

Effects of Exchange Rate on Current Account in Fragile Five: Is the End of QE a Solution for Chronic Current Account Deficits?

Tahsin Karabulut¹ and Ahmet Şahbaz²

Abstract

Fragility of national currencies belonging to “Fragile Five” countries has increased in the aftermath of the declaration of Federal Reserve about the end of Quantitative Easing program. The values of national currencies against U.S. dollar are depreciated. Both the structure of financial systems and absence of financial capital needed in the pathway to economic development are effective on exchange rates. In addition to economic developments after May 2013, Fragile Five economies achieved to reduce current account deficit in recent years. The situation with national currencies brings another question into mind if the depreciation in national currencies is effective on current account deficit. In this study, we aim to investigate the structure of relation between variables via SVAR analysis. Results show that most of the economies are gained from depreciation of national currencies. The depreciation of national currencies is not effective in South Africa and India. This result indicates that the structure of export is different in these countries.

Keywords: Fragile five, Current account deficit, Quantitative easing

Jel Codes: F32, F41

1. Introduction

The global finance crisis led the economies to implement unusual monetary policies. Not only Japanese central bank has implemented this program, also Bank of England, Federal Reserve (FED) and European Central Bank (ECB) have started to apply “Quantitative Easing” program (QE). While the program aims to increase the quantity of national currency, the transmission mechanism would appreciate the production. The size of the QE program in the U.S. was the biggest program compare to others.

By the end of QE, a new acronym has occurred. That is “fragile five” economies. The countries which national currencies depreciated after the end of QE are Brazil, Turkey, India, Indonesia and South Africa. The economies have considerably fragile financial systems and they have high financial capital to finance investments. In May 2013, Federal Reserve declared that they stopped the Quantitative Easing program by the end of 2014. That made exchange rates against U.S. dollar more vulnerable to FED Announcements.

Current account balance is the key component of the balance of payment (BOP) and of vital importance in macroeconomic analysis of an open economy. Current account balance measures current payments and current receipts between residents of a country and rest of the world (Wanjau, 2014: 97). It measures the extent to which an economy is a net borrower or net lender vis-à-vis the rest of the world over a particular period (Henry and Longmore, 2003: 2). The current account deficit gives important insight about macroeconomic condition of the domestic variable.

While current account surplus means that economy is considerably in good condition, current account deficit imply an excess of domestic absorption over aggregate supply/income (Henry and Longmore, 2003: 2). It may be a serious problem for the economy. Generally, large and persistent current account deficit may signal ill-performance and vulnerability of

¹ Associate Prof., Department of Economics, Faculty of Social Sciences and Humanities, Necmettin Erbakan University, Konya, Turkey, Email: tkarabulut@konya.edu.tr

