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Dynamics of current account deficits over the economic cycle of countries with an emergence horizon

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Abstract

This article highlights the different phases of a business cycle in the presence of persistent current account deficits. The relationship is facilitated by the quantile regression method. In this method the regression parameters are determined around the conditional mean in the quadratic form of the deficit dynamics. The empirical analyses are thus carried out on six (06) African countries with fixed and different emergence horizons covering the period 2005q1-2014q4. The results of the individual estimations lead to policy recommendations discussed according to whether the effects are procyclical for Côte d'Ivoire, countercyclical for Benin, Mali, Niger and Democratic Republic of São Tomé and Príncipe and both procyclical and countercyclical for the Democratic Republic of Congo for specific quantiles.

1. Introduction

The recent financial crisis of 2008 has rekindled debates on the issues of economies's emergence [1], especially those in developed ones. There is a global review of policy development from this category of countries, which are now setting growth targets for a given period. According to the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII, 1996), this manifest will to be an emerging country should respect three requirements, including the achievement of an economic growth higher than 5% in the long term, the development of the industrial sector facilitating the diversification of the economy and the attraction of international capital flows. These constraints require an international synchronization of economic cycles driven by increased international trade and integration efforts (Allegret and Essaadi, 2011) at the level of candidate countries. However, this convergence is still not implicit due to the existence of macroeconomic imbalances. The effect of these imbalances is assimilated in this paper to the phenomenon of current account procyclicality, when the current account balance deteriorates when the output gap is positive. The opposite is defined as countercyclicality.

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1. Eight criteria for emergence: 1. economic growth rate; 2. population size; 3. diversification of production; 4. The importance of exports and imports (openness rate); 5. Integration into the international financial world; 6. The strategic role of the State for development; 7. Investment in research and development; 8. The capacity to protect the territory (Hugon, 2010).

Most candidate countries have global imbalances[2], including balance of payments imbalances and particularly current account balances[3], which give an overall picture of a country's external position vis-à-vis the rest of the world. As such, it is revealed in the literature as one of the greatest concerns of international macroeconomics (Obstfeld and Rogoff, 1995, 2000). To this end, the purpose of this paper is to analyze the impact of the dynamics of current account deficits on the cyclical movements of African economies defined in a finite horizon emergence policy. Among these economies, we consider Benin, the Democratic Republic of Congo (DR Congo), Côte d'Ivoire, Mali, Niger and the Democratic Republic of São Tomé and Príncipe (DR STP).

Table 1 presents four (04) different horizons set by the countries under study. The first and closest is the 2020 horizon set by Côte d'Ivoire. The second, set by Benin and Mali, is 2025. For the third and fourth, horizons, they allow respectively to distinguish the DR STP, the DR Congo and Niger.

Table 1. Emergence Horizons (E.H.)

Pays	Monetary Union	Monetary Unit	E.H.
Bénin	WAEMU*	XOF	2025
Côte d'Ivoire	WAEMU	XOF	2020
Mali	WAEMU	XOF	2025
Niger	WAEMU	XOF	2035
DR Congo	No	Congolese Franc	2030
DR STP	No	Dobra	2030

Note: *WAEMU: West African Economic and Monetary Union. Source: Author

All of these countries have in common not only a very high level of debt, but also the characteristic of economies that are very opened to the outside world and therefore vulnerable to international shocks[4] This high level of external dependence is marked by a high degree of persistence of current account deficits since 2006 for all countries (Figure 1).

The level of persistence has gradually varied since 2010. It is more pronounced in Benin unlike in Côte d'Ivoire where it is moderate with a tendency. Moderation without trend is noted for the rest of the selected countries. Prior to this date, all countries experienced strong persistence in their current account balance.

These observations are reinforced by the low-industrialization monoculture that characterize these economies. Therefore, the various emergence horizons set will require strong and sustainable growth within a stable and planned macroeconomic framework (AfDB, 2016).

In this context, a strong opening to the outside world could have consequences on the dynamics of their respective economic growth. This is illustrated in Figure 1. This figure shows that there are procyclical and countercyclical relationships between the evolution of the external trade balance and the GDP[5]. Indeed, the balance widens from 2010 and is globally procyclical for Côte d'Ivoire and countercyclical for the other countries. This date marks the aftermath of the financial crisis, the contagion effects of which are transmitted through the current account. More intense foreign trade with European trading partners (particularly France) reduces monetary flows and raises the real effective exchange rate. The accompanying deterioration in the terms of trade explains the loss

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2. Global imbalances arising from the chronic external deficit of the United States, and the chronic external surplus of Japan, the emerging countries (especially in Asia) and the oilexporting countries. These imbalances have known adverse effects: excessive creation of liquidity, misallocation of world savings (Aglietta M., 1996).

3. According to the 6th manual (IMF, 2008).

4. Any event of unexpected political instability resulting in profound political and economic disruption (Fuchs-Schunden, 2008).

