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# A comparative analysis of the impact of current account balances on economic growth of sane countries

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## Abstract

This study investigates the impact of current account balance on economic growth in SANE countries which comprises of South Africa, Algeria, Nigeria and Egypt. A comparative study is conducted on the impact which current account balance has on each country's economic growth. Various theoretical expositions have led to contradictory conclusions on the impact which current account balance has on economic growth. To achieve the objective of this study, ARDL estimation technique is employed to investigate the comparative analysis and fully modified panel OLS (FMOLS) is employed to investigate the overall impact of current account balance on economic growth. It was discovered from the study that current account balance has a significant negative impact on economic growth for Algeria, Egypt and Nigeria while it has a significant positive impact on economic growth for South Africa. The implication of this finding is that the structure of an economy with respect to her main source of foreign exchange earnings determines the impact of such activities reflected by her current account balance on the country's economic growth. It is therefore recommended that special attention should be paid to the diversification of the export base. This can principally be through technological innovations, agriculture and so on. Therefore, the mitigation or neutralization of the effect of any short fall or negative shock in the oil sectors can only be achieved by the implementation of reforms and policies that will reduce dependence on oil and promote dependence on the non oil sectors.

***Keywords:*** Current Account Balance; Economic Growth; ARDL; FMOLS Technique



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## 1. Introduction

It has been documented and adjudged in literature that the current account of an economy reflects the wellbeing of the country and at the same time shows the economic and financial relations of a country with the rest of the world; this is as well seen as an important component of balance of payment (Eğilmez and Kumcu, 2011). Hence, it has a determining role on economic decisions and expectations. Current account comprises of balance trade relations, net cash transfers at a recorded point in time and net factor income or primary income which is the difference between the receipts on foreign investments and payments made to international investors.

Developed countries consistently make efforts to ensure that the earnings received from exportation are greater than the payments made for importation of goods and services; otherwise put; such countries strive to attain favourable balance of trade. This however is not always applicable to developing countries in which SANE (South Africa, Algeria, Nigeria and Egypt) countries are part of. The system and the political state of an economy reflects in the current account balance of the nation, whether it be deficit or surplus. For deficits, this implies that the country's payment for goods and services imported is higher than her receipts for exportation of goods and services; such country reflects government and an economy that is a potential net debtor with the rest of the world. For such economy, her investment is higher than her saving by using the resources of other countries to finance its domestic investment and consumption. Countries recording a current account deficit have strong imports, a low saving rates and very high personal consumption rates as a percentage of disposable incomes.

This study focuses on the effect of current account on the growth of SANE countries which comprises of South Africa, Algeria, Nigeria and Egypt who are majorly staunch oil exporters. There is a high level of uncertainties in the current account balance of mostly oil producing countries due to the fluctuations in the global oil prices and at times their volume of production. First, given that natural resource with special attention to oil is exhaustible raises the need for inter-generational equity considerations. This should be a major concern for such countries in which their oil depletion is at an increasing rate. Second, the Dutch disease phenomenon in which increase in the rate of natural resource production will eventually lead to real appreciation of the domestic currency which reduces the competitiveness of non-oil exports and increasing imports, adversely impacts the current account position (i.e. deficit) and its prospects.

Careful understanding of the factors driving the current account of these SANE countries under study is necessary for assessing its impact (current account balance) on economic growth. Hence, it is important for decision makers to estimate the level of current account that will spur economic growth and sustain the growth rate given its macroeconomic characteristics such as her demographic structure, macroeconomic policies and developmental stages. Some of the factors postulated as the determinants of current account balance include; oil price (Gruber and Kamin, 2007), trade openness (Hermann and Winkler, 2009), financial intermediation and integration (Aizeman, 2007), fiscal policy and public saving (Gruber and Kamin, 2007) and so on. However, the impact of these factors on current account surplus, differ from its impact on current account deficit. The most frequently occurring current account position in Nigeria is current account deficit, while that of Algeria is current account surplus.

Recent macroeconomic crisis arising from the recent oil price shock such as the recession and the depreciation of the Naira to dollar in the case of Nigeria, and also the deterioration of the fiscal and external balances in SANE countries with a fortunate limited effect on economic growth in Algeria due to its reserves. However the effect it has had on economic growth in Nigeria is short of catastrophic. Illustratively in 2015, real GDP of Algeria grew by 3.9% and inflation increased to 4.8%. The fiscal deficit doubled to 16% as a ratio of GDP which led to fall in hydrocarbon revenues with corresponding fall in its exports; this led to the worsening of the current account deficit. Although, the nation's reserve was large, but this fell by 35 billion US dollars to 143 billion US dollars; external debt remains very low. In the case of Nigeria, growth slowed sharply from 6.3% in 2014 to an estimated 2.7% in 2015. This explains the drop in exports of about 40% in 2015, pushing the current account from a surplus of 0.2% of GDP to a deficit projected at 2.4% of the GDP. Reserves fell to US$28.3billion at the end of 2015 from US$34.3billion in 2014 (World Development Indicator, 2016).

The crux of this study is to compare the effect of current account on economic growth in SANE countries and investigate the relationship between financial openness, trade openness and current account balance in the context of selected countries.

Current account links the domestic economy and the rest of the world economy dictating the health status of an economy. Furthermore, it represents how import and export activities affect the economy as a whole. This study is to investigate the extent to which Trade openness and financial openness affect the probability of a country being subjected to a current account deficit or surplus as the case may be. Furthermore, the lack of cross-country empirical evidence as previous studies have focused on country specifics is surprising given the fact that the position of the current account is typically used as one of the main leading indicators for future behaviour of an economy and is part of the everyday decision process of policy makers.

For the purpose of data analysis, a period of 30 years (i.e. 1986-2015) will be considered. Furthermore, trade ratio will be used to measure the trade openness while the Chinn-Ito Index (KAOPEN) will be used as a measure of financial openness. The determinants such as, oil price, Real exchange rate (Real effective exchange rate), Real interest rate and other relevant variables may be included to measure the impact of current account on the economic growth of selected countries.