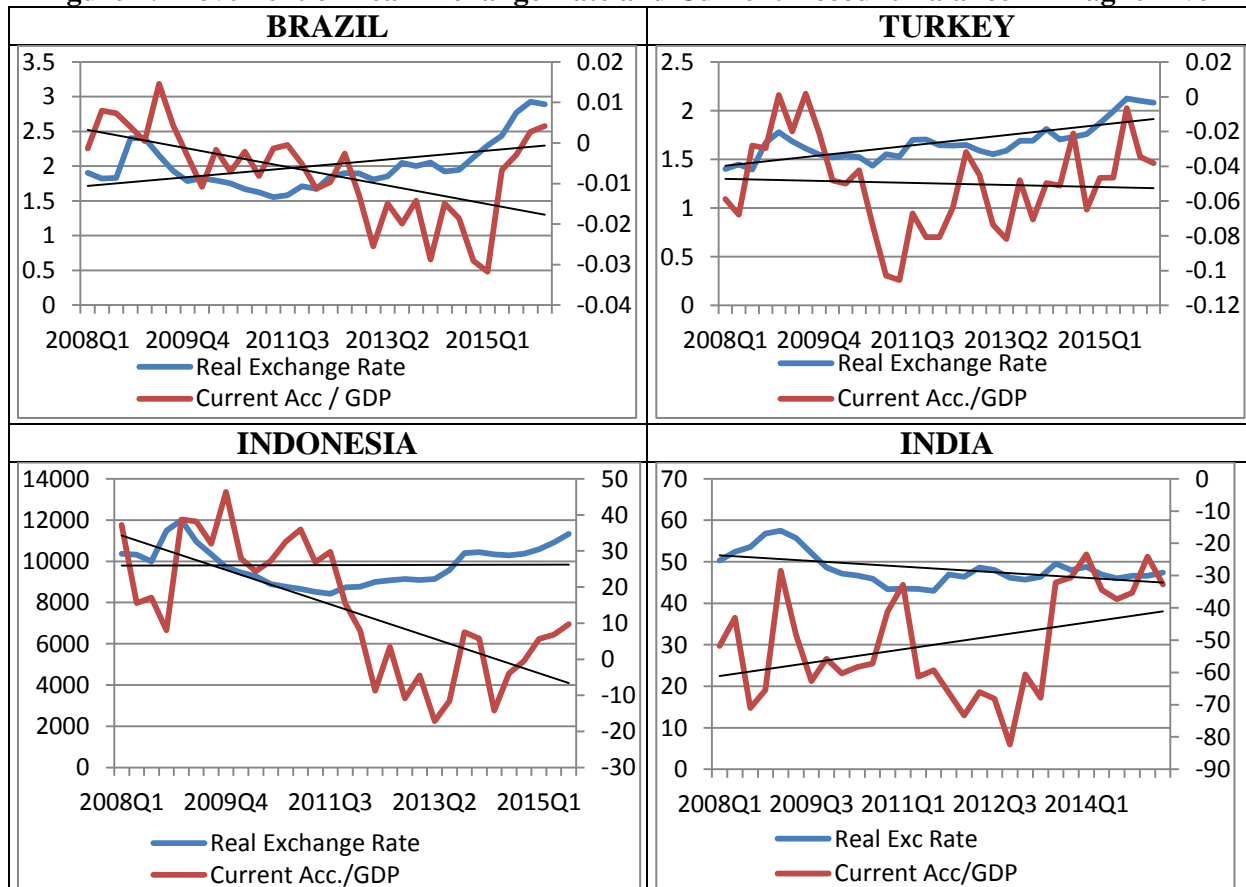
² Corresponding Author and Associate Prof., Department of Economics, Faculty of Social Sciences and Humanities, Necmettin Erbakan University, Konya, Turkey, Email: asahbaz@konya.edu.tr

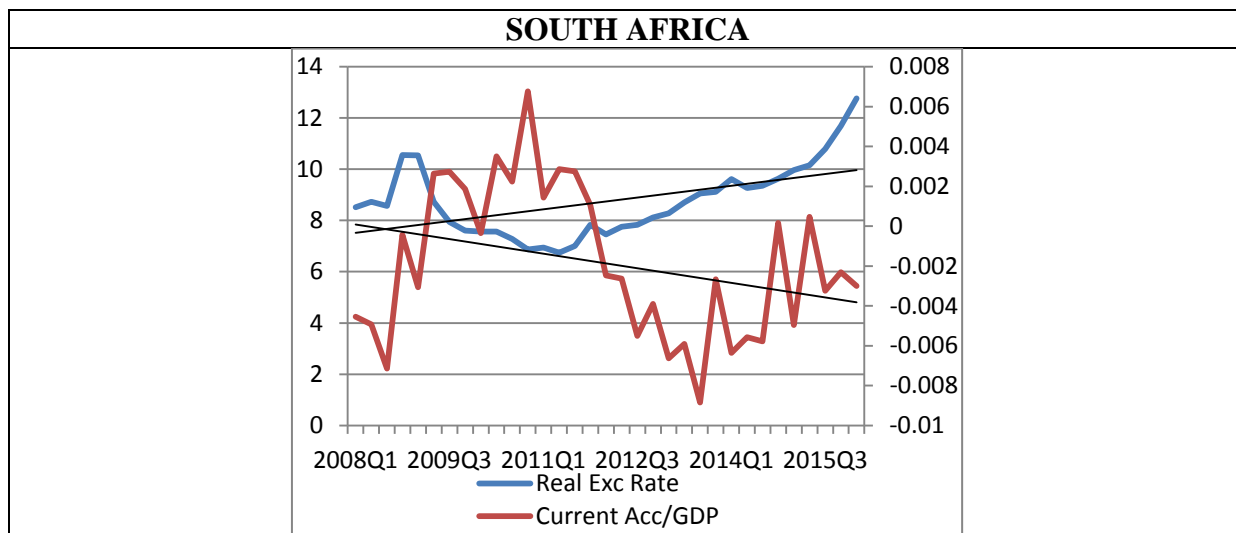
the economy. Persistent current account deficit is also a key indicator of low savings and investment, lack of international competitiveness and structural economic problem such as an undeveloped financial system (Wanjau, 2014: 98). On the other hand, it has been long held view that one way to correct current account deficit is to allow for depreciation in the real exchange rate, which would alter international trading decisions through changes in relative prices (Henry and Longmore, 2003: 3).