5. hese are theories that take internal phenomena of the economic system as the cause of cycles. They can therefore be monetary mechanisms, linked to production, or the distribution of income.
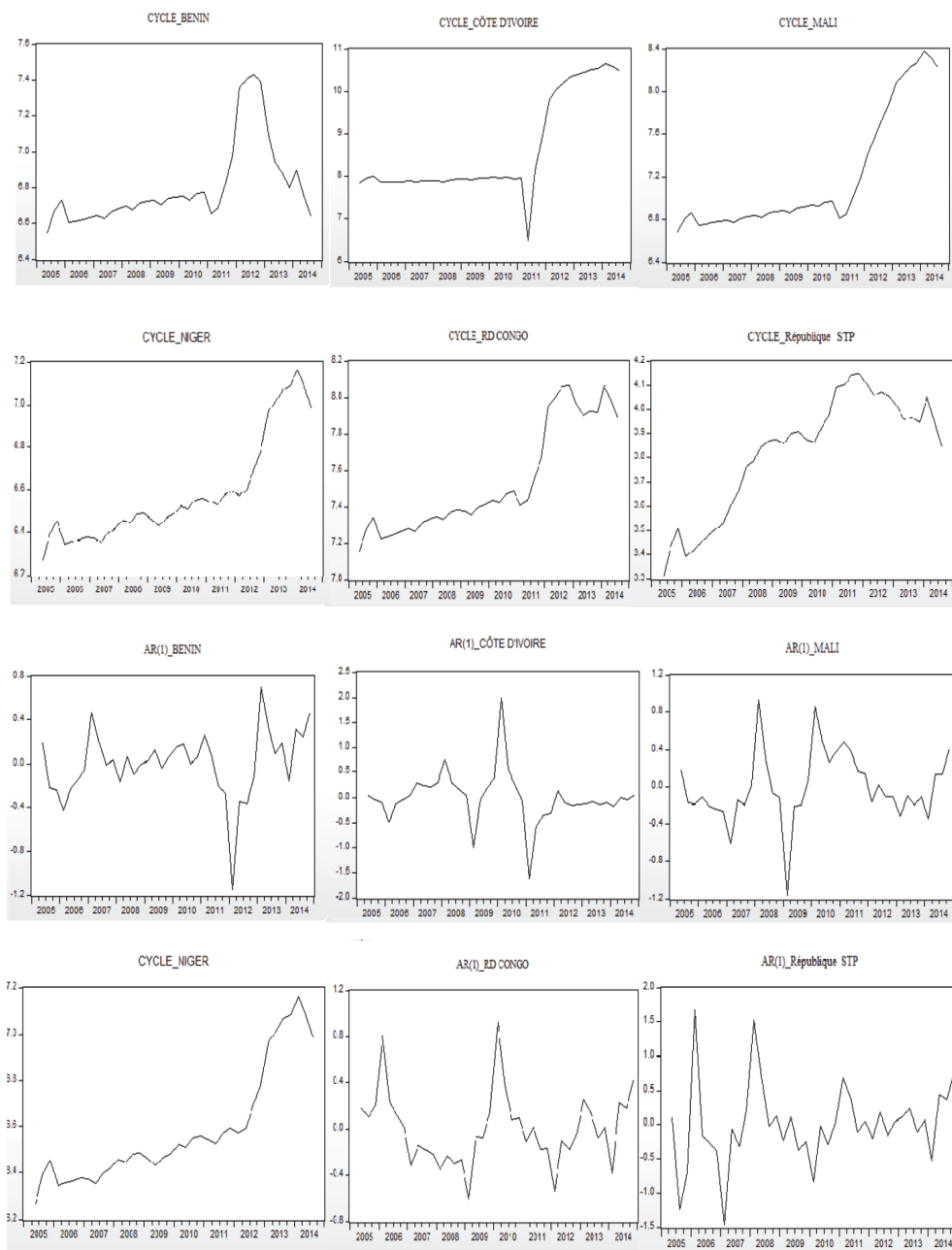
Source: Author

Figure 1. Graphical Relationship between the Persistence of Current Account Deficits and the Business Cycle

of competitiveness reflected in persistent external deficits and manifested in low exports. Thus, the inter-temporality of the current account deficit has no impact on the business cycle.

The rest of this paper is organized around five sections. Section 2 summarizes some theoretical and empirical debates. Section 3 discusses the relevance of the steps in the methodology used. Section 4 presents the basic theoretical model of analysis. Section 5 conducts an empirical verification of the theoretical model and an interpretation of the results. Section 6 concludes.

2.   Literature review

The literature identifies two sources associated with the nature of current account deficits. The first is related to domestic factors (rising fiscal deficits and an appreciation of the real effective exchange rate) and the second to external factors (deteriorating terms of trade and falling foreign real interest rates) (Khan and Knight, 1983; Howard, 1989). These sources also distinguish two effects of the inverse relationship between persistent current account deficits (Clower and Ito, 2012) and economic growth depending on whether countries belong to a currency union or not.

2.1   *Theoretical review of the relationship between the current account deficit and economic growth*

Considering that the link between current account deficits and economic growth results from imports of intermediate and investment goods, deficits can be countercyclical (Boileau and Normandin, 2008) and also procyclical. Thus, when growth-oriented economies have a high degree of trade openness, the result may be a higher demand than the foreign currency supply (and vice versa) (Romer, 2006). This fact is theoretically explained by the intertemporal current account approach, proposed by Sachs (1981) and Buiter (1981), and extended by Obstfeld and Rogoff (1995). The applications of the theoretical modeling that follow also have two directions. One is to establish the evidence for the basic model[6](Nason and Rogers, 2002). The other examines the long-run relationship between the current account and its macroeconomic determinants (Gruber and Kamin, 2007).

These analyses have been further developed in the context of countries in a heterogeneous monetary union. Indeed, the stage theory indicates that there is a stable relationship between the level of development of a country and its current account balance. This is why current account deficits induce, first, an accumulation of foreign debt that triggers an unanticipated reversal of capital flows (sudden stop); second, they result from a credit-financed asset price bubble; and third, they are financed by techniques that generate an interweaving of international financial counterparty commitments that carry hidden systemic risks (Angelini and Farina, 2012).

n addition, Clower and Ito (2012) state that the degree of persistence of current account deficits leads to a depreciation of the terms of trade, the level of financial development and discourages foreign direct investment in developed and developing countries. Giavazzi and Spaventa (2010), show beyond that these deficits do not have a negative influence on the growth of economies in union and even on its functioning. The authors conclude that the influence can only be pronounced if the use of credit does not respect the intertemporal solvency constraint. This is not the case in a monetary union. This led Tressel and Wang (2014), to show that in a heterogeneous monetary union, there are global imbalances that generate adjustment costs. Thus, uncertainty in the currency area justifies the effect of current account deficits on large and abrupt movements in exchange rates and interest rates that heavily affect the growth of economies. According to Angelini and Farina (2012), this situation can lead to the breakup of the entire union. Moreover, the problem of diverging competitiveness that emanates from it is reflected in the emergence of current account imbalances (Holger *et al.*, 2009). Faced with this obstacle, member countries aim to restore their competitiveness. Indeed, Eichengreen (2014) concludes that competitiveness is difficult to achieve because of its almost uncertain nature through the non-linearity observed in the dynamics of current account balances.

