2. In this process, the effects of credits on the current account balance are investigated by dividing credits in three groups, the credits to households, firms and government.

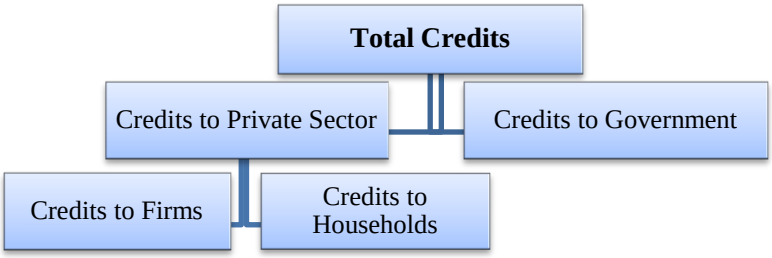
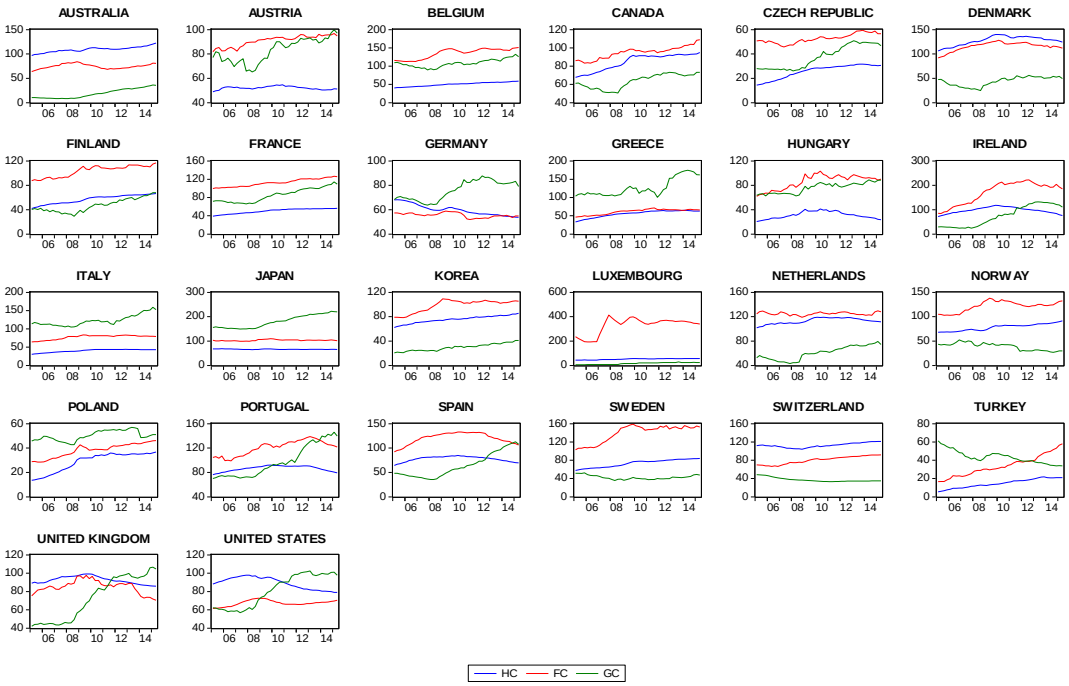


Figure 2: The Types of Credits
Source: http://stats.bis.org/statx/toc/CRE.html Date Accessed: 12.02.2016.

The types of credits to GDP ratio developments in the related countries in the period examined in are given in Figure 3.



HC: Household Credits, **FC:** Firm Credits, **GC:** Government Credits.

Figure 3: The Types of Credits to GDP Ratio
Source: http://stats.bis.org/statx/toc/CRE.html Date Accessed: 12.02.2016.

As can be seen from the Figure 3, the all type of credits to GDP ratios in almost all countries over the years generally demonstrate rising trend. From the point of

Turkey, the credits used by government are declining constantly over the years examined. Behind this declining, there seems to be reforms of the fiscal and financial discipline implementations put into effect in the aftermath of 2001 crisis and 2008 Global Financial Crises.

2.3. Relationship between Credits and Current Account Balance

The relationship between credits and current account balance varies according to the usage and types of credits. For instance, the credits to consumers or households may have a detrimental effect on the current account balance by increasing the demand of consumers to imported goods. From the viewpoint of usage, when given in order to ensure the input of imported goods of firms, the credits may have negative effect on current account balance in short-term. But, in the long-term, they may have positive effect on it through increasing production. In case there are binding credit constraints to particular exporting firms, an expansion in credits to these firms may also have positive effect on the balance.