On the other hand, real exchange rate is one of the most important and strategic macroeconomic fundamental that plays a key role in ensuring a country competitive in international trade. An increasing real exchange rate would increase export and reduce import. So the current account deficit will reduce. In this regard, exchange rate one of the key determinant of the current account balance.

In the context of theoretical explanations, it is important to investigate the relation between two variables to answer “how real exchange rate deficit affect current account deficit” and “if there is a persistent impact on current account in the economies with fragile financial systems”. After the end of QE U.S. dollar appreciated and as a result of appreciation, exchange rate of fragile five countries’ depreciated.

Figure 1: Movement of Real Exchange Rate and Current Account Balance in Fragile Five





It is possible to see the movement of real exchange rate and current account deficit in each country. As can be seen in the figure 1, the real exchange of each country has started to increase after the announcement of FED. But the change in current account balance is not same in all countries. Especially in Indonesia, the current account deficit seems worsens after 2013. This is contrary to theoretical expectations. On the other hand, increase in real exchange rate heals current account deficit over in other economies. That means the end QE may affect current account balances via real exchange depreciation.

In the light of theoretical explanations and graphical analysis about fragile five countries, the aim of this study is to investigate the impact of real exchange rate change in fragile five countries on current account deficit. In the following section, we summarize international literature. In the third section, methodology is summarized. In the fourth section, empirical findings are interpreted and implications are made in the light of empirical findings.

2. Literature Review

The relation between exchange rate and current account deficit is investigated by numerous researchers in the existing literature. The researchers employ different econometric methods as well as different time periods.

In early studies of [Sarchinell \(1982\)](#), [Khan and Knight \(1983\)](#), [Howard \(1989\)](#) and [Dornbusch \(1988\)](#) find similar findings about the effect of current account deficit. According to [Dornbusch \(1988\)](#) real exchange rate is effective on current account deficit. But it depends on some criteria. One of them is its ability to redirect demand for exports and imports in the right direction and by the right magnitude may determine whether an open economy benefits from trade with the rest of the world ([Wanjau, 2014: 98](#)).

[Bagnai and Manzocchi \(1999\)](#), [Boyd et al. \(2001\)](#), [Calderon et al. \(2002\)](#) and [Herwatz and Siedenburg \(2007\)](#) employed panel data analysis methods in order to investigate different country groups. The common conclusion with the country groups is that real exchange rate is an important indicator of current account balance.

[Kandil and Greene \(2002\)](#) for United States, [Erbaykal \(2007\)](#) and [Yucel \(2003\)](#) for Turkey, [Ogwuru \(2008\)](#) for Nigeria, [Britte and McCombia \(2009\)](#) for Brazil, [Wanjau \(2014\)](#) for Kenya investigate the relation. The results imply the relation for these countries. [Şahbaz \(2011\)](#) applies the Turkish economy for the sustainability of the current account deficit and finds positive results for the sustainability of the deficit.

Although the theoretical explanations and existing literature, the relation between variables seems contrary to literature in the fragile five countries. For this reason, the study

investigates the different country group has fragile financial system by employing structural VAR method which is useful for investigating financial variables.