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6. The intertemporal approach model.

This other implication was previously justified by the fact that the creation of monetary unions leads to a decline in the well-being of agents in the various member countries (Fagan and Gaspar, 2008). Consequently, the deterioration of the current account, which favors an increase in domestic demand and an appreciation of the real effective exchange rate, constrains economic stability overall, hence the cyclically of the economy. This fluctuation in growth is therefore linked to structural and stochastic shocks in economies considered or not in a monetary union (Hall, 2015).

2.2   Empirical review of the relationship between the current account deficit and economic growth

The variant nature of shocks has enhanced the literature on macroeconomic models characterizing business cycles (Bidder and Smith, 2012). Thus, we generally distinguish two types of modeling. The first relies on the importance of permanent shocks, analogous to long-run risk (Epstein and Zin, 1989) and using mostly Markovian models (Hamilton, 1989). The second, on the other hand, uses quantile regression models characterizing average distortions and error detection probabilities (Koenker and Basset, 1978; Hansen and Sargent, 2011). For example, when the level of exports increases as production costs decline and costs fall in a fast-growing economy, a positive impact on the current account deficit results. However, the direction of the impact of economic growth on the current account deficit depends on the level of savings in the country. Also, economic growth, that depends on imports, therefore, leads to an increase in production and inevitably imports and ultimately the current account deficit according to the study of Coskun (2010).

Many studies in the literature examine the relationship between economic growth and the current account deficit. Debelle and Faruqee (1996) showed that countries with rapid economic growth tend to have a high rate of current account deficit. However, Calderon *et al* (2000) found in their research on forty- four developing countries that an increase in GDP growth can have a negative effect on the current account deficit. This latter relationship is also confirmed by Kandil and Greene (2002), who, in the context of the United States, showed that the current account deficit is correlated with the increase in real GDP in the long run and that this correlation is inverse and significant.

Moreover, this long run relationship, is established by Yilmaz and Akinci (2011) who find a negative causal relationship. Kasman *et al* (2005) found that there is a consistent correlation in this same time space between the current account deficit, the real exchange rate and economic growth in Turkey. These results further support those that have focused on the short-run correlation between these two phenomena (Chinn and Prasad, 2000). Thus, the occurrence of these deficits exerts influences on the current account crisis–growth relationship (Komarek and Melecky, 2005). Moreover, in a study attempting to determine the presence of a causal relationship between the current account deficit, economic growth and the exchange rate, Erbaykal (2007) was able to establish their definite relationship. In another study, Telatar and Terzi (2009) examined the relationship between the current account deficit and economic growth using VAR analysis and confirmed the negative relationship between these two economic phenomena.

3.   Methodology

The dichotomous relationship between economic growth and the current account deficit requires an appropriate methodology to relate it to African countries with targeted emergence policies.

3.1   Theoretical basis and specification of the model

3.1.1   Theoretical model of analysis

We use the theoretical model developed by Husted (1992) and based on the analyses of Hakkio and Rush (1991). This model allows us to consider the budget constraint at each period t, for an open economy:

$$C_t = Y_t + B_t^f - I_t - (1 + r_t) B_t^f \qquad (1)$$

Where C_t is the government consumption at period t, r_t is the world interest rate and B_t^f is the international borrowing? Thus, the intertemporal constraint of the budget is given by:

$$B_t^f = \sum_{i=1}^{\infty} \mu_i \left[Y_{t+1} - C_{t+1} - I_{t+1} \right] + \lim_{i \to 0} \mu_i B_t^f \tag{2}$$

Where $\mu_t = \prod_{j=1}^{i} \left(\frac{1}{1+r_{t+j}} \right)$ is a product of the first discount factors i. We can therefore note that:

$$Y_t - C_t - I_t = X_t - M_t = CA_t \tag{3}$$

Where, $X_t - M_t$, the difference between exports and imports at time t. This difference measures the current account balance (CA_t), as well as:

$$CA_t = Y_t - G_t - I_t \tag{4}$$

At the same time, the augmented form of a Romer-Taylor general equilibrium model is given by:

$$Y_t = CA_t + G_t + I_t + C_t \quad (7) \text{ such as } C_t = a + b \left(Y_t - T_t \right) \tag{5}$$

(7) becomes $Y_t = CA_t + G_t + I_t + a + b \left(Y_t - T_t \right)$; lets ask $T_t = G_t$ (Barro, 1990a)

$$(1 - b) Y_t = a + CA_t + (1 - b) G_t + I_t \tag{6}$$

$$Y_t = G_t + \frac{a + CA_t + I_t}{(1 - b)} \tag{7}$$

So, $Y_t = f \left(G_t, CA_t, I_t \right)$

3.2   Model specification
We choose to linearize equation (8) to facilitate its estimation. Thus, in order to make our model explicit, we postulate that the function f is non-linear. The specification of the model allows us to write with the expected signs:

$$\Delta PIB_t^i = a - b CA_t^i + c CA_t^{2i} - d G_t^i + \varepsilon_t^i \Delta pib_t^i = a - bca_t^i + cca_t^{2i} - dg_t^i + \varepsilon_t^i$$

with: $ca_t^i = \log \left(CA_t^i \right)$, the same form as the other variables and i the country index t, the temporal dimension. The description of the model variables is given in Table 2:

3.3   Estimation data and econometric model
3.3.1   Estimation data
The data we use are from the annual frequency series database. The study period starts from 1995q1 to 2014q4. These data are all from the World Bank (2015). Because the period over which the data are available is relatively short, we choose to transform them at a quarterly level, using the interpolation method of Goldstein and Khan (1976). A more detailed explanation is presented in Appendix A1. Using quantile regression allows us to estimate our model over a larger sample of 76 quarters.