The effect of credits on current account balance can also change based on credit markets. In the periods when the supply of credit is constant and the demand of credits upsurges, the surpluses in the demand of credits can affect negatively on this balance supposing that this excess is financed from external resources (Alioglları et al., 2015, p. 3-4).

When it comes to the credits to government, the imbalances occurring in government spending's cause countries to borrow from external resources on the ground that it could not be funded with the help of internal resources. If government uses these credits to finance the investments, these credits can have positive effect on the balance by allowing increase in production in long-term.

3. Literature Review

In literature, there are a great number of studies analyzing the relationship between credits and its types on the bases of single-country and multiple country studies. As some of them directly search for the relationship between total credits and current account deficit, others have investigated the effects of credits together with other factors on the balance under name of the determinants on current deficit. Considering in both single and multiple country studies, it is seen generally that there has been causality from the credits to current account balance.

Rapid credit growth increases the possibility of the crisis, resulting from the current account. Based on the importance of it, Erdem et al. (2014) studied the effects of domestic credits and exchange rates on current account balance by using annual data in the period 1986-2010 for 15 OECD countries. With the help of PMGE and MGE analyses where they ascertain the long-run coefficients, as expected, they reached to the conclusion that the expansions in net domestic

credits affect current account balance negatively in both long-run and short-run. For the variable exchange rate, this relationship in short-run is not statistically significant, but it is positive in long-run.

By considering the financial depths of 49 countries in Europe in period 1991-2011 through system GMM, Ekinci et al. (2015) looked into the correlation between credits and current account balance. After examining, they concluded that while in the countries with lower financial depths, credit expansion has a more powerful effect on current balance, in the other words; this expansion in the countries in the early stages of financial development has a more disruptive effect on it in the case of any possible imbalance on current account balance. These results revealed that in the countries with lower financial depth, policy makers should utilize from this credit tools carefully so that they don't cause the imbalances on this balance.

The control over the credits given to consumers is another critical issue to curb in current account deficit. The potential effects of the developments in sub-items of these credits vary on current deficit. Particularly, in countries with current deficits like Turkey, the acquisition of this knowledge is critical for policy makers. Handling with this topic, Kılıc (2015) searched for the causality between current deficit and consumer, housing, vehicle loans and individual credit cards, all of which are sub-items of total credits. In the consequence of the analysis, they ascertained the long run relationship between variables, and there is unidirectional causality running from all variables to the current deficit, except for individual credit cards.

One of the major aims of central banks is to provide domestic and international economic balance. In this respect, lowering the reserve requirement as an expansionary monetary policy in contraction periods, in which inflation inertia occurs, will increase the amount of loans that banks can give, and in this way, invigorates economy by enhancing aggregate demand. On the other hand, in attempt to provide domestic balance, the implementation of this policy may also cause the deterioration on external balance with expansion of amounts of credits, inducing the demand for imported goods to rise. Considering this point of view, Telatar (2011) investigated the reasons and sources of current deficit, and aimed to reveal the causality between total credits given to consumers and its sub-items and current deficit. The study covered the period 2003Q1-2010Q4, and its findings are in the line with Kılıc (2015), confirming that there is not statistically significant ascertained relationship running from total credits to current deficit, but only from consumer credits to current deficit.

Another study to be noted, examining the case of Turkey, is of Atıs and Saygılı (2014). In this study; by using data spanning the period from 1998Q1 to 2013Q1, vector error correction model was employed. The analysis results point out that an increase in credits get current deficit raise. At the same way, Gocer et. al (2013)

for the period of 1992Q1-2012Q3, Sacık and Karacayır (2014) examining the period 2004Q1-2013Q3 also came to the same conclusion in their studies.

As the share of the credits in GDP displays financial sophistication of countries, this ratio never gives the information of whether these credits are given to private sector or households. In this context, separately dealing with the credits given to private sector and firms, and examining the compositions and changes of these credits on external balance, Buyukkarabacak and Krause (2005) made use of quarterly data of 9 transition economies for the period between 1990Q1 and 2004Q3. In the result of the analysis, while founding statistically significant and negative correlation between net export and the credits to households, they could not attain to the significant correlation between the credits to firms and net export.

