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The importance of the exchange rate regime in limiting current account imbalances in sub-Saharan African countries

Blaise Gnimassoun

UMR 7235

Université de Paris Ouest Nanterre La Défense
(bâtiment G)
200, Avenue de la République
92001 NANTERRE CEDEX

Tél et Fax : 33.(0)1.40.97.59.07
Email : nasam.zaroualete@u-paris10.fr

The importance of the exchange rate regime in limiting current account imbalances in sub-Saharan African countries*

Blaise Gnimassoun†

Abstract

One of the major current concerns of economic policy in developing countries is the choice of the appropriate exchange rate regime to consolidate and accelerate the pace of economic growth. This paper aims to investigate whether the choice of a country's exchange rate regime may affect current account imbalances for sub-Saharan African economies. To this end, we first use Bayesian model averaging (BMA) to address concerns about model uncertainty and identify the key determinants (fundamentals) of external balances. Then, estimating current account imbalances over the 1980-2012 period, we show that flexible exchange rate regimes are more effective in preventing such disequilibria. Consequently, candidates for membership of monetary unions should discuss widely the possible adjustment mechanisms before forming such unions; one potential measure being the sharing of external risks at regional level.

JEL Classification: F32, F33, C11.
Keywords: Current account imbalances, Exchange rate regime, Bayesian model averaging, Sub-Saharan Africa

1 Introduction

The choice of exchange rate regime and its impact on macroeconomic performance is undoubtedly one of the most controversial topics in macroeconomic policy (Levy-Yeyati and Sturzenegger, 2003). If the debate on the relative merits and demerits of alternative exchange rate regimes is longstanding, it remains topical for developing countries, especially for sub-Saharan African countries that are seeking an appropriate regime to consolidate and strengthen their economic impetus (Yagci, 2001; Masson, 2008; Bird and Rowlands, 2009; Qureshi and Tsangarides, 2012). Several internal and external factors justify the attention paid to this issue: the economic performances achieved in sub-Saharan Africa during the 2000s, as well as the unexplored potential economic growth, the gradual opening of some countries to international financial flows, the increasing global imbalances and their implications, the need to strengthen regional trade, etc. While the average economic growth of

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†EconomiX-CNRS, University of Paris Ouest, France.

sub-Saharan Africa stagnated in the 1980s and 1990s (2.6% and 2.2% respectively), it has doubled in the 2000s to stand at 5.5%, with predictions that remain strong according to the International Monetary Fund (IMF).[1] With the aim of enhancing this economic trend in the long term and stimulating sub-regional markets, the enthusiasm for monetary unions is increasingly apparent in sub-Saharan Africa.[2]

Several reasons could justify the formation of monetary unions or the choice of a fixed exchange rate regime for developing countries,[3] namely the intensification of regional trade, the level of which remains low given the high specialization of these countries in commodity exports, the credibility of economic policy—mainly fiscal policy—the management of which is usually much more rigorous in countries with fixed exchange rate regimes, and the legibility of monetary policy that is favourable to foreign capital and investment. Contrasting with these arguments, it is well known that the adoption of such schemes involves the abandonment of the exchange rate as an instrument for adjusting external imbalances.[4] Regarding the case of the euro area, there is some evidence that external imbalances have increased since the introduction of the common currency (see for instance, Berger and Nitsch, 2010; Holmes et al., 2010; Proaño et al., 2012; Körner and Zemanek, 2013). The adjustment of these imbalances, which is still ongoing, has been particularly painful in economic terms (falling wages, rising unemployment, labour market reforms, popular protests) partly because member countries can no longer individually use the exchange rate as an adjustment instrument. In a context in which some sub-Saharan African countries are tempted by other monetary policies, especially other exchange rate policies, the question of the link between the exchange rate regime and external imbalances is thus particularly acute.

While the increase in global imbalances during the 2000s has renewed interest in the literature on sustainability and the adjustment of current accounts, little attention has been paid to the link between current account imbalances and the exchange rate regime.[5] In addition, to the best of our knowledge, no study has addressed the case of developing countries. The focus

[1] See World Economic Outlook (WEO), April 2014.

[2] In addition to the project of a monetary union for West Africa, five East African countries (Burundi, Kenya, Rwanda, Tanzania and Uganda) signed on November 30, 2013 a protocol agreement establishing a monetary union. The project of In addition to the monetary union project for West Africa, five East African countries (Burundi, Kenya, Rwanda, Tanzania and Uganda) signed a protocol agreement on 30 November 2013 establishing a monetary union. The West African project aims to merge the West African Monetary Zone (WAMZ), consisting of Gambia, Ghana, Guinea, Nigeria and Sierra Leone, with the West African Monetary Union (WAMU), including Benin, Burkina Faso, Guinea Bissau, Ivory Coast, Mali, Niger, Senegal and Togo. The WAMZ is a monetary union undergoing training, whereas the WAMU is an existing monetary union with the CFA franc as its currency. The economic bloc of the Southern African Development Community (SADC), consisting of Angola, Botswana, the Republic of Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Swaziland, South Africa, Tanzania, Zambia and Zimbabwe, also plans to form a monetary union. Some coordination of monetary and exchange rate policies already takes place between South Africa, Lesotho and Swaziland, although the relationship is closer to that of a currency board.

[3] See, for example, Guillaume and Stasavage (2000), Chang and Velasco (2000), Frankel (2012), Qureshi and Tsangarides (2012).

[4] Throughout this paper, the terms "current account imbalances" and "external imbalances" are used interchangeably.

[5] Most of these studies focus on current account reversal (Clarida et al, 2007; Freund, 2005; Freund and Warnock 2007) or the link between the latter and the exchange rate regime (Chinn and Wei, 2013; Ghosh et al, 2013; Pancaro, 2013).

on industrialized countries is justified in part by the fact that their external imbalances also represent a challenge to the stability of the global economy. However, the case of developing economies—sub-Saharan African countries in particular—is also of great interest as external imbalances represent a challenge for their own development.

Within this context, marked by the debate on the choice of exchange rate regime in sub-Saharan Africa, this paper aims to examine the relationship between current account imbalances and the exchange rate regime, investigating whether the latter plays a significant role in limiting the former. This investigation is particularly interesting with regard to the growth and development of sub-Saharan African countries that depend heavily on the performance and stability of their open sector due to their strong reliance on export earnings.

Turning to methodological issues, data regarding current account imbalances deserve some comments. In the existing literature, external imbalances are usually viewed simply as current account deficits and surpluses. However, it is well known that relatively large deficits are natural in an intertemporal framework, typically when a country begins its development process, strengthening domestic investment by importing capital (Sachs et al., 1981; Obstfeld and Rogoff, 1995; Chinn and Ito, 2007; Bussière et al., 2010). It is thus more appropriate to refer to external imbalances when the current account deviates from the level determined by its fundamentals as proposed by Lane and Milesi-Ferretti (2012) and Ca' Zorzi et al. (2012).[6] In other words, instead of considering current account deficits and surpluses, we measure external imbalances as the difference between the observed current account and its medium-term estimated value. To this end, the first challenge we face is to identify the main determinants of current account for sub-Saharan African countries in the context of the absence of clear theoretical guidance and the presence of model uncertainty emerging from empirical studies.

To identify the main determinants of current account positions while addressing model uncertainty, we employ the Bayesian model averaging (BMA) technique.[7] This procedure allows us to avoid problems of degrees of freedom due to the potentially large number of determinants, especially for developing countries for which data are generally limited. Furthermore, its flexibility allows us to take into account not only the conventional current account fundamentals, but also other less well-known potential determinants that might be specific to the countries considered. In addition, this approach has the advantage of avoiding the arbitrary choice of a current account model and providing accurate estimates of the medium-term current account and thence external imbalances.

Our paper contributes to the literature in several ways. First, we address for the first time a topical and far-reaching issue in terms of economic policy for sub-Saharan African countries, namely the potential influence of the exchange rate regime on external imbalances. Second,

[6] See also the IMF studies on the methodology of the assessment of the current account and exchange rate, including Isard and Faruqee (1998), Isard et al. (2001) and the IMF (2013). See also Bussière et al. (2010) for the European Central Bank.

[7] Bayesian techniques are often used to choose a model of economic growth among millions of potential specifications derived from theory and empirical studies (see Sala-i-Martin, 1997; Fernandez et al., 2001; Sala-i-Martin et al., 2004; among others). It was recently used for the first time in a study on the current account by Ca' Zorzi et al. (2012).

we draw on the BMA approach to address model uncertainty and robustly identify the current account fundamentals without ignoring the structural characteristics of the countries under study. Third, we specifically account for the medium-term determinants of the current account position by estimating a relationship linking the current account to its fundamentals. This allows us to derive more reliable current account equilibrium values than those based on the usual Hodrick-Prescott filtered series and also go further than studies that simply consider the deficits and surpluses of current account as the external imbalances.

Our findings show that the current account position in sub-Saharan Africa is mainly determined by foreign direct investment (FDI), financial deepening, fiscal balance, initial net foreign assets, oil balance, migrants' remittances, official development assistance (ODA) and stage of development. Studying the link between current account imbalances and the exchange rate regime, we show that a flexible exchange rate regime is most effective in preventing absolute external imbalances.

The rest of the paper is organized as follows. Section 2 reviews the potential current account determinants. In Section 3, we briefly present the methodology and the results of the BMA approach. Section 4 is devoted to the assessment of external imbalances and their relationship with the exchange rate regime. Finally, Section 5 concludes the paper.

2 Potential current account determinants for Sub-Saharan African countries

The fundamentals presented in this section are derived from the predictions of theoretical models and also from previous empirical studies, in particular those related to medium-term determinants of current account (Debelle and Faruqee, 1996; Calderon et al., 2002; Chinn and Prasad, 2003; Lane and Milesi-Ferretti, 2012). Whereas Debelle and Faruqee (1996) and Chinn and Prasad (2003) focus on both developing and industrialized countries and employ cross-sectional and panel approaches, Calderon al. (2002) consider only developing countries in a panel framework. In addition to the traditional determinants presented in these papers, we also propose other less known potential fundamentals, which are linked to specific factors related to the countries under study.

2.1 Macroeconomic policy stance, macroeconomic performance and life cycle

Fiscal balance. The link between current account and fiscal balance is generally shown to be positive, giving rise to the well-known "twin deficits hypothesis". This positive relationship is consistent with the predictions of several theoretical models. Blanchard's (1985) finite-horizon model and the overlapping generation models (see Obstfeld and Rogoff, 1996) indicate that a deterioration in fiscal balance tends to have the same negative effect on the current account to the extent that it involves a redistribution of income from future to present generations. This

relationship does not hold in the particular case of Ricardian equivalence in which private savings fully offset changes in public saving.

Degree of exchange rate flexibility and exchange rate policy. As the degree of exchange rate flexibility can affect the ability of an economy to respond to external shocks, one could argue that a flexible exchange rate regime is more likely to limit current account imbalances. According to Milesi-Ferretti and Razin (1996), the degree of exchange rate flexibility in response to external shocks can affect the ability of an economy to sustain current account deficits. It is therefore more relevant to look at the relationship between current account imbalances and exchange rate regime, as we do in Section 4, rather than between current account and exchange rate regime. However, given that exchange rate policy may also affect the price competitiveness of an economy, the real effective exchange rate is usually employed to examine this competitiveness channel. As an appreciation in exchange rate corresponds to a loss of price competitiveness, a negative relationship is expected between the real effective exchange rate and current account position.

Trade integration. Trade openness is a macroeconomic policy choice that may impact the current account, a more open economy being more vulnerable to external shocks. This vulnerability is greater when trade flows are not diversified (Milesi-Ferretti and Razin, 1996). In this respect, the degree of openness to international trade is often used as a proxy for barriers to trade. It could also be correlated with other factors that make a country attractive to foreign capital (Bussière et al., 2010). Thus, the sign associated with this variable can only be determined empirically.

Net foreign assets. The current account and net foreign assets are linked by definition as the current account is nothing else than the change in net foreign assets. However, the level of net foreign assets may affect the current account in opposite directions. On the one hand, we can expect a negative relationship to the extent that an economy with a high level of net foreign assets can afford to run trade deficits while remaining solvent. On the other hand, a positive relationship is likely to the extent that an improvement in the net foreign asset position leads to an increase in net foreign income flows, which improves the current account.

Economic growth. Economic growth is often identified as a potential determinant of current account. Its impact could be related to its effects as perceived by households regarding their future income: if they anticipate a rise in their future income, they increase their present consumption at the expense of savings. Consequently, economic growth exerts a negative effect on the current account.

Stage of development. This variable is often included in current account models to capture the convergence process. Indeed, economies that are beginning their economic development process have a greater need for investment and are likely to finance it by external borrowing (Obstfeld and Rogoff, 1996). Thus, low-income countries are expected to experience larger current account deficits that decrease with the improvement in their level of development. The literature typically uses the ratio of gross domestic product (GDP) per capita in terms of purchasing power parity (PPP) as a measure of stage of development and empirical studies generally introduce the squared relative income to allow for a non-linear relationship between

relative income and current account (see Chinn and Prasad, 2003).

Demography. The life-cycle model provides a direct link between the stage in the life cycle and the behaviour of consumption and savings. A change in the age structure of the population will affect national saving behaviour and therefore the current account. Several variables, such as the old-age-dependency ratio, the young-age-dependency ratio and population growth, are used in the literature to evaluate the link between changes in the demographic structure and current account. The aging rate, defined as the expected change in the old-age-dependency ratio in the future, has also been introduced recently in the literature; countries in which the population is aging faster are expected to have higher savings (see Lane and Milesi-Ferretti, 2012). Except for the aging rate, a negative relationship is expected between the other variables and the current account.

2.2 Structural features, external financing and international environment

Financial integration (financial deepening). The degree of sophistication and internationalization of the financial system can affect the level of savings and investment in an economy. However, the relationship between this variable and the current account is ambiguous. Indeed, while a well-developed financial system could induce more savings because higher yields are expected, it might also indicate fewer borrowing constraints and therefore lower savings (or more investment). Moreover, the effects on domestic investment are also not clear from a theoretical point of view (Ca' Zorzi et al., 2012). As a measure of the sophistication and internationalization of the financial system, Ca' Zorzi et al. (2012) use the sum of foreign assets and liabilities as a share of GDP. Other authors use the ratio of money and quasi money (M2) to GDP as a proxy for financial deepening (Chinn and Prasad, 2003; Allegret et al., 2013), or the ratio of private credit to GDP (Chinn and Ito, 2007; Gruber and Kamin, 2007; Aghion et al., 2009).