For a better understanding of the structure and representation of the information contained in our data, we present a descriptive analysis that follows (Table 3).

Observation of the economies of the countries identified for this study (Table 3) reveals a wide fluctuation in economic aggregates. This reflects the very erratic behavior of the economy of the

Table 2. Description of Model Variables

Variables	Description
$\Delta pib = pib - pibp$	The change in national output, which is approximated by the gross domestic product (GDP), is the difference between its actual value and its potential value. This potential value is determined using the Baxter-King filter? [a].
g	Current account deficit (according to the 6th Balance of Payments Manual)
ca	Public expenditure
c et d	Constant elasticities
b	The (vector of) parameters to be estimated
a	The constant
ε	The error term

a. It freezes the extraction of series on the frequency domain and offers flexibility in the analysis of variables, especially macroeconomic variables, from a short–, medium– and long–term perspective (Comin and Gertler, 2006).

Table 3. Descriptive Statistics of Economic Aggregates for Some Countries with an EMERGENCE Horizon

Current account (Ca)			
Country	average	Sd	(min; max)
Bénin	−2, 175	0,601	[−3, 72; −1, 03]
Côte d'Ivoire	0,369	1,088	[−0, 89; 2, 97]
Mali	−1, 895	0,814	[−3, 22; −0, 55]
Niger	−4, 398	1,559	[−7, 02; −1, 91]
DR Congo	−1, 344	1,160	[−2, 71; 0, 87]
DR STP	−6, 112	1,600	[−9, 32; −3, 15]
Public expenditure (g)			
Country	average	Sd	(min; max)
Bénin	5,466	0,453	[4, 29; 6, 38]
Côte d'Ivoire	5,347	0,480	[4, 35; 6, 52]
Mali	6,020	0,718	[4, 46; 7, 72]
Niger	6,106	1,161	[4, 63; 9, 01]
DR Congo	4,317	0,649	[3, 14; 5, 74]
DR STP	10,422	1,865	[7, 15; 13, 09]
GDP			
Country	average	Sd	[min; max)
Bénin	915,079	265,055	[600, 67; 1691, 82]
Côte d'Ivoire	11551,437	14170,903	[−638, 88; 42270, 18]
Mali	1617,934	1,508	[793, 40; 4379, 28]
Niger	526,078	209,281	[526, 07; 1298, 69]
DR Congo	1957,595	630,253	[1277, 11; 3198, 64]
DR STP	46,296	10,727	[27, 31; 63, 28]

Notes: Sd : Standard Deviation ; min : minimum ; max : maximum. Source: World Development Indicators (2015)

community of countries seeking to achieve emergence within a fixed time frame. These strong variations justify the high dependence of these countries, price takers, on external factors, those relating to the context of the world economy.

The highest nominal value of Gross Domestic Product is 11,551.437 billion USD, recorded for Côte d'Ivoire and the lowest is 46.296 billion USD for São Tomé and Príncipe. Apart from Côte d'Ivoire, the relatively lower values (compared to the mean) of the standard deviations demonstrate small disparities in the levels of economic growth in the sub-periods. Moreover, the level of growth in these sub-countries is in contrast to the level of the current account balance, which on average remains in deficit. Côte d'Ivoire is therefore an exception, with a positive relationship between its growth and its current account balance. Its performance is linked to its position as the leading cocoa producer and the dynamism of its private sector. Examination of the last variable, public expenditure, indicates a certain similarity, except for São Tomé and Príncipe, in their policy of financing expenditure through public debt, which should promote aggregate demand in a context of price and wage rigidity. Over the last five years, the average debt-to- GDP ratio for this group of countries is the highest at 33.52% (Côte d'Ivoire) and the lowest at 19.91% (Niger). However, the relatively high level of indebtedness in São Tomé and Príncipe (77.5 on average over the period 2010-2015) explains the high value of public expenditure compared to the other countries, which represents about 22.51% of the country's national wealth.

3.3.2   Econometric model

Similar to the panel data and Markov process analyses done by Debelle and Faruqee (1996), Kandil and Greene (2002), and Clower and Ito (2012) that replicate the correlation of the current account with economic growth in emerging, small open economies, and developed countries, respectively, we rely on the quantile regression methodology. This methodology highlights the non- linearity between business cycle volatility and current account dynamics

Quantile regression (Koenker and Bassett, 1978) is performed for each of the countries in our sample. This method has seen a revival in its flexible generalization of standard theoretical regression (Koenker and Hallock, 2001). Indeed, it postulates a model for the mean of a variable y_t conditioned on the values of the variable x_t, such that $E(y_t \mid x_t) = x_t \beta$, where the vector parameter β is estimated so as to minimize the square of the sum of the residuals. The estimated model explains the changes in the conditional mean of y_t, resulting from the different values taken by x_t. However, in the context of quantum regressions, the interest is not on the conditional means, but on the conditional distribution of y_t.

The distribution can be characterized by defined quantiles such as $q \in (0, 1)$ with $\tau = (0.05, 0.1, 0.15, 0.2, \ldots, 0.8, 0.85, 0.9, 0.95)$. Thus, the formalization of the distribution probability function of the random variable y_t with th quantile defined by the quantile function $Qq(.)$ to have $Qq(y_t) = F^{-1}(q)$. The quantile regression model is given by:

$$Q_q(y_t \mid x_t) = x_t \beta(q)$$

Where the components of the vector parameter β give the marginal effects of the distribution variable. Estimates of the vector parameters given by q, are obtained from:

$$\hat{\beta}(q) = \arg\min \sum_t \rho_q \left[y_t - x_t(\beta(q)) \right]$$

With the function ρ_q defines for $\omega_t \equiv y_t - x_t(\beta(q))$, and $\rho_q[\omega_t] = (q - I_{\omega_t < 0})\omega_t$ such that $I_{\omega_t < 0} = 1$ if $\omega_t < 0$ and $I_{\omega_t < 0} = 0$ otherwise (Linnemann and Winkler, 2016).