There are some studies in literature, examining the effects of credits as the private and public sector. One of them is of Boamah et al. (2011). Covering the years between 1993 and 2007 and employing Bounds test approach, this study suggests that as domestic credits and the credits to private sector have a negative impact on the current account balance in both long-run and short run, the credits to public sector affects this balance in only short-run.

The analysis of the effect of credits on current account balance is also done by classifying credits as consumer and commercial loans. Based on this approach, Aliogullari et al. (2015) searched the relationship between there credits and current account deficit. The findings obtained from the study point out that while consumer loans have a deteriorating impact on current account deficit, the latter has no statistically significant impact on this balance.

The increase in the volume of credits is also got associated with economic growth in literature. From this point, Angeles (2015), by dividing the period examined by ten years, researched the correlation between the credits to private sector, households and firms. In consequence of analysis done by using system GMM, she concluded that only the credits given to firms have a positive impact on economic growth.

There are also some studies available in literature, investigating the correlation between current account deficit and other macroeconomic variables. One of them, Calderon et al. (2000), used the annual data for the years between 1966 and 1995 in 44 countries. Finally, they found out that the problem of current account deficit is persistent in developing countries. In addition to this, while the inflating domestic credits makes current account bigger, the increase in saving rates have positive impact on this balance and the shock causing the exchange rate to appreciate affects negatively current account balance.

4. Data, Method and Findings

In this study, the relationship the between the credits to firms, households and government and current account balance for the years between 2005Q1-2015Q2 in 26 OECD countries[1] through the panel data methods (PMGE and MGE) has been investigated.

4.1. Data Set

Estimating the relationship between credits used by decision-makers and current account balance, we chose the current account balance to GDP ratio as dependent variable and the types of credits to GDP ratio as independent variable. The brief definitions of the variables contained in this study are as seen Table 1. To compare the countries with each other and to standardize these variables, these variables to GDP ratios are used in particular.

Table 1: Data Set

Variables	Abbreviation	Definition of the Variables
Current Account Balance to GDP Ratio	**CAB**	It states the sum of foreign trade, services, net investment income and unrequited current transfers to GDP ratio.
Firm Credits to GDP ratio	**FC**	This credit type is calculated as the credits to non-financial corporations owned by public and private to GDP ratio.
Government Credits to GDP Ratio	**GC**	It equals to the credits to government to GDP ratio. While calculating this credit type, the core debt instruments used are debt securities, cash, loans, deposits. The value of this sum is in consolidated basis.
Households Credits to GDP Ratio	**HC**	It shows the credits to households and non-profit organizations servicing the households to GDP ratio.

Source: http://stats.bis.org/statx/toc/CRE.html Date Accessed: 12.02.2016.

[1] In this study; the data of Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, South Korea, Luxembourg, Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, Turkey, Britain and the United States are used. Chile, Estonia, Iceland, Israel, Mexico, New Zealand, Slovakia and Slovenia are excluded out because of the lack data.

4.2. Method

In applied researches, before estimating the relationship between the variables, it is important to control whether the variables are stationary or not, to put it another way, whether they contain unit root. Otherwise, the estimations obtained can demonstrate the features of spurious regression. Furthermore, the factors like financial integration; spatial effects and the fact that there is high dependence between the variables require examining cross sectional dependencies of the series in panel data researches in the case of determining the cross-section dependencies, before going to unit root tests. After determining cross-section dependence, the use of second generation unit root tests is appropriate. If not so, the first-generation unit root test can be used. While the some of the first-generation unit roots tests are Maddala and Wu (1999), Breitung (2000), Hadri (2000), Choi (2001), Levin, Lin and Chu-LLC (2003) and Im-Pesaran and Shin (2003); a few of the second-generation unit root tests are O'Connell (1998), Pesaran (2003), Moon and Perron (2004), Bai and Ng (2004), Breitung and Das (2005) and Pesaran (2007).

In the study, we employed PMGE and MGE in estimating the relationship between the credits to household, government and firms and current account balance. MGE does not impose any restriction on the coefficients in the specification of Autoregressive Distributed Lag Model (ARDL) and it obtains long-run derivations of the coefficients with the help of the means of long-run coefficients got from ARDL estimations. This estimator does not allow the coefficients belonging to panel units to be the same. On the other hand, PMGE imposes restrictions on the long-run coefficients, but enables constants, the variances of error terms and short-run coefficients to change. On account of this, the panel ARDL allows long-run and short-run homogeneity assumptions to realize. In applied analysis, the homogeneity test developed by Hausman (1978) is employed to determine which one of the estimators generates more efficient and consistent results.