The remaining section of this work will be divided into four namely literature review; theoretical framework and research methodology; empirical analysis and findings; and conclusion and policy implications.

## 2. Literature review

### 2.1. Determinants of current account balance

It has been documented in literature on the major determinants of current account balance. In literature, scholars acknowledged some determinants in the medium run which has to do with the demographic structure, net oil revenue, fiscal balance and economic growth. From these identified determinants, current account balance can be modelled to be a function of fiscal balance, economic growth, net oil revenue and the demographic structure. There are however other determinants that are peculiar to oil exporting countries.

### 2.1.1. Fiscal balance

Favourable fiscal balance of an economy increases the national savings cum current account balance. The Full Ricardian Equivalence postulates an economic situation in which public saving is set off by private saving but empirical literature supporting this postulation is scanty especially in developing and industrial countries (Bernheim, 1987). To this effect, higher government revenue over expenditure translates into favourable current account balance. In literature, fiscal balance is the ratio of government budget balance to GDP in deviation from the weighted average budget balance of trading countries. Conceptually, if the resultant effect of trading between two countries leads to the strengthening of each other fiscal balance, this will translate into favourable macroeconomic conditions not necessarily impacting on their current account balance. It then implies that current account balance can only improve by the same measure in which fiscal balance improves making fiscal balance a major determinant of current account balance.

### 2.1.2. Net Foreign Assets (NFA)

It has being documented in literature as well that net foreign assets can impact on the current account balance principally in two ways. These are; countries having a very huge net foreign assets balance can still sustain higher trade deficit while remaining solvent which will then translates into an inverse relationship between net foreign assets and current account balance. Secondly, countries also that have higher positive net foreign assets can also enjoy higher foreign income flows which translates into a positive relationship between net foreign assets and current account balance. It has being empirically documented that the second effect is highly plausible. The net foreign asset is estimated in this study as the ratio of net foreign assets to GDP. This is done in order to avoid the problem of endogeneity with the current account (Lane and Ferretti, 2007).

### 2.1.3. Demographic factors

Demographic factors have the tendency to have a long lasting effect on current account balance. In other words, the population structure of the economy impacts heavily on the current account balance. For instance, an economy that has an economically dependent population translates into increase in the level of national consumption which then reduces savings and this negatively impacts on the current account balance. This factor however is peculiar to specific country or rather put, is country specific and as such, it will have a cross-country effect on aggregate national savings. In estimating the effect of demographic structure of the population, two variables can be conveniently used and these are the age dependency ratio and population growth rate which are both measured in deviation from trading partners weighted averages. The UNDP clearly provides the boundary for the age dependency ratio which is set of all population below 15 years and those above 65 years old. The independent population or the working population is defined as the age population of the set containing people between 15 and 64 years. In the study conducted by Lee et al. (2008), only old-age dependency ratio was used. In their methodology, the total dependency ratio is more relevant for the sample countries since the share of young population in oil exporting countries is always higher than the ageing population found in developed countries.

### 2.1.4. Oil wealth

The natural resource in the form of unused oil resource is also a major determinant of current account balance especially for oil exporting countries. For most oil exporting countries, their oil wealth is always greater than their net foreign assets especially those that have large oil reserves such as Saudi Arabia and other countries that are at their early phase of oil exploration such as Kazakhstan that has deficit net foreign assets principally because of the high level of importation of machineries used for the construction of oil refinery. In order to determine how oil wealth can be estimated, we estimate the remaining proven oil reserves at each year which is valued according to the present year's values of oil price instead of the undiscounted valuation that would not affect the results of the regression as long as the same extraction and discount rates are used for all countries. The a priori expectation of the oil wealth coefficient is inverse meaning that countries with high oil wealth can accommodate high current account deficit and they will still be solvent. Also, to avoid endogeneity problem in model estimation, the oil wealth is lagged to one period.

### 2.1.5. Oil balance

This encompasses the variations in oil prices and also the quantity of oil produced together with the aggregate demand for oil. If the world's demand for oil increases, this will lead to increase in either the price of crude oil or the quota of oil supplied by oil producing countries. For either ways definitely, foreign exchange earnings of the exporting country will increase and this will improve the current account balance. To this end, the a priori expectation between oil balance and current account balance is positive and direct. This oil balance again is measured as the ratio of the oil trade balance to GDP.

### 2.1.6. Degree of maturity in oil production

The gestation period of oil production to a large extent determines the current account balance of the oil exporting country. Take for an instance, a country that just discovered oil and has thus, just commenced production will invest heavily in oil infrastructures leading to increase in importation of such machineries. This transaction will worsen the current account balance of such oil exporting country. In the case of already established oil producers, they don't need to invest anymore in oil infrastructures but with the production and export of oil, they will accumulate large oil revenues and this will improve current account balance tilted towards the positive aspect. It then implies that the effect which the degree of maturity in oil production will have on current account balance is ambiguous dependent on whether the exporting country is a starter or already established oil exporter.

### 2.1.7. Economic growth

The size of the nation's output which partly explains the developmental stage of the country greatly determines the status of the current account balance. During the early stages of development, such country imports capital and as such, the country is expected to run into current account deficit. As such economy attains a greater level

of development, the current account balance will improve as such country can efficiently export products much more than her importation thereby importing the current account balance. To measure economic development, one can use the relative income or economic growth. The relative income's a prori expectation with current account balance is positive while for economic growth, it is expected to have an inverse relationship.