Oil balance. This variable captures the sensitivity of the current account and the economy to changes in oil prices. An increase in oil prices should improve the current account for oil-exporting countries and depreciate that of oil-importing countries. Thus, this variable allows the effect of oil prices to differ in sign and magnitude across countries (see Lee et al., 2008). Gruber and Kamin (2007) indicate that although the oil balance is a sub-part of the overall current account balance, its changes will not be correlated strictly to the current account if the non-oil balance also responds to oil price shocks. A positive relationship is nevertheless expected between the oil balance and current account position.

Terms of trade. In addition to the oil balance, terms of trade are generally introduced in current account models to capture the effects of changes in world market prices for a country's exports and imports (see Lane and Milesi-Ferretti, 2012). Logically, we expect a positive effect from improved terms of trade on the current account to the extent that this improvement implies an augmentation in export prices relative to import prices.

Foreign aid. As shown by Rajan and Subramanian (2011), foreign aid could generate a Dutch disease effect. If this channel is proved for sub-Saharan African countries, a negative impact

from aid on the current account through the appreciation of the exchange rate is expected. Beyond the potential Dutch disease effect, a negative relationship between aid and the current account can be expected if the aid for social projects contributes to lower precautionary savings on the part of households. Studying external balances in low-income countries, Christiansen et al. (2010) found a negative effect from total foreign aid on the current account, generated especially by concessional loans.

Migrants' remittances. In relation to aid, remittances can be considered a potential determinant of the current account for developing countries. Remittances towards developing countries have increased in recent years and their impact on the real exchange rate in the recipient economies is the subject of several studies (Amuedo-Dorantes and Pozo, 2004; Lartey et al., 2012, inter alia). Remittances may also have an impact on investment and consumption in the beneficiary countries. For example, Lartey (2013) finds that remittances have a significant impact on investment in sub-Saharan Africa. The effect of remittances on the current account depends in part on its relative impact on investment and savings.

Foreign direct investments (FDI). As FDI is likely to have an impact on national investment and savings, it is intimately linked to the current account. Fry (1993) studies the impact of FDI on domestic investment and savings and deduces its influence on the current account for a set of developing countries. The link between the current account and FDI should be negative if the latter contributes more to strengthening domestic investment than domestic savings and vice versa.

Civil liberties. The quality of a country's institutions generally affects its attractiveness and credibility for foreign investment. Similarly, efficient and stable institutions are better able to inspire confidence among domestic private agents (both national and foreign) to stimulate investment and savings. Therefore, one may wonder about the relationship between the quality of institutions and the current account, in particular for developing countries. Civil liberties were used by Bussière et al. (2010) and Ca' Zorzi et al. (2012) as one of the potential determinants of the current account. Other institutional variables are constructed by the World Bank. However, unlike civil liberties, data on these variables are not available over a long period or for all countries.

International environment. Although it is not often listed among the determinants of the current account, the international environment can have a significant impact, particularly for developing countries. As they predominantly export raw materials, developing countries are dependent on international conditions. Indeed, a favourable international environment could improve their export earnings and consequently their current account through greater foreign demand. However, a transmission delay may be observed. To capture its effect on the current account of developing countries, Calderon et al. (2002) use the economic growth of industrialized countries (OECD) and the world real interest rate as measures of the international environment.

Heavily Indebted Poor Countries (HIPC) initiative. Several countries in sub-Saharan Africa have benefited from the HIPC Initiative established by the World Bank and the IMF in 1996 with the aim of reducing the overall external debt of countries to bring it back to a

sustainable level. If the HIPC Initiative itself cannot be considered a determinant of the current account, it is important in the case of sub-Saharan African countries to pay attention to the potential impact of such an initiative. Indeed, Coulibaly and Gnimassoun (2013) show that this initiative has had a significant impact on the current account sustainability of the recipient countries. A simple empirical way to monitor the impact of the HIPC Initiative is to introduce a dummy variable in the current account model.

3 The benchmark current account model for Sub-Saharan African countries

The set of empirical relationships between the current account and its fundamentals cannot be fully analysed through a single theoretical model (Chinn and Prasad, 2003). Empirical studies are generally conducted to examine the predictions of different theoretical models, and most of them operate an arbitrary choice of model specification given the lack of clear theoretical guidance. This *a priori* choice is subject to potential bias given the very large number of possible specifications that are ignored. This bias is especially more likely in studies on developing countries because in addition to the traditional current account fundamentals, other potential determinants (such as ODA and migrants' remittances, civil liberties, for example) may be added to account for their specificity. Moreover, the lack or limited availability of data for these countries increases the inefficiency of an empirical model with several explanatory variables. It is therefore important to adopt an efficient strategy that combines the relevance of the explanatory variables and the robustness of the estimation. As a result, we adopt an econometric approach based on model uncertainty through the Bayesian model averaging.

3.1 Bayesian Model Averaging (BMA) methodology

We use the BMA technique[8] to shed light on the main fundamentals of the current account while considering the uncertainty associated with model specification given the relatively large number of potential determinants. The interesting aspect of this approach is that it addresses two major issues that typically arise in empirical studies with a relatively large number of explanatory variables and limited data and for which classical regression models do not provide an effective response, namely: (i) which variables should be included in the model and (ii) their respective importance.

Let us consider the following empirical current account model:

$$y = \alpha_\gamma + X_\gamma \beta_\gamma + \epsilon \qquad \epsilon \sim N(0, \sigma^2 I) \tag{1}$$

where y is the current account, X is the matrix of potential explanatory variables, α_γ is the constant, β_γ denotes the coefficients, and ϵ is the error term.

[8]This technique is briefly presented in this paper. For more technical details, we refer the reader to some key references, such as Hoeting et al. (1997, 1999) and Fernandez et al. (2001).

BMA addresses the problem of uncertainty in relation to model specification by estimating models for all possible combinations of $\{X\}$ and constructing a weighted average. Assuming that X contains K potential explanatory variables, this means estimating 2^K variable combinations and thus 2^K models, each with a certain probability of being the "true" model. If θ is the quantity of interest, such as coefficients β, the associated posterior distribution given data D is:

$$p\left(\theta|\, D\right) = \sum_{\gamma=1}^{2^K} p\left(\theta|\, M_\gamma, D\right) p\left(M_\gamma|\, D\right) \tag{2}$$

Thus, the posterior distribution of θ is an average of the posterior distribution under each of the models considered, weighted by their posterior model probability. For a model M_γ, the latter are obtained using Bayes' theorem:

$$p\left(M_\gamma|\, D\right) = \frac{p\left(D|\, M_\gamma\right) p(M_\gamma)}{\sum_{l=1}^{2^K} p\left(D|\, M_l\right) p(M_l)} \tag{3}$$

where $p\left(D|\, M_\gamma\right) = \int p\left(D|\, \theta_\gamma, M_\gamma\right) p\left(\theta_\gamma|\, M_\gamma\right) d\theta_\gamma$ is the integrated likelihood of model M_γ, θ_γ is the vector of parameters of model M_γ, $p\left(\theta_\gamma|\, M_\gamma\right)$ is the prior density of θ_γ under model M_γ, $p\left(D|\, \theta_\gamma, M_\gamma\right)$ is the likelihood and $p(M_\gamma)$ is the prior probability that M_γ is the true model. The latter has to be elicited by the researcher and should reflect prior beliefs. As Fernandez et al. (2001), we choose a uniform prior probability, i.e. $p(M_\gamma) = 2^{-K}$. This is a popular choice to represent the lack of prior knowledge.

Following Hoeting et al. (1999), the posterior mean and variance of θ are respectively given by:

$$E\left(\theta|\, D\right) = \sum_{\gamma=0}^{2^K} \widehat{\Delta}_\gamma p\left(M_\gamma|\, D\right), \tag{4}$$

$$V\left(\theta|\, D\right) = \sum_{\gamma=0}^{2^K} (V\left(\theta|\, D, M_\gamma\right) + \widehat{\Delta}_\gamma^2) p\left(M_\gamma|\, D\right) - E\left(\theta|\, D\right)^2, \tag{5}$$

where $\widehat{\Delta}_\gamma = E\left(\theta|\, D, M_\gamma\right)$.

3.2 Data

We draw on a panel of 44 sub-Saharan African countries.[9] The data are annual, spanning the period from 1980 to 2012. We collected and constructed data on the basis of the list

[9]We initially considered the 48 sub-Saharan African countries (according to the World Bank) and selected the 44 countries for which data on the current account were available over our whole period. The four countries that are not included are Eritrea, Liberia, Somalia and South Sudan.

of potential determinants of the current account position presented in Section 2. Several of these determinants, namely the fiscal balance, GDP growth rate, the level of PPP-adjusted GDP per capita, as well as all demographic variables, were expressed in relative terms, given that only their idiosyncratic shifts should affect the current account (see Chinn and Prasad, 2003; Lane and Milesi-Ferretti, 2012). Thus, the country-specific weighted averages of foreign variables are computed using the average foreign trade flows during the period 1996-2012. The first ten trading partners are considered for each country (see the list and the weight of trade partners in the Appendix, Table A1). Data sources and their descriptions are shown in Table A2 and descriptive statistics are provided in Table A3 in the Appendix.

For the purpose of ensuring robustness, we consider two sets of data: five-year averaged data and annual data covering all the countries studied. Both types of data are used for various purposes which may be complementary. On the one hand, the five-year averaged data allow the smoothing of business-cycle fluctuations and therefore an in-depth focus on the underlying determinants of the current account (see among others, Chinn and Prasad, 2003; Ca' Zorzi et al., 2012; Lane and Milesi-Ferretti, 2012). This is particularly relevant in the case of developing countries for which measurement errors are also at stake, in addition to the significant short-term fluctuations they face due to the volatility of commodity prices. On the other hand, the use of longer time series (annual data) allows for more variation both across and within countries, which should help in obtaining the real robust determinants of the current account (see Dufrenot et al., 2010 concerning growth determinants).

3.3 Estimation Results

We consider the 21 potential determinants of the current account discussed in Section 2, leading to the estimation of more than two million different models (exactly $2\hat{2}1$=2097152 models). The results of the BMA approach for all the 44 sub-Saharan African countries are presented in Table 1. The importance of the variables in explaining the current account position ($p(\beta_i \neq 0|\, D)$) is given in the column "BMA PIP", which represents the posterior inclusion probabilities (PIPs), i.e. the sum of posterior model probabilities for all models in which a variable was included. A variable is supposed to be relevant in explaining the current account and is considered a fundamental variable when its PIP is greater than or equal to 50% and there is no uncertainty about its sign (see Raftery et al., 2001; Dufrenot et al., 2010).

The results for the annual data and for the five-year averaged data are very close. In both cases, eight fundamentals of the current account are identified, among which seven are common, namely: FDI, financial deepening, fiscal balance, net foreign assets, oil balance, migrants' remittances and stage of development. The similarity between these results reflects the fact that the medium-term fundamentals of the current account (five-year averaged data) are not especially different from the short-term fundamentals (annual data). Turning to the eighth variable, relative GDP growth is identified only in the five-year averaged data, while ODA is retained only for the annual data. ODA is likely to be regarded as a fundamental of the current account to the extent that its PIP is higher than 80% for the annual data and also is not negligible (27%) for the five-year averaged data. Consequently, ODA is linked to the current account to a much greater extent in the short term, which is of considerable relevance

as the volume of aid to developing countries is often determined by the economic conditions in donor countries. Regarding relative GDP growth, its inclusion in the model is only significant for the five-year averaged data, suggesting that this variable is rather a medium-term determinant of the current account.

Table 1: BMA estimates for full sample

Variables	Annual data				5-year averaged data			
	BMA PIP	Post. Mean	Post. S.D.	Cond. Pos. Sign	BMA PIP	Post. Mean	Post. S.D.	Cond. Pos. Signe
CLIB	0.043	0.000	0.001	0.982	0.062	0.000	0.001	0.974
FDI	**1.000**	**-0.950**	**0.051**	**0.000**	**1.000**	**-0.830**	**0.135**	**0.000**
FINT	**1.000**	**-0.006**	**0.001**	**0.000**	**0.993**	**-0.007**	**0.002**	**0.000**
FIS	**0.997**	**0.172**	**0.042**	**1.000**	**0.686**	**0.236**	**0.191**	**1.000**
HIPC	0.250	0.004	0.007	1.000	0.113	0.002	0.007	0.999
L.NFA	**1.000**	**0.020**	**0.003**	**1.000**	**0.992**	**0.027**	**0.007**	**1.000**
L.OECD_G	0.043	0.005	0.042	0.972	0.074	0.043	0.212	1.000
ODA	**0.841**	**-0.095**	**0.053**	**0.000**	0.271	-0.039	0.074	0.000
OILB	**1.000**	**0.231**	**0.022**	**1.000**	**1.000**	**0.215**	**0.042**	**1.000**
OPEN	0.038	0.000	0.002	0.868	0.138	0.004	0.012	0.932
RAGING	0.044	-0.003	0.034	0.141	0.052	-0.005	0.061	0.252
REER	0.057	-0.001	0.003	0.000	0.077	-0.002	0.008	0.000
REM	**1.000**	**0.279**	**0.048**	**1.000**	**0.751**	**0.189**	**0.132**	**1.000**
RGROWTH	0.059	-0.003	0.018	0.000	**0.970**	**-0.400**	**0.133**	**0.000**
RO	0.063	-0.002	0.009	0.001	0.047	0.000	0.009	0.489
RPOPG	0.198	-0.099	0.229	0.000	0.045	-0.002	0.119	0.531
RPROD	**0.939**	**0.082**	**0.043**	**1.000**	**0.501**	**0.043**	**0.051**	**1.000**
RPROD2	0.154	-0.007	0.043	0.341	0.194	0.011	0.043	0.856
RY	0.070	0.001	0.004	0.971	0.066	0.000	0.006	0.657
TOT	0.182	0.003	0.007	1.000	0.070	0.001	0.006	1.000
WRIR	0.295	-0.169	0.298	0.000	0.071	-0.045	0.233	0.000

Note: The results are based on 500,000 draws and 100,000 burn-ins. For each simulation, we use a uniform prior[10] and the birth-death MCMC sampler. Statistics in bold are those for which the posterior inclusion probability is greater than or equal to 50%. The correlation between iteration counts and analytical posterior model probabilities for the 2,000 best models is 0.9993.