PMGE and MGE are based on ARDL model. Unrestricted ARDL (p, q) model can be formulated as follows.

$$\Delta y_{it} = \emptyset_i y_{it-1} + \beta_i' s_{it} + \sum_{j=1}^{p-1} \lambda_{ij}^* \Delta y_{it-j} + \sum_{j=0}^{q-1} \delta_{ij}^* \Delta s_{it-j} + \varepsilon_{it} \qquad (1)$$

In the equation given above, y_{it} is the dependent variable, representing current account balance of the countries studied in this essay. Δy_{it} also expresses the differences of the dependent variable. In a similar way, s_{it} stands for independent variables, representing three different types of credits used separately in three different models to explain the dependent variable. Δs_{it} are also the differences of the independent variables expressed.

In this equation,

$$\emptyset_i = -\left(1 - \sum_{j=1}^{p} \lambda_{ij}\right), \beta_i = \sum_{j=0}^{q} \delta_{ij}\,, \lambda_{ij}^{*} = -\sum_{m=j+1}^{p} \lambda_{im}\,, \delta_{ij}^{*} = -\sum_{m=j+1}^{q} \delta_{im} \qquad (2)$$

$\emptyset_i$ is error correction paramater, λ_{ij} are the coefficients of lagged dependent variable (scalars), δ (i, j) (k×1) are coefficient vectors, the indices *i* is the number of units, *t* is time, *q* is optimal lag length, u_{it} shows disturbance term. The fact that error-correction parameter is negative and statistically significant points out that the short-run deviations among the cointegrated series will disappear in the long-run and thereby series' coming to the equilibrium in the long-run (Tatoglu, 2011a, 104).

The panel vector error correction models used in this study, analyzing the long-run and short-run relations can be formulated as seen below.

$$\Delta CAB = \emptyset_i \varepsilon_{it-1} + \beta_{i1}' FC + \sum_{j=1}^{p-1} \lambda_{ij1}\, \Delta CAB_{it-1} + \sum_{j=0}^{q-1} \delta_{ij1}\, \Delta FC_{it-j} + u_{it} \qquad (3)$$

$$\Delta CAB = \emptyset_i \varepsilon_{it-1} + \beta_{i1}' GC + \sum_{j=1}^{p-1} \lambda_{ij1}\, \Delta CAB_{it-1} + \sum_{j=0}^{q-1} \delta_{ij1}\, \Delta GC_{it-j} + u_{it} \qquad (4)$$

$$\Delta CAB = \emptyset_i \varepsilon_{it-1} + \beta_{i1}' HC + \sum_{j=1}^{p-1} \lambda_{ij1}\, \Delta CAB_{it-1} + \sum_{j=0}^{q-1} \delta_{ij1}\, \Delta HC_{it-j} + u_{it} \qquad (5)$$

4.3. Findings

In this section, firstly, the cross-sectional dependence between the series is examined. Secondly, after determining that, the second-generation unit root test is utilized from to ascertain the stationary degree of the series. Thirdly, by cointegration test, the long-run relationship is determined. Lastly, the results obtained from the analyses are given on tables and the findings are interpreted.

4.3.1. Cross-Sectional Dependence Tests

One of the important issues in panel data studies is to control if there is cross-sectional dependence between the series used. If there is cross sectional dependence between the series, analyzing without taking in consideration of this situation significantly affects negatively the results to be obtained.

The existence of cross-section dependence in the series and the cointegration equation needs to be tested and considered especially in choosing unit root and cointegration test before starting the analysis. Otherwise, the results of the analysis made may be biased and inconsistent. The presence of cross-sectional

dependence between the series can be examined by Berusch-Pagan (1980) LM test or Pesaran (2004) CD test. The Berusch-Pagan (1980) LM test is appropriate when the time dimension is larger than the horizontal section size (T>N), the Pesaran (2004) CD test can be used in case both the time dimension is larger than the cross-section size and the cross-section size is larger than the time dimension (N>T). But, because these tests are biased when the group mean is zero but the individual mean is different from zero, Pesaran (2008) developed a new test statistic, correcting this deviation by means of adding the variance and the mean to the test statistic (Altintas and Mercan, 2005: 359).

