Macroeconomics and Monetary Economics

Determinants of the Current Account
Balance in Nigeria, Ghana and Cote d'Ivoire

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Abstract: This study analyzed the relationship between the current account balance of the balance of payment and its determinants for the periods 1978 to 2008 in Nigeria, Ghana and Cote d' Ivoire. The analysis was based on the saving-investment theory and also in line with the intertemporal approach. Using a linear Vector Autoregressive (VAR) approach, our results show that all the variables, except the relative income (RELY), real effective exchange rate (REER) and domestic investment (INV) for Nigeria, Ghana and Cote'd'Ivoire respectively are important in explaining the long run relationship. However, there was no evidence of short run relationship between the variables and the current account balance in all the three countries. The presence of long run co-movements between the current account balance and its determinants found in this study implies the effectiveness of targeting one of the variables in influencing the long run behaviour of the other variables. The current account imbalance observed in our selected countries was unavoidable and reflected the complexity of the economic problems the countries faced during these years.

Keywords: balance of payments; relative income; reel effective exchange rate; domestic investment

JEL Classification: C52; F32; F41

1. Introduction

A striking feature of the current account balance (CAB) in West African region is the recurrent deficits. A variety of factors have been advanced in explaining these imbalances. Empirical research suggests that an overvalued real exchange rate, inadequate foreign exchange reserves, excessively fast domestic credit growth, unfavourable terms of trade shocks, inflation, low growth in partner countries and higher interest rates in industrials countries influence the occurrence of persistence current account deficits experienced by the majority of West African countries over the years. The decrease in the export prices of cocoa from Cote d'Ivoire and Ghana

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has led to a growing current account deficit in these countries. A fall in the world oil price account for the current account deficits experienced by Nigeria in the late 1980s and early 1990s. Prolonged deficits may become unsustainable, crowd out domestic saving or lead to economic instability with foreign investors unlikely to hold assets denominated in that country's currency (Opoku-Afari, 2005; Osakwe & Verik, 2009).

On the basis of the above, this paper seeks to find out the key economic determinants of the size of the current account balance in three selected West African countries. Although, there abound numerous empirical literature on the behaviour of current account balance, most of the studies are based either on the experiences of a set of developed countries or on the basis of large samples consisting of a mixture of developed and developing countries. With regard to methodological issues, most of the existing empirical literatures have a major focus on cross section and panel data analysis which have been carried out in a multi-country framework without much consideration to their time series dimension. The problem with this approach is that it is based on the assumption of homogeneity in the observed relationship across countries and can only provide a generalized picture for such economies. This paper adopts a linear Vector Autoregressive (VAR) approach to investigate the factors that may influence the behaviour of current account in each of the selected West African countries between 1978 and 2011. The countries are- Nigeria, Ghana and Cote d'Ivoire. These countries are chosen because they are considered the main economic forces of the region.

An understanding of the current account balance and its determinants will therefore, not only aid better policy prescriptions but also help policy makers to determine the main determinants which affect the size of current account balance, and consequently, to create and perform adequate macroeconomic policy measures in order to achieve sustainable level of current account balance.

The rest of this paper is structured as follows: Section 2 presents trends in current account balances of three selected economies in West Africa. Section 3 presents the theoretical, methodological and empirical literature pertaining to current account balance determination. The theoretical framework and the methodology make up section 4. Section 5 contains the estimation and interpretations of the results of the model while the conclusions and recommendations for policy complete the final section.

2. Stylised Facts on Current Account developments of Nigeria, Ghana and Cote'd'Ivoire

Nigeria, Ghana and Cote d'Ivoire, which are the main economic forces of the West Africa sub-region with more than 80% of its wealth, have experienced varying fortunes. The current account balance in these countries has shown a remarkable variation over time.

