On the Sustainability of Current Account Deficits in Indonesia: Error Correction Mechanism Approach

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Abstract- This study investigates the sustainability of the current account deficits in Indonesia. We employed ECM (Error Correction Mechanism) approach to find out relationship in the long run and short run during 2000 quarter 1 up to 2015 quarter 4. The condition of the current account deficit is inseparable from the macroeconomic indicators. The results of the long run estimation of current account deficits is negatively influenced by real gross domestic product. In the short run estimation of current account deficits is positively influenced by real gross domestic products, real effective exchange rate, and the open economic. While negatively influenced by inflation. The research recommended to the financial policy authority relates to the fluctuation of macroeconomic variables for a policy-making basis on the sustainability the current account deficits in Indonesia, because this is one of the parameters that determine the economic performance of a country.

Index Terms- Current account deficits, Error Correction Mechanism, Macroeconomic indicators.

I. INTRODUCTION

Indonesia is one of the countries that embrace the open economy system in the current era of globalization. A country with an open economy system will conduct economic activities with other countries because some output is sold on the domestic market and some of it is sold in foreign markets. The realization of the relationship of the open economic system is shown by the international trade activities recorded in the current account balance as it is one of the indicators of macroeconomics used to assess the economic stability of a country and reflect the strength of international competitiveness in utilizing the resources owned by the country [1].

The role of the current account balance for a country is, First, the current account balance is one of the key factors for economic growth. Secondly, a country's current account balance mainly reflects the trade balance. Thirdly, since the current account balance determines the evolution of a country's stock [2].The current account imbalance has been a major source of concern by economists [3]–[5]. Consequently, economists are trying to explain the changes in the current account balance to estimate the sustainable levels to cause required changes in the balance. Implications of imbalance and sustainability of the current account are important issues in international macroeconomics because the current account balance reflects the performance of the economy and as a measure to assess economic growth by policymakers and investors [6]–[13].

The process of economic globalization will increase international trade and capital mobility resulting in the current account balance in some countries experiencing a deficit state [14]. The current account deficit is one of the main indicators of external imbalance of global economies [15]–[19]. The concept of current account deficit has long been the focus of research debates for economic policy making [20]–[25]. The trend towards current account deficits can be observed in Indonesia. The current account deficit is challenging because if exposed to large external shocks and have limited capability to finance the current account deficit will result in economic crises such as currency crises, external debt and international reserve reductions for developing countries [11], [26]–[33].

Figure 1 summarizes the condition of the current account balance in Indonesia over the past ten years. Based on figure 1, the current account condition in Indonesia has surplus in 2005 to 2011, but the current account condition has a sustained deficit in 2012 to 2015. The condition of the current account Indonesia fluctuating is inseparable from macroeconomic variable shocks. According to the theory of international financial economics that the condition of the current account is influenced by macroeconomic indicators, such as economic growth, exchange rate and inflation [34]. Based on previous research conducted by [2], [5], [21], [35]–[38], which the current account balance is influenced by economic growth, exchange rate, inflation, and economic openness.