### *2.1.8. Exchange rate*

The price of the domestic currency in relation to the foreign currency determines to a large extent the current account balance position of such country. The transmission mechanism through which exchange rate exerts influence on current account balance is the interest rate differential (Granger, 1969). The interest rate differential is measured as the difference between the foreign interest charged and the domestic interest charged $\left(i^f - i^d\right)$. The rate of change in exchange rate can also impacts on the interest rate differentials. Given that assets are perfect substitutes and the country operates under monetary policy approach, then if foreign interest rate decease with respect to domestic interest rate, this makes local investment profitable, international investors will then buy portfolios domestically to take advantage of the higher returns and as such, there will be appreciation of exchange rate. This appreciation of exchange rate will cause domestic goods to become expensive and import cheaper; hence, import will outweigh export thereby causing current account balance to worsen (Khan et al., 2012).

### 2.1.9. *Theoretical* exposition

The Inter-temporal approach to Current Account follows a modern macroeconomic model of the open economy which emphasizes that the current account is an inter-temporal phenomenon. The dynamics of the current account balance provides information and at the same time serves as a roadmap to economic agents in an open economy. Thus, current account balance is a pointer to the wellbeing of the economy. Since the 1950s and beyond, various theories have been established to explain the reasons for changes in current account balance and its major determinants amongst other macroeconomic fundamentals. But the failure of such existing theories to provide explanation for the changes in current account balance in the face of evolving macroeconomic issues has led to the formulation of the inter-temporal approach to current account (ICA).

The Inter-temporal approach to Current Account explores the implications of modelling the current account based on assumptions of representative individuals that made forecasts of the relevant variables in a rational expectations context. Buiter (1981); Sachs (1981); Obstfeld (1982); Greenwood (1983); Svensson and Razin (1983) have developed such models highlighting these features. This was the result from both theoretical advances and from economic events at the international level (Obstfeld and Rogoff, 1994). On the one side, the Lucas's Critique of econometric policy evaluation was one important theoretical motivation for an inter-temporal approach. Given that economic agents are forward looking, in terms of making decisions, open-economy models might yield more reliable policy conclusions if demand and supply functions were derived from the optimization problem of households and firms rather than specified to match reduced-form estimates based on ad hoc econometric specifications. On the other side, further impetus to develop an inter-temporal

approach came from events in the world capital market, especially the substantial current account imbalances that followed the sharp world oil-price increases of 1973-74 and 1979-80 in developed and non oil developing countries. The divergent patterns of current account adjustments by industrialized and developing countries raised the inherently inter-temporal problem of characterizing the optimal response to external shocks. The systematic empirical tests that involve the inter-temporal approach employed the Campbell and Shiller (1987) method to derive the optimal current account of an economic agent using the Vector Autoregression approach. Obstfeld and Rogoff (1995) further extended this approach. Standard inter-temporal model of the current account takes a view of current account from the savings versus investment nexus approach that involves economic agents who overtime strives to smoothes consumption and borrowing abroad. Take for instance, this technique presupposes that current account will become deficit if income is low in the short run or investment is very high. This standard inter-temporal model can be seen as a very good technique of analysing current account balances.

In empirical literature today, vast researches in the area of current account balance employing the inter-temporal approach have been done. Most literature on this subject applied the basic present value of current account and then extended it in estimating the likely fluctuations that will occur in current account balance both for a developing country and a developed country. Such researches are the likes of Shefffin and Woo (1990); Otto (1992); Ogus and Niloufer (2006); Goh (2007); Khundrakpam and Rajiv (2008).

The Savings-Investment Gap and the Macroeconomic Balance Approach to Current Account sprang up when persistent real exchange rate misalignments and associated current account deficits and surpluses became a feature of the post-Bretton Woods system of the floating exchange rates among the major currencies. Economists began to look for more sophisticated explanations of current account developments. This resulted in greater emphasis on the identity between the savings-investment gap and the current account balance:

$$CA_t \equiv SP_t + SG_t - IG_t - IP_t \qquad \text{.....(2.1)}$$

Where CA is the current account balance (CA > 0 indicates a surplus), SP represents private savings, SG, government savings (i.e., the current fiscal position), IP private investment, IG public investment and the subscript, t, indicates a generic, discrete time period.

This change in approach immediately suggested to economists that, under certain conditions, current account imbalances that when viewed from the M-F perspective appear to be grounds for urgent policy action, might actually be sustainable over the long term. In particular, in countries where the opportunities for investment in productive capital have been sizable relative to saving propensities, current account deficit might be sustainable for longer periods of time. After all, experience has shown that for decades, countries such as Canada and Australia have consistently run current account deficits of 1 or 2 percent of GDP, or occasionally more, with no marked signs of macroeconomic instability.

The consumption-smoothing approach employs both the assumptions of high capital mobility and the permanent income theory of consumption in a small, open economy to predict what capital flows would be if agents behave in accordance with the permanent income theory. Under this approach, a country's current account will be in deficit whenever national cash flow, defined as output (gross domestic product, or GDP) less investment less government spending, is expected to rise over time. It will be in surplus whenever national

cash flow is expected to fall over time. This is the analogue to Campbell's (1987) point that, according to the permanent income hypothesis, household saving is equal to the expected present value of future declines in household labour income. Intuitively, if cash flow is expected on average to grow over time, the country finds it optimal to borrow against future resources (that is, to accumulate indebtedness) by running a current account deficit. If, however, national cash flow is expected to fall over time, as might be the case if government spending were expected to increase in the future, the country would run a current account surplus (increase its savings) today in order to be able to maintain consumption in the future at a level consistent with permanent income.

The consumption smoothing approach to current account focuses instead on the long-run saving and investment decisions of private agent. In this context, equation 2.1 can be given a somewhat different interpretation: economies can grow at full potential with or without showing current account deficits or surpluses. Instead, what determines the current account position of a particular country is the savings-investment gap, which ultimately depends on the willingness of foreigners to hold its liabilities. Countries with a higher savings ratio will tend to be net capital exporters and run sustained current account surpluses, while countries with a lower savings ratio will tend to import capital and therefore run current account deficits. Thus whereas the M-F model can only analyze short-term changes in the current account position, the fundamental concern of the consumption smoothing approach is the inter-temporal sustainability of the current account.