In the study; firstly, it is controlled whether are cross section dependence between the series with the help of CD test developed by Pesaran (2004) and the findings obtained are as shown in Table 2.

Table 2: Average Correlation Coefficient and Pesaran (2004) CD Test*

Variable	CD Test	p-value	corr	abs(corr)
CAB	4.69	0.000	0.040	0.438
FC	63.44	0.000	0.543	0.687
GC	57.35	0.000	0.493	0.785
HC	43.07	0.000	0.369	0.646

***:** the null hypothesis for cross–section dependence. **abs(corr):** the average absolute value of off-orthogonal elements of cross section correlation matrices of error terms.

According to test results, for all of the variables used in the study, the null hypothesis can be rejected. That is to say, there is cross section dependence among the series. Thus, it is more convenient to use the second generation unit root tests generating more consistent results in the case of existing cross section dependence.

4.3.2. Unit Root Tests

Cross-Sectionally Augmented IPS (CIPS) Unit Root Test developed by the Pesaran (2007) has been utilized to examine the unit roots. This test creates a new test statistic for all general panel by averaging unit root test statistics belonging to each cross-section (Altintas and Mercan, 2005: 362).

Table 3: Pesaran (2007) CIPS Unit Root Test Results

Variables	WITHOUT TREND			WITH TREND	
	Lag Level	Zt-bar	p-value	Zt-bar	p-value
CAB	0	-4.503	0.000	-5.913	0.000
	1	0.180	0.572	-1.457	0.072
	2	1.027	0.848	-0.208	0.418
	3	0.675	0.750	-0.058	0.477
FC	0	1.247	0.894	1.676	0.953
	1	-0.621	0.267	-1.434	0.076
	2	-1.401	0.081	-3.262	0.001
	3	1.123	0.869	-0.887	0.188
GC	0	-0.690	0.245	1.965	0.975
	1	-0.080	0.468	3.602	1.000
	2	0.737	0.769	4.805	1.000
	3	0.285	0.612	5.206	1.000
HC	0	6.538	1.000	5.380	1.000
	1	4.979	1.000	1.039	0.851
	2	5.796	1.000	1.804	0.964
	3	5.098	1.000	1.258	0.896
THE FIRST DIFFERENCE					
CAB	0	-23,417	0.000	-22.605	0.000
	1	-17,212	0.000	-15.337	0.000
	2	-10.652	0.000	-8.380	0.000
	3	-8.987	0.000	-6.477	0.000
FC	0	-17.297	0.000	-16.884	0.000
	1	-9.574	0.000	-8.341	0.000
	2	-8.428	0.000	-6.915	0.000
	3	-6.598	0.000	-4.881	0.000
GC	0	-20.918	0.000	-20.602	0.000
	1	-13.107	0.000	-12.131	0.000
	2	-8.423	0.000	-7.696	0.000
	3	-3.305	0.000	-1.734	0.041
HC	0	-12.798	0.000	-14.645	0.000
	1	-7.188	0.000	-7.411	0.000
	2	-4.393	0.000	-4.572	0.000
	3	-2.657	0.004	-1.686	0.046

As can been seen on Table 3 where the unit root test results take place, specially according to two and three lags level with trend, the variables used in the study are not stationary by the level degree, whereas the first difference of them are stationary.

4.3.3. Cointegration Tests

The presence of long-run relationship between the variables which are I (1) is sought via Westerlund, Pedroni and Kao cointegration tests. According to all of Westerlund tests, there is long-run relationship among the variables. In a similar way, the six of Pedroni tests and Kao tests point to the same results (see also Table 4).