For the periods between 1979 and 1981 Nigeria experienced surplus in its current account balance majorly as a result of substantial rises in crude oil prices. Outside these years, the country's current account showed a deficit pattern over the period 1982-1983. The following three years marked current account surpluses to the magnitude of 10.6%, partly reflecting the tightening of trade controls during 1983-1986 periods when the government introduced the Economic stabilization Act of 1982 and the National economic Emergency Act of 1985. These austerity measures emphasized reduction in aggregate absorption, without much focus on structural issues. Between 1987 and 1988, the country experienced deficit followed by current account surplus for the period 1989-1992. However the following three years recorded deficits, followed by current account surplus up to 1997. Except for 1998, the country has been recording a current account surplus up to 2011 with a peak of 32.5% in 2005. (Figure 2.1)
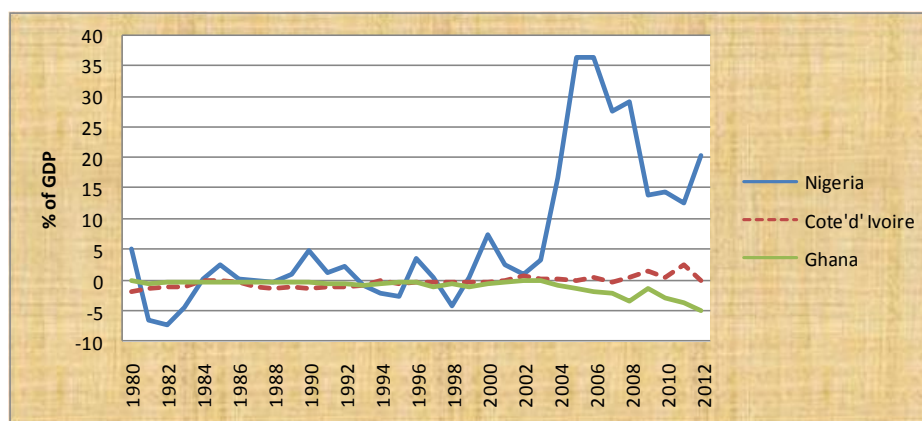

Figure 2.1. Trends in the Current Account balance of Nigeria, Ghana and Cote d'Ivoire: 1978-2012

Source: Africa Development Indicators (ADI), 2013

The current account balance in Ghana has persistently been in deficits since 1981, but with significant variation over the periods (Fig.2.1). For the period 1978-2011, the current account registered an average deficit of -4.9% of GDP. This modest average worsened significantly in the late 1990s where somewhat larger fluctuations

and deficits occurred with a peak of 12.5%, 10.3% and 11.7% of GDP in 1999, 2005 and 2008 respectively. Deficits due to the first economic crisis in the 21st century are the largest ever faced by Ghana within the period under analysis and reached their peak in 2008. The deficit in the current account could mean a terms of trade shock, as Ghana's major exports cocoa and gold suffered a sharp fall in world prices in addition to rising crude oil prices on the international market during the periods.

Côte'd'ivoire's current account balance also reveal deficits. Between 1978 and 1984, the current account balance was in deficit averaging about 12.6% of GDP. This could be attributed to the crisis of 1981-1983 in which the prices of the country's principal exports, notably coffee and cocoa slide considerably (Fig. 2.1). Although the current deficit began to narrow after 1990 currency devaluation, the trend slowed down from 1999 after which it turned surplus from 2002 to 2006 with a drop in 2007. This is possibly the result of rise in the price of cocoa on the international market. The country current account picked up again in 2009 with surplus being recorded.

Another useful way of analysing these current account developments is to cast them in the familiar savings-investment framework, where the deficit on current account is a measure of the gap between investment and domestic savings (a saving gap). An excess of investment over savings indicates that an economy needs to import resources to finance investment beyond the level of capital accumulation in the domestic economy (Osakwe & Verik, 2007).

3. Literature Reviews

3.1 Review of Theoretical Models of Current Account Determinants

A variety of theoretical models have been used to explain the determinants of the current account balance. Each of the models carries with it different economic policy implications. The traditional analysis of current account imbalances and their adjustment was based either on the so-called "elasticity approach" or the "absorption approach", while the intertemporal approach is the more recent approach.

The elasticity approach emphasizes the role of the exchange rate and trade flows in the current account adjustments. The analysis was pioneered by Alfred Marshall (1923), Abba Lerner (1944) and later extended by Joan Robinson (1937) and Fritz Machlup (1939). It is mainly based on the analysis of price elasticity of demand for imports and that of demand for exports, with respect to changes in exchange rate. It thus has the benefit of giving straightforward estimates of the price and income elasticities of exports and imports, making it easy to predict the partial-equilibrium impact on the trade deficit of expected changes in the terms of trade and relative income growth. However, the main weakness of this approach is that it is a partial equilibrium based analysis as it only looks at the traded goods market and ignores the interaction of other various markets in an economy.