The consumption smoothing view hinges on a sort of Modigliani-Miller irrelevance Theorem of international macroeconomics; in a country that has free access to international capital markets, the mix of domestic and external capital is largely irrelevant in the financing of a country's fixed capital formation because both must be remunerated at the risk-adjusted equilibrium rate of return prevailing on the world market. It is crucial, in other words, to ensure that the net present value of investment projects is positive; whereas the geographical source of financing is irrelevant.

The elasticity approach explains the key role which the price at which currencies are exchanged between countries and then trade relations plays in explaining the level of current account balance. This approach was developed by Marshall (1923) and Lerner (1944). It was later extended by Robinson (1937). The cornerstone of this approach hinges on the price elasticity of demand for imports and also for that of export. According to the theory, current account balance will becomes favourable provided that the elasticity of demand for export is higher than the elasticity of demand for imports. The major limitation of this approach is that it is a partial equilibrium analysis in that it only considers the aspect of traded goods and doesn't consider the activities of other sectors of the economy.

The absorption approach follows a pattern although closely related to the elasticity approach only that this approach defines current account balance as the gap between income and absorption which is also the difference between savings and investment. The theory presupposes that if an economy consumes more than it is producing (that is; absorption is greater than her income), to make up the difference, the economy must import the balance form another country and this will worsen the current account balance. On the contrary, given that the economy's consumption is less than what she is producing, then the excess production will have to be exported and this will improve the current account balance. This approach is more suitable because it is

clear and doesn't provide a misconception about the relationship; it is also inclusive in that all the activities of the agents in the economy are taken into consideration.

Researchers have employed the absorption approach and have been adjudged to be more reliable in modelling current account balance (Hung and Gamber, 2010). The absorption approach begins with the framework of the national accounts in estimating the relationship between external and internal balances.

$$Y_t = C_t + I_t + G_t + \left(X_t - M_t\right) \quad \text{.....(2.2)}$$

By rearranging the variables,

$$\left(X_t - M_t\right) = Y_t - C_t - I_t - G_t = S_t - I_t \quad \text{.....(2.3)}$$

Where the internal balances of $C_t + I_t + G_t$ are defined as consumption, investment and government expenditure. Then the external balance is represented by the difference between export and import.

## 2.2. Empirical literature

Discussions on current account mostly centred on its sustainability. Recently, these discussions have rapidly increased especially in developing countries. The most important result found in the studies on the subject is that current account varies from country to country and is connected with the fragility and crisis susceptibility of the economy of a country. In the literature, generally, empirical attempts are made to determine the degree to what current account balance and its size, besides other macroeconomic variables, is influential on economic growth (especially on economic crises).

According to the analysis results of Edwards (2002), though empirical findings vary by the group of countries addressed and the definition of crisis, increase in current account deficit raises the possibility of a crisis in the group of developing countries except for Africa. When all groups of country are included in the analysis, results vary by the definition of crisis. Edwards (2002), concluded that while increase in current account deficit affects crises that have a broad definition, it does not have any statistical effect on crises that have a narrow definition. Freund and Wamock (2007) conducted a study for developed countries by examining the relationship between current account balance and economic growth for the periods 1980 till 2003 and from theirs findings; they concluded that that increase in current account deficit has a negative effect on economic growth.

The study conducted by Telatar and Terzi (2009) investigated the relationship between current account balance and economic growth for Turkey by using quarterly data ranging between the periods of the first quarter of 1991 till the fourth quarter of 2005. For his analysis, he employed the Granger causality estimation technique in determining the causal relationship and then employed Vector autoregression to examine its impacts. From his findings, increases in economic growth rate leads to higher current account deficit.

The studies conducted by Kostakoğlu and Dibo (2011) also investigated the causal relationship and impact existing between current account balance and economic growth for Turkey for a period ranging from 1991 till 2010. He employed Vector Autoregression and discovered that increase in economic growth caused current account deficit.

## 3. Research methodology

Research methodology deals with the scientific approach and manner in which a study is conducted. Basically, it provides an outline of the research design, estimation technique, sources and measurement of data. This study will be analysing the impact of current account balance on economic growth in each country using the Autoregressive Distributed Lag Model (ARDL) approach, and then the results will be compared. Furthermore, the overall impact will be determined with the use of Fully Modified OLS (FMOLS) panel regression analysis.

The ARDL approach has a superior advantage because it minimizes the too many choices that are frequently made using other approaches such as the Johansen Co-integration method. Also, in the ARDL approach, the variables can have different lag length criteria but other methods do not allow for such. There are two steps to be followed using the ARDL approach. The first one is to examine if there is a long run relationship among the selected variables of interest and this is done by using the technique recommended by Peseran (2001). The second stage involves the estimation of a long run relationship between the dependent variable and the explanatory variable(s); then we can then estimate the short run elasticities using the error correction representation of the ARDL model.

### 3.1. Model specification

Arising from the theoretical framework and in relation to SANE countries and following the model construct of Kostakoğlu and Dibo (2011), the empirical model for this study is specified as:

$$RGDP_{it} = f\left(CAB_{it},\ REXR_{it},\ RI_{it},\ OILP_{it},\ TROP_{it},\ FOP_{it},\ \mu_{i,t}\right) \qquad \text{.....(3.1)}$$

Where: $RGDP_{it}$ represents growth rate of real GDP of country i at time t, $CAB_{it}$ represent current account balance of country i at time t, $REXR_{it}$ represents real exchange rate of country i at time t, $RI_{it}$ represents real interest rate of country i at time t, $OILP_{it}$ represents oil price of country i at time t, $TROP_{it}$ represents trade openness of country i at time t, $FOP_{it}$ represents financial openness of country i at time t and $\mu_{it}$ represents Error term of country i at time t. $RGDP_{it}$ is the dependent variable while $CAB_{it}$, $REXR_{it}$, $RI_{it}$, $OILP_{it}$, $TROP_{it}$ and $FROP_{it}$ are the independent variables. The above Model can be expressed in estimation form as follows:

$$RGDP_{it} = \beta_0 + \beta_1 CAB_{it} + \beta_2 REXR_{it} + \beta_3 RI_{it} + \beta_4 OILP_{it} + \beta_5 TROP_{it} + \beta_6 FOP_{it} + \mu_{it} \qquad \text{....(3.2)}$$

Where: $\beta_0$ =Autonomous (Intercept), $\beta_1$ =Coefficient of $CAB_{it}$, $\beta_2$ =Coefficient of $REXR_{it}$, $\beta_3$ =Coefficient of $RI_{it}$, $\beta_4$ =Coefficient of $OILP_{it}$, $\beta_5$ =Coefficient of $TROP_{it}$, $\beta_6$ = Coefficient of Financial openness, $\mu_{it}$ =Sample Residual or Stochastic Error Term.