Table 4: Panel Westerlund, Pedroni and Kao Cointegration Tests

COINTEGRATION BETWEEN CAB AND FC											
WESTERLUND				PEDRONI						KAO	
Statistics	**Value**	**Z-Value**	**P Value**	**Statistics**	**Value**	**P Value**	**Statistics**	**Value**	**P Value**	**t-statistics**	**P value**
G_t	-1.27	-1.47	0.071	**Panel v**	-5.45	1.000	**Group rho**	-24.1	0.000	-22.9	0.000
G_a	-5.20	-1.57	0.058	**Panel rho**	-30.4	0.000	**Group PP**	-57.1	0.000	-	-
P_t	-6.47	-3.31	0.001	**Panel PP**	-44.7	0.000	**Group ADF**	-37.3	0.000	-	-
P_a	-4.58	-6.26	0.000	**Panel ADF**	-38.1	0.000	-	-	-	-	-
COINTEGRATION BETWEEN CAB AND GC											
Statistics	**Value**	**Z-Value**	**P Value**	**Statistics**	**Value**	**P Value**	**Statistics**	**Value**	**P Value**	**t-statistics**	**P value**
G_t	-1.73	-3.71	0.000	**Panel v**	-5.53	1.000	**Group rho**	-23.7	0.000	4.04	0.000
G_a	-6.44	-2.96	0.002	**Panel rho**	-28.3	0.000	**Group PP**	-54.1	0.000	-	-
P_t	-6.47	-3.31	0.001	**Panel PP**	-43.9	0.000	**Group ADF**	-38.1	0.000	-	-
P_a	-3.56	-4.46	0.000	**Panel ADF**	-37.0	0.000	-	-	-	-	-
COINTEGRATION BETWEEN CAB AND HC											
Statistics	**Value**	**Z-Value**	**P Value**	**Statistics**	**Value**	**P Value**	**Statistics**	**Value**	**P Value**	**t-statistics**	**P value**
G_t	-1.63	-3.21	0.000	**Panel v**	-5.47	1.000	**Group rho**	-25.1	0.000	-14.9	0.000
G_a	-5.75	-2.18	0.014	**Panel rho**	-31.3	0.000	**Group PP**	-60.3	0.000	-	-
P_t	-7.80	-4.45	0.001	**Panel PP**	-45.7	0.000	**Group ADF**	-34.6	0.000	-	-
P_a	-5.63	-8.11	0.000	**Panel ADF**	-35.7	0.000	-	-	-	-	-

4.3.4. PMGE and MGE Estimation Results

After finding the long-run relationship between the series, the intensity and direction of them are analyzed through PMGE and MGE, and only MGE findings are given on Table 5. Firstly, the effect of the credits to firms on current account balance is investigated. To find the estimator explaining the relationship best, we employed Hausman long-run homogeneity test. On the basis of Hausman test statistics value (7.41), the null hypothesis is rejected. Therefore, MGE is generating more correct results and both long-run and short-run parameters changes depending on units. As for the error-correction parameter (ec), it is statistically significant, representing the speed of coming to the equilibrium of the short-run deviations stemming from the fact that the series are not stationary. Generally, in error correction models, it is required for these parameters to be negative in order for co-integration and long run equilibrium. The lowness of this coefficient point outs the high speed of system coming to equilibrium long run. On the contrary, the positive coefficient values for these parameters signal to deviating system and relations from long-run equilibrium.

Accordingly, 36 percent of the imbalances occurring in a period will disappear on next period and in the long run series will approach to the equilibrium. It means that the time for coming to the equilibrium is approximately 6-7 months. For the variable FC, the coefficients for long and short run are significant. In the short run, one point increase in the firm credits causes nearly a 0.053 point decrease in

the current account balance. More clearly, in the short run, an increase in the credits to firms makes the current deficit go up.

Considering the sustainability of the current deficit, the short-run parameters being quite low poses not serious risk in terms of countries. Besides that, it can be seen that this effect is inversed in long-run. Accordingly, one point increase in the long-run in the firm credits leads to an approximately 0.18 point increase in current account balance. This result suggests that in spite of the fact that the credits used by firms lead to current deficit in short-run; by inducing investments and thereby rising export, it will cause the current surplus in the long run. With respect to the impact of the government credits on current account balance, the findings of the analyses are presented on the same Table. Given the fact that Hausman test statistics value is 8.58, it can be inferred that MGE brings more correct results out. In addition to this, we have detected that error correction term and long-run parameters are statistically significant, meaning that the 91% of imbalances occurring in a period will be corrected on next period and it will be ensured to come to the equilibrium in the long-term. Starting from this, it can be stated that the speed of coming to the equilibrium is quite high. According to the long-run parameter of public sector, one point increase in the credits used by this sector causes nearly a 0.078 point increase in the current account balance. The fact that the long-run parameters of either firms or public sector are being positive reveals the productive side of these decision-makers. Hence, by inducing the export, the production is highly-likely lead to a surplus on current account balance.