If certain fundamentals, such as fiscal balance, net foreign assets, oil balance and stage of development, were expected given that they are highlighted by most previous empirical studies (see references in Section 2), this is not necessarily the case for other variables, such as financial deepening, ODA, migrants' remittances and FDI. Often, these are not or only poorly examined in empirical studies that generally focus on the traditional determinants of the current account without considering explicitly the specificity of the countries studied. This highlights the value of the BMA approach in identifying the fundamentals of the current account without bias and without ignoring the characteristics of the countries under study.

Whilst it is important to determine properly the fundamentals of the current account, it is equally important to check whether the signs of the coefficients associated with the different variables are consistent with the predictions of theoretical models. The column "Post Mean" displays the coefficients averaged over all models, including the specifications wherein the variable was not contained (in which case its coefficient is zero). The coefficient sign can

[10]Given that the choice of prior may influence the results, we have specified other types of priors (fixed and random with different sizes 5, 7, 9, 11). The results do not significantly change (see Figure A.1. in the Appendix).

be derived from the column "Cond.Pos.Sign" which shows the "posterior probability of a positive coefficient expected value conditional on inclusion", respectively "sign certainty" (see Zeugner, 2011). When the statistic is close to 1, the variable undoubtedly has a positive sign, whereas when it is close to zero, the variable has a negative sign. Figure 1 goes further in the analysis and presents the posterior coefficient densities to shed light on their sign and to compare them to theoretical predictions.

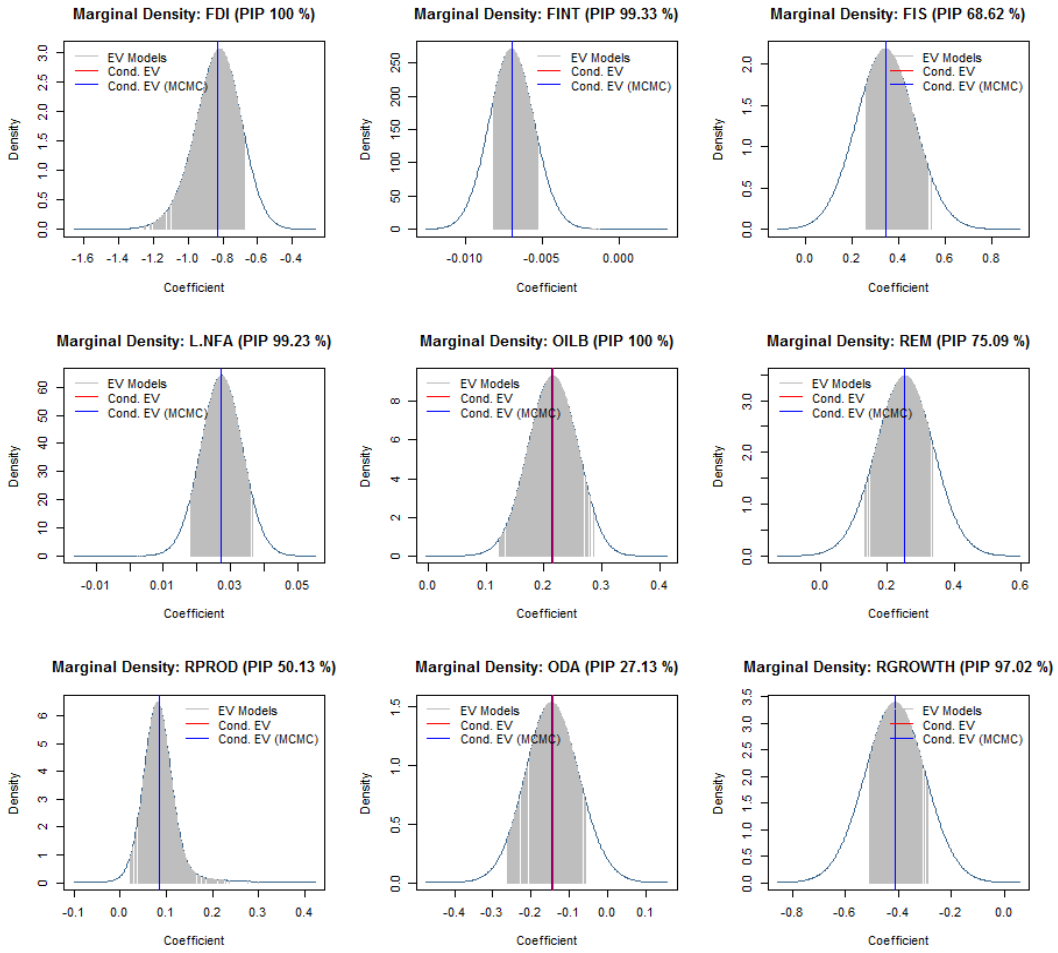
As shown in Figure 1, the signs of the traditional fundamentals are consistent with theoretical predictions. Indeed, the fiscal balance is clearly positively related to the current account, 95% of the mass of its posterior coefficients being between 0.099 and 0.593 with an estimated average of 0.19. For comparison, Chinn and Prasad (2003) found a coefficient ranging between 0.39 and 0.45 for their subsample of developing countries. Christiansen et al. (2010) obtained a coefficient ranging between 0.24 and 0.37 for a sample of low-income countries. According to our findings, the "twin deficit" assumption seems to apply to sub-Saharan African countries, which means that an increase in fiscal deficits leads to a deterioration in the external balance. This is consistent with the predictions of overlapping generation models, as well as Blanchard's (1985) finite horizon model. Similarly, initial net foreign assets and the oil balance have a positive influence on the dynamics of the current account, which is in line with most empirical studies (see e.g. Chinn and Prasad, 2003; Lee et al., 2008; Ca' Zorzi et al., 2012; IMF, 2013). Indeed, our results show that the coefficients associated with initial net foreign assets and the oil balance are concentrated at 95%, between 0.015 and 0.034 for initial net foreign assets and between 0.132 and 0.300 for the oil balance, with respective estimated averages of 0.027 and 0.215. Thus, our estimated coefficient for net foreign assets is very close to that of Chinn and Prasad (2003), which ranges between 0.017 and 0.043 for their subsample of developing countries. Ca' Zorzi et al. (2012) find significant estimated coefficients of 0.03 for net foreign assets and 0.14 for the oil balance for their sub-sample of African countries, which are also very close to ours. In addition, the stage of development appears to be related positively to the current account, with an estimated coefficient between 0.019 and 0.176, confirming the theoretical effect expected in the context of the convergence process. Regarding financial deepening, although there is no clear theoretical guidance on the direction of its link with the current account (Ca' Zorzi et al., 2012), our results show that this link is negative for sub-Saharan African countries even if the coefficient is very low (between -0.010 and -0.004, with an estimated average of -0.007).[11] This negative relationship—also evidenced by Cheung et al. (2010) and Allegret et al. (2013)—can be justified by the fact that the movement of domestic financial liberalization that occurred in many sub-Saharan African countries during the 1980s and was reinforced in the 1990s has contributed to reducing borrowing constraints and boosting investment and a positive relationship between financial deepening and investment has been established in most studies (Benhabib and Spiegel, 2000; Christopoulos and Tsionas, 2004, among others).

In addition to these fairly standard results, our estimates establish that other variables, such as FDI, migrants' remittances and, to some extent, ODA, influence the dynamics of the current account in sub-Saharan African countries. The coefficient associated with remittances from

[11] This negative relationship is also maintained even if we take the ratio of M2 to GDP as a proxy for financial deepening, but the latter does not appear statistically significant.

migrants is globally between 0.081 and 0.421, with an estimated average of 0.189. Regarding FDI and ODA, their influence on the current account is shown to be negative (with coefficients between -1.114 and -0.578, and between -0.282 and -0.002 respectively).

Figure 1: Posterior Coefficient Densities



Note: The coefficients represented here are those obtained from 5-year averaged data. "EV" denotes expected value, "Cond. EV" refers to the expected coefficient based on analytical posterior model probabilities and "Cond. EV (MCMC)" denotes the expected conditional coefficient from MCMC. "Cond. EV" and "Cond. EV (MCMC)" coincide in most cases.

To gain a greater understanding of the relationship between these non-traditional variables and the current account, we examine the relationship between each of these and savings and investment. Table 2 presents these links for different types of data (annual, five-year averages, cross-sectional) for all countries. We find that the negative relationship between FDI and the current account can be clearly explained by the savings-investment channel. Indeed, although FDI seems to have a positive and significant impact on savings and investment for sub-Saharan African countries, the influence on domestic investment is much higher than

on domestic savings. The difference between the coefficients associated with savings and investment is equal to the coefficient linking FDI and the current account. We also observe that the negative relationship between ODA and the current account could be explained by the same channel. Indeed, ODA is associated with a decline in national savings in sub-Saharan African countries, while it has no significant influence on investment. Given that ODA is often oriented towards social spending (health, education) or social projects, it would contribute to reducing the precautionary savings of households and consequently national savings. The positive relationship between migrants' remittances and the current account cannot really be clarified by reference to the same channel as such remittances seem to have an almost equal impact on investment and savings (even with a slight advantage for investment).

Table 2: Link between (FDI, REM, ODA) and (Saving, Investment)

Variables	Annual data (1980-2012)		5-year averaged data (1980-2012)		Cross-sectional data (mean 1980-2012)	
	Saving Coef.	Investment Coef.	Saving Coef.	Investment Coef.	Saving Coef.	Investment Coef.
FDI	**0.12****	**1.17*****	**0.31*****	**1.34*****	**1.14*****	**2.81*****
	[2.46]	[23.84]	[2.83]	[12.43]	[3.03]	[7.43]
REM	**0.30*****	**0.37*****	**0.30*****	**0.37*****	**0.31****	**0.37****
	[9.87]	[13.09]	[5.53]	[5.62]	[2.58]	[2.22]
ODA	**-0.16*****	**0.06***	**-0.21*****	**0.05**	**-0.22**	**0.20**
	[-5.22]	[1.72]	[-3.53]	[0.74]	[1.63]	[1.03]

Note: T-statistics are given in brackets; *** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

3.4 Robustness checks

To assess the robustness of our results and ensure that we have identified the "true" fundamentals of the current account, we reprocess our database to eliminate possible outliers that could potentially bias our results. As a first step, we exclude all countries for which the absolute value of the current account is greater than or equal to 45% of GDP at any point in time. In a second step, we exclude countries with significant missing data (greater than or equal to 25% of the total number of observations for variables previously considered relevant). Finally, given that data issues tend to be more frontloaded and that some relevant variables, such as fiscal balance, are available for the vast majority of the countries from 1990 onwards, we consider the shorter period 1990-2012. This also allows us to check if the fundamentals remain robust over time. Our sample now comprises 35 countries[12] over the period 1990-2012. The BMA results for this new sample are reported in Table 3.

These results clearly confirm our previous findings. Indeed, six of the seven fundamentals previously identified jointly for the annual and five-year averaged data, namely FDI, financial integration, fiscal balance, initial net foreign assets, oil balance and stage of development, are also retained here. The seventh variable, migrants' remittances, also has a PIP of 100% for

[12]The nine countries excluded from the initial sample are Chad, the Central African Republic, the Democratic Republic of Congo, Equatorial Guinea, Malawi, Mauritania, Sao Tome and Principe, Zambia and Zimbabwe.

the annual data and a PIP of 35% for the five-year averaged data, highlighting the robustness of this variable as a current account fundamental. The only variable which is no longer identified as a fundamental is relative GDP growth. In addition, two new variables are identified using the annual data, namely population growth and the world real interest rate, which are negatively linked to the current account. These results are not very surprising because (i) financial openness in most sub-Saharan African countries actually began from 1990 onwards and (ii) the result regarding population growth is fairly standard in empirical studies (see Lee et al, 2008; Christiansen et al., 2010; Lane and Milesi-Ferretti, 2012). The sign of the coefficients also remains stable and consistent with previous results, as illustrated in Figure 2, showing the marginal density of posterior coefficients.