The absorption approach takes cognizance of the fact that current account balance can be viewed as the difference between income and absorption, or equivalently, the difference between savings and investment. It states that if an economy spends more than it produces (i.e. absorption exceeds income), it must import from other countries for its excess consumption and spending and such economy thus runs a current account deficit. On the other hand, if this economy spends less than it produces (i.e. income exceeds absorption), it runs a current account surplus. This approach provides a more inclusive, and less misleading, framework to analyze and forecast the current account than does the elasticity approach by making it easier to incorporate determinants of financial account transactions into modelling the current account balance. Alexander (1959), is one of the most important paper evaluating this effect. Debelle and Faruqee (1996) adopted this approach in their study.

More recent theory tends to analyze current account developments on the basis of models of intertemporal maximization, either of the representative-agent or of the overlapping-generation variety. Sachs (1981, 1982), and Greenwood (1883) first focus on this approach, whileObstfeld and Rogoff (1995) among others, developed extensions to the basic model in several directions. The intertemporal approach to current-account analysis extends the absorption approach through its recognition that private saving and investment decisions, and sometimes even government decisions, result from forward-looking calculations based on expectations of future productivity growth, government spending demands, real interest rates, and so on. The intertemporal approach achieves a synthesis of the absorption and elasticity's view. The approach is widely applied by Isard et al (2001), Chin and Prasard (2003) and Mozy (2009).

3.2. Methodological Review

From the plethora of economic literature reviewed, the main methodologies explored by researchers to determine the effect of sets of macroeconomic variables on the current account balance are: accounting approach, quantity-based approach and Intertemporal Optimal approach

The Accounting Approach is a balance sheet-based approach (BSA), such as the external sustainability approach and determining the equilibrium current account as one consistent with a benchmark for the desired net foreign asset position. The BSA represents a framework for identifying Stock - based vulnerabilities and transmission mechanisms between sectors. Knowledge of balance sheet mismatches can aid policymakers in reducing and identifying appropriate policy response once a financial crisis unfold. One of the key insights of the BSA is that cross-holding of assets between residents can create internal balance sheet mismatches that can leave accounting vulnerable to external balance of payment crisis. This approach is found in the work of Milesi-Ferreti and Razin (1996).

Thequantity-based approach such as the macro-balance approach aims to identify the equilibrium exchange rate that allows for the simultaneous compliance of an external balance and an internal equilibrium, estimate of medium-term current account balances as a function of medium-term characteristics of the economy or fundamentals. One of its main objectives is the estimation of a long-term exchange rate level (or time path) consistent with the underlying fundamentals, thus allowing policymakers to recognize short-term misalignments in exchange rates. This underlying current account balance approach may however indicate an undervaluation of a currency, which nevertheless would be justified once the uncertainty over future policy is taken into account. Isard and Faruqee (1998) and Artus and Knight (1984) are some of the examples under this methodology.

The Intertemporal Optimal Approach provides econometric estimates of a reduced form equation for the current account balance as a function of fundamental variables. These models have been extensively tested using time-series econometric techniques, VAR and Panel data techniques, which use both the time and cross-sectional dimension to the data. The intertemporal approach, as it is founded on utility maximizing decisions by economic agents, it provides a better way to judge sustainability of the deficits than an approach based on aggregate relationships between saving and investment. Large deficits according to the intertemporal approach can be optimal and sustainable and therefore not a cause of concern for policymakers. Debelle and Faruqee (1996), Calderon, Chong and Loayza (1999), Chin and Prasad (2000), Gruber and Kahn (2007) are examples under this methodology.

3.3. Empirical Review of Literature

Evidence from past studies indicates that there are conflicting results on the same data sets of variables that determines the current account balances.

Aristovnik (2007) used a (dynamic) panel-regression technique to characterize the properties of current account variations across selected MENA (Middle East and North African countries) economies between 1971 and 2005. The results indicate that higher (domestic and foreign) investment, government expenditure and foreign interest rates have a negative effect on the current account balance. Chinn and Ito (2007, 2008) in their extended research of the work of Chinn and Prasad (2003) find that the standard determinants, such as demographics and income variables, used in the work of Chinn and Prasad (2003) cannot alone explain the upswing in Asian countries' current account. Therefore, they augment Chinn and Prasad (2003) specification with indicators of financial development and legal environment that are likely to affect saving and investment behaviour and economic growth. Gruber and Kamin (2007), using a panel data of 61 countries over the period 1982-2003 and including the standard current account determinants such as per capita income,