The study employs secondary sources of data spanning from the World development Index (2016) and IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) for the years1986 to 2015 where four determinants of economic growth are used.

## 4. Empirical analysis and findings

### 4.1. Trend analysis

Given that the thrust of this research work is to conduct a comparative analysis of the effect of current account on economic growth in SANE (South Africa, Algeria, Nigeria and Egypt) countries, it is imperative that a trend analysis be conducted on current account balance between the periods 1986 – 2015 for the SANE economies. Figure 4.1 shows the trend analysis of the current account balance.

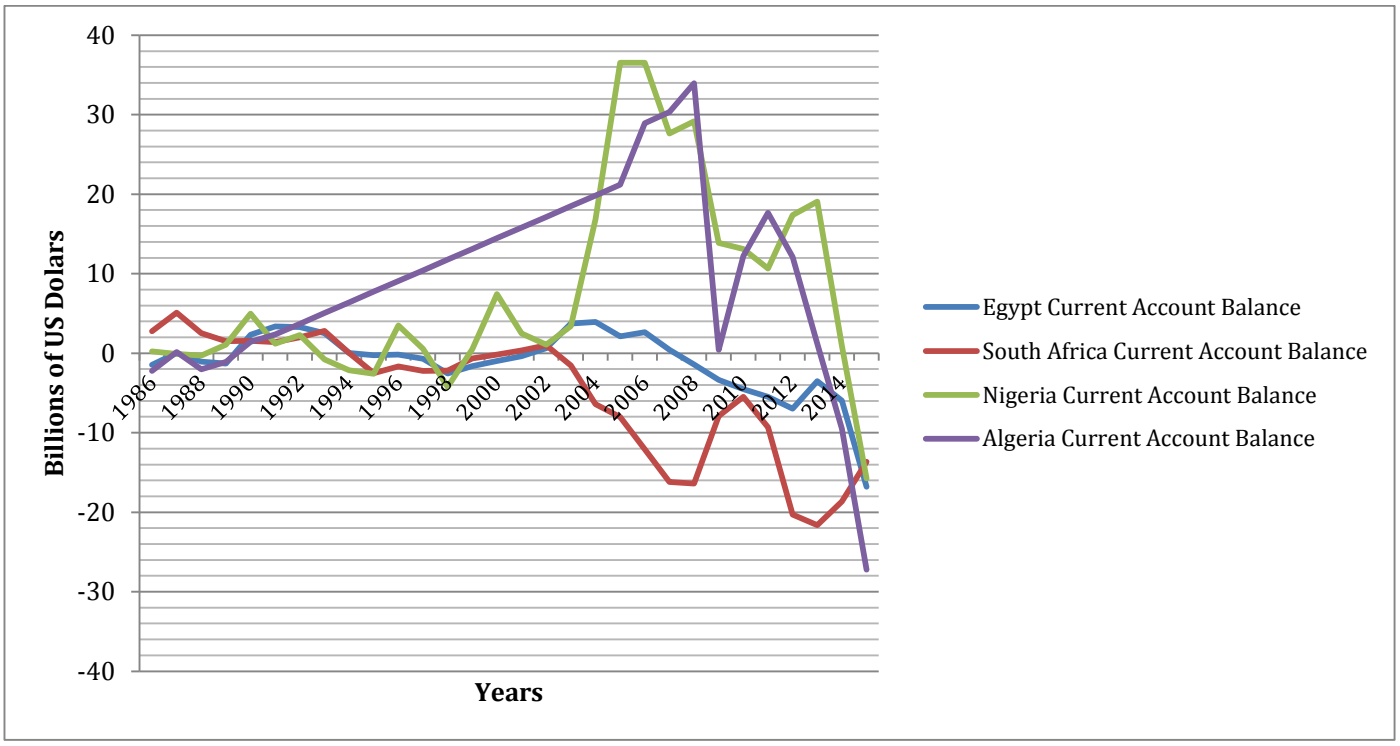


**Figure 4.1.** SANE Countries Current Account Balance (Source: Authors Computation using Data Extracted from WDI, 2016)

Figure 4.1 reveals the trend analysis of the current account balance for the SANE countries. It can be revealed that Egypt has a surplus current account balance between the periods 1986 till 2014 but declined in 2015. Most of the SANE economies except South Africa had surplus current account balance not until after the 2008 global economic meltdown when these economies started experiencing deficit current account balance. South Africa has had fluctuating current account balance and this has majorly been attributed to the unstable political system cum economic performance experienced in the late 1980s and early 1990s. Nigeria's current account balance greatly increased in the mid 2000s and this is attributed to increase in crude oil price which is the thrust of the Nigerian economy.

## 4.2. Descriptive Statistics

In order to further examine the statistical properties of variables, descriptive statistics is conducted on the current account balances of the SANE countries as this provides a general statistical background of the variables.