Table 3: BMA robustness results

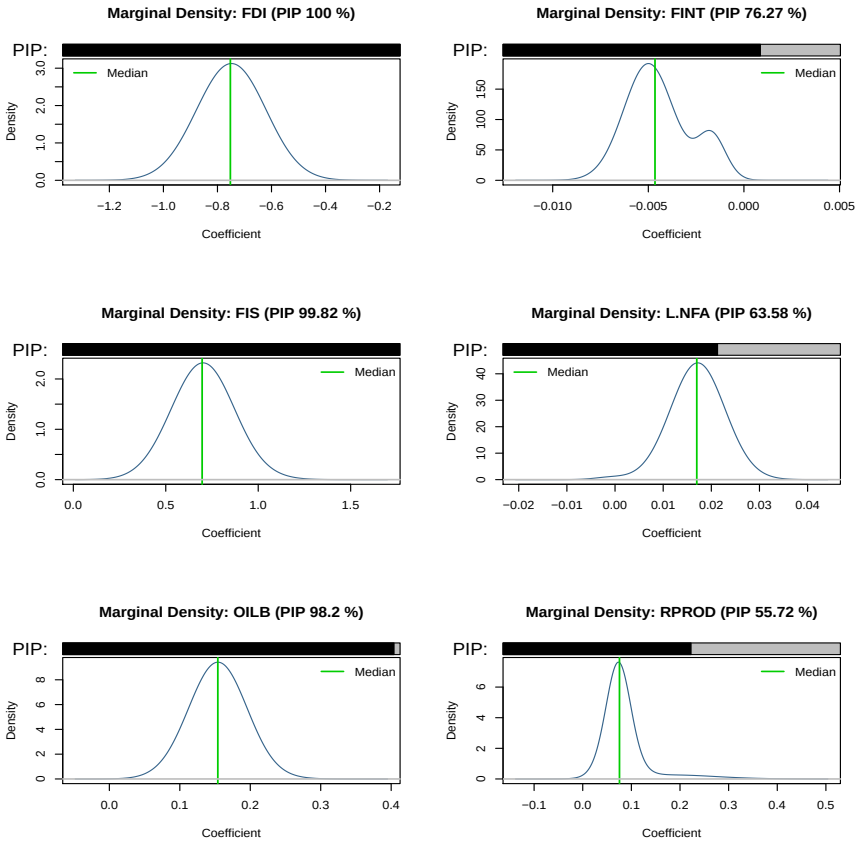
Variables	Annual data				5-year averaged data			
	BMA PIP	Post. Mean	Post. S.D.	Cond. Pos. Sign	BMA PIP	Post. Mean	Post. S.D.	Cond. Pos. Signe
CLIB	0.039	0.000	0.000	0.359	0.048	0.000	0.001	0.292
FDI	**1.000**	**-0.653**	**0.069**	**0.000**	**1.000**	**-0.749**	**0.127**	**0.000**
FINT	**1.000**	**-0.005**	**0.001**	**0.000**	**0.763**	**-0.003**	**0.002**	**0.000**
FIS	**1.000**	**0.477**	**0.059**	**1.000**	**0.998**	**0.701**	**0.175**	**1.000**
HIPC	0.044	0.000	0.002	0.141	0.039	0.000	0.003	0.768
L.NFA	**1.000**	**0.013**	**0.003**	**1.000**	**0.636**	**0.011**	**0.009**	**0.991**
L.OECD_G	0.067	0.012	0.062	1.000	0.416	0.524	0.716	1.000
ODA	0.079	-0.003	0.014	0.000	0.279	-0.041	0.075	0.000
OILB	**1.000**	**0.185**	**0.020**	**1.000**	**0.982**	**0.151**	**0.046**	**1.000**
OPEN	0.254	-0.005	0.011	0.000	0.065	0.001	0.006	0.786
RAGING	0.040	0.000	0.026	0.474	0.066	-0.013	0.102	0.289
REER	0.068	0.001	0.005	1.000	0.033	0.000	0.004	0.618
REM	**1.000**	**0.205**	**0.048**	**1.000**	0.347	0.059	0.092	1.000
RGROWTH	0.039	0.000	0.010	0.737	0.039	-0.003	0.030	0.120
RO	0.162	-0.006	0.017	0.000	0.038	0.000	0.008	0.388
RPOPG	**0.749**	**-0.491**	**0.344**	**0.000**	0.299	-0.285	0.500	0.000
RPROD	**0.983**	**0.098**	**0.042**	**1.000**	**0.557**	**0.048**	**0.058**	**1.000**
RPROD2	0.154	-0.012	0.043	0.108	0.166	-0.001	0.050	0.660
RY	0.045	0.000	0.002	0.916	0.072	-0.001	0.006	0.260
TOT	0.096	0.001	0.004	1.000	0.039	0.000	0.004	0.945
WRIR	**0.980**	**-0.843**	**0.254**	**0.000**	0.075	-0.050	0.234	0.000

Note: The results are based on 500,000 draws and 100,000 burn-ins. For each simulation, we use a uniform model prior and the birth-death MCMC sampler. Statistics in bold are those for which the posterior inclusion probability is greater than or equal to 50%. The correlation between iteration counts and analytical posterior model probabilities for the 2,000 best models is 0.9988.

As another robustness check, we look at what would have prevailed had we only used classic regression techniques to determine the fundamentals of the current account. We thus perform panel OLS estimations on both the entire sample and on the second restricted sample of 35 countries. This conventional method[13] is the most commonly used in empirical studies on the medium-term determinants of the current account (see Chinn and Prasad, 2003; Chinn and Ito, 2005; Gruber and Kamin, 2007; Ca' Zorzi et al., 2012; Lane and Milesi-Ferretti, 2012; Gnimassoun and Mignon, 2013; Steiner, 2014; among others). The results are presented

[13]Other methods are common in the literature, such as instrumental variables and the generalized method of moments. However, after presenting their advantages and disadvantages, Ca' Zorzi et al. (2012) conclude, as do Chinn and Prasad (2003), that it is more appropriate to use simple pooled OLS on non-overlapping average data in the analysis of medium-term determinants of the current account.

Figure 2: Robustness check for the Posterior Coefficient Densities



Note: The coefficients represented here are those obtained from 5-year averaged data according to the robustness analysis.

in Tables A.3 and A.4 in the Appendix and are consistent with our previous BMA findings regardless of the type of data used. For example, we find that all the fundamentals identified by BMA are significant at the 1% level for the different regressions based on models that include all potential determinants of the current account. We also note a strong similarity between the values of coefficients estimated by BMA and those estimated using classic regressions. Other variables, such as terms of trade, the young-age-dependency ratio and trade openness, have the expected signs but their significance depends (in most cases) on the model specification. Regarding the young-age-dependency ratio, for instance, the negative sign derives from the face that the population is inactive and that an increase in this ratio compared to that of the active population will lead to a decline in national savings. The problem is that in developing countries, the share of the population of working age does not necessarily reflect the share of the working population. Consequently, the expected effect of the young-age-dependency ratio on national savings is not necessarily obtained as the indicator itself does not reflect reality.[14]

[14]Moreover, the correlation coefficient between national savings and the young-age-dependency ratios are

4 Current account imbalances and the exchange rate regime

Having shedding light on the fundamentals of the current account in the previous section, we now examine the relationship between external imbalances and the exchange rate regime. This is a key question, especially for developing countries for which the choice of the exchange rate regime is crucial to consolidate and accelerate the pace of their economic growth. Since the works of Friedman (1953) and Mundell (1961), it has been well known that the main disadvantage of belonging to a monetary union or the choice of a fixed exchange rate regime is the loss of the autonomy of exchange policy to deal with external shocks, such as terms of trade shocks for example. One might think that countries under fixed exchange rate regimes or those belonging to a monetary union may have more current account imbalances, which is detrimental to economic growth. However, other works, including those of Giavazzi and Pagano (1988), Aghevli et al. (1991) and Blanchard and Giavazzi (2002), show that this does not necessarily generate more current account imbalances as countries that opt for such a system generally have more discipline in terms of economic policy—especially fiscal policy—which is often governed by rules. According to these authors, the choice of a fixed exchange rate regime or membership in a monetary union strengthens the credibility of the countries concerned. The debate on this issue is still open, as illustrated by the recent works of Ghosh et al. (2013) and Chinn and Wei (2013) which show different results for the role of the exchange rate regime in the adjustment of current accounts.

4.1 Assessment of current account imbalances

We define current account imbalances as the gap between the observed current account (in percentage of GDP) and its estimated "equilibrium" value as follows:

$$CA_{i,t}^{gap} = CA_{i,t} - \widehat{CA}_{i,t} \tag{6}$$

where $CA_{i,t}^{gap}$ is our measure of current account imbalance, $CA_{i,t}$ is the observed current account and $\widehat{CA}_{i,t}$ is the equilibrium current account estimated from fundamentals. In other words, the external imbalances are defined as the residues from the estimation of equation (1). According to our previous results, the equilibrium current account is given by:

$$\begin{aligned}\widehat{CA}_{i,t} = \widehat{\beta}_1 FDI_{i,t} + \widehat{\beta}_2 FINT_{i,t} + \widehat{\beta}_3 FIS_{i,t} + \widehat{\beta}_4 L.NFA_{i,t} \\ + \widehat{\beta}_5 ODA_{i,t} + \widehat{\beta}_6 OILB_{i,t} + \widehat{\beta}_7 REM_{i,t} + \widehat{\beta}_8 RPROD_{i,t}\end{aligned} \tag{7}$$

For the assessment of external imbalances, we use annual data.[15] We keep our two samples for

0.02 and 0.04 for the annual and five-year averaged data respectively. Thus, we do not comment further on these coefficients, derived from a particular specification and not identified by BMA. The fact that BMA does not identify these variables as relevant determinants of the current account seems quite reasonable.

[15] We do not use five-year averaged data, which have the characteristic of smoothing fluctuations in the economic cycle, as this is worthwhile in identifying the underlying determinants of the current account. However, in the analysis of external imbalances, we cannot ignore economic fluctuations. Moreover, the fundamentals identified from the annual data are broadly similar to those identified with the five-year averaged data. Thus, using these same fundamentals here, we maintain consistency with the previous results.

comparison purposes. However, to avoid the over-interpretation of external imbalances due to their possible overestimation, we pay more attention to the results from the sample purged of outliers. Table 4 summarizes the coefficients obtained from regressions (BMA, panel OLS, instrumental variables[16](IV)) based only on fundamentals (see Table A.6 in the Appendix). As the current account imbalances derived from these coefficients give very similar results,[17] we keep those obtained with BMA.

Table 4: Coefficients of the fundamentals

Variables	Whole sample (1980-2012)			Reduced sample (35 Countries from 1990 to 2012)		
	BMA benchmark	Panel OLS	IV regression	BMA benchmark	Panel OLS	IV regression
$\widehat{\beta}_{FDI}$	-0.950	-0.947	-1.059	-0.653	-0.710	-0.751
$\widehat{\beta}_{FINT}$	-0.006	-0.006	-0.008	-0.005	-0.006	-0.005
$\widehat{\beta}_{FIS}$	0.172	0.180	0.638	0.477	0.467	0.752
$\widehat{\beta}_{L.NFA}$	0.020	0.019	0.007	0.013	0.018	0.020
$\widehat{\beta}_{ODA}$	-0.095	-0.117	-0.110	-0.041	-0.143	-0.008
$\widehat{\beta}_{OILB}$	0.231	0.229	0.175	0.185	0.177	0.289
$\widehat{\beta}_{REM}$	0.278	0.252	0.225	0.205	0.164	0.348
$\widehat{\beta}_{RPROD}$	0.072	0.046	0.060	0.098	0.028	0.058

Note: The columns "BMA" refer to the BMA results presented respectively in Tables 1 and 3. The columns "Panel OLS" show the coefficients estimated using panel OLS regressions based only on the fundamentals. The columns "IV regression" show the coefficients estimated using instrumental variables (IV) regression based only on the fundamentals (see Table A.6 in Appendix).

4.2 Empirical relationship between current account imbalances and the exchange rate regime

Having evaluated external imbalances, we can now explore whether there is an empirical link between these disequilibria and the exchange rate regime. We use two measures for comparison and robustness purposes: the *de facto* exchange rate classifications initially developed by Reinhart and Rogoff (2004) and recently updated by Ilzetzki, Reinhart and Rogoff (2008)—henceforth IRR—as well as the IMF official classifications (the de jure classifications).[18] Drawing on these classifications, we define three broad categories of exchange rate regimes—fixed, intermediate and flexible—allowing greater clarity in the analysis, as is fairly standard in the literature (see Chinn and Wei 2013; Ghosh et al, 2013; Pancaro, 2013).[19]

Figure 3 displays the relationship between external imbalances and exchange rate regimes.

[16]Instrumental variables (IV) regression is used here to correct biases associated with a possible endogeneity phenomenon. Lagged values of the explanatory variables are used as instruments. We find similar results by regressing the current account on the lagged values of the regressors by OLS.

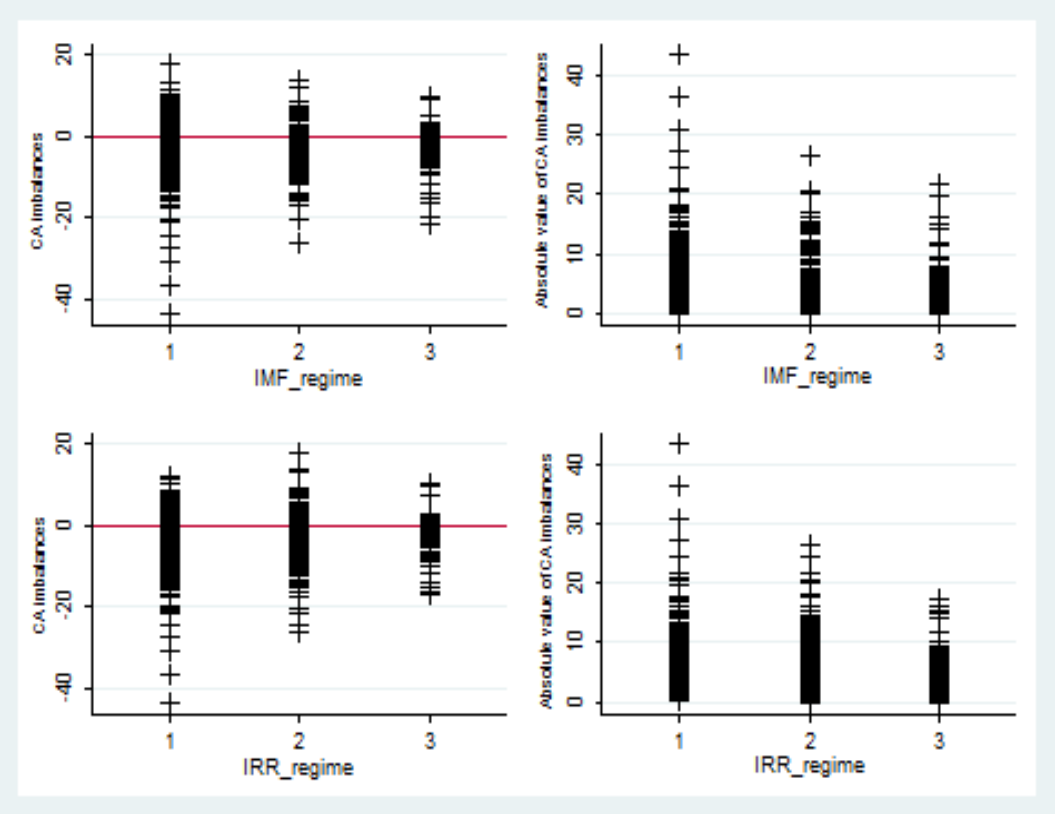
[17]The correlation coefficients calculated between external imbalances are close to unity; see Table A.7 in the Appendix.