relative growth rates, fiscal balance, demographic factors and international trade openness find that the Asian surpluses can be well explained by a model that incorporates, in addition to standard determinants, the impact of financial crises on current accounts. However, their model fails to explain the large U.S. current account deficit even when the model is augmented by measures of institutional quality. Saqib et al (2007) utilized cointegration and error correction techniques in estimating the long and short run behavioural relationship between Pakistan's current account balance and difference economic variables. The empirical results advocate that there exists a significant relationship between the current account balance and the balance of trade, domestic saving, total consumption and workers remittances during the period 1972-2005. Doisy/Hervé (2003) estimates a benchmark for current account positions applying a solvency constraint and also identifies determinants of the saving-investment balance. They include the fiscal balance, the share of the private sector in value added, the per capita income, the ratio of capital income to wage income and the openness of an economy. Mozy (2009), results reveal that factors that matter in determining current account balance in oil countries are fiscal balance, oil balance, oil wealth, age dependency and the degree of maturity in oil production. Calderon, Chong and Loayza (1999) also investigated empirical relations between current account developments and a large number of macroeconomic variables proposed in the literature on the panel sample of 44 developing countries during the period 1966-1995. They adopt an econometric methodology that controls for simultaneity and reverse causation through a reduced-form approach rather than adopting a particular structural model and distinguishing between within economy and cross-economy effects. They observed the following: current account deficits are moderately persistent, increase in GDP causes increase in current account deficit, temporary increases in the level of public or private savings has a positive effect on current account balance (while permanent increases are not significant), temporary shocks due to worsens in terms of trade or real exchange rate appreciation causes increase in current account deficits (while permanent impacts are no significant), increase in the level of economic growth in developed countries and increase in the level of world interest rates reducing the level of current account deficit of developing countries.

Yang (2011) examines both the long-run and short-run impacts of initial stock of net foreign assets, degree of openness to international trade, real exchange rate and relative income on current account balances for eight selected emerging Asian economies over the period 1980-2009, making use of the cointegrated VAR (Vector Autoregression) methodology. The paper finds that current account behaviours in emerging Asian economies are heterogeneous. Initial stock of net foreign assets and degree of openness to international trade are important factors in explaining the long-run behaviour of current accounts. Belke and Dreger (2013), uses a panel econometric techniques to examine the determinants of current account imbalance in the Euro area. The analysis show that lack of competitiveness was responsible for

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the external deficits of the Euro countries experiencing external deficit cum debt crisis while the evidence is not feasible for surplus countries.

4. Theoretical Framework and Model Specification

Economic theory provides an established theoretical /conceptual framework for analyzing the determinants and the implications of current account balances. Since a country's current account balance is the counterpart of the difference between the country's total savings and total investment expenditure, its determinants must be found among the factors that may cause saving and investment within a country to differ in any period of time.

Following the work of Herrmann and Jochem (2005), this study attempts to empirically test some of the determinantsof the current account as suggested by saving-investment theory, also in line with the intertemporal approach as a benchmark to define the factors that affect the current account in our selected countries.

The starting point of the empirical analysis is the accounting identity of the current account (CA) which is equal to the difference between domestic saving (S) and investment (I).

Taking the equation for national income

$$Y = C + I + G + X - M \qquad (1)$$

Defining gross domestic savings as S =C + I + G, equation (1) becomes

$$CA = X - M = S\text{-}I \qquad (2)$$

This study aims to focus on pattern of domestic savings and domestic investment and basic identity is:

$$C = S\text{-}I \qquad (3)$$

For normalization purposes and to remove heteroskedasticity that usually plaque the estimation of nominal variable equation, all variables are expressed as ratios of GDP (Y) and thus we have:

$$\frac{CA}{Y} = \frac{S}{Y} - \frac{I}{Y} \qquad (4)$$

We specify the domestic saving to GDP ratio (S/Y) as a function of different economic variables, including domestic real GDP per capita (Y/ N) relative to the real GDP per capita of a reference country (Y */ N*) , the real effective exchange rate (REER) and the ratio of domestic investment to GDP (I/Y). It is obvious that

domestic investment plans by private agents will affect private saving ratios to the extent that these are financed domestically.

Our basic private saving specification is the following:

$$\frac{S}{Y} = f\left[\frac{\frac{Y}{N}}{\frac{Y^*}{N^*}}, REER, \frac{I}{Y}\right] \qquad (5)$$

In addition to the basic specification, the following financial and demographic factors are considered to explain the domestic saving rate: (i) the financial deepening (M2) (ii) the dependency ratio (DER). The extended domestic saving specification reads as:

$$\frac{S}{Y} = f\left[\frac{\frac{Y}{N}}{\frac{Y^*}{N^*}}, REER, \frac{I}{Y}, M2, DER\right] \qquad (6)$$

The national real per capita income (Y/N) in relation to the real per capita income of the world or of a reference country (Y*/N*) represents an important factor in explaining the current account and characterizes an economy's stage of development. Anticipating real convergence and expecting a higher income in the future, consumers in emerging economies take on debt in order to smooth their long-term consumption.Besides the consumption smoothing the comparatively high capital productivity provides an important explanation for the fact that current account deficits are typical of catching-up countries. However, by considering fixed investment, this component will explicitly be taken into account below. Therefore the estimated influences of the relative per capita income exclusively reflect consumption effects.