Quantile regression remains more robust than Ordinary Least Squares. It is not, in the context of non-linear models, linked to (i) the different regimes allowed by the model; (ii) the choice of a

business cycle indicator; and (iii) the choice of parametric specification of the transition functions. In contrast, the quantile regression in this paper evaluates the impact of the deficit shock through conditional distributions.

4.   Empirical verification and interpretation of results
The empirical results are presented and interpreted in turn.

4.1   Empirical verification
Relationship (9) allows us to verify the hypotheses according to which, on the one hand, the persistence of current account deficits admits a non-linear process and, on the other hand, procyclical and counter-cyclical effects explain the link between current account deficits and the economic cycle.

To this end, Table 4 summarizes all the results. It can be seen that the quantiles chosen $\tau=$ (0.025,0.1,0.25,0.5,0.75,0.9,0.975) characterize the studied phenomenon well and justify the hetero-geneity between all the countries under study and those particularly in the monetary union.

The quantiles in Table 4 show the overall nonlinearity of the current account, on the one hand, and the pro- and counter-cyclical effects of the dynamics of current account balances on the economic cycle of each of the countries studied, on the other.

The nonlinearity due to the persistence of current account deficits takes the form of a "bell-shaped" curve for countries such as Benin, Mali, Niger and DR Congo at specific quantile values. Another "U" shape is appreciated in Côte d'Ivoire, Niger, DR Congo and the DR STP. Thus, the threshold is a maximum and a minimum in the first and second cases, respectively.

Concerning the effects of current account deficits, a comparison of the signs of the coefficients of these deficits and their intertemporal persistence allows us to observe their positive (procyclical, opposite signs) and negative (counter- cyclical, same signs) influence on the economic cycle (Figure 2 in Annex A2).

4.2   Interpretation of results
From the results obtained, we can say that the countercyclical relationship indicates that the evolution of the current account balance is opposite to that of the economic cycle observed by the output gap at the level of each country. The opposite analysis concludes the procyclical relationship.

Indeed, faced with a negative transitory external shock, spontaneously leading to a budget deficit, the government is forced to reduce spending and increase its external deficit. However, given an intertemporal budget constraint that implies stability in the government's net financial wealth over the infinite horizon (absence of a Ponzi scheme), the government increases its net financial assets less (or borrows more) than in the presence of policy distortions (Guillaumont Jeanneney and Tapsoba, 2011). Côte d'Ivoire, a WAEMU member, and the Democratic Republic of Congo are defined in this analysis for all but 0.025 and [0.025 - 0.5] quantiles respectively. Thus, in addition to the fact that these economies have procyclical current account trends, their government expenditures are also procyclical. This situation does not favor the attenuation of the business cycle and thus macroeconomic stability.

On the other hand, the other countries, in their march towards emergence on their own horizon, will also tend in this expansion phase to increase their spending and reduce taxes. This rather economy-friendly approach is controversial because of its strong preference for the massive importation of tradable goods and services. This alternative situation is detrimental to the overall growth of the economy concerned, justifying the countercyclical nature of their link. Otherwise, in the intertemporal hypothesis, the governments of Benin, Mali, Niger, the Republic of São Tomé and Príncipe and the DR Congo, subject to a permanent budgetary balance constraint, practice, like other developing countries, a procyclical fiscal policy that is accentuated in the event of a recession.

Table 4. Model Estimation Results using Quantile Regression

Benin	0.025	0.1	0.25	0.5	0.75	0.9	0.975
Ca	−0.19	−0.12	−0.81	−1.04*	−0.53	−0.39	−0.51**
	(0.81)	(0.88)	(0.22)	(0.00)	(0.12)	(0.12)	(0.09)
LCa^2	0.02	0.07	−0.50	−0.80**	−0.20	−0.03	−0.14
	(0.98)	(0.93)	(0.45)	(0.08)	(0.63)	(0.91)	(0.67)
Lg	1.08	−0.98	−0.16	−0.29	0.04	−0.14	−0.14
	(0.17)	(0.19)	(0.79)	(0.51)	(0.92)	(0.66)	(0.71)
C	7.99∗	7.92*	5.993*	6.23*	5.95*	6.37*	6.26*	
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Côte d'Ivoire	0.025	0.1	0.25	0.5	0.75	0.9	0.975
Ca	−0.47*	−0.78*	−0.92*	−1.04*	−1.12*	−1.07*	−1.22*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
LCa^2	0.23	0.36*	0.31*	0.36*	0.38*	0.34*	0.38*
	(0.11)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Lg	1.63	2.69	4.12*	4.47*	4.42*	4.86*	5.51*
	(0.30)	(0.12)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
C	5.72*	4.30	2.16	2.03	2.33	1.66	0.83
	(0.04)	(0.13)	(0.34)	(0.30)	(0.21)	(0.18)	(0.66)
Mali	0.025	0.1	0.25	0.5	0.75	0.9	0.975
Ca	0.11*	0.08	−0.04	−0.15	−0.10*	−0.09*	−0.12*
	(0.02)	(0.21)	(0.75)	(0.189)	(0.00)	(0.00)	(0.00)
LCa^2	0.24*	0.20	0.02	−0.11	−0.04	−0.03	−0.08*
	(0.01)	(0.15)	(0.92)	(0.53)	(0.43)	(0.36)	(0.02)
Lg	1.06*	1.06*	0.95*	0.84*	0.84*	0.87*	0.95*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
C	4.36*	4.36*	4.56*	4.75*	4.80*	4.77*	4.67*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Niger	0.025	0.1	0.25	0.5	0.75	0.9	0.975
Ca	−0.16	−0.31**	−0.53*	−0.73	−0.92	−1.04	−3.60*
	(0.45)	(0.09)	(0.00)	(0.35)	(0.46)	(0.31)	(0.00)
LCa^2	−0.03	−0.10	−0.32*	−0.48	−0.76	−0.80	−2.29*
	(0.82)	(0.44)	(0.01)	(0.37)	(0.27)	(0.17)	(0.00)
Lg	0.39	0.75*	0.64*	1.56*	5.16*	5.18*	8.31*
	(0.38)	(0.04)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
C	5.85*	5.04*	5.09*	3.36*	−2.56	−2.60	−10.90*
	(0.00)	(0.00)	(0.00)	(0.04)	(0.44)	(0.36)	(0.00)
DR Congo	0.025	0.1	0.25	0.5	0.75	0.9	0.975
Ca							
	(0.11*	−0.06**	−0.09*	−0.12*	−0.17*	−0.20*	−0.20*
LCa^2	−0.03*	−0.09)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	(0.00)	(0.13)	−0.004*	−0.01	0.01**	0.01*	0.01*
Lg	1.53*	1.52*	1.21*	1.05*	0.66*	0.84*	0.91*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
C	4.49*	4.59*	5.18*	5.48*	6.22*	5.92*	5.80*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
DR STP	0.025	0.1	0.25	0.5	0.75	0.9	0.975
Ca	1.20*	1.19*	0.94*	0.59**	0.49*	0.27	0.28
	(0.00)	(0.00)	(0.02)	(0.06)	(0.02)	(0.56)	(0.55)
LCa^2	2.70*	2.67*	2.09*	1.37	1.08**	0.34	0.37
	(0.00)	(0.00)	(0.04)	(0.123)	(0.09)	(0.79)	(0.78)
Lg	−0.40	−0.40	−0.28	−0.24**	−0.06	−0.01	−0.00
	(0.256)	(0.201)	(0.165)	(0.08)	(0.609)	(0.989)	(0.99)
C	2.14*	2.18*	2.57*	3.08*	3.14*	4.35*	4.312*
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)