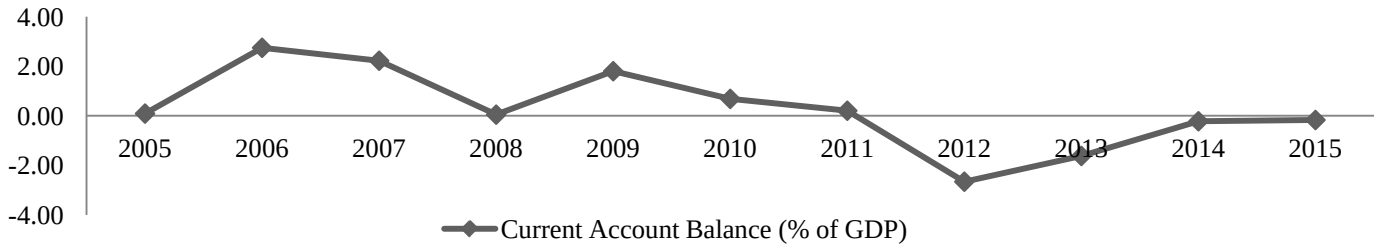

Figure 1: Condition of the current account in Indonesia

The importance of research about the current account balance are; the first, the current account balance describes the effect of foreign economic transactions on national income; the second, current account balance showing the structure and composition of economic transactions and the international financial position of a country; the third, to assist the government in taking policy. Based on various relevant theories and research, the current account deficits cannot be separated from the influence of macroeconomic variables. The main purpose of this research is to answer some questions between current account deficits and macroeconomic indicators, such as real gross domestic products, real effective exchange rate, open, and inflation in Indonesia. In this respect, Error Correction Mechanism approach was employed to specify the sustainability of the current account deficits in Indonesia from 2000 quarter 1 up to 2015 quarter 4.

II. LITERATURE REVIEW

Research on fluctuations in the current account balance has been done by some previous researchers [39] analyze the current account deficit of 44 developing countries during 1966-1995. Their findings suggest: current account deficits are moderately persistent; GDP growth worsens the current account deficit; temporary increase of public savings or private savings improves the current account balance; temporary appreciation of the real exchange rate or the deterioration of terms of trade wide the current account deficit but their impact in the long term is not significant; a temporary increase of the level of economic growth in developed countries leads to a reduction of current account deficits.

[40] take up quite different econometric methods compare to [39] and their attention is to the medium-term determination of current account. Their empirical analysis consist of a wide database of 18 developed countries and 71 developing economies. The findings show that the budget balance, the initial net foreign assets (NFA) and financial indicators are positively correlated with the current account balance in developing countries. Their model was further expanded by [41], analyzing the impact of the financial crisis in the current account balance. [36] update the work of [40] respectively the impact of legal and institutional indicators.

[42] focus on developing economies and low income states. Among others, they found that the appreciation of the real exchange rate and deterioration of total terms of trade deteriorate the current account deficit.
[43] their results suggest that the fiscal balance significantly affects the current account, as well as they argue that the increase of net foreign assets improves the current account balance. [44] and [35] examine the excessive deficits of the current account in the most of new member states of EU. Based on panel data estimations deficits in these countries are mainly determined by the relative income per capita and high capital investments. Analyzing the developing countries of Europe, [45] finds that economic growth and transition index have negative and significant impact on the current account balance.

[6] examines the main determinants of the current account balance to assess the possible extension of current account deficits in selected transition economies, Eastern Europe and the former Soviet Union. The analysis covers the period 1992-2003 and using different estimates for both empirical models (A and B). According to the empirical model A, FYROM for period 2000-2003 captures a current account deficit of 7.1% of GDP, while according to model B, the current account deficit is lower 5.1% of GDP. [38] investigate the potential determinants of current account positions in FYROM for both, the short run and long run dynamics covering the period 1998q1-2013q4. Empirical results indicate that the financial development, fiscal balance and terms of trade are positively correlated with the current account balance, while openness to international trade is negatively correlated with the current account balance.

III. RESEARCH METHODOLOGY

Type and Sources of Data

This study entirely used secondary data sources covering the year ranged from 2000 quarter 1 up to 2015 quarter 4. Data are collected from FED (Fred Economic Data) and BI (Bank Indonesia). The data set includes Current Account (CA), Real Gross Domestic Product (RGDP), Real Effective Exchange Rate (REER), Inflation, Open Economics (OPEN). Table 1 summarized the description of data and data sources used in this study.