Substituting equation (4) into accounting identity of current account yield

$$\frac{CA}{Y} = f\left[\frac{\frac{Y}{N}}{\frac{Y^*}{N^*}} REER, \frac{I}{Y}, M2, DER\right] - \frac{I}{Y} \qquad (7)$$

Domestic investment is taken into the equation both as determining factor of private saving, as well as an autonomous variable influencing directly the current account balance.

A linear representation of equation (5) can be written as:

$$\frac{S}{Y} = \beta_0 + \beta_1 \left[\frac{Y}{N} \Big/ \frac{Y*}{N*} \right] - \beta_1 REER + (\beta_3 - 1)\frac{I}{Y} + \beta_4 M2 + \beta_5 DER \qquad (8)$$

Where

$(\beta_3 -1) = 0$, and fixed domestic investment is assumed to be completely financed by domestic savings (Feldstein-Horioka hypothesis).

4.1. Model Specification

Following the above analysis, we estimate a model which may be expressed in the following general form:

$$CAB = \beta_0 + \beta_1 RELY + \beta_2 REER + \beta_3 INV + \beta_4 M2 + \beta_5 DER + \mu \quad (9)$$

Where: CAB is current account balance, RELY is relative income (Real gross domestic Product), REER is real effective exchange rate (log), INV is domestic Investment, M2 is Financial deepening and DER is a dependency ratio

4.2 Definition of variables and Source of data

- **Relative Gross Domestic Product (RGDP):** It is defined as per capital income of the countries to the U.S dollars. This variable captures the stage of development effects. The stages of development hypothesis for the balance of payment suggests that a small open-economy that starts from relatively low domestic income is expected to have low saving, as the optimal consumption levels are high relative to current income.We expect relative real GDP per capita to be positively related to private saving and current account as the economy catches up and a higher level of development is achieved.

- **Real effective interest rate (REER):** Changes in the real effective exchange rate play an important role in the relative income and asset position of an economy.Thus, an increase in REER is expected to decrease private saving and the current account. However, a temporary real appreciation should result in an improvement of the current account according to the consumption smoothing hypothesis. Overall, the link between the real exchange rate and saving ratio can only be determined empirically.

- **Domestic Investment (INV)**: It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital. It has the effect of reducing the current account balance. So a positive relationship is expected between current account and Investment

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- **Financial Deepening (M2)**: Money and quasi money comprise the sum of currency outside banks, demand deposits other than those of the central government, and the time, savings, and foreign currency deposits of resident sectors other than the central government. This definition of money supply is frequently called M2

- **Dependency ratios (DER)**: Age profile of the population is likely to be a structural determinant of domestic saving. An increase in the dependency ratio will decrease the saving ratio because, according to the life-cycle hypothesis, the young and the old are net consumers. However, other factors like the desire of the elderly to leave bequests, the uncertainties about the lifespan after retirement and the financial support that will be required, as well as the public-pension portion of their incomes, may urge them to save rather than spend. Consequently, the effect of the demographic variable on private saving and the current account may be positive or negative.

The study uses annual data series for analyzing current account determinants for the three selected West African countries: Nigeria, Ghana, and Cote d'ivoire. The main data source is the African Development Indicators (ADI) 2013 and the IMF's World Economic Outlook (WEO), 2012.

5. Estimation Techniques

In order to determine the potential relationships among the various variables that determine the current account balance through the inter-temporary approach, the Johansen cointegration and error correction methodology is to be applied. This test, however necessitates that variables used in a given model be stationary (i.e. have no unit root) which means that their stochastic properties are time invariant. A number of studies have shown that models with nonstationary variables tend to result in spurious or "nonsensical" regressions and unreliable test statistics. Yet, a non-stationary variable can, if appropriately differenced, achieve stationarity (Granger, 1986). The appropriate number of differencing is called the order of integration. That is, if a time-series Z becomes stationary after being differenced d times, it is said that Z is integrated of order d, denoted by $Z \sim I(d)$.