**Table 4.1.** Descriptive Statistics of Current Account Balance of SANE countries

| | Algeria Current Account Balance | Egypt Current Account Balance | Nigeria Current Account Balance | South Africa Current Account Balance |
|---|---|---|---|---|
| Mean | 7.05 billion | -1.12 billion | 7.48 billion | -4.87 billion |
| Median | 1.42 billion | -0.549 billion | 2.37 billion | -1.94 billion |
| Maximum | 34.0 billion | 3.92 billion | 36.5 billion | 5.10 billion |
| Minimum | -27.2 billion | -16.8 billion | -15.8 billion | -21.6 billion |
| Std. Dev. | 15.8 billion | 4.13 billion | 12.4 billion | 7.76 billion |
| Skewness | -0.018675 | -1.838805 | 0.949798 | -0.829712 |
| Kurtosis | 2.781191 | 7.959080 | 3.372754 | 2.417072 |
| Jarque-Bera | 0.034901 | 47.64661 | 4.684262 | 3.866867 |
| Probability | 0.982701 | 0.000000 | 0.096123 | 0.144651 |

*Source: Authors Computation using Data Extracted from WDI, 2016*

The summary statistics of these variables are provided in table 4.1 showing the averages and medians, along with maximum and minimum values recorded for the period. The descriptive results revealed that Nigeria has the highest current account balance surplus with the average standing at 7.48 billion US dollars over the period while South Africa has the least standing at an average of -4.87 billion US dollars. The descriptive statistics however showed that Nigeria has experienced the current account balance surplus in a single year and this stresses the effect of oil price volatility on current account balance and also as Nigeria is the highest exporter of crude oil amongst the SANE countries. All the distributions were negatively skewed with the exception of Nigeria current account balance that was positively skewed during the study period. Algeria and South Africa current account balance had platykurtic (fat or short-tailed) kurtosis while on the other hand, Egypt and Nigeria current account balance were leptokurtic because their kurtosis value were greater than three. Jarque-Bera test revealed that only the Egypt current account balance was not normally distributed, with the probability value of the variable less than 5% confidence level.

## 4.3. Unit root test

The study deployed Augmented Dickey-Fuller (ADF) test to examine the stationarity of the time series and test the null hypothesis of unit root. It is expected that the series do not contain unit root in order to find relationship among the variables in the long run. The test is carried out at level, and first difference using 5% Mackinnon Critical value. The variables of Real GDP (RGDP), real exchange rate (REXR), Real interest rate (RI), oil price (OILP), Trade openness (TROP), and Financial openness (FOP) for each of the SANE countries were tested. The levels of statistics of the tests are reported in table 4.2.

**Table 4.2.** Augmented Dickey-Fuller (ADF) Unit Root Test Result

| Variable | Method | At Level | | | At First Difference | | | Order |
|---|---|---|---|---|---|---|---|---|
| | | ADF statistics | 5% critical C.value | Prob | ADF statistics | 5% C.value | Prob | |
| **Algeria** | | | | | | | | |
| CAB | ADF | -0.683377 | -3.081002 | 0.8221 | -3.699526* | -3.119910 | 0.0186 | I (1) |
| FOP | ADF | -4.6119** | -2.967767 | 0.0010 | - | - | - | I (0) |
| REXER | ADF | -2.719918 | -3.004861 | 0.0866 | -3.380860* | -2.976263 | 0.0208 | I (1) |
| RGDP | ADF | 1.032579 | -2.971853 | 0.9958 | -3.612051* | -2.971853 | 0.0120 | I (1) |
| RI | ADF | -3.8355** | -3.012363 | 0.0090 | - | - | - | I (0) |
| TROP | ADF | -1.916700 | -2.967767 | 0.3204 | -4.899051** | -2.971853 | 0.0005 | I (1) |
| **Egypt** | | | | | | | | |
| CAB | ADF | 0.821062 | -2.967767 | 0.9927 | -2.982360* | -2.976263 | 0.0478 | I (1) |
| FOP | ADF | -1.177544 | -2.967767 | 0.6702 | -4.382154** | -2.971853 | 0.0018 | I (1) |
| REXR | ADF | -0.602980 | -2.967767 | 0.8551 | -3.560363* | -2.971853 | 0.0135 | I (1) |
| RGDP | ADF | 0.751697 | -2.998064 | 0.9907 | -4.054135** | -2.998064 | 0.0051 | I (1) |
| RI | ADF | -3.01794* | -2.976263 | 0.0458 | - | - | - | I (0) |
| TROP | ADF | -1.092766 | -2.967767 | 0.7049 | -4.219813** | -2.971853 | 0.0028 | I (1) |
| **Nigeria** | | | | | | | | |
| CAB | ADF | -2.010394 | -2.971853 | 0.2809 | -3.267400* | -2.971853 | 0.0264 | I (1) |
| FOP | ADF | -8.8909** | -3.098896 | 0.0000 | - | - | - | I (0) |
| REXR | ADF | -3.7963** | -2.967767 | 0.0075 | - | - | - | I (0) |
| RGDP | ADF | 0.968995 | -2.967767 | 0.9950 | -5.324668** | -2.971853 | 0.0002 | I (1) |
| RI | ADF | -5.2954** | -2.967767 | 0.0002 | - | - | - | I (0) |
| TROP | ADF | -2.594740 | -2.967767 | 0.1055 | -3.893525** | -3.012363 | 0.0080 | I (1) |
| OILP | ADF | -1.321686 | -2.967767 | 0.6057 | -3.837294** | -2.971853 | 0.0070 | I(1) |
| **South Africa** | | | | | | | | |
| CAB | ADF | 1.931153 | -3.004861 | 0.9996 | -5.004895** | -3.004861 | 0.0019 | I(1) |
| REXR | ADF | 0.176135 | -2.967767 | 0.9661 | -3.708127** | -2.971853 | 0.0096 | I(1) |
| RGDP | ADF | 0.704436 | -2.967767 | 0.9901 | -3.855144* | -2.971853 | 0.0236 | I(1) |
| RI | ADF | -2.619543 | -2.967767 | 0.1007 | -6.207848** | -2.971853 | 0.0000 | I(1) |
| TROP | ADF | -1.602130 | -2.967767 | 0.4688 | -4.798415** | -2.971853 | 0.0006 | I(1) |

** Implies significant at 5% meaning that the variable is stationary at that order*
*** Implies significant at 1% meaning that the variable is stationary at that order*
*Source: Authors Computation using Data Extracted from WDI, 2016*

## 4.4. ARDL bounds test for co-integration

From table 4.2, some of the variables are stationary at level and some of them are stationary at first difference, it is difficult to conduct F-test. This is because the critical values for the F-test are not available for an arbitrarily mix of I(0) and I(1) variables. However, Peseran prescribes a technique to investigate the appropriate order in which the variables are co-integrated. Peseran et al. (2001) supplied bound for the critical value for the asymptotic distribution of the F-statistic.