3. Model and Methodology

The current account deficit has numerous determinants. It is possible to put a lot of variables, but we limit it to real exchange rate. In order to see change current account balance, we divide it to nominal GDP and we realize it. Also we calculate the real exchange rate for U.S. dollar / Turkish Lira by employing U.S. consumer price index and domestic consumer price index. So, the real exchange rate (RER) and ratio of current account deficit to nominal GDP (RCA) are the variables employed in the model.

The time span is different for each country. In this regard, the period for Brazil covers the period between 1991Q1 – 2016Q1, for Turkey 1987Q1 – 2016Q1, for India 2004Q1 – 2015Q2, for Indonesia 1990Q1 – 2015Q3 and for South Africa the time period covers 1980Q1 – 2016Q1.

In this study, the effects of real exchange rate on current account deficit were tested with SVAR analysis. The variable vector used in the study is as follows,

$$x_t = (RER, RCA)$$

Performing the SVAR analysis depends on obtaining deconstructive terms (ε_t). Variance – covariance matrix of Cholesky decomposition and reduced VAR resid are used for this. Relation between structural destructive term and reduced VAR resid is given below:

$$\begin{bmatrix} u_t^{RER} \\ u_t^{RCA} \end{bmatrix} = \begin{bmatrix} S_{11} & 0 & 0 \\ S_{21} & S_{22} & 0 \end{bmatrix} = \begin{bmatrix} \varepsilon_t^{RER} \\ \varepsilon_t^{RCA} \end{bmatrix}$$

It is a triangular matrix which denotes that some structural shocks has no simultaneous effect on some other variables when the ranking of internal variables is constant in model. According to this, structural model is determined by putting $k(k-1)/2$ constraint on S matrix. In here, k denotes number of internal variables. Thus, Comparing with structural VAR model, coefficients for each variable are not forecasted like unrestricted VAR model in the same number with each variable. Consequently in each equation some variables are left out of account (Lebe et al., 2009: 73).

4. Empirical Findings

In typical VAR analysis, it is important to employ stationary series. For this reason, it is the first step to check stationary of the variables. We employ Augmented Dickey Fuller (1981) and Phillips – Perron (1989) unit root tests.