In this study, therefore, we employ vector autoregressive (VAR) based cointegration tests using the methodology developed in Johansen (1991, 1995). The purpose of these cointegration tests is to determine whether the variables in our current account balance model cointegrated or not. The presence of a cointegration relation(s) forms the basis of the vector error correction model (VECM) specification.

6. Presentation of Results of the Model

6.1 Unit Roots Test

Table 6.1. Unit root/Stationarity tests (with intercept and Trends)

| | Augmented Dickey Fuller (ADF) Test | | | | | | | | |
| | Nigeria | | | Ghana | | | Cote d' Ivoire | | |
Variables	Level	1st Difference	Order I(d)	Level	1st Difference	Order I(d)	Level	1st Difference	Order I(d)
CAB	-3.302	-6.259	I(1)	-3.921	-4.111	I(0)	-3.342	-6.049	I(1)
RELY	-5.866	-6.588	I(0)	0.292	-8.671	I(1)	-4.267	-11.074	I(1)
LREER	-2.588	-4.004	I(1)	-3.175	-6.981	I(1)	-4.439	-6.512	I(0)
INV	-6.502	-5.719	I(0)	-3.930	-6.50	I(0)	-3.513	-4.671	I(1)
M2	-0.943	-4.826	I(1)	-1.839	-5.672	I(1)	-2.078	-3.511	I(1)
Critical Values: 1% = -4.296729 and 5% = -3.568379									

Source: Extracted from E-Views 7 Output

| | Phillip-Perron (PP)Test | | | | | | | | |
| | Nigeria | | | Ghana | | | Cote d' Ivoire | | |
Variables	Level	1st Difference	Order I(d)	Level	1st Difference	Order I(d)	Level	1st Difference	Order I(d)
CAB	-2.770	-8.0175	I(1)	4.068	-11.682	I(0)	-3.475	-7.265	I(1)
RELY	-5.866	-32.002	I(0)	-2.341	-6.871	I(1)	-4.274	-12.99	I(1)
LREER	-2.721	-3.975	I(1)	-3.200	-18.139	I(1)	-4.712	-6.59	I(0)
INV	-8.929	-7.0424	I(0)	-3.92	-14.875	I(0)	-3.548	-4.620	I(1)
M2	-1.183	-4.832	I(1)	-2.057	-5.675	I(1)	-2.078	-4.579	I(1)
Critical Values: 1% = -4.296729 and 5% = -3.568379									

Source: Extracted from E-Views 7 Output

The results for the ADF and PP statistics show that variables RELY and INV achieved stationarity at level in case of Nigeria while CAB and INV achieved

stationarity at level in case of Ghana and achieve level stationarity in the case of Cote'd'Ivoire.. However, when other variables were differenced once and subjected to ADF and PP tests, the test statistics exceeded their critical values at the 1% and 5% significant level respectively. These results suggest that the series for each of the countries are integrated of order one *I(1)* and at level, I*(0)*. As mentioned in section 3, *I*(0) and *I*(1) variables could be cointegrated,. The variable DER was not reported as its integration pattern cannot be determined and as such cannot be carried into cointegration test.

6.2. Cointegration

The Johansen cointegration procedure performs two tests-Trace (λ_{trace}) and Max-eigenvalue (λ_{max}). In order to save the degrees of freedom, the highest lag length in the testing–down procedure of the lag-length tests was taken to be two for each of the countries. Table 6.2 shows the results of the Johansen tests below

Table 6.2. The results of the Johansen tests

Country	Hypothesized No. of CE(s)	Eigen value	Trace Statistic	5 Percent critical Value	Max-Eigen Statistic	5 Percent critical Value
Nigeria	r = 0	0.688970	73.32668*	69.81889*	36.20387*	33.87687
	r ≤ 1	0.464765	37.12281	47.85613	19.37651	27.58434
	r ≤ 2	0.285366	17.74630	29.79707	10.41551	21.13162
	r ≤ 3	0.147692	7.330789	15.49471	4.954041	14.26460
	r ≤ 4	0.073804	2.376748	3.841466	2.376748	3.841466
Ghana	r = 0	0.760176	100.3330*	69.81889	41.40762*	33.87687
	r ≤ 1	0.567648	58.92538*	47.85613	24.31696	27.58434
	r ≤ 2	0.465936	34.60841*	29.79707	18.18996	21.13162
	r ≤ 3	0.407856	16.41845*	15.49471	15.19616*	14.26460
	r ≤ 4	0.041272	1.222288	3.841466	1.222288	3.841466
Cote d'Ivoire	r = 0	0.745079	90.27090*	69.81889	42.37089*	33.87687
	r ≤ 1	0.546793	47.90001*	47.85613	24.53360	27.58434
	r ≤ 2	0.448823	23.36641	29.79707	18.46665	21.13162
	r ≤ 3	0.145401	4.899755	15.49471	4.870796	14.26460
	r ≤ 4	0.000934	0.028959	3.841466	0.028959	3.841466