Notes: In brackets are the p-value. *, **, mean that the coefficients are significant at 5% and 10% respectively. Source: Author

Thus, this budgetary shock leads to an increase in the external demand of the States, which will further increase the current account balance and, in turn, reduce the growth of the countries.

5.   Discussions and recommendations

5.1   Discussions

The correlation between current account deficits and economic growth has generated a series of debates and discussions to determine the causal nature of its effects. This study complements the almost non-existent literature in Africa, and especially in the context of the emergence policy adopted by many African countries.

Our results theoretically confirm those of Boileau and Normandin (2008) who present the bidirectional relationship between growth and the current account deficit. We also prove that with a budget constraint, the findings of Yilmaz and Akinci (2011) remain limited. The study of Telatar and Terzi (2009) is also augmented by the value added by the findings of our study. The unidirectional relationship between the current account deficit and economic growth can no longer be considered, especially in the long run.

5.2   Recommendations

The presence of structural changes in the economies, with a sustainable growth process, induces countercyclicality and procyclicality with their respective economic cycles. The countries in our sample are therefore vulnerable to
external shocks and are affected differently depending on whether they belong to a monetary union. As a result, policymakers in these countries have motives to be concerned about widening current account deficits for several reasons. First, the current account balance is really a measure of the health of the economy. If foreign investors and international agencies are convinced that the current account deficit is affecting the growth of the economy, it is unlikely that they will want to hold currency assets in these countries and support their development. Second, depending on the dynamics and magnitude of current account deficits, they lead to an accumulation of external debts that can negatively affect domestic production and even investment decisions.

Therefore, when the economy experiences procyclicality in its current account deficits, the government should generally direct its spending toward local development investments. The depth of these deficits forces economies to reduce export taxes and, in turn, discourage imports.

Conversely, when the state has a countercyclical foreign policy, it is important to protect its economy by giving preference to imports of non-tradable goods. This will ultimately increase public spending on infrastructure and industrialization in order to increase their domestic production capacity for export.

Moreover, in the absence of an intertemporal constraint on the said balance, is it not possible to improve the development of the financial market of each country that aspires to certain emergence. Post-Keynesian analysis clarifies the impact of financial market development on the cyclical dynamics of growth. According to this analysis, capital flows can be detrimental to a nation that wishes to revive its economy. Indeed, the risks posed by financial markets on economic activity are most present during reversals of confidence in these markets, in other words, when conventions are called into question. In periods of confidence, there is no real negative impact of financial markets. On the contrary, the growth of available liquidity encourages investment by facilitating risk-taking. Thus, the development of financial markets generates stability in economic growth and ultimately reduces the high external dependence (Agénor, 2015).

6.   Conclusion

This article analyzes the non-linear effects of the dynamics of current account deficits on the economic cycle of six (06) countries aspiring to emerge at a known horizon. The estimations allowed us to verify,

first, the non-linearity of the persistence of the deficits and second, the effects of this inter-temporality.

The implications of the dynamics of the current account balance led to two results, the first of which distinguishes between Côte d'Ivoire and DR Congo, which show procyclicality, and the second, countercyclicality for all countries except Côte d'Ivoire at certain quantile values.

Thus, despite the good will of states to define their growth path with a view to a future emergence, the inter-temporality of current account deficits is increasing. As a result, strong openness and external dependence as a principle of growth no longer appear relevant. The results of this reflection reveal the interest for emerging economies to adopt a countercyclical external policy. This policy is linked to the nature of public spending for a certain industrialization, the development of financial markets and local private investment, thus opening up the debate on macroeconomic adjustment when economies have a persistent current account deficit.

Biographical notes
Marius Achi is a PhD candidate in economics at the University of Félix Houphouet-Boigny. His research interests are particularly anchored on dynamic macroeconomic and DSGE Model.

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Conflict of interest
The author declares no conflict of interest.