Table 1: Results for Unit Root Test

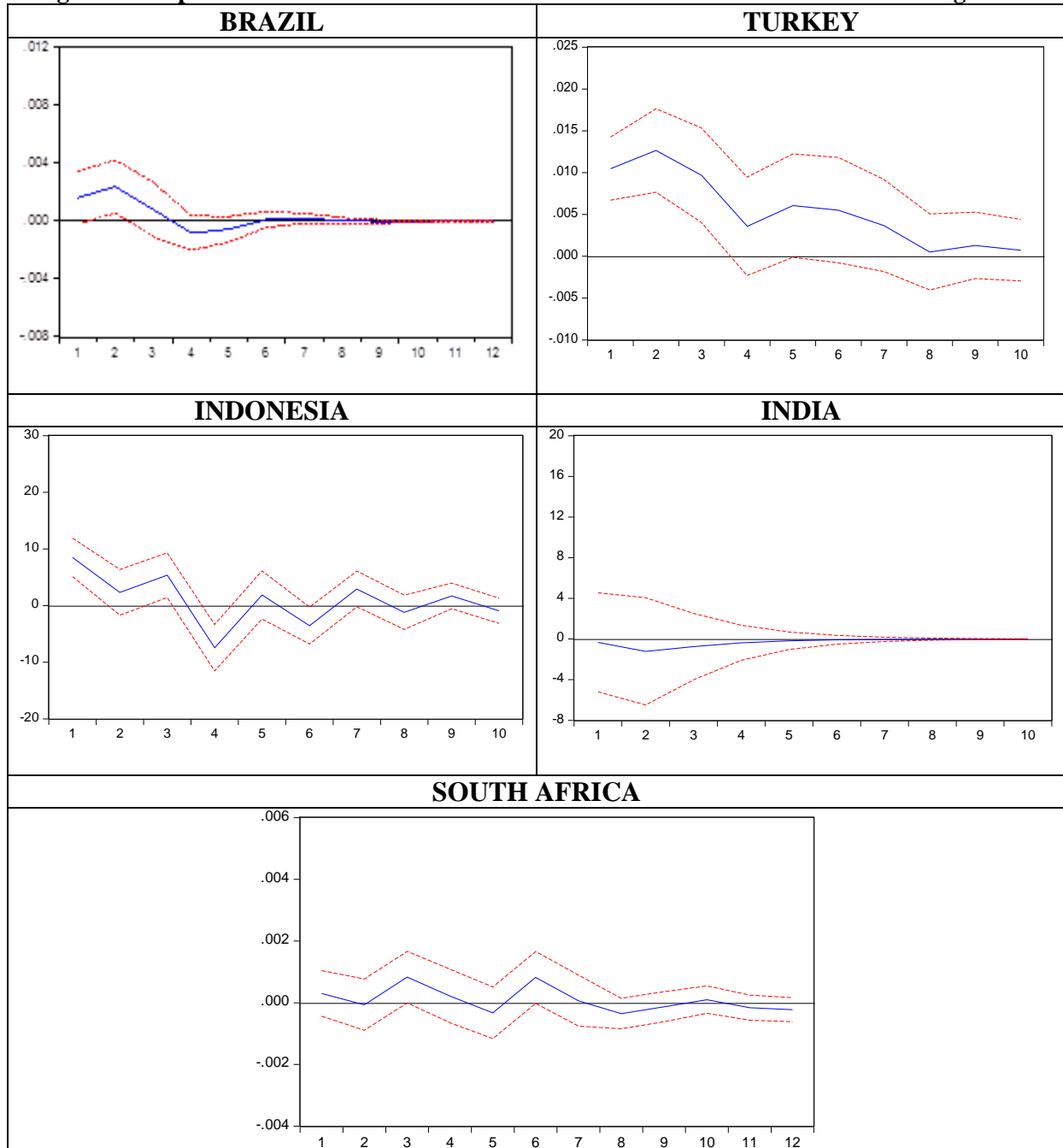
Levels	Country	Vrb.	ADF	PP	First-Differences	ADF	PP
Intercept	Brazil	RCA	-2.42 (0) [0.371]	-2.32 (5) [0.625]	Intercept	-9.46 (0) [0.00]***	-10.05 (10) [0.00]***
		RER	-2.35 (0) [0.097]*	-10.876 (9) [0.00]***		-5.273 (3) [0.00]***	-34.104 (13) [0.00]***
	India	RCA	-1.576 (5) [0.484]	-1.875 (3) [0.340]		-3.942 (4) [0.03]**	-4.749 (2) [0.00]***
		RER	-6.313 (1) [0.00]***	-6.181 (7) [0.00]***		-9.390 (2) [0.00]***	-15.124 (12) [0.00]***
	South	RCA	-2.614 (1) [0.092]*	-5.424 (8) [0.00]***		-16.751 (0) [0.00]***	-17.024 (2) [0.00]***

Trend and Intercept	Africa	RER	-3.472 (2) [0.010]**	-3.833 (7) [0.00]***	-13.144 (1) [0.00]***	-16.579 (5) [0.00]***
		RCA	-3.536 (1) [0.00]***	-2.013 (4) [0.280]	-4.776 (2) [0.00]***	-3.814 (2) [0.00]***
	Turkey	RER	-0.042 (4) [0.950]	-7.590 (3) [0.00]***	-5.634 (3) [0.00]***	-50.194 (12) [0.00]***
		RCA	-1.971 (1) [0.298]	-1.660 (5) [0.447]	-5.761 (0) [0.00]***	-5.895 (3) [0.00]***
	Indonesia	RER	-1.088 (4) [0.717]	-7.873 (2) [0.00]***	-5.882 (3) [0.00]***	-38.196 (15) [0.00]***
		RCA	-2.35 (0) [0.679]	-2.24 (5) [0.896]	-9.41 (1) [0.034]**	-10.01 (10) [0.026]**
	Brazil	RER	-2.226 (4) [0.468]	-10.953 (10) [0.00]***	-5.409 (3) [0.00]***	-35.187 (13) [0.00]***
		RCA	-1.555 (5) [0.790]	-1.319 (2) [0.869]	-3.150 (4) [0.04]**	-4.721 (2) [0.00]***
	India	RER	-2.072 (3) [0.544]	-6.230 (8) [0.00]***	-9.219 (2) [0.00]***	-14.427 (12) [0.00]***
		RCA	-3.144 (1) [0.100]	-6.203 (8) [0.00]***	-16.654 (0) [0.00]***	-16.920 (2) [0.00]***
	South Africa	RER	-3.153 (2) [0.098]*	-3.977 (7) [0.011]**	-13.314 (1) [0.00]***	-16.894 (5) [0.00]***
		RCA	-5.347 (1) [0.00]***	-2.633 (4) [0.267]	-4.784 (2) [0.00]***	-3.864 (2) [0.01]**
	Turkey	RER	-2.509 (4) [0.322]	-11.534 (6) [0.00]***	-5.725 (3) [0.00]***	-50.870 (12) [0.00]***
		RCA	-1.998 (1) [0.594]	-1.629 (5) [0.774]	-5.884 (0) [0.00]***	-6.021 (3) [0.00]***
	Indonesia	RER	-2.583 (4) [0.288]	-8.650 (1) [0.00]***	-6.283 (3) [0.00]***	-41.282 (14) [0.00]***