*Note: * denote the rejection of the null hypothesis at 5% significance level respectively*

Source: Extracted from E-Views 7 Output

The results indicate that the variables under examination are cointegrated for Nigeria, Ghana, and Cote d'Ivoire at 5% level. Both tests confirm that a long-run relationship exists between the current account balance and other previously given

explanatory variables for the three economies. However, the two test statistics provide different results. The λ_{trace} and λ_{max} suggest that, at 5% significance level, there is only one cointegrating relationship for Nigeria. In the case of Ghana, λ_{trace} suggests four cointegrating realationship and λ_{max} shows two cointegrating relationship. In the case of Cote'd'Ivoire, the λ_{trace} statistics λ_{max} indicates two and one cointegrating relationship at 5% significance level respectively. Johansen and Juselius (1990) suggest that for any conflict between max λ_{tmax} and trace λ_{trace}, the λ_{max} result should prevail for inferences. For ease of interpretation, we allow max λ_{tmax} to prevail and we therefore conclude that there is 1 cointegrating relationships in the current account balance model. The other interesting conclusion from this analysis is that there are cointegrating relationships between $I(0)$ and $I(1)$ variables, thus corroborating Harris's (1995) finding that variables integrated of different orders may be cointegrated.

The number of cointegrating relationships obtained in the previous step, the number of lags and the deterministic trend assumption used in the cointegration test are all used to specify a VECM to distinguish between the long and short run determinants of the current account balance.

Table 6.3. Johansen Cointegrating - Vector Normalized co-integrating coefficients

(Long-run dynamics)

Variables	CAB	RELY	REER	INV	M2	C
Nigeria	1.000000	-0.044438 [-0.19476]	0.927740 [7.15589]*	1.780805 [8.92645]*	-2.209048 [-3.68159]*	-56.12836
Ghana	1.000000	9.262408 [5.81282]*	0.000551 [0.58384]	-0.369886 [-2.46677]*	-18.957322486 [-6.957347]*	-3.963879
Cote'd' Ivoire	1.000000	-0.406774 [-3.98824]*	0.026804 [5.21182]*	-0.375336 [-1.54833]	-0.702855 [-5.42541]*	53.75581

Note: Figures in [ ] indicates t-statistics and the asterisk denotes statistically significant at 5%

Source: Extracted from E-Views 7 Output

A number of interesting results emerge from the above. First, the zero coefficient restriction is rejected for CAB for all the selected countries. This indicates that CAB can be used as a valid dependent variable in the normalized cointegrating equation. Second, the results suggest that the independent variables behave quite differently in determining the current account balance in each of the selected economy

The long-run relationship between the current account balance and the relative income (RELY) is negative for Nigeria and Cote'd'ivoire with the coefficient

insignificant and significant respectively. This implies that the current account deficit increases as real GDP per capita converges to that of the whole Sub-Saharan African region in Nigeria and Cote'd'Ivoire. The long run relationship of RELY in Ghana however result is positive and statistically significant. In this regard, the stage of development does not matter for Nigeria and Cote'd'Ivoire but it does for Ghana.

Also, the relationship between the real effective exchange rate (*REER*) and the current account balance is positive for all the three countries. The relationship is significant in the case of Nigeria and Cote'd'Ivoire but insignificant in Ghana. This implies that real effective exchange rate seems not to play a role in explaining the evolution of the current account in Ghana model.

Increasing net inflows of (INV) is positive and significant for Nigeria. A negative but significant coefficient is observed in the case of Ghana while the relationship is negative and insignificant for Cote d' I'voire.

The assessment of the relevance of a financial deepening variable (usually proxied by money and quasi money (M2) as a per cent of GDP) shows negative and statistically significant results for the three countries. Indeed, the traditional interpretation of this variable as a measure of the depth and sophistication of the financial system suggests that financial deepening could induce saving relatively more than investment in the long run. The result here however, indicates that saving a channel through which financial deepening influence the current accounts. Again we analyse both the speed of convergence of the current account balance towards its long-run equilibrium level and the fundamentals in the short-run dynamics of the current account. All the results are reported in Table 6.4.