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Appendix A: Methodology to transform the data at a quarterly level (Goldstein and Khan, 1976)

Goldstein and Khan (1976) consider three consecutive annual observations y_{t-1}, y_t and y_{t+1} a flow variable y(s). They define the quadratic function passing through these three observations according to the following system of equations:

$$\int_0^1 \left(as^2 + bs + c \right) ds = y_{t-1} \quad \int_1^2 \left(as^2 + bs + c \right) ds = y_t \quad \int_2^3 \left(as^2 + bs + c \right) ds = y_{t+1}$$

System 1 They solve the system of equations (1) in a, b et c and obtain the following values,

$$a = 0,5y_{t-1} - 1,0y_t + 0,5y_{t+1}$$
$$b = -2,0y_{t-1} + 3,0y_t - 1,0y_{t+1}$$
$$c = 1,833y_{t-1} - 1,166y_t + 0,333y_{t+1} \quad \text{System 2}$$

From these values a, b et c, Goldstein et Khan (1976), calculate twelve (12) standard coefficients due to three (3) per quarter from which the quarterly data, for any annual observation y_t, can be interpolated as follows.

$$T_1 = \int_1^{1,25} \left(as^2 + bs + c \right) ds = 0,0545y_{t-1} + 0,2346y_t - 0,0392y_{t+1}$$

$$T_2 = \int_{1,25}^{1,50} \left(as^2 + bs + c \right) ds = 0,0079y_{t-1} + 0,2655y_t - 0,0234y_{t+1}$$

$$T_3 = \int_{150}^{1,75} \left(as^2 + bs + c \right) ds = -0,0234\gamma_{t-1} + 0,2655\gamma_t + 0,0078\gamma_{t+1}$$

$$T_4 = \int_{1,75}^{2} \left(as^2 + bs + c \right) ds = -0,039\gamma_{t-1} + 0,2343\gamma_t + 0,0547\gamma_{t+1} \text{ System 3}$$

Notes: 1. Multiplying each observation by 4 gives series at a quarterly level, at the annual rate. 2. When comparing the new series obtained with the observed series, the relative error is on average around 2%.