Table 1: Description of data and sources

Variabel	Abbreviation	Description	Source
Current Account	CA	Total Current Account Balance for Indonesia, Percent of GDP	Fred Economic Data
Real Gross Domestic Product	RGDP	Gross Domestic Product by Expenditure in Constant Prices: Total Gross Domestic Product for Indonesia, Index 2010=1	Fred Economic Data
Real Effective Exchange Rate	REER	Real Broad Effective Exchange Rate for Indonesia, Index 2010=100	Fred Economic Data
Open Economics	OPEN	Ratio of exports plus imports to GDP for Indonesia, Percent of GDP	Fred Economic Data
Inflation	INF	Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services for Indonesia, Percent	Bank Indonesia

Model Specification

The analytical tool used in this research is econometric model with ECM (Error Correction Mechanism). Some steps to use the ECM test are; the first is a stationarity test of data using ADF test and Phillips-Perron test which aims to know there is no significant change in the data; the second is if all the variables pass from the unit root test, then the next cointegration test to determine the possibility of long run relationship, in this study used Engle Granger method to test the cointegration of variables by using statistical test ADF-PP test to see the error term (u) of the basic model is stationary or not; the third is long run relationship test, the long run equation on the ECM model is the basic equation, which is not stationary in level; the fourth is a short run relationship test, stationary error term (u) in the basic model, also used as one of the variables in the short-run equation. Short-run equations also use variables that are similar to those of long-run equations, but they have been stationarized on the same order.

This study uses 4 determinants variable to sustainability of current account deficits in Indonesia, it is based on result from relevant research about factors influencing current account deficits, that is:

$$CA = f(RGDP, REER, OPEN, INF) \quad [1]$$

Based on the function equation, ECM model can be derived as follows:

The first is the basic model:

$$CA_t = \alpha_0 + \alpha_1 RGDP_t + \alpha_2 REER_t + \alpha_3 OPEN_t + \alpha_4 INF_t + U_t \quad [2]$$

Where t = year; α_0 = constant; $\alpha_{1\text{-}10}$= coefficients; U = error term.

The second is cointegration of the basic model:

$$U_t = CA_t - \alpha_0 - \alpha_1 RGDP_t - \alpha_2 REER_t - \alpha_3 OPEN_t - \alpha_4 INF_t \quad [3]$$

The third is the ECM model:

$$\Delta CA_t = \alpha_0 + \alpha_1 RGDP_t + \alpha_2 REER_t + \alpha_3 OPEN_t + \alpha_4 INF_t + \alpha_5 \Delta U_{t-1} + \varepsilon_t \quad [4]$$

Where Δ = change; U_{it-1}= the one period lagged value of the error term.

IV. EMPIRICAL RESULTS

The analysis first starts with variables checked through Augmented Dickey-Fuller (ADF) test and Phillips-Perron for unit root test in determining the stationarity of variables. Based on table 2, by looking at the value of t-statistics and p-value, which OPEN and INF stationary in level, while CA, RGDP, and REER stationary in first difference. Based on the unit root test in table 2, not all variables stationary in level, but all variables stationary in first difference, so the application of ECM method can be continued.

Table 2: Unit root test statistics

Variables	Test	Level		First Difference		
		t-statistics	p-value	t-statistics	p-value	Decision
CA	ADF	-1.700788	0.1795	-10.81266***	0.0000	I(I)
	PP	-2.491380	0.1224	-11.99219***	0.0000	
RGDP	ADF	6.553304	1.0000	-2.968409**	0.0436	I(1)
	PP	6.945524	1.0000	-6.307715***	0.0000	
REER	ADF	-2.018626	0.2783	-8.769815***	0.0000	I(1)
	PP	-1.916161	0.3230	-8.769815***	0.0000	
OPEN	ADF	-3.019143**	0.0386	-	-	I(0)
	PP	-2.165777**	0.0226	-	-	
INF	ADF	-3.812371***	0.0046	-	-	I(0)
	PP	-3.475396**	0.0119	-	-	

The notifications ***, ** and * denote 1%, 5% and 10% level of significance, respectively.
Source: Authors' calculations using e-views 8.

For the second analysis, since the ECM model can be used in this study, it is followed by cointegration test of Engle Granger method by using the ADF-PP test statistic to see the error term from the basic model is stationary or not summarized in table 3. Based on table 3, estimation for Indonesia was found that the variables used in this study have cointegration, since the value of error term from the basic model is stationary in level, this means that the variables studied have long run relationship.