[18]The *de facto* classifications reflect country real practice until 1997; the IMF classifications were based on the country's official claim. Another well-known classification is that proposed by Levy-Yeyati and Sturzenegger (2002). We do not use it here because it has not recently been updated.

[19]See Table A.8 in the Appendix. The correlation coefficient between the IRR and IMF classifications after being grouped into three broad categories is 0.60.

As shown, external imbalances have higher amplitudes under fixed and intermediate regimes, irrespective of the classification scheme. However, given the difference in the number of observations between exchange rate regimes, it is important to consider the relative shares of imbalances depending on exchange rate regimes. According to the IMF classification, approximately 15% of the absolute values of external imbalances under fixed and intermediate regimes are greater than 10% against only 6% under the flexible regime. When considering the IRR classifications, this share is 16% under the fixed exchange rate regime, 13% under the intermediate regime and 8% under the flexible regime. The share of external imbalances greater than 20% in absolute value is higher under the fixed and intermediate regimes.

Figure 3: Current account imbalances and exchange rate regimes



Note: These graphs are constructed from the reduced sample (35 countries in the period 1990-2010) to limit extreme values that may be caused by possible outliers. However, the graphs for the whole sample are very similar to these. Regimes 1, 2 and 3 denote fixed, intermediate and flexible exchange rate regimes respectively.

External imbalances, being the residues derived from the medium-term estimation of the current account, are by definition the consequence of deviations of the fundamentals from their medium-term value. Thus, in addition to our variable of interest, namely the exchange rate regime, it is also important to include the deviations of the fundamentals from their medium-term value as control variables. As economic determinants in developing countries generally vary with their stage of development, we consider as the medium-term value of

fundamentals their moving average of order 3. Moreover, as currency crises tend to exacerbate external imbalances, we follow the literature by including a dummy variable for the crisis years as in the database of Reinhart and Rogoff (2010). This is even more important as several countries in our panel, in particular the CFA zone countries, experienced a devaluation of their currency in 1994. A positive sign is thus expected for this variable. As significant positive or negative external imbalances are not optimal, our dependent variable is the absolute value of external imbalances. Indeed, as argued by Blanchard and Milesi-Ferretti (2011), there are both national and international reasons for a country to reduce its external imbalances (surpluses or deficits). Similarly, to study the impact of exchange rate regimes on currency misalignments, Dubas (2009) uses the absolute value of exchange rate misalignments as the dependent variable. This allows us to check whether the exchange rate regime influences the overall external imbalances. Finally, our specification to investigate the link between external imbalances and exchange rate regimes is given by:

$$\begin{aligned}\left|CA_{i,t}^{gap}\right| = \vartheta_i + \varphi_t + \pi_1 REGM_{i,t} + \pi_2 CRISIS + \pi_3 GAP_{i,t}^{FDI} \\ + \pi_4 GAP_{i,t}^{FINT} + \pi_5 GAP_{i,t}^{FIS} + \pi_6 GAP_{i,t}^{L.NFA} + \pi_7 GAP_{i,t}^{ODA} \\ + \pi_8 GAP_{i,t}^{OILB} + \pi_9 GAP_{i,t}^{REM} + \pi_{10} GAP_{i,t}^{RPROD} + \mu_{i,t} \quad (8)\end{aligned}$$

Our explanatory variable of interest is the exchange rate regime ($REGM$) that takes the values 1, 2 and 3 for fixed, intermediate and flexible exchange rate regimes respectively. If the coefficient associated with this variable is negative and significant, it means that the flexibility of the exchange rate regime allows the limiting of overall external imbalances. In the reverse case, the flexibility of the exchange rate regime would lead to more external imbalances and if this coefficient is not significant, it indicates that the exchange rate regime has no effect on the overall external imbalances. The variable reflecting currency crises ($CRISIS$) takes the value 1 in the years of currency crisis for a specific country and 0 otherwise. The other control variables are the deviations of the fundamentals from their medium-term value. These are considered both in nominal terms and in relation to absolute values. Although positive signs are expected for the absolute values of these deviations, this is not necessarily the case for nominal deviations (calculated deviations, positive or negative).

The estimate of the coefficient of interest (π_1) does not provide all information concerning the role of the exchange rate regime and in particular the relative impact of each regime. Thus, we explore this effect by rewriting equation (8) as follows:

$$\begin{aligned}\left|CA_{i,t}^{gap}\right| = \vartheta_i + \varphi_t + \pi_{1,1} REGM1_{i,t} + \pi_{1,2} REGM2_{i,t} + \pi_2 CRISIS + \pi_3 GAP_{i,t}^{FDI} \\ + \pi_4 GAP_{i,t}^{FINT} + \pi_5 GAP_{i,t}^{FIS} + \pi_6 GAP_{i,t}^{L.NFA} + \pi_7 GAP_{i,t}^{ODA} \\ + \pi_8 GAP_{i,t}^{OILB} + \pi_9 GAP_{i,t}^{REM} + \pi_{10} GAP_{i,t}^{RPROD} + \mu_{i,t} \quad (9)\end{aligned}$$

Equation (9) is the same as equation (8) with the difference that REGM is decomposed into its three components $REGM1$, $REGM2$ and $REGM3$ (fixed, intermediate and flexible exchange

rate regimes respectively). $REGM1$ takes the value 1 for a particular year if the exchange rate regime is classified as fixed in this year and 0 otherwise. We proceed in the same way for $REGM2$ and $REGM3$.[20]

The results of the estimation of the parameters from equation (8) are displayed in Table 5. As shown, there is a strong link between overall external imbalances and the exchange rate regime regardless of the classification and the sample; however, this link is stronger for the IRR classification and the reduced sample. The negative coefficient associated with the variable REGM suggests that a flexible exchange rate regime allows the limiting of absolute external imbalances. The variable CRISIS has the expected sign but appears generally insignificant. This result can be explained by the fact that the countries under study have actually experienced few or no real currency crises specific to themselves even though the countries in the CFA zone experienced currency devaluation in 1994. Regarding the other control variables, deviations in net foreign assets are significantly associated with an increase in absolute external imbalances regardless of the sample. The impact of the deviations in variables such as FDI, the oil balance, migrants' remittances and fiscal balance appears remarkably more significant when one considers the whole panel. We also note that the absolute deviations in ODA play a significant role in increasing absolute external imbalances.

Returning to our variable of interest, Tables 6 and 7 show the results of estimating the parameters of equation (9) allowing the specific effect of each exchange rate regime to be examined. Under each classification, we have six columns. In the first two columns, fixed and intermediate regimes are included in the estimation and the flexible regime is used for identification. In the next two columns, intermediate and flexible regimes are considered and in the last two columns, we look at the relative effect of fixed and flexible regimes. The results for the reduced sample (Table 6) clearly highlight that the flexible exchange rate regime plays a key role in reducing external imbalances and the intermediate exchange rate regime performs better than the fixed regime. Indeed, taking as our reference the fixed regime, for example, we find that the flexible exchange rate regime is associated with the lowest degree of absolute external imbalances with an estimated parameter of between -2.5 and -2.1 depending on the classification. The intermediate regime follows with an estimated coefficient of between -1.1 and -0.9 for the IRR classification, but its coefficient does not appear significant for the IMF classification. Moreover, compared to the intermediate case, the flexible regime reduces external imbalances by approximately 1.4 point more for both classifications, whereas the fixed regime increases these imbalances by approximately 1 point more for the IRR classification. Regarding the control variables, CRISIS has the expected sign but is not statistically significant. The fundamentals the deviations of which contribute most significantly to increasing absolute external imbalances are primarily net foreign assets, the oil balance and, to a lesser extent, migrants' remittances and fiscal balance.

[20]Note that we clearly cannot introduce all three regimes simultaneously because of collinearity. Regimes are introduced in pairs, the third regime being used for identification in the equation (see Dubas, 2009). In equation (9), for example, $REGM3$ is used for identification. We then alternate between exchange rate regimes to check the robustness of our results.

Table 5: Overall effect of the exchange rate regime

Variables	Reduced sample (35 Countries from 1990 to 2012)				Whole sample			
	IRR regime		**IMF regime**		**IRR regime**		**IMF regime**	
	Model 1	Model 2	Model 2	Model 1	Model 1	Model 2	Model 2	Model 1
REGM	**-1.200*** **	**-0.927*** **	**-0.963*** **	**-0.642*** **	**-0.745** **	**-0.525** **	**-0.702** **	-0.256
	(0.277)	(0.264)	(0.246)	(0.232)	(0.311)	(0.252)	(0.287)	(0.260)
DEVA	2.982	2.990	3.788	3.624	3.041	1.889	4.276	2.618
	(7.040)	(6.719)	(6.953)	(6.716)	(2.788)	(4.229)	(5.277)	(4.319)
GAP_FDI	-0.0249	-0.0842	-0.0549	-0.0697	0.275***	0.373**	0.284*	0.372**
	(0.121)	(0.180)	(0.124)	(0.182)	(0.0699)	(0.158)	(0.159)	(0.160)
GAP_FINT	-0.000525	-0.00173	-0.000835	-0.00212*	0.000294	-0.000961	-0.000455	-0.00140
	(0.00128)	(0.00117)	(0.00149)	(0.00122)	(0.00128)	(0.00149)	(0.00199)	(0.00155)
GAP_FIS	0.221**	0.229	0.192*	0.199	0.0816*	0.207***	0.0860	0.192**
	(0.102)	(0.142)	(0.108)	(0.158)	(0.0447)	(0.0740)	(0.132)	(0.0783)
GAP_L.NFA	0.0204*	0.0369***	0.0276***	0.0373***	0.0296***	0.0464***	0.0429***	0.0480***
	(0.0108)	(0.00687)	(0.00888)	(0.00516)	(0.00659)	(0.00872)	(0.0104)	(0.00800)
GAP_ODA	0.0900	0.316**	0.145	0.353**	-0.131	0.250**	-0.150	0.298**
	(0.122)	(0.138)	(0.139)	(0.154)	(0.0831)	(0.119)	(0.125)	(0.131)
GAP_OILB	-0.133	0.547***	-0.106	0.555***	0.549***	0.577***	0.576***	0.567***
	(0.196)	(0.189)	(0.204)	(0.195)	(0.0818)	(0.182)	(0.183)	(0.185)
GAP_REM	0.432**	0.400*	0.462**	0.380	0.783***	0.467**	0.866***	0.501**
	(0.191)	(0.236)	(0.184)	(0.241)	(0.205)	(0.226)	(0.194)	(0.222)
GAP_RPROD	-0.366	0.301	-0.422	0.385	-0.338	0.612*	-0.230	0.719*
	(0.256)	(0.359)	(0.281)	(0.375)	(0.216)	(0.361)	(0.330)	(0.376)
CONSTANT	8.848***	6.546***	6.673***	4.401***	5.060**	3.662	4.672*	2.964
	(1.798)	(1.690)	(1.488)	(1.672)	(2.511)	(2.611)	(2.460)	(2.632)
OBS	511	511	481	481	614	614	578	578
R-SQUARED	0.171	0.281	0.181	0.206	0.201	0.394	0.241	0.408

Note: Robust standard errors are in parentheses; *** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level. Models 1 are those in which the deviations in the fundamentals are in nominal terms (not in absolute value), whereas in Model 2, we take the absolute value of these deviations.

Table 6: Specific effect of the exchange rate regime (Reduced sample)

	IRR regime						**IMF regime**					
Variables	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
REGM 1	**2.488*** **	**1.841*** **			**1.088** **	**0.943** **	**2.091*** **	**1.391*** **			0.664	0.449
	(0.587)	(0.590)			(0.465)	(0.403)	(0.539)	(0.514)			(0.471)	(0.468)
REGM 2	**1.400** **	**0.898**	**-1.088** **	**-0.943** **			**1.426** **	0.943	-0.664	-0.449		
	(0.637)	(0.625)	(0.465)	(0.403)			(0.665)	(0.665)	(0.471)	(0.468)		
REGM 3			**-2.488*** **	**-1.841*** **	**-1.400** **	-0.898			**-2.091*** **	**-1.391*** **	**-1.426** **	-0.943
			(0.587)	(0.590)	(0.637)	(0.625)			(0.539)	(0.514)	(0.665)	(0.665)
DEVA	2.990	2.989	2.990	2.989	2.990	2.989	3.724	3.588	3.724	3.588	3.724	3.588
	(7.040)	(6.727)	(7.040)	(6.727)	(7.040)	(6.727)	(6.946)	(6.717)	(6.946)	(6.717)	(6.946)	(6.717)
GAP_FDI	-0.0244	-0.0846	-0.0244	-0.0846	-0.0244	-0.0846	-0.0595	-0.0654	-0.0595	-0.0654	-0.0595	-0.0654
	(0.121)	(0.180)	(0.121)	(0.180)	(0.121)	(0.180)	(0.126)	(0.183)	(0.126)	(0.183)	(0.126)	(0.183)
GAP_FINT	-0.000545	-0.00172	-0.000545	-0.00172	-0.000545	-0.00172	-0.000913	-0.00215*	-0.000913	-0.00215*	-0.000913	-0.00215*
	(0.00128)	(0.00117)	(0.00128)	(0.00117)	(0.00128)	(0.00117)	(0.00150)	(0.00123)	(0.00150)	(0.00123)	(0.00150)	(0.00123)
GAP_FIS	0.221**	0.229	0.221**	0.229	0.221**	0.229	0.193*	0.202	0.193*	0.202	0.193*	0.202
	(0.102)	(0.142)	(0.102)	(0.142)	(0.102)	(0.142)	(0.109)	(0.159)	(0.109)	(0.159)	(0.109)	(0.159)
GAP_L.NFA	0.0204*	0.0370***	0.0204*	0.0370***	0.0204*	0.0370***	0.0273***	0.0369***	0.0273***	0.0369***	0.0273***	0.0369***
	(0.0108)	(0.00683)	(0.0108)	(0.00683)	(0.0108)	(0.00683)	(0.00885)	(0.00523)	(0.00885)	(0.00523)	(0.00885)	(0.00523)
GAP_ODA	0.0894	0.316**	0.0894	0.316**	0.0894	0.316**	0.145	0.355**	0.145	0.355**	0.145	0.355**
	(0.122)	(0.139)	(0.122)	(0.139)	(0.122)	(0.139)	(0.140)	(0.154)	(0.140)	(0.154)	(0.140)	(0.154)
GAP_OILB	-0.132	0.547***	-0.132	0.547***	-0.132	0.547***	-0.107	0.553***	-0.107	0.553***	-0.107	0.553***
	(0.197)	(0.190)	(0.197)	(0.190)	(0.197)	(0.190)	(0.204)	(0.195)	(0.204)	(0.195)	(0.204)	(0.195)
GAP_REM	0.430**	0.400*	0.430**	0.400*	0.430**	0.400*	0.455**	0.379	0.455**	0.379	0.455**	0.379
	(0.191)	(0.236)	(0.191)	(0.236)	(0.191)	(0.236)	(0.186)	(0.241)	(0.186)	(0.241)	(0.186)	(0.241)
GAP_RPROD	-0.377	0.301	-0.377	0.301	-0.377	0.301	-0.422	0.380	-0.422	0.380	-0.422	0.380
	(0.262)	(0.360)	(0.262)	(0.360)	(0.262)	(0.360)	(0.281)	(0.375)	(0.281)	(0.375)	(0.281)	(0.375)
CONSTANT	5.167***	2.428*	7.655***	5.618***	6.841***	4.676***	3.639***	2.375	5.730***	3.767**	5.066***	3.318**
	(1.743)	(1.451)	(1.755)	(1.639)	(2.204)	(1.712)	(1.384)	(1.555)	(1.410)	(1.598)	(1.447)	(1.620)
OBS	511	511	511	511	511	511	481	481	481	481	481	481
R-SQUARED	0.171	0.281	0.171	0.281	0.171	0.279	0.182	0.280	0.182	0.280	0.182	0.280

Note: Robust standard errors are in parentheses; *** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level. Models 1 are those in which the deviations in the fundamentals are in nominal terms (not in absolute value), whereas in Model 2, we take the absolute value of these deviations.