Table 6.4. VECM Current account CAB Adjustment equation

(Short run dynamics)

Variables	Nigeria	Ghana	Cote d' Ivoire
D(CAB(-2))	-0.085185 [-0.32669]	-0.029303 [-0.13460]	0.102411 [0.46432]
D(RELY(-2))	-0.234905 [-0.95609]	2.910531 [0.90414]	-0.179259 [-1.58816]
D(LREER(-2))	-0.025403 [-0.54069]	-0.000166 [-0.13019]	0.026108 [1.31765]
D(INV(-2))	0.224157 [0.86014]	0.188008 [0.98041]	-0.169965 [-0.46211]
D(M2(-2))	-0.430094 [-0.76972]	0.191418 [0.46658]	-0.981256 [-1.43280]
ECM(-1)	-0.081995 [-0.46633]	-0.617751 [-1.67651]	-0.981256 [-1.43280]
C	0.734275 [0.89310]	-0.511118 [-0.65472]	0.586037 [-0.37630]

Note: Figures in [ ] indicates t-statistics and the asterisk denotes statistically significant at 5%

Source: Extracted from E-Views 7 Output

One important finding is that the coefficients of the error correction term is correctly signed (i.e. a negative sign) for the three countries. However, the coefficients of the error correction term were not statistically significant for the three economies. The non-significance of the error correction term indicated that the current account balance was weakly exogenous, implying that deviations from equilibrium were not corrected in the short run, as there was no tendency for the current account to return to equilibrium.

6. Conclusion and Policy Recommendations

This study analyzed the relationship between the current account balance and its theoretical determinants for the periods 1978 to 2010 for the three economic forces of West African countries; Nigeria, Ghana and Cote d' Ivoire. The analysis was based on the saving-investment theory, also in line with the intertemporal approach, as a benchmark to define the factors that affect the current account in the long run. Using the Johansen cointegration and error correction methodology, the finding indicates that the current account balance is subject to permanent changes as a result of changes in its fundamentals. Evidence of cointegration allowed the estimation of VECM, which simultaneously provided the parameter estimates for both the long and short run relationships. The result shows that RELY is not significant in explaining the variations in the current account balance of Nigeria. REER, is also not important in explaining the current account balance of Ghana while INV is insignificant in specifying the long run relationship of the current account balance of Cote'd'Ivoire while the variables coefficients alternate between positive and negative indicating structural differences of the selected countries All the variables except the relative income (RELY), real effective exchange rate (REER) and domestic investment (INV) for Nigeria, Ghana and Cote'd'Ivoire respectively are important in explaining the long run relationship. However, there was no evidence of short run relationship between the variables and the current account balance in the three countries. The main conclusion is that the current account imbalance observed in our selected countries was unavoidable and reflected the complexity of the economic problems the country faced during these years.

The results of this study have a number of policy implications. First, the presence of long run co-movements (cointegration) between the current account balance and its determinants found in this study implies the effectiveness of targeting one of the variables in influencing the long run behaviour of the other variables. If this interpretation holds and given the significant long run relationship between the current account and the savings –investment variables as well as financial variable uses in this study, it would justify the stance taken by the government and monetary

authorities in Nigeria, Ghana and Cote d' Ivoire of pursuing a sound economic monetary policy.

Second, liberalizing trade (more openness) is one of the tools in the policy maker's arsenal to avoid overvaluation both in the short and long run. This finding further confirms the stance of the monetary authorities of our selected economies acting on the fundamentals of the real exchange rate instead of directly managing the exchange rate of their domestic currency.

Third, strong saving and investment fundamentals alone are not sufficient to prevent external difficulties. More attention must be paid to the composition of investment, and a bigger effort must be made to better understand the policies that will maintain them. In particular, care must be taken to prevent their quick reversal when growth weakens and confidence wanes. With inadequate policy settings, including persisting distortions in the trade structure, productivity growth could not be sustained for long, and economic fundamentals can quickly erode

Finally, from a policy perspective, current account imbalances are neither good nor bad. They are merely the result of the interplay of demand and supply inside an economic area. While one might want to tackle distortions that could lead to sub-optimal decisions regarding the appropriate amount of savings and investment, macroeconomic policies should be directed at sustaining economic growth with low inflation rather than some current account target. A word of caution is sounded however that as the effects of shocks vary from one country to another, there is no universal solution to the problems of fluctuations in current account balance.

7. References

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