Table 5: MGE and Hausman Test Results (All Models)[2]

D. CAB (Dependent Variable)	**(1)**	**(2)**	**(3)**
Long Run (LR)			
L. FC	.1880545*** (.0713937)		
L. GC		.0784394** (.0329275)	
L. HC			.0206875 (.0715091)
ec (error correction)	-.3650392*** (.0641588)	-.9192264*** (.1156891)	-.8589978*** (.1465573)
Short Run (SR)			
D1. FC	-.0535794* (.0289205)		
D1. GC		-.041527 (.0491931)	
D1. HC			-.382817** (.1850045)
Hausman	**chi2(1)** =7.41***	**chi2(1)** =8.58***	**chi2(1):** 10.56***
Observations	1036	1036	1036

Notes: Standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

[2] The results of the PMGE will be shared with the interested parties when requested.

Basing on the Hausman test statistics, the estimator explaining best the effect of the household credits on current account balance is MGE. In this model, the error-correction parameter (-0.86) is negative and statistically significant. This indicates that the speed of coming to the equilibrium is quite high. It means that for the system, the time for coming to the equilibrium is approximately 4-5 months, meaning that 86 percent of the imbalances occurring in a period will disappear on next period and in the long run series will approach to the equilibrium. In contrast to firms and public sector, for households, only short-run parameter is significant. Accordingly, one point increase in household credits in the short-run leads to a 0.38 point reduction in current account balance. It can interpret in way that an increase in the propensity of households to consume causes import to rise.

To wrap up, the findings obtained in this study, where the effects of type of credits used by decision-makers in economy on current account balance are analyzed, point out that the effects of the credits given to government and firms in the long-run are positive. Besides this, we could not detect significant relationship between household credits and this balance in the long run. When it comes to the short-run, while we found that the effect of the credits used by household and firms are negative, we could not come across any relationship as regards public sector.

5. Conclusion and Evaluation

With globalizing world, the increasing trade volume has come along with current account problems to some countries. Searching for the solution to this problem, the countries have been striving to determine the reasons of these deficits in the short-term and long-term. In this regard, the revelation of the reasons for these deficits is of vital importance in terms of comparing economics policies with each other to implement. This study divides the credits, as seen one of the determinant on current account balance, into three groups as follows: household, firms and government credits, which the search with this classification is new to literature. Besides that, it includes the 26 OECD countries as a sample, in another point differing from other studies. It aims to determine the effect of each credit type on current account balance separately in the related period. To that end, the all of the variables to GDP ratios are utilized as data set. In this process, with the help of the PMGE and MGE, some of panel data methods, the degree and directions of the short-run and long-run relations between the variables have been identified. Firstly, the presence of cross section dependence has been tested through CD Test. Having found this dependence, the stationaries of the series are tested by CIPS unit root test. In the light of the unit test results, all of the series is seen being I (1). On the back of that, the presence of the long-run relationships between the variables has been revealed through Westerlund, Pedroni and Kao tests. Considering the fact that all series are cointegrated, it is confirmed that the

estimator explaining best relationship between every one of the type of credits and current account balance is MGE by Hausman test.

As the consequence of the analysis, one point increase in the credits to firms leads in the short run to a 0.053 point reduction in current account balance, and in the long run, it results with 0.18 point increase in this balance. These findings could be account for the fact that, in the short-run, the credits make the import to rise but in the long run, by increasing the investments and production, have positive impact on this balance. When it comes to households, it is found that a one point increase in the credits causes a 0.38 point reduction in current account balance, as the same findings obtained by Büyükkarabacak and Krause (2005). Starting from this point, it can be inferred that household credits have negative impact on this balance in the short run by enhancing demand for imported goods. For the coefficients of government credits, this increase leads to a 0.078 point rise in the balance in the long run. This result differs from the finding reached by Boamah et al. (2011) that the public sector credits are significant in the short run. Either firm or government credit's being positive are explained by the productive side of these units. Besides that, it is detected that the coefficients of all of the three variables are negative and significant, pointing that there is relationship coming to the equilibrium in the long term between variables.

The result of this analysis displays that the central banks aiming to stabilize the current account balance is in the need of improving separate policies with regards to each type of credits instead of a policy as a whole. At the same time, the findings suggest that the credits given to the sectors having strong productive side could have positive impact on current account balance in the long-run. Therefore, this effect, from the point of the countries being exposure to chronic current account balance problems, shows to the necessity to be taken into consideration the sectors using credits in the implementation of monetary policies.

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