Table 7: Specific effect of the exchange rate regime (Whole sample)

	IRR regime						**IMF regime**					
Variables	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
REGM 1	**1.782*** **	**1.261** **			0.167	0.140	**1.474** **	0.664			0.535	-0.0980
	(0.534)	(0.541)			(0.521)	(0.412)	(0.629)	(0.583)			(0.477)	(0.453)
REGM 2	**1.615** **	**1.121***	-0.167	-0.140			0.939	0.762	-0.535	0.0980		
	(0.631)	(0.580)	(0.521)	(0.412)			(0.715)	(0.699)	(0.477)	(0.453)		
REGM 3			**-1.782*** **	**-1.261** **	**-1.615** **	**-1.121***			**-1.474** **	-0.664	-0.939	-0.762
			(0.534)	(0.541)	(0.631)	(0.580)			(0.629)	(0.583)	(0.715)	(0.699)
DEVA	3.180	1.959	3.180	1.959	3.180	1.959	4.262	2.566	4.262	2.566	4.262	2.566
	(5.110)	(4.209)	(5.110)	(4.209)	(5.110)	(4.209)	(5.277)	(4.302)	(5.277)	(4.302)	(5.277)	(4.302)
GAP_FDI	0.275	0.375**	0.275	0.375**	0.275	0.375**	0.284*	0.377**	0.284*	0.377**	0.284*	0.377**
	(0.172)	(0.158)	(0.172)	(0.158)	(0.172)	(0.158)	(0.159)	(0.159)	(0.159)	(0.159)	(0.159)	(0.159)
GAP_FINT	0.000185	-0.00102	0.000185	-0.00102	0.000185	-0.00102	-0.000504	-0.00147	-0.000504	-0.00147	-0.000504	-0.00147
	(0.00161)	(0.00149)	(0.00161)	(0.00149)	(0.00161)	(0.00149)	(0.00200)	(0.00156)	(0.00200)	(0.00156)	(0.00200)	(0.00156)
GAP_FIS	0.0816	0.202***	0.0816	0.202***	0.0816	0.202***	0.0866	0.194**	0.0866	0.194**	0.0866	0.194**
	(0.135)	(0.0744)	(0.135)	(0.0744)	(0.135)	(0.0744)	(0.133)	(0.0781)	(0.133)	(0.0781)	(0.133)	(0.0781)
GAP_L.NFA	0.0294**	0.0457***	0.0294**	0.0457***	0.0294**	0.0457***	0.0429***	0.0474***	0.0429***	0.0474***	0.0429***	0.0474***
	(0.0137)	(0.00877)	(0.0137)	(0.00877)	(0.0137)	(0.00877)	(0.0104)	(0.00805)	(0.0104)	(0.00805)	(0.0104)	(0.00805)
GAP_ODA	-0.136	0.259**	-0.136	0.259**	-0.136	0.259**	-0.152	0.303**	-0.152	0.303**	-0.152	0.303**
	(0.114)	(0.119)	(0.114)	(0.119)	(0.114)	(0.119)	(0.125)	(0.130)	(0.125)	(0.130)	(0.125)	(0.130)
GAP_OILB	0.552***	0.585***	0.552***	0.585***	0.552***	0.585***	0.575***	0.563***	0.575***	0.563***	0.575***	0.563***
	(0.196)	(0.183)	(0.196)	(0.183)	(0.196)	(0.183)	(0.183)	(0.186)	(0.183)	(0.186)	(0.183)	(0.186)
GAP_REM	0.773***	0.457**	0.773***	0.457**	0.773***	0.457**	0.864***	0.500**	0.864***	0.500**	0.864***	0.500**
	(0.210)	(0.222)	(0.210)	(0.222)	(0.210)	(0.222)	(0.196)	(0.223)	(0.196)	(0.223)	(0.196)	(0.223)
GAP_RPROD	-0.394	0.601*	-0.394	0.601*	-0.394	0.601*	-0.231	0.712*	-0.231	0.712*	-0.231	0.712*
	(0.320)	(0.360)	(0.320)	(0.360)	(0.320)	(0.360)	(0.330)	(0.376)	(0.330)	(0.376)	(0.330)	(0.376)
CONSTANT	2.440	1.848	4.222*	6.258**	4.056*	2.970	2.497	2.048	3.970	2.712	3.436	2.810
	(2.426)	(2.546)	(2.439)	(2.940)	(2.419)	(2.541)	(2.498)	(2.680)	(2.437)	(2.620)	(2.474)	(2.666)
OBS	614	614	614	614	614	614	578	578	578	578	578	578
R-SQUARED	0.204	0.396	0.204	0.396	0.204	0.396	0.241	0.408	0.241	0.408	241	0.408

Note: Robust standard errors are in parentheses; *** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level. Models 1 are those in which the deviations in the fundamentals are in nominal terms (not in absolute value), whereas in Model 2, we take the absolute value of these deviations.

Referring to the whole panel (Table 7), most of the control variables—with the exception of the currency crisis and deviations in financial deepening—significantly explain overall external imbalances. As in the case of the restricted sample, the flexible exchange rate regime contributes significantly to reducing external imbalances in comparison to fixed and intermediate regimes, but the magnitude seems lower (between -1.8 and -1.3 points for the fixed regime and between -1.6 and -1.1 points for the intermediate regime using the IRR classification). However, for the IMF classification, the flexible exchange rate regime seems to do better only in comparison to the fixed regime. Moreover, the difference between the fixed and intermediate regimes seems low in relation to the IRR classification and there is an insignificant difference for the IMF classification. However, as previously stressed, more interest should be paid to the results obtained from the reduced sample as outliers in the overall sample are likely to influence the results.

Altogether, our empirical results show that there is a strong link between the exchange rate regime and external imbalances. The flexible exchange rate regime allows the limiting of absolute external imbalances. To a lesser extent, the intermediate regime is better than the fixed regime in terms of limiting external imbalances. Moreover, for most regimes, deviations in the current account fundamentals from their medium-term values tend to increase absolute external imbalances. Our conclusions are in line with Friedman's thesis, according to which flexible exchange rate regimes allow a faster adjustment of the current account. Our findings are also consistent with those of Coulibaly and Gnimassoun (2013), which show that current account sustainability was higher for countries under a flexible exchange rate regime over the period 1980-2011. Moreover, employing a panel of 95 developing countries, Mu and Ye (2013) find that fixed exchange rate regimes increase the duration of high deficit spells and thus delay current account adjustment, thereby supporting our results even though our samples are different. Even if we do not explicitly deal with the same issue, our findings are in line with those of Levy-Yeyati and Sturzenegger (2003) who find that for developing countries (largely composed of countries in our sample), less flexible exchange rate regimes are associated with slower growth, as well as with greater output volatility. Indeed, for developing countries, especially those in our sample, output volatility is probably related to external imbalances, all aspects detrimental to the stability of growth and therefore to development. Our findings are also consistent with those of Edwards and Levy-Yeyati (2005), who find that flexible exchange rate regimes help reduce the real impact of terms of trade shocks.

5 Conclusion

Despite the various crises that marked the 2000s, developing countries have experienced quite remarkable economic performance. In this context, the choice of the exchange rate regime to consolidate and accelerate the momentum of economic growth becomes a central issue, together with the intentions of forming monetary unions. In this paper, we focus on sub-Saharan African countries and investigate whether the choice of a country's exchange rate regime can influence the magnitude of its external imbalances. To this end, we first identify the main current account determinants of these countries by accounting for their structural characteristics using the Bayesian model averaging (BMA) approach. We then determine medium-term ex-

ternal imbalances based on the following key fundamentals: foreign direct investment (FDI), financial deepening, fiscal balance, initial net foreign asset position, oil balance, migrants' remittances, official development assistance (ODA) and stage of development. Finally, using *de facto* as well as *official* exchange rate classifications, we demonstrate that there is a strong link between external imbalances and exchange rate regimes. More specifically, the flexible exchange rate regime is the most effective in preventing absolute external imbalances.

While our findings do not promote the choice of fixed exchange rate regimes or monetary unions in sub-Saharan Africa, they are in no way opposed to such guidance. Monetary unions can clearly be beneficial for sub-Saharan African countries, but the low economic diversification in sub-Saharan Africa should not be neglected. Specifically, the sharing of exogenous risks must be at the centre of discussions to avoid the painful economic measures often related to the adjustment of external imbalances for a particular country. In relation to this, Tapsoba (2010) advocates saving as an effective means of coping with heterogeneous shocks in the context of the envisaged monetary union in West Africa. Our findings support the development of adjustment mechanisms against external imbalances at a regional level, the responsibility for which will be the jurisdiction of future central banks.

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APPENDIX

Table A.1. Countries and their main trade partners

Country	Main trade partners										Sum
Angola	China	USA	Portugal	France	India	TPC	South Africa	Brazil	Canada	Spain	
	28.7%	23.7%	5.7%	4.8%	4.6%	4.2%	3.5%	2.6%	2.0%	2.0%	82.0%
Benin	China	France	India	Nigeria	Thailand	USA	Netherlands	Malaysia	Brazil	Mali	
	23.1%	8.2%	7.4%	4.6%	4.4%	4.2%	2.8%	2.6%	2.5%	2.5%	62.5%
Botswana	UK	South Africa	Norway	Zimbabwe	China	USA	Belgium	Israel	Nigeria	Namibia	
	36.0%	35.0%	4.1%	4.1%	3.1%	2.7%	1.6%	1.4%	1.3%	1.3%	90.6%
Burkina Faso	France	Ivory Coast	Switzerland	China	Togo	Ghana	Belgium	India	Italy	USA	
	15.6%	14.2%	8.0%	5.9%	4.4%	4.4%	3.5%	2.4%	2.2%	2.2%	62.9%
Burundi	Belgium	Saudi Arabia	Kenya	Germany	France	Tanzania	Uganda	Italy	China	India	
	11.3%	9.4%	7.7%	5.8%	5.4%	5.4%	5.3%	5.2%	5.0%	3.4%	64.1%
Cameroon	France	Italy	Spain	China	Nigeria	Netherlands	USA	Belgium	Germany	UK	
	16.3%	8.8%	8.5%	8.1%	7.5%	5.6%	5.3%	4.3%	3.3%	2.5%	70.1%
Cape Verde	Portugal	Netherlands	Spain	Brazil	Italy	France	USA	Belgium	China	Germany	
	42.3%	12.8%	7.1%	5.1%	3.3%	3.3%	3.2%	2.7%	2.6%	2.5%	85.0%
CAF	Belgium	France	Cameroon	Korea	Netherlands	USA	China	Spain	Japan	Germany	
	22.1%	18.5%	6.2%	6.1%	5.3%	4.2%	4.1%	3.1%	2.4%	2.3%	74.4%
Chad	USA	France	China	Cameroon	Portugal	Germany	Netherlands	UK	Belgium	Nigeria	
	51.4%	12.1%	6.2%	4.5%	4.0%	3.2%	1.8%	1.7%	1.7%	1.2%	88.0%
Comoros	France	UAE	Pakistan	South Africa	India	China	Singapore	Kenya	Turkey	Mauritius	
	24.7%	11.2%	7.4%	6.0%	5.4%	4.5%	3.7%	3.5%	2.4%	2.3%	70.9%
Congo, Rep.	China	USA	France	Korea	Italy	TPC	India	Netherlands	Spain	Germany	
	24.2%	22.1%	10.3%	4.7%	3.7%	3.5%	3.3%	2.8%	2.1%	1.9%	78.6%
Ivory Coast	France	Nigeria	Netherlands	USA	Germany	Italy	Spain	China	Ghana	UK	
	16.5%	12.9%	8.3%	6.7%	4.2%	3.4%	2.7%	2.6%	2.3%	2.3%	62.0%
RDC	China	Belgium	South Africa	Zambia	USA	France	Finland	Netherlands	Germany	Zimbabwe	
	20.5%	18.0%	9.3%	7.8%	7.1%	4.0%	2.8%	2.4%	2.3%	2.3%	76.4%
Eq Guinea	USA	China	Spain	France	Japan	Italy	TPC	Netherlands	Nigeria	Canada	
	18.9%	14.5%	13.7%	6.9%	5.8%	5.5%	5.2%	3.9%	3.0%	2.9%	80.2%
Ethiopie	China	Saudi Arabia	USA	India	Italy	Germany	Japan	UAE	Turkey	UK	
	15.5%	11.2%	7.5%	6.0%	5.7%	5.3%	5.1%	4.0%	2.7%	2.3%	65.3%
Gabon	USA	France	China	Spain	TT	Japan	Italy	Netherlands	Germany	Malaysia	
	36.1%	16.1%	10.8%	3.1%	3.0%	2.3%	2.1%	2.1%	1.9%	1.9%	79.4%

Note: USA = United States, TPC = Taiwan Province of China, CAF = Central African Republic, RDC = Democratic Republic of the Congo, UK = United Kingdom, UAE = United Arab Emirates, STP = Sao Tome and Principe, TT = Trinidad and Tobago.