Notes: The figures in parenthesis denote the lag length selected by the Schwarz criterion. ***, **, and * denote statistical significance at the 1%, 5% and 10% level of significance, respectively. Values within the brackets show the probability ratios. For the ADF test: The figures in parenthesis denote the results of Dickey Fuller test in the case of zero lag length and lag length chosen due to SIC criteria. For the ADF test, the [Mac Kinnon \(1996\)](#) critical values for model with constant -3.485, -2.885, -2.579 at the 1%, 5% and 10% levels. The critical values for the model with constant and trend -4.035, -3.447 and -3.148 at the 1%, 5% and 10% levels, respectively.

For the PP test: Values in the parenthesis show bandwidths obtained according to Newey-West using Bartlett Kernel criteria. For the PP test [Mac Kinnon \(1996\)](#) critical values for model with constant -3.483, -2.884, -2.579 at the 1%, 5% and 10% levels. The critical values for model with constant and trend -4.033, -3.446 and -3.148 at the 1%, 5% and 10% levels, respectively.

The unit root test results imply that series for each country present that all variables are stationary in their first differences. So we include the variables with their first differences. The second step in the SVAR analysis is to determine lag length for each country. The most important point with the lag selection is to check if there is autocorrelation problem. According to lag length and autocorrelation test results, the number of lag is two in Brazil, one in India, four in Indonesia, six in South Africa and five in Turkey.

Figure 2: Response of Current Account Deficit to a 1% Positive Shock in Real Exchange Rate

The results of impulse - response analysis are presented in the figure 2. Response of current account deficit in Brazil is positive for three quarters. Result is significant statistically and theoretically. An increase in real exchange rate reduces current account deficit by increasing current account balance. This is an expected finding for a country that an depreciation of currency will make it competitive compare to other economies.

The response of current account balance to a positive shock in Turkey is positive for four quarters. Similar to Brazilian case, the result is significant theoretically and statistically. But it is more persistent and the strength of response is higher than Brazilian case.

In Indonesia, the response of current account balance to a shock in real exchange rate is positive and statistically significant. Although it is stronger than the previous countries, it is valid for only two months.

The real exchange variable affects current account balance positively in the South African economy. Although it is significant theoretically, result is insignificant statistically. Similarly, response of current account balance to a real exchange shock in India is negative. This result is insignificant theoretically and statistically. Lastly the response of current account deficit is negative. This is contrary to theoretical expectations. Also it is insignificant statistically.

Conclusion

No doubt, the end of QE has affected financial structure of the emerging market economies such as Brazil, Turkey and South Africa. On the other hand, it has brought another opportunity that competitiveness of these countries via national currency depreciation.

In this study, we aim to analyze effects of the end of “Quantitative Easing” program implemented by Federal Reserve in “Fragile Five” economies. To do so, we investigate the response of current account balance to depreciation in national currency. Results show that depreciation in national currencies of the selected economies is some effective on current account balance. In the case of Brazil, Turkey and Indonesia, real exchange rate increase (depreciation in national currency) would reduce the current account deficit. Although the strength of the response of current account balance is different for each economy, it is possible to interpret the results as a positive impact of end of QE have a positive impact on current account of emerging market economies.