Appendix B: Estimation of the quantile process

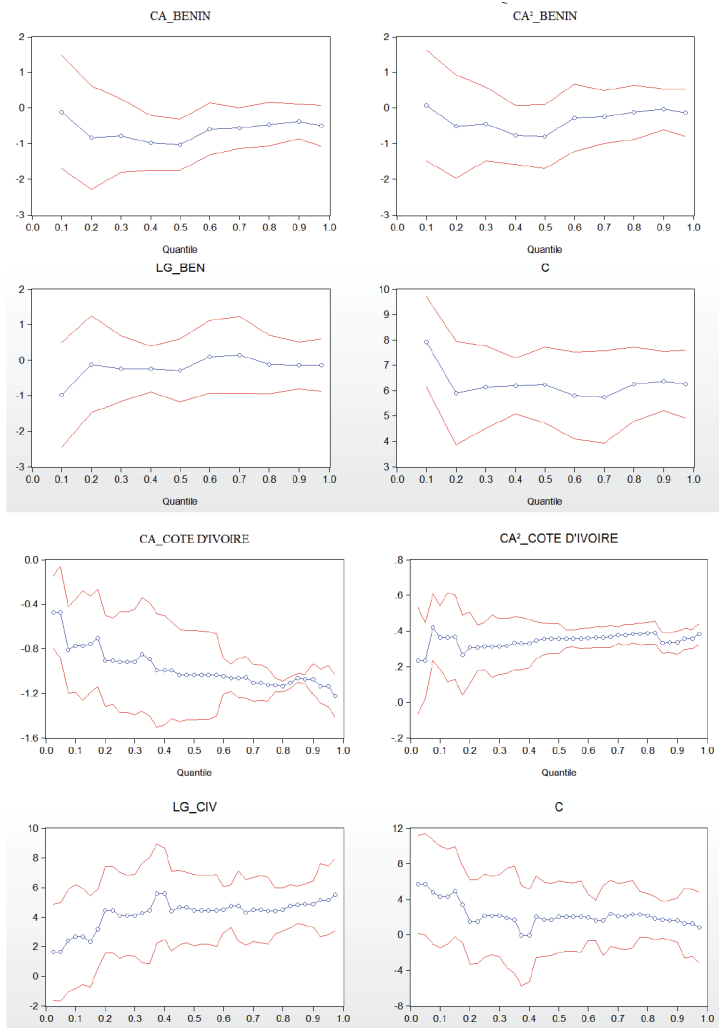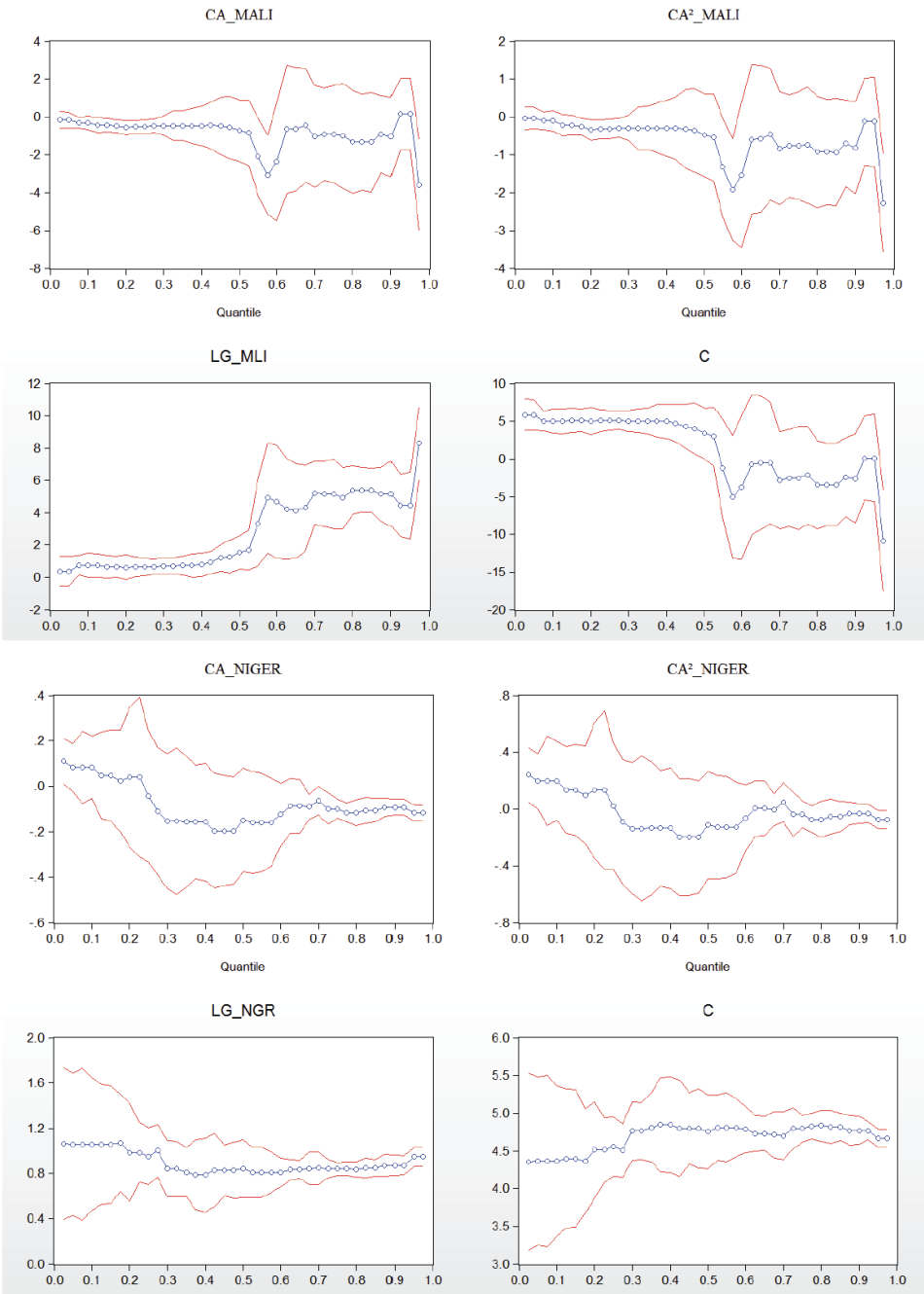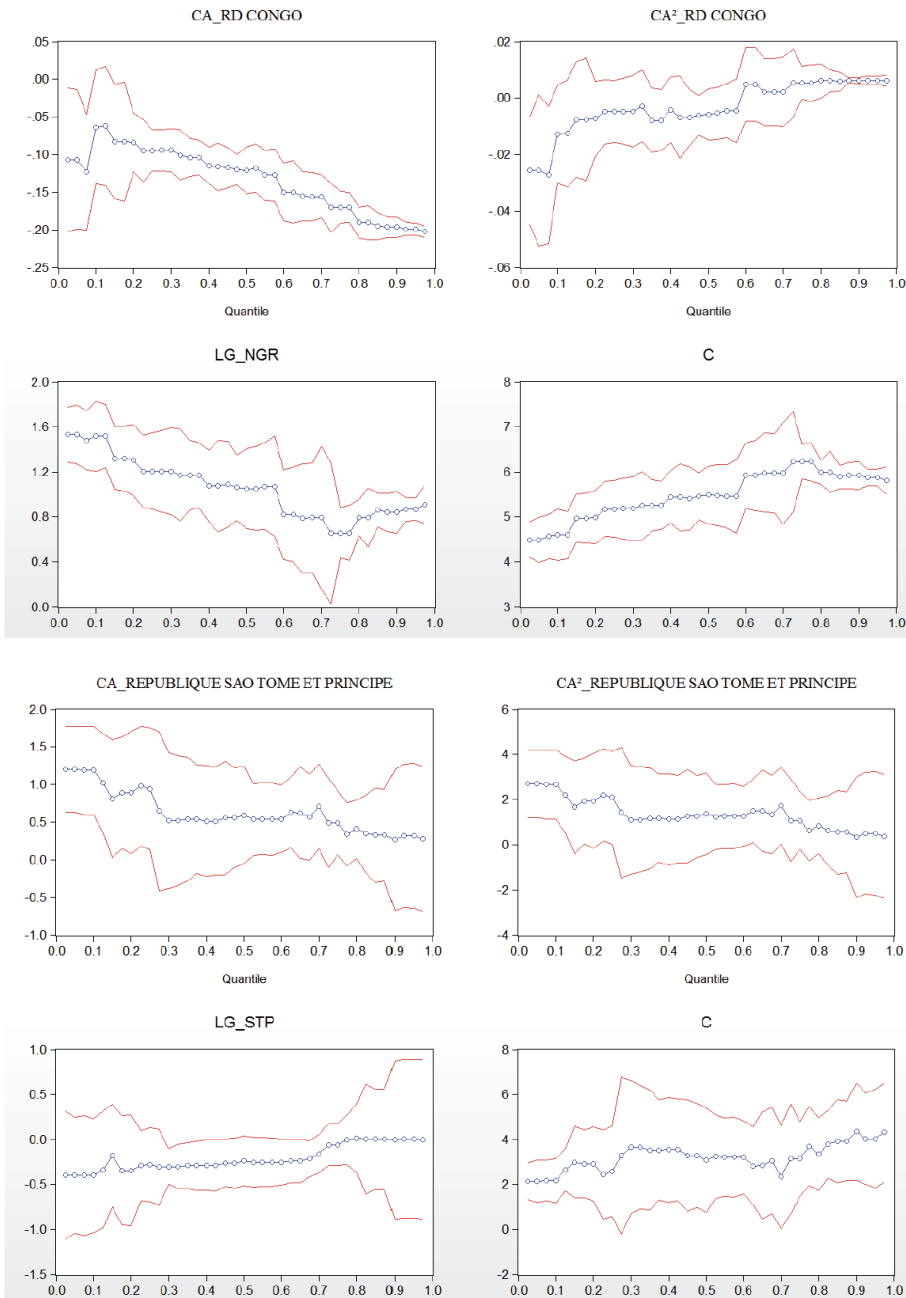**Figure 2.** Evolution of Coefficients by Quantiles

Figure 2 continue..

Figure 2 continue..

Source: Author