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Competitiveness and exchange rate regime: the case of the CEMAC zone

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SUMMARY: Since the beginning of the nineties, the occurrence of exchange rate crises, notably the crises of the European Monetary System (EMS) in 1992-1993 and 1995, the Mexican crisis in 1994, the crisis of the emerging Asian countries in 1997-1998, the Brazilian and Russian crises in 1998, the Turkish crisis in 2000-2001 and the Argentinean crisis in 1998-2002 have brought back to the forefront the problem of choosing the best exchange rate regime. The purpose of the paper is to determine between the three exchange rate regimes (the fixed exchange rate regime, the intermediate exchange rate regime and the flexible exchange rate regime), the one that allows for a significant improvement in the competitiveness of the member economies of a heterogeneous monetary union, in this case the CEMAC zone. The empirical model tested for this purpose revealed that the fixed exchange rate regime is the one that allows such an improvement, even if the choice of such a regime is suboptimal, because of its inability to promote the management of national disparities within the zone.

KEYWORDS: Competitiveness, fixed exchange rate regime, intermediate exchange rate regime, flexible exchange rate regime, heterogeneous monetary union, multinomial model.

I. INTRODUCTION

Since the beginning of the 1990s, the occurrence of exchange rate crises, notably the crises of the European Monetary System (EMS) in 1992-1993 and 1995, the Mexican crisis in 1994, the crisis in emerging Asian countries in 1997-1998, the Brazilian and Russian crises in 1998, the Turkish crisis in 2000-2001 and the Argentine crisis in 1998-2002 have brought the issue of choosing the best exchange rate regime back into the spotlight. Thus, while most analyses assess the effects of an exchange rate regime on economic growth, little work has been done on the effects of the exchange rate regime on the competitiveness of an economy that is a member of a heterogeneous monetary union. The notion of competitiveness can be understood from two perspectives: the results perspective and the means perspective (Lafay, 1976). In relation to the results perspective, the competitiveness of a national economy is measured by its capacity to face international competition. In this sense, different sub-accounts of the balance of payments are generally used to account for a country's performance in trade with the rest of the world (Raffinot and Venet, 2003). Two types of competitiveness can then be distinguished: competitiveness in the strict sense measured by the trade balance, on the one hand, and competitiveness in the broad sense measured by the current account, on the other.

According to the means approach, competitiveness depends on several factors and the focus is precisely on the determining role of prices. Without taking into account the capital balance and all other things being equal, a faster augmentation of prices at home than abroad leads to a deterioration in the trade balance, while a relatively smaller increase leads to an improvement in the trade balance (Mathis et al., 1988 and Krugman, 1994). The mechanism thus described contributes to the evolution of exchange rates, since the trade balance is one of the main components of the balance of payments. On this subject, most analyses reveal that exchange rate variations over the long term must compensate for divergences in the evolution of domestic prices (expressed in national currency) (Yasui, 2013). However, a comparison of different developed countries tends to reveal a "price paradox", which is mainly expressed by structural factors related to international specialization. From this point of view, an economy is competitive when its production apparatus is adapted to changes in world demand (Balassa, 1965; Lafay and Herzog, 1989). The exchange rate regime is defined as the set of rules governing the monetary authorities' methods of intervention in the foreign exchange market (Friedman, 1953). Four exchange rate regimes can then be distinguished: - perfectly flexible exchange rates allowing a real peg, because the value of the currency is determined from day to day according to market mechanisms;