Given that the sum of trade flows with the first ten trading partners is less than 100%, the different weights were then normalized to 100%.

Table A.1. (continued)

Country	Main trade partners										Sum
Gambia, The	China	Senegal	UK	Brazil	India	Ivory Coast	Netherl.	Belgium	France	USA	
	19.2%	7.5%	6.1%	6.0%	5.5%	5.2%	4.9%	4.3%	4.1%	3.6%	66.4%
Ghana	China	UK	USA	Netherl.	Nigeria	France	Germany	Italy	India	South Africa	
	9.9%	7.4%	7.2%	7.1%	7.0%	6.1%	4.2%	4.1%	3.9%	3.4%	60.2%
Guinea	France	USA	Spain	India	Belgium	China	Netherl.	Russia	Germany	Ireland	
	10.9%	8.1%	7.2%	6.4%	6.2%	5.9%	4.5%	4.4%	4.1%	4.0%	61.7%
Guinea-Bissau	India	Portugal	Senegal	USA	Thailand	Italy	Netherl.	Spain	China	France	
	32.5%	14.8%	11.7%	3.5%	3.5%	3.3%	3.1%	2.6%	2.5%	2.3%	79.9%
Lesotho	South Africa	USA	Hong Kong	China	TPC	Belgium	Korea	Germany	India	Canada	
	46.5%	19.3%	6.6%	5.9%	5.5%	4.5%	3.1%	1.4%	1.1%	0.8%	94.6%
Kenya	India	UK	UAE	China	USA	South Africa	Uganda	Netherl.	Saudi Arabia	Japan	
	8.0%	7.4%	7.0%	6.4%	5.9%	5.2%	4.8%	4.4%	4.3%	4.0%	57.5%
Madag,	France	China	USA	South Africa	Bahrain	Germany	Mauritius	India	Singapore	Belgium	
	22.6%	10.8%	8.5%	4.6%	4.4%	4.1%	4.0%	3.0%	2.9%	2.3%	67.2%
Malawi	South Africa	USA	Germany	Zimbabwe	India	Zambia	UK	China	Mozamb.	Tanzania	
	25.7%	5.9%	5.0%	4.8%	4.7%	4.3%	4.2%	3.9%	3.9%	2.8%	65.3%
Mali	South Africa	France	Senegal	Ivory Coast	China	Switzerland	Germany	Belgium	USA	Thailand	
	14.0%	11.5%	10.8%	10.6%	8.4%	3.6%	3.2%	2.5%	2.4%	2.3%	69.4%
Mauritania	China	France	Spain	Italy	Japan	Netherl.	Belgium	Germany	USA	Ivory Coast	
	19.6%	13.2%	6.6%	6.1%	5.3%	5.1%	5.1%	4.7%	3.6%	2.6%	72.0%
Mauritius	France	UK	India	South Africa	China	USA	Italy	Germany	Spain	Japan	
	13.6%	13.2%	10.0%	7.0%	6.5%	6.4%	3.5%	3.3%	2.7%	2.6%	68.7%
Mozamb.	South Africa	Netherl.	China	India	Belgium	Portugal	Australia	Italy	USA	Spain	
	29.5%	9.3%	5.9%	5.5%	5.2%	3.6%	3.4%	3.3%	3.3%	3.3%	72.5%
Namibia	South Africa	UK	USA	China	Angola	Spain	Germany	France	Italy	Canada	
	38.6%	10.0%	6.0%	5.1%	5.1%	4.8%	3.5%	2.5%	2.3%	1.9%	79.9%
Niger	France	Nigeria	China	USA	Ivory Coast	Japan	Belgium	Netherl.	India	Korea	
	22.4%	12.3%	9.1%	8.0%	4.1%	2.8%	2.7%	2.6%	2.6%	2.3%	68.8%
Nigeria	USA	India	Brazil	Spain	China	France	Netherl.	Germany	UK	Italy	
	28.6%	7.8%	5.9%	5.3%	5.1%	4.8%	4.4%	3.8%	3.6%	2.4%	71.8%
Rwanda	Kenya	Uganda	UAE	China	Belgium	USA	Germany	Tanzania	Congo Rep.	India	
	18.3%	10.5%	6.4%	6.1%	5.9%	5.3%	5.3%	4.1%	3.1%	2.8%	67.9%

Note: USA = United States, TPC = Taiwan Province of China, CAF = Central African Republic, RDC = Democratic Republic of the Congo, UK = United Kingdom, UAE = United Arab Emirates, STP = Sao Tome and Principe, TT = Trinidad and Tobago, Netherl. = Netherlands, Mozamb. = Mozambique.
Given that the sum of trade flows with the first ten trading partners is less than 100%, the different weights were then normalized to 100%.

Table A.1. (continued)

Country	Main trade partners										Sum
STP	Portugal	Angola	Japan	Belgium	Netherlands	France	Gabon	Brazil	China	USA	
	52.4%	14.6%	5.3%	4.8%	3.3%	2.3%	2.2%	1.4%	1.2%	1.0%	88.5%
Senegal	France	Nigeria	India	Mali	UK	China	Italy	Spain	Netherlands	Thailand	
	18.8%	6.5%	6.2%	5.5%	5.0%	4.4%	4.2%	3.8%	3.4%	3.1%	60.8%
Seychelles	UK	France	Saudi Arabia	Italy	Singapore	Spain	South Africa	Germany	UAE	USA	
	12.5%	12.1%	12.0%	6.9%	6.0%	5.7%	5.6%	5.0%	4.7%	3.7%	74.1%
Sierra Leone	Ivory Coast	Belgium	China	USA	Netherlands	UK	Germany	Canada	Japan	India	
	23.8%	9.1%	7.9%	6.6%	5.5%	5.3%	5.0%	4.4%	3.8%	3.3%	74.6%
South Africa	Germany	China	USA	UK	Japan	Saudi Arabia	India	Italy	France	Netherlands	
	9.8%	9.7%	9.4%	7.2%	7.0%	3.3%	3.3%	3.1%	2.7%	2.4%	57.7%
Sudan	China	Japan	Saudi Arabia	UAE	India	Egypt	Germany	UK	Korea	Italy	
	33.9%	9.0%	6.5%	5.9%	3.8%	2.8%	2.5%	2.4%	1.9%	1.9%	70.7%
Swaziland	South Africa	USA	Korea	India	UK	China	Mozambique	TPC	Thailand	Zimbabwe	
	40.9%	7.6%	3.6%	3.2%	3.1%	3.1%	2.7%	2.6%	2.4%	1.7%	70.8%
Togo	China	France	Ghana	India	Netherlands	Burkina Faso	Nigeria	Benin	Ivory Coast	Germany	
	15.5%	8.0%	5.9%	5.0%	4.4%	4.2%	3.7%	3.6%	3.3%	3.2%	56.9%
Uganda	Kenya	UAE	India	China	South Africa	Japan	UK	Germany	Netherlands	USA	
	17.5%	8.2%	6.9%	5.5%	4.5%	4.3%	4.3%	4.0%	3.2%	3.1%	61.4%
Tanzania	China	India	South Africa	UAE	Kenya	Japan	UK	Germany	Switzerland	Netherlands	
	11.4%	11.1%	7.6%	6.2%	5.8%	5.1%	4.0%	3.7%	2.9%	2.9%	60.7%
Zambia	South Africa	China	Switzerland	RDC	UK	Zimbabwe	India	UAE	Korea	Kuwait	
	25.1%	13.6%	8.5%	8.3%	4.0%	3.8%	2.8%	2.7%	2.5%	2.2%	73.4%
Zimbabwe	South Africa	China	Botswana	UK	Zambia	Germany	USA	Japan	RDC	Netherlands	
	35.9%	6.3%	5.0%	4.7%	4.2%	3.8%	3.7%	3.6%	3.0%	2.5%	72.7%

Note: USA = United States, TPC = Taiwan Province of China, CAF = Central African Republic, RDC = Democratic Republic of the Congo, UK = United Kingdom, UAE = United Arab Emirates, STP = Sao Tome and Principe, TT = Trinidad and Tobago.

Given that the sum of trade flows with the first ten trading partners is less than 100%, the different weights were then normalized to 100%.

Table A.2. Data sources and Definition of the variables

Primary data	Sources	Notation	Comments
Current account balance	WEO Database (IMF)	CA	% of GDP
Fiscal balance	WEO Database	FIS	Expressed as a ratio to GDP and measured relative to a weighted-average of the fiscal balance of country i's trading partners
Net foreign asset to GDP ratio (Lagged)	Updated and extended version of dataset constructed by Lane and Milesi-Ferretti (2011)	L.NFA	% of GDP
Level of PPP-adjusted GDP per capita	WEO Database	RPROD	Relative to a weighted-average of country i's trading partners
Old-age dependency ratio	WDI (The World Bank)	RO	Defined as the ratio of the population aged 65 and older to the working-age population, and measured relative to a weighted average of country i's trading
Young dependency ratio	WDI	RY	Defined as the ratio of the population aged 65 and older to the working-age population, and measured relative to a weighted average of country i's trading
Population growth rate	WDI	RPOPG	Annual growth of total population
Aging rate	Author's construction following Lane and Milesi-Ferretti (2012)		defined as the expected change in the old- age dependency ratio in the future (constructed as the difference between the age dependency ratio in year t+20 and the ratio in year t, where the t+20 estimate is based on United Nations population projections)
Trade openness	WDI	OPEN	(Exports + Imports)/GDP
GDP growth rate	WEO Database	RGROWTH	Real GDP growth
Oil balance	WEO	OILB	Oil trade balance in % of GDP
Terms of trade	WDI	TOT	Index, price of exports/price of imports
Migrants' Remittances	WDI	REM	Worker's remittances, receipts
Real effective exchange rate	UNCTAD Statistics and author's calculation	REER	Real effective exchange rates are the weighted averages of bilateral exchange rates adjusted by relative consumer prices

Note: WEO: World Economic Outlook; WDI: World Development Indicators; FWS: annual Freedom in the World Survey; UNCTAD: United Nations Conference on Trade and Development.

Table A.2. (continued)

Primary data	Sources	Notation	Comments
Financial integration	Updated and extended version of dataset constructed by Lane and Milesi-Ferretti (2011)	FINT	Sum of external assets and liabilities in % of GDP
Official Development Assistance	UNCTAD Statistics	ODA	Net official development assistance (ODA), received, in % of GDP
Foreign direct investment	UNCTAD Statistics	FDI	Foreign direct investment, net inflows, in % of GDP
OECD economic growth (Lagged)	OECD database	L.OECD_G	Average real economic growth rate of OECD countries
World real interest rate	IFS (IMF)	WRIR	World nominal interest rate adjusted by CPI percentage change for OECD countries
Civil liberties	FWS	CLIB	Indexed between 1 (free) and 7 (no free)
HIPC initiative	Author	HIPC	0 before HIPC initiative and 1 after for recipient countries and 0 for other countries

Note: WEO: World Economic Outlook; WDI: World Development Indicators; FWS: annual Freedom in the World Survey; UNCTAD: United Nations Conference on Trade and Development; OECD: Organisation for Economic Co-operation and Development.
This table contains 20 potential determinants of the current account on 21. The last determinant discussed in Section 2 is the relative income squared.

Table A.3. Descriptive statistics

VARIABLE	Obs	Mean	Std. Dev.	Min	Max
CA	1451	-6.110	10.414	-125.670	40.825
CLIB	1443	4.640	1.481	1.000	7.000
FDI	1438	0.038	7.470	-46.422	145.330
FINT	1387	22.306	20.333	2.455	133.816
FIS*	943	9.107	17.730	0.060	179.068
L.NFA	1419	211.438	46.028	95.307	341.091
L.OECD_G	1452	52.581	15.997	23.278	104.673
ODA	1439	1.265	1.157	-10.216	8.062
OILB	1382	-5.347	3.100	-14.821	3.583
OPEN	1408	2.279	18.267	-60.902	116.311
RAGING	1452	69.947	39.625	3.983	263.877
REER*	1386	11.667	11.430	-0.252	95.536
REM	1161	3.941	11.071	0.000	106.412
RGROWTH*	1420	112.410	48.171	0.000	357.576
RO*	1452	2.965	6.113	-14.683	90.456
RPOPG*	1452	126.977	71.208	25.909	768.291
RPROD*	1402	157.513	355.983	0.000	7575.742
RPROD2*	1402	2.073	1.095	1.136	5.696
RY*	1452	464.033	148.088	100.000	700.000
TOT	1372	-70.664	124.251	-541.032	1720.696
WRIR	1452	2.550	1.551	-3.516	4.886

Note: * for variable expressed in relative terms.