There is no relation between real exchange rate and current account balance in India and South Africa. Although the financial systems of binary have had affected by the end of QE, it has no impact on export and import volume. The difference between countries may come from structure of the real economy and export – import sectors. When we focus on India and South Africa, the mining and commodity sectors are the main sectors revive the foreign trade. In this regard, the commodity prices may be the initial provocateur instead of real exchange rate. So it is possible to say that although financial structures of the selected countries are similar, impacts of the end of QE on real economy via financial system may be different due to production structure of the economy. In this regard, developing countries have to complete structural reforms in order to overcome fragility in both financial and real sectors.

References

- Bagnai, A. & Manzonchi, S. (1999). Current-account reversals in developing countries: The role of fundamentals. *Open Economic Review*, 10, 143-163.
- Boyd, D., Caporale, G.M. & Smith, R. (2001). Real exchange rate effects on the balance of trade: Cointegration and the Marshall–Lerner condition. *International Journal of Finance and Economics*, 6, 187–200.
- Britto G. & McCombie J. (2009). Thirlwall’s Law and the long run equilibrium growth rate: An application to Brazil. <http://www.ppge.ufrgs.br/akb/encontros/2009/53.pdf>
- Calderon, C.A., Chong A. & Vloayza, N. (2002). Determinants of current account deficits in developing countries. *Contributions to Macroeconomics*, 2(1), 1-31.
- Dickey, D.A. & Fuller, W.A., (1981). Distribution of the estimators for autoregressive time series with a unit root. *Econometrica*. 49, 1057-1072.
- Dornbusch R. (1988). Open economy macroeconomics. Oxford University Press, 2nd Ed. New York.
- Erbaykal, E. (2007). Türkiye’de ekonomik büyüme ve döviz kuru cari açık üzerinde etkili midir? Bir nedensellik analizi. *Zonguldak Karaelmas Üniversitesi Sosyal Bilimler Dergisi*, 3(6), 81–88.

- Henry, C. & Longmore, R. (2003). Current account dynamics and the real effective exchange rate: The Jamaican experience. *Bank of Jamaica Working Paper*, March 2003.
- Herwartz, H. & Siedenburg, F. (2007). Determinants of current account imbalances in 16 OECD countries: An out-of-sample perspective. *Review of World Economics*, 143(2), 349–374.
- Howard, D.H. (1989). Implications of the U.S. current account deficit. *Journal of Economic Perspectives*, 3(4), 65–153.
- Kandil, M. & Greene, J. (2002). The Impact of cyclical factors on the U.S. balance of payments. *IMF Working Paper*, 02/05.
- Khan, M.S. & Knight, M.D. (1983). Determinants of current account balances of non-oil developing countries in the 1970s. *IMF Staff Papers*, 4(30), 819–842.
- Lebe, F., Kayhan, S., Adıgüzel, U. & Yiğit, B. (2009). The empirical analysis of the effects of economic growth and exchange rate on current account deficit: Romania and Turkey samples. *Journal of Applied Quantitative Methods*, 4(1), 69 – 81.
- Ogwuru, H. (2008). Exchange rate dynamics and current account balance in Nigeria. *Journal of Finance and Economic Research*, 3(1), 1-16.
- Phillips, P.C.B. & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika*. 75(2), 335-346.
- Sarcinell, I. M. (1982). Current account deficit, foreign borrowing and monetary policy: The Italian experience. *Banca Nazionale del Lavoro-Quarterly Review*, 141, 147–164.
- Şahbaz, A. (2011). Cari işlem açıklarının sürdürülebilirliği: 2001-2011 Türkiye örneği. *Çukurova Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 20(3), 417-432.
- Wanjau, B. M. (2014). The relationship among real exchange rate, current account balance and real income in Kenya. *International Journal of Business and Social Sciences*, 5(9), 97 – 118.
- Yücel, Y. (2003). Dynamics of the current account of balance of payments in Turkey. 7. *İktisat Kongresi*, ODTÜ, Ankara.