For various circumstances, it provides the critical values for both the upper bounds and the lower bounds. The lower bounds makes the assumption that the variables are I(0) while for the upper bound presupposes that the variables are I(1).

If the calculated F-statistic is below the lower bound, it can be concluded that the variables are I(0), and hence no co integration is possible, by definition. If the F-statistics exceeds the upper bound, it can be concluded that there is co-integration. Finally if the test statistic falls between the bounds, the test is inconclusive. The Peseran results for the four individual SANE countries are presented in table 4.3.

**Table 4.3.** ARDL Bounds Wald statistic Result

| LOS | Algeria EQN I(0) | I(1) | Egypt Equation I(0) | I(1) | Nigeria Equation I(0) | I(1) | South Africa EQN I(0) | I(1) |
|---|---|---|---|---|---|---|---|---|
| 10% | 2.12 | 3.23 | 2.12 | 3.23 | 2.12 | 3.23 | 2.12 | 3.23 |
| 5% | 2.45 | 3.61 | 2.45 | 3.61 | 2.45 | 3.61 | 2.45 | 3.61 |
| 2.5% | 2.75 | 3.99 | 2.75 | 3.99 | 2.75 | 3.99 | 2.75 | 3.99 |
| 1% | 3.15 | 4.43 | 3.15 | 4.43 | 3.15 | 4.43 | 3.15 | 4.43 |
| F-Stat | 4.689 | | 17.347 | | 7.925 | | 7.053 | |
| D.F | 6 | | 6 | | 6 | | 6 | |

*Source: Authors Computation using Data Extracted from WDI, 2016*

Table 4.3 shows that for the four equations estimated, computed F-statistic falls above the 5% upper bound; we would conclude that the variables are I(1) as in 4.689 > 3.61, 17.347 > 3.61, 7.925 > 3.61 and 7.053. > 3.61meaning that the model are I(1) variables.

## 4.5. Comparative analysis

### *4.5.1. ARDL Result*

This section presents the comparative analysis of the effect of current account balance on economic growth in SANE countries. The results are presented in table 4.4 below.

**Table 4.4.** ARDL Long Run Result and Co-integrating Equation

| | Algeria | | Egypt | | Nigeria | | South Africa | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | **Coefficient** | **t-stat** | **Coefficient** | **t-stat** | **Coefficient** | **t-stat** | **Coefficient** | **t-stat** |
| ACAB | -0.0003** | -3.2635 | -0.0016* | -3.1814 | -0.4625* | -2.5768 | 0.0749* | 3.0878 |
| AREXR | 0.0014 | 1.0429 | 0.0493** | 4.8793 | 0.0070 | 0.9066 | -0.0069 | -0.0161 |
| ARII | -0.0051 | -0.6920 | 0.0159** | 6.1564 | 0.0346 | 0.7997 | 1.2241 | 0.0882 |
| OILP | 0.0050* | 2.6316 | 0.0101** | 7.0675 | -0.0155 | -0.4651 | 0.2137 | 0.0900 |
| ATROP | 0.0104 | 1.9498 | -0.8793* | -3.0217 | 0.0114 | 0.6814 | -1.1934 | -0.0860 |
| AFOP | 1.4965 | 0.4622 | 0.1708* | 10.1019 | 22.6706 | 0.9060 | -0.1017 | -0.0898 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| C | 24.1337** | 30.434 | 24.8943** | 485.557 | 21.3462** | 5.0592 | 33.0048 | 0.3910 |
| CointEq(-1) | -0.1779* | -2.5466 | -0.2816** | -4.7256 | -0.6634* | -2.8590 | -0.8453* | -2.0883 |

** Implies significant at 5% ** Implies significant at 1%*
*Source: Authors Computation using Data Extracted from WDI, 2016*
*Dependent Variable: LOG (RGDP)*

**Table 4.5.** Statistical Properties and Post Diagnostic Results

| | Algeria | | Egypt | | Nigeria | | South Africa | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | **Statistics** | **Prob.** | **Statistics** | **Prob.** | **Statistics** | **Prob.** | **Statistics** | **Prob.** |
| R-squared | 0.998871 | - | 0.99 | - | 0.997 | | 0.999 | - |
| Adj R-squared | 0.997331 | - | 0.99 | - | 0.994 | | 0.998 | - |
| F-statistic | 640.63 | 0.0000 | 9885.693 | 0.0000 | 301.8268 | 0.0000 | 1018.495 | 0.000 |
| Durbin Watson | 2.29 | - | 1.98 | - | 2.44 | - | 1.93 | - |
| BPG Hetroskedasticity | 0.658699 | 0.7775 | 1.774643 | 0.2243 | 1.807991 | 0.1533 | 0.488899 | 0.901 |
| B-G Serial LM(F-stat) | 0.186951 | 0.8326 | 4.919196 | 0.0659 | 3.662838 | 0.0641 | 0.455653 | 0.646 |
| Ramsey RESET (F-stat) | 0.204496 | 0.6608 | 0.775999 | 0.4123 | 0.525691 | 0.4836 | 0.398020 | 0.539 |
| Jarque-Bera Statistics | 0.0123 | 0.9939 | 0.669308 | 0.7156 | 4.399123 | 0.1112 | 2.101661 | 0.349 |
| AIC model selection | -5.503 | - | -8.29 | - | -3.441 | - | -6.030 | - |

*Source: Authors Computation using Data Extracted from WDI, 2016*

The result from table 4.4 reveals that current account balances in Algeria, Nigeria and Egypt all have negative impacts on economic growth and they are statistically significant as their probabilities are less than 5%. The result shows that only current account balance in South Africa has a positive impact on economic growth. The negative impact of current account balance implies that deficit current account balance spurs economic growth. The result also reveals that the negative impact that current account balance has is felt most in Nigeria followed by Egypt while Algeria is less felt.