Table A.4. Classical regression results for full sample

	Annual data			**5-year averaged data**		
VARIABLES	Panel OLS 1	Panel OLS 2	Panel OLS 3	Panel OLS 1	Panel OLS 2	Panel OLS 3
CLIB	0.00245			0.00607		
	(0.00253)			(0.00443)		
FDI	-0.926***	-0.963***	-0.960***	-0.769***	-0.840***	-0.817***
	(0.0607)	(0.0497)	(0.0497)	(0.144)	(0.112)	(0.113)
FINT	-0.00579***	-0.00619***	-0.00617***	-0.00669***	-0.00621***	-0.00667***
	(0.000867)	(0.000832)	(0.000831)	(0.00152)	(0.00141)	(0.00138)
FIS	0.160***	0.173***	0.178***	0.251*	0.350***	0.353***
	(0.0407)	(0.0398)	(0.0399)	(0.129)	(0.119)	(0.118)
HIPC	0.0138	0.0131**	0.0140**	0.0181		
	(0.00897)	(0.00623)	(0.00625)	(0.0176)		
L.NFA	0.0179***	0.0192***	0.0193***	0.0265***	0.0248***	0.0256***
	(0.00302)	(0.00280)	(0.00280)	(0.00646)	(0.00584)	(0.00570)
L.OECD_G	0.0946			0.694		
	(0.183)			(0.616)		
ODA	-0.0834**	-0.112***	-0.114***	-0.0470	-0.157**	-0.136***
	(0.0371)	(0.0344)	(0.0344)	(0.0765)	(0.0612)	(0.0512)
OILB	0.206***	0.242***	0.241***	0.168***	0.195***	0.189***
	(0.0248)	(0.0202)	(0.0202)	(0.0446)	(0.0356)	(0.0350)
OPEN	-0.00379			-0.00528		
	(0.0108)			(0.0197)		
RAGING	0.241			0.0993		
	(0.199)			(0.351)		
REER	-0.0129			-0.0171		
	(0.0104)			(0.0212)		
REM	0.333***	0.261***	0.260***	0.313***	0.206**	0.215***
	(0.0572)	(0.0456)	(0.0456)	(0.106)	(0.0810)	(0.0775)
RGROWTH	-0.0424			-0.409***	-0.386***	-0.383***
	(0.0517)			(0.128)	(0.111)	(0.110)
RO	-0.0466*			-0.0366		
	(0.0262)			(0.0450)		
RPOPG	-0.527**	-0.463*	-0.465*	0.0142		
	(0.264)	(0.245)	(0.245)	(0.553)		
RPROD	0.210***	0.0684***	0.0673***	0.205*		0.0451**
	(0.0673)	(0.0171)	(0.0171)	(0.121)		(0.0193)
RPROD2	-0.122*			-0.104		
	(0.0705)			(0.125)		
RY	0.0216			0.0183		
	(0.0139)			(0.0238)		
TOT	0.0175**			0.0157		
	(0.00858)			(0.0156)		
WRIR	-0.340			-0.205		
	(0.304)			(0.766)		
TIME_DUM			-0.0193			-0.0171
			(0.0122)			(0.0118)
CONSTANT	-0.0607	-0.0175*	-0.0167*	-0.101	0.00716	
	(0.0417)	(0.00984)	(0.00985)	(0.0779)	(0.00879)	
OBS	711	727	727	175	178	178
R-SQUARED	0.533	0.521	0.523	0.640	0.608	0.735

Standard errors are in parentheses; *** (resp. **, *): significant at the 1% (resp. 5%, 10%) level.

Figure A.1. Effect of the prior choice

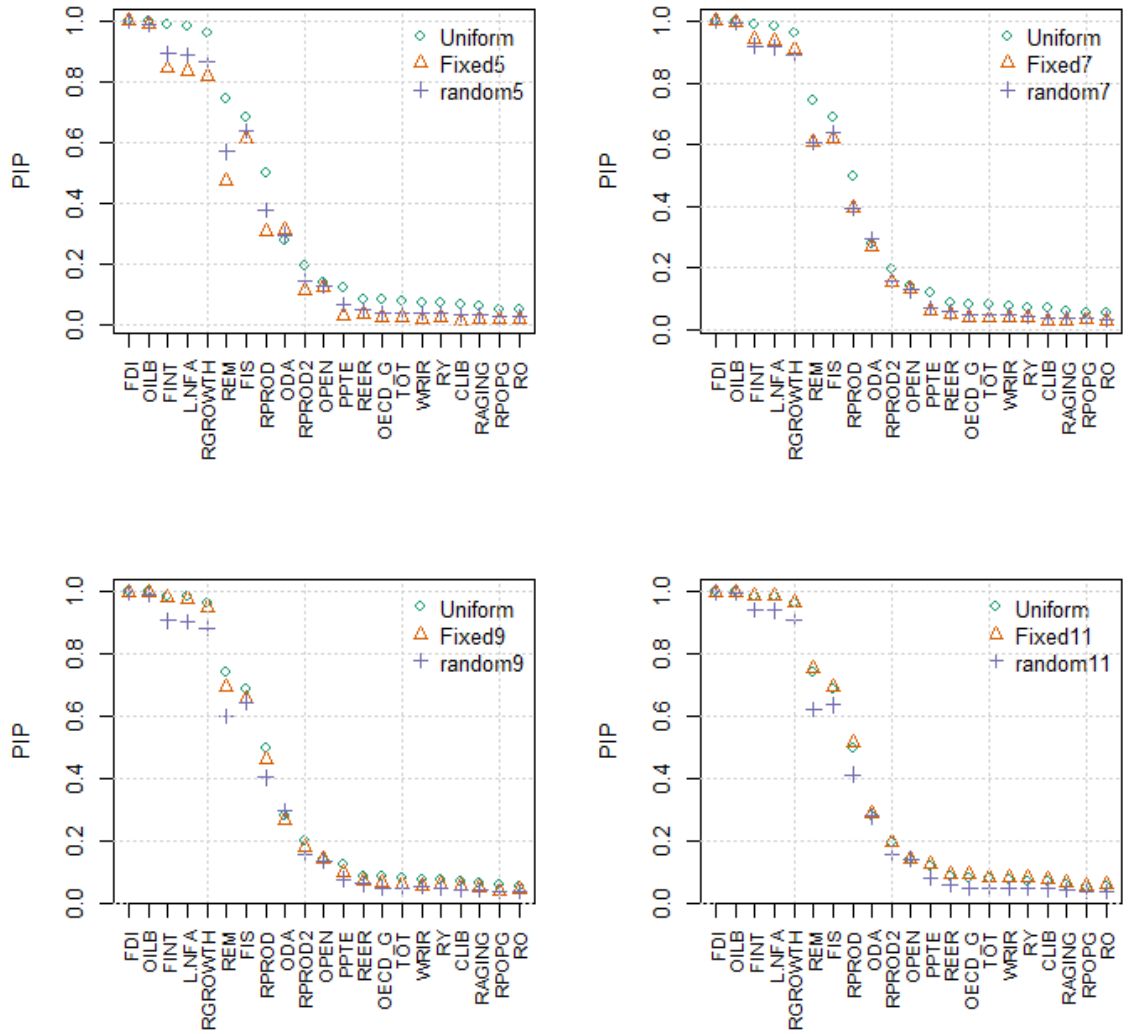

Table A.5. Classical regression results for 35 SSA countries from 1990

	Annual data			**5-year averaged data**		
VARIABLES	Panel OLS 1	Panel OLS 2	Panel OLS 3	Panel OLS 1	Panel OLS 2	Panel OLS 3
CLIB	-0.000867			0.00259		
	(0.00246)			(0.00446)		
FDI	-0.605***	-0.619***	-0.609***	-0.597***	-0.667***	-0.662***
	(0.0719)	(0.0687)	(0.0676)	(0.136)	(0.110)	(0.106)
FINT	-0.00401***	-0.00450***	-0.00463***	-0.00429***	-0.00534***	-0.00560***
	(0.000803)	(0.000756)	(0.000741)	(0.00144)	(0.00127)	(0.00123)
FIS	0.476***	0.466***	0.475***	0.609***	0.621***	0.634***
	(0.0610)	(0.0592)	(0.0581)	(0.156)	(0.149)	(0.144)
HIPC	0.00224			-0.0123		
	(0.00895)			(0.0204)		
L.NFA	0.00972***	0.0122***	0.0131***	0.0150**	0.0189***	0.0202***
	(0.00290)	(0.00263)	(0.00260)	(0.00633)	(0.00545)	(0.00528)
L.OECD_G	0.200			1.544**	1.181**	0.839
	(0.172)			(0.627)	(0.514)	(0.507)
ODA	-0.0405			-0.0733		
	(0.0350)			(0.0749)		
OILB	0.167***	0.185***	0.178***	0.133***	0.167***	0.162***
	(0.0240)	(0.0196)	(0.0192)	(0.0467)	(0.0349)	(0.0337)
OPEN	-0.0212**	-0.0233**	-0.0233**	-0.0202		
	(0.0105)	(0.0103)	(0.0101)	(0.0186)		
RAGING	0.164			-0.0695		
	(0.188)			(0.334)		
REER	0.0169			0.0236		
	(0.0130)			(0.0240)		
REM	0.273***	0.253***	0.233***	0.233**	0.185***	0.167**
	(0.0513)	(0.0472)	(0.0461)	(0.0931)	(0.0707)	(0.0685)
RGROWTH	0.0147			-0.0213		
	(0.0494)			(0.148)		
RO	-0.0450*	-0.0383*	-0.0296	-0.0382		
	(0.0242)	(0.0218)	(0.0214)	(0.0427)		
RPOPG	-0.828***	-0.736***	-0.608***	-0.810		
	(0.234)	(0.225)	(0.221)	(0.503)		
RPROD	0.232***	0.204***	0.194***	0.258**	0.0737***	0.0739***
	(0.0622)	(0.0528)	(0.0516)	(0.110)	(0.0227)	(0.0219)
RPROD2	-0.150**	-0.118*	-0.104*	-0.198*		
	(0.0647)	(0.0602)	(0.0587)	(0.113)		
RY	0.00937			0.00537		
	(0.0131)			(0.0220)		
TOT	0.0144			0.00796		
	(0.00931)			(0.0170)		
WRIR	-0.746**	-0.837***	-0.0554	-1.151		
	(0.296)	(0.221)	(0.250)	(0.890)		
TIME_DUM			0.0495***			0.0329***
			(0.0118)			(0.0101)
CONSTANT	-0.0441	0.00322	-0.0332**	-0.0753	-0.0600***	-0.0591***
	(0.0387)	(0.0130)	(0.0141)	(0.0724)	(0.0143)	(0.0138)
OBS	598	600	600	144	144	144
R-SQUARED	0.485	0.476	0.509	0.625	0.587	0.618

Standard errors are in parentheses; *** (resp. **, *): significant at the 1% (resp. 5%, 10%) level.

Table A.6. Coefficients of the fundamentals based on Panel OLS estimations

VARIABLES	**All the sample**			**Sample without outliers (35 Countries from 1990 to 2012)**		
	Panel IV CA	Panel OLS 1 CA	Panel OLS 2 CA	Panel IV CA	Panel OLS 1 CA	Panel OLS 2 CA
FDI	-1.059***	-0.947***	-0.961***	-0.751***	-0.647***	-0.710***
	(0.160)	(0.0493)	(0.0490)	(0.130)	(0.0627)	(0.0624)
FINT	-0.00830***	-0.00608***	-0.00641***	-0.00548***	-0.00493***	-0.00585***
	(0.00174)	(0.000830)	(0.000819)	(0.00180)	(0.000767)	(0.000755)
FIS	0.638*	0.180***	0.188***	0.752***	0.468***	0.467***
	(0.356)	(0.0396)	(0.0396)	(0.139)	(0.0602)	(0.0613)
L_NFA	0.0263***	0.0193***	0.0208***	0.0199***	0.0138***	0.0178***
	(0.00652)	(0.00280)	(0.00272)	(0.00733)	(0.00267)	(0.00257)
ODA	-0.110**	-0.117***	-0.162***	-0.00750	-0.0520	-0.143***
	(0.0529)	(0.0335)	(0.0268)	(0.0862)	(0.0323)	(0.0264)
OILB	0.175***	0.229***	0.227***	0.289***	0.177***	0.177***
	(0.0440)	(0.0197)	(0.0198)	(0.0438)	(0.0189)	(0.0193)
REM	0.225***	0.278***	0.252***	0.348***	0.207***	0.164***
	(0.0719)	(0.0450)	(0.0436)	(0.0821)	(0.0408)	(0.0405)
RPROD	0.0602***	0.0722***	0.0462***	0.0575*	0.0777***	0.0284***
	(0.0199)	(0.0161)	(0.0112)	(0.0349)	(0.0147)	(0.0105)
CONSTANT	-0.0168	-0.0156**		-0.0603***	-0.0322***	
	(0.0163)	(0.00700)		(0.0184)	(0.00684)	
Observations	681	727	727	561	600	600
R-squared	0.503	0.516	0.620	0.473	0.448	0.558
Number of id	44	44	44	35	35	35

Note: Robust standard errors are in parentheses; *** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.

Table A.7. Correlation between the estimated current-account gaps

CA imbalances	BMA	OLS	IV
BMA	***1.000***	0.999	0.942
OLS	**0.998**	***1.000***	0.944
IV	**0.917**	**0.913**	***1.000***

Table A.8. Classification of exchange rate regime

IRR Fine classification	**code**	**IMF official classification**	**code**
No separate legal tender	1	No separate legal tender	1
Pre announced peg or currency board arrangement	2	Pre announced peg or currency board arrangement	1
Pre announced horizontal band that is narrower than or equal to +/-2%	3	Pre announced horizontal band that is narrower than or equal to +/-2%	1
De facto peg	4	De facto peg	1
Pre announced crawling peg	5	Pre announced crawling peg	2
Pre announced crawling band that is narrower than or equal to +/-2%	6	Pre announced crawling band that is narrower than or equal to +/-2%	2
De factor crawling peg	7	De factor crawling peg	2
De facto crawling band that is narrower than or equal to +/-2%	8	De facto crawling band that is narrower than or equal to +/-2%	2
Pre announced crawling band that is wider than or equal to +/-2%	9	Pre announced crawling band that is wider than or equal to +/-2%	3
De facto crawling band that is narrower than or equal to +/-5%	10	De facto crawling band that is narrower than or equal to +/-5%	3
Moving band that is narrower than or equal to +/-2 % (i.e., allows for both appreciation and depreciation over time)	11	Moving band that is narrower than or equal to +/-2 % (i.e., allows for both appreciation and depreciation over time)	3
Managed floating	12	Managed floating	3
Freely floating	13	Freely floating	4
Freely falling	14	Freely falling	5

	Our own classification		
Regime	IRR code	Regime	IMF code
Fixed exchange rate regime	1, 2, 3, 4	Fixed exchange rate regime	1, 2
Intermediate exchange rate regime	5, 6, 7, 8, 9, 10, 11	Intermediate exchange rate regime	3
Flexible exchange rate regime	12, 13, 14	Flexible exchange rate regime	4, 5