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- administered exchange rates, by which countries in practice set target zones for their currencies, calculated on the basis of exchange rate levels compatible with fundamentals, to which a fluctuation band is added (1) ; - fixed exchange rates with adjustable parities, where any adjustments are based on a concern for a real peg; - the currency board, which is a regime in which the central bank's currency is entirely backed by foreign exchange reserves, whose variations strictly control the fluctuations of the money supply in circulation. This means that the exchange rate is irremediably fixed, on the one hand, and that the authorities refrain from issuing money to the banking system and the state (a regime based on a nominal peg), on the other hand.Overall, most of the work on the link between competitiveness and exchange rate regimes distinguishes between two analytical approaches:
1°) that which deals with the direct effect of the exchange rate regime;
2°) the analysis of the indirect effects of a given type of exchange rate regime in relation to the others.
With respect to the direct effect of the exchange rate regime, the analyses focus on the appreciation of the impact of the exchange rate regime on the variables in the economy. In this respect, even if in the long run the real exchange rate always returns to its equilibrium value, the process of adjustment towards such equilibrium may prove to be different for the fixed and flexible exchange rate regimes (Mundell, 1963).
With respect to the indirect effects of the exchange rate regime, most literature distinguishes three types of exchange rate regime: fixed exchange rate (2), flexible exchange rate (3), and intermediate exchange rate (4) (IMF, 1997; Devereux and Engel, 1998; and Bismut and Ripoll, 2000). Thus, the type of exchange rate regime affects other determinants of economic growth, including investment (Aizenman, 1994; Campa and Goldberg, 1999; Benassy-Quéré, Fontagné, and Lahrèche-Révil, 2001), the degree of trade openness (Clark, 1973; Franke, 1991; Rose, 2000; and Frankel and Rose, 2002), and the level of financial development (Aizenman and Hausman, 2000; Chang and Velasco, 2000). All of this work, which promotes the International Monetary Fund's typology of exchange rate regimes (IMF, 1999), relies on information provided by individual member countries, which greatly reduces the robustness of their results. As a result, alternative classifications of exchange rate regimes have been proposed (Bubula and Ötker-Robe, 2002; Levy-Yeyatis and Struzenegger, 2002; and Reinhart and Rogoff, 2004).
The field of investigation selected for this analysis is the Economic and Monetary Community of Central Africa (5) (CEMAC) for four main reasons:
1°) it is an area made up of countries that market similar products (oil, wood, manganese, etc.) in third markets ;
2°) the six member countries of the zone have in common a fixed exchange rate regime based on four basic principles that are supposed to guarantee the credibility of CEMAC (6) ;
3°) the zone has little involvement in international trade (7);
4°) the CEMAC zone is heterogeneous, as it is characterized by national and sectoral disparities in the financial and real spheres of the economy. With respect to the financial sphere, the heterogeneity of the zone is manifested through disparities in financial conditions on the credit market. Two groups of member countries can therefore be distinguished, notably the core (Cameroon, Gabon) with more flexible financial conditions and macroeconomic stabilization capacity, and the periphery (Central African Republic, Chad) with restrictive financial conditions. Compared to the real sphere of the economy, the heterogeneity of the zone is geographical due to the fact that the CEMAC zone is made up of coastal countries (Cameroon, Congo, Gabon and Equatorial Guinea), on the one hand, and landlocked countries (Central African Republic and Chad), on the other. In this respect, the purpose of this study is to determine which of the three exchange rate regimes (the fixed exchange rate regime, the intermediate exchange rate regime and the flexible exchange rate regime) allows for a significant improvement in the competitiveness of an economy that is a member of a heterogeneous monetary union, in this case the CEMAC zone. Our reflection then revolves around two axes: the model for determining the exchange rate regime best suited to improving competitiveness in the CEMAC zone (I), and the interpretation of the results (II).

I- The model for determining the exchange rate regime likely to improve competitiveness in the CEMAC zone: We will first present the analytical framework and the articulation of the model, before proceeding to its estimation.

1.1- The analytical framework and the articulation of the model: The theoretical framework for the analysis used here is the New Keynesian economy (8) (Gertler and Kiyotaki, 2015). To this end, we rely on the model of Aloui and Sassi (2005), which allows us to assess the effect of the type of exchange rate regime on economic growth in a sample of 53 countries between 1973 and 1998. An adaptation of the reference model leads to the introduction of the external competitiveness of the member economies of the heterogeneous monetary union (9).

The explained variable of the model is therefore external competitiveness (comp), which is represented by the terms of trade indicator, measured by the ratio between the prices of exports and imports.
The explanatory variables are as follows:

1°) the exchange rate regime characterizing a discrete variable (10) defined in code form as follows. The value 0 corresponds to the code of the fixed exchange rate regime, the value 1 is the code of the intermediate exchange rate regime and the value 2 represents the code of the flexible exchange rate regime.
We favour the classification of exchange rate regimes by Reinhart and Rogoff (2004), which studies the evolution of exchange rate regimes on a homogeneous basis over a long period. It thus differs from other classifications of exchange rate regimes in two main respects :
- it incorporates the existence of multiple exchange rates and parallel markets, which provides a more complete view of exchange rate regimes ;
- It considers exchange rate regimes as long-term, because they are estimated over five-year periods;
2°) the level of development of the financial sector, which is measured by the ratio of credit to the private sector to Gross Domestic Product (GDP);
3°) economic growth, captured by the annual growth rate of gross domestic product;
4°) finally, the inflation rate, measured by the annual variation of the consumer price index.
The model is then written as follows:

$$comp = f(rc; X), \qquad [1]$$

$comp$, the competitiveness of the economy i member of the CEMAC zone ;
rc, a multinomial variable composed of three categories, namely: the fixed exchange rate regime (rcf), the intermediate exchange rate regime(rci) and the flexible exchange rate regime$(rcfl)$;
X, the vector of other quantitative explanatory variables likely to influence the price competitiveness of the CEMAC member economy. More specifically, these are the level of development of the financial sector, economic growth and the inflation rate.
For estimation purposes, we prefer to present the model in the form of a cylindrical panel, which is characterized by the same number of periods for each individual considered, i.e. :

$$comp_{it} = \beta_0 + \beta_{rcf} rcf_{it} + \beta_{rci} rci_{it} + \beta_{rcfl} rcfl_{it} + \beta_{df} df_{it} + \beta_y y_{it} + \beta_{infl} infl_{it} + \varepsilon_{it}, \qquad [2]$$