Table 3: Cointegration test statistics of error term from the basic model

Variables	Test	Level		First Difference		
		t-statistics	p-value	t-statistics	p-value	Decision
Ut	ADF	-4.227433***	0.0013	-	-	I(0)
	PP	-4.270294***	0.0011	-	-	

The notifications *** denote 1% level of significance, respectively.
Source: Authors' calculations using e-views 8.

For the third analysis, since the variables have cointegration and there is a long run relationship, it is followed by long run test summarized in table 4 with coefficients, statistics, and prob. Variables have cointegrated, then there is a long run relationship between current account and variables caused it for the estimate Indonesia, the variable significant affecting current account deficits in the long run are RGDP which are consistent with the research [2], [34], [38], [43]. While REER, OPEN, and INF are not caused current account deficits in long run, which are consistent with the research [5], [21], [35].

Table 4: Long run relationships from basic model

Variable	Coefficient	t-statistic	Prob.
C	12.29446	3.300123	0.0016
RGDP	-0.069598	-6.164468	0.0000
REER	-0.036231	-1.293251	0.2010
OPEN	-0.044964	-0.962996	0.3395
INF	0.012231	0.206297	0.8373
R-squared	0.562015		

Source: Authors' calculations using e-views 8.

For the fourth analysis, since the ECM model can be applied in this study, it is followed by short run test of the same order of each variable summarized in table 5 with coefficients, statistics, and prob. Based on table 5, the one period lagged value of the term error of the short run equation is denote 1 percent of significant that occurs in Indonesia. This condition indicates that there is short run problems caused by insignificant variables. In the estimates for Indonesia, the short run influencing current account deficits are RGDP, REER, OPEN, and INF which are consistent with research [2], [5], [37], [38].

Table 5: Short run relationships estimated from ECM model

Variable	Coefficient	t-statistic	Prob.
C	-0.136711	-0.260897	0.7951
D(RGDP)	0.051527	0.127507	0.8990
D(REER)	0.062598	1.380348	0.1730
D(OPEN)	0.024132	0.310999	0.7570
D(INF)	-0.054597	-0.604320	0.5481
D(RES(-1))	-0.371641	-2.894129	0.0054
R-squared	0.539559		

Authors' calculations using e-views 8.

V. CONCLUSION

This paper used an ECM (Error Correction Mechanism) approach to analyze long run and short run relationships on the sustainability current account deficits in Indonesia with various macroeconomic indicators that influence it. The estimated results in the long run for Indonesia, based on the coefficient of determination (R-squared) of the ability of variables in this study explained the condition on the sustainability of current account deficit in Indonesia is 56.2015%. The current account deficits condition in Indonesia in the long run is determined by Real Gross Domestic Product with a negative influence. This condition occurs because if the country experiences an increase in gross domestic product with a relatively high percentage of other countries, then its current account will decrease. If real income increases then consumption of goods will also increase as a portion of the increase in consumption of imported products, this condition caused the current account will be deficits.

The estimated results in the short run for Indonesia, based on the coefficient of determination (R-squared) of the ability of variables in this study explained the condition on the sustainability of current account deficit in Indonesia is 53.9559%. The current condition of the current account deficit in Indonesia is determined by all the independent variables used in this study. This condition occurs because in the short run stability of macroeconomic indicators such as Real Gross Domestic Products, Real Effective Exchange Rate, Open Economics, and Inflation is influenced by many things that come from internal factors and external factors, so that Indonesia as a developing country involved in trading activities international are vulnerable to this.

The current account deficits are inseparable from the macroeconomic indicators. Indonesia should focus on the variable that has the greatest effects in the long run and short run to keep its stability for current account balance. Based on the coefficient value of the long run estimation result that the biggest effect on the sustainability current account deficits in Indonesia is the Real Gross Domestic Products and the biggest effect for the short run is Real Effective Exchange Rate. Based on this, the government of Indonesia should prioritize to maintain the stability of Real Gross Domestic Products and Real Effective Exchange Rate so that current account deficits can be controlled. If Indonesia is able to maintain the stability of the macroeconomic indicators, overall for Indonesia will have stable condition of the current account balance.

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