Considering the statistical properties of the ARDL result reported in table 4.5 for Algeria, the R-squared value of 0.9988 indicates that about 99.88% variation in real GDP is explained in the model by the explanatory variables, for Egypt, the R-squared value of 0.99 indicates that about 99% variation in real GDP is explained in the model by the explanatory variables, for Nigeria, the R-squared value of 0.997 indicates that about 99.7% variation in real GDP is explained in the model by the explanatory variables and for South Africa, the R-squared value of 0.999 indicates that about 99.9% variation in real GDP is explained in the model by the explanatory variables. The F-statistics of is statistically significant for all the equations as their probabilities are less than 0.05 and this shows that there is a considerable harmony between real GDP and the explanatory variables put together. This confirms that all the independent variables jointly have significant influence on the dependent

variable. The Durbin-Watson statistic of all the equations indicates that there is no serial correlation associated with the regression result as they can be approximated as 2.

Considering the Post Diagnostic test results, the Breusch-Pagan-Godfrey (BPG) tests for the presence of heteroskedasticity in a regression result; the BPG tests the null hypothesis of no heteroskedasticity against the alternative hypothesis heteroskedasticity. The BPG probability value was greater than 5% for the equations implying there is no presence of heteroskedasticity in the regression results. The B-G Serial Correlation Lagranger Multiplier (LM) test is used to test for higher order Autoregressive Moving Average (ARMA) errors and is applicable whether or not there is lagged dependent variable(s). The B-G tests the null hypothesis of no serial correlation against the alternative hypothesis of serial correlation. The results of the B-G Serial Correlation LM probability for all equations were greater than 5%, hence we fail to reject the null hypothesis of no serial correlation implying that the models have no higher order ARMA(*p*) correlation. The Ramsey (Regression Specification Error Test) RESET was used to examine the stability of the ARDL model. The Ramsey RESET tests for specification error in terms of omitted variables, incorrect functional form and correlation between the explanatory variables and the error term. The Ramsey RESET tests the null hypothesis of unbiasedness and consistency which produces a zero mean vector for against the alternative of specification error. The result revealed that the probabilities for all the equations are greater than 5% thereby failing to reject the null hypothesis; this implies that the models are free from specification error. The Jarque-Bera statistics test for the normality distribution of the equation, against the alternative hypothesis. The probability of the Jarque-Bera tests conclude that the equations are normally distributed as their probability values are greater than 5%. In the model, the error correction term $CointEq_{t-1}$ is well specified and correctly signed. The coefficient of the $CointEq_{t-1}$'s are approximately -0.18, -0.28, -0.66, -0.85. The negative signs in the $CointEq_{t-1}$ confirm the existence of co-integrating relationship.

## 4.6. Overall Impact of Current Account Balance on SANE Countries

A fully modified OLS (FMOLS) is estimated to examine the overall effect of current account balance on SANE countries. The result is as presented in table 4.6.

**Table 4.6.** Panel FMOLS Estimate

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| CAB | 1.029543 | 0.404756 | 2.543616 | 0.0079 |
| REXR | -0.000245 | 0.000610 | -0.401277 | 0.6891 |
| RI | 0.009070 | 0.001905 | 4.760437 | 0.0000 |
| OILP | 0.008888 | 0.000599 | 14.83351 | 0.0000 |
| TROP | -0.004981 | 0.002274 | -2.190731 | 0.0308 |
| FOP | 0.267981 | 0.100501 | 2.666448 | 0.0090 |
| R-squared | 0.884291 | | | |
| Adjusted R-squared | 0.873772 | | | |

*Source: Author Computation using Data Extracted from WDI, 2016*

*Dependent Variable: log(RGDP)*

Table 4.6 reveals that there is a positive impact of current account balance on economic growth. Comparing this result with that of the individual analysis as presented in table 4.4, we can discover that on individual basis, current account balance has a negative impact on economic growth for Algeria, Egypt and Nigeria while for South Africa, it has a positive impact on economic growth. The economic intuition of this is that for the SANE countries, undertaking common foreign exchange rate policies to stimulate current account surplus will spur economic growth.

## 5. Conclusion and recommendation

This study examines the impact of current account balance on economic growth in SANE countries comprising of South Africa, Algeria, Nigeria and Egypt for the periods 1986 till 2015. ARDL estimation technique is employed to investigate the comparative analysis. We discovered from the study that current account balance has a significant negative impact on economic growth for Algeria, Egypt and Nigeria while it has a significant positive impact on economic growth for South Africa. The implication of this finding is that the structure of an economy with respect to her main source of foreign exchange earnings determines the impact of such activities reflected by her current account balance on economic growth of such country. Algeria, Nigeria and Egypt are major crude oil exporters and the oil price shock has created impact on the current account balance which has negative effects on economic growth. South Africa has her main source of foreign exchange earnings from the sale of gold and the gold market has relatively remained stable over the years of study; this translated to positive impact of current account balance on economic growth. It is therefore recommended special attention should be paid to the diversification of the export base. This can principally be through technological innovations, agriculture and so on. Therefore, the mitigation or neutralization of the effect of any short fall or negative shock in the oil sectors can only be achieved by the implementation of reforms and policies that will reduce dependence on oil and promote dependence on the non oil sectors.

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