with :
(i), the index characteristic of the member countries of the CEMAC zone; (t), the characteristic index of the time dimension ; $comp_{it}$, the external competitiveness of the economy i member of the monetary union at period t ; rcf_{it}, the fixed exchange rate regime chosen by economy i, a member of the CEMAC zone, at period t ; rci_{it}, the intermediate exchange rate regime chosen by economy i, a member of the CEMAC zone at period t ; $rcfl_{it}$, the flexible exchange rate regime chosen by economy i, a member of the CEMAC zone at period t ; β_{rcf}, the coefficient of the fixed exchange rate regime; β_{rci}, the coefficient of the intermediate exchange rate regime; β_{rcfl}, the coefficient of the flexible exchange rate regime; β_{df}, the coefficient of the variable level of development of the financial sector; β_y, the coefficient of the variable annual growth rate of economic activity; β_{infl}, the coefficient of the inflation variable; β_0, the constant ; ε_{it}, the error term of the economy i member of the CEMAC zone at period t.
The sign of the coefficients for the three types of exchange rate regime (including the fixed, intermediate, and flexible exchange rate regimes) can be positive or negative. A positive sign of the coefficient of the fixed exchange rate regime reveals that it has a positive influence on the external competitiveness of CEMAC member economies. A negative sign of the coefficient of the fixed exchange rate regime variable shows that it has a negative influence on the external competitiveness of CEMAC zone member economies, suggesting that such a regime can lead to a significant improvement in the external competitiveness of the economies in this monetary zone.
The same applies to the effect of the intermediate exchange rate regime, on the one hand, and the flexible exchange rate regime, on the other.
We can now proceed to the estimation of the model, before the presentation of the results obtained.

1.2- Model estimation and presentation of results : We adopt the following working hypothesis: the fixed exchange rate regime has a positive effect, compared with the intermediate exchange rate regime and the flexible exchange rate regime, on the external competitiveness of an economy that is a member of a heterogeneous monetary union.
The database used for the estimation consists of quantitative variables (external competitiveness, economic growth rate, inflation rate, and level of development of the financial sector) and qualitative variables (the fixed exchange rate regime, the intermediate exchange rate regime, and the flexible exchange rate regime). The panel is made up of the six (6) member countries of the CEMAC zone. The data used come from World Bank statistics (WDI, 2019). They are annual and cover the period from 1970 to 2019 (i.e. 49 years) for five (5) member countries (Cameroon; Central African Republic, Congo, Gabon and Chad), on the one hand, and from 1985 to 2019 (i.e. 34 years) for Equatorial Guinea, on the other hand, due to its late accession to CEMAC in 1984.

As far as the preliminary tests are concerned, the econometric approach used leads to differentiate the assessment of the robustness of the quantitative variables from that of the qualitative variables. The treatment of quantitative variables involves an analysis of their stochastic dynamics, which requires testing their respective stationarity, on the one hand, and the existence of at least one long-term cointegration relationship between the explained variable and the vector of other determinants, on the other hand. For stationarity, we use the panel unit root test, in particular the test of Im, Pesaran and Shin (2003) whose interest is to increase the number of observations, thus increasing the power of the tests compared to those carried out on individual time series in small samples (Hurlin and Mignon, 2005). Applied to our field of investigation, the use of this test (Im, Pesaran and Shin, 2003) has the advantage of integrating the heterogeneity of the area.

Table 1 below summarizes the results of the unit root tests applied to the variables in the model.

Table 1: Results of the panel unit root test

	Test d'Im, Pesaran et Shin (IPS)	p-value
Comp	-3,0E+15	0,0000
y	-14,7494	0,0000
infl	-13,2889	0,0000
df	-7,19225	0,0000

Source: Results obtained from Eviews 8.

The variables of the model are therefore stationary in first difference (integrated of order 1).

We can now proceed with the panel cointegration test, i.e. the definition of a long-term systematic comovement between the vector of model variables (Yoo, 2006). To do so, we use Pedroni's (2001) test, the results of which are summarized in Table 2 below.

Table 2: Results of panel cointegration tests

Tests	statistique	P-value	Statistique pondérée	P-value
Panel v-Statistic	-1,461980	0,9281	-0,976082	0,8355
Panel rho-Statistic	0,745732	0,7721	-0,083028	0,4669
Panel PP-Statistic	-0,533329	0,2969	-1,691627	0,0454
Panel ADF-Statistic	2,295727	0,9892	1,263912	0,8969

Source: Results obtained from Eviews 8.

This shows that competitiveness and all the explanatory variables of the model have at least a long-term relationship within the CEMAC zone retained in our sample. Following Arellano and Bond (1991), we favour statistical inference by the generalized method of moments (GMM). More precisely, this is an estimator that assumes, on the one hand, that the error terms are independent and homoscedastic between individuals and over time, and that uses the residuals obtained to construct an estimate of the variance-covariance matrix. It is therefore a method that allows for heteroskedasticity between individuals, autocorrelation of error terms, and simultaneity and measurement error biases to be taken into account (Bourbonnais, 2018).

A summary of the results of the model estimates is presented in Table 3 below.

Table 3: Synthesis of Model Estimation Results

	explained variable : external competitiveness $(comp)$		
explanatory variables	Coeff.	t-stat	P-value
flexible exchange rate regime $(rcfl)$	2,723	4,0306	0,0001
intermediate exchange rate regime (rci)	7,402	4,0306	0,0001
fixed exchange rate regime (rcf)	20,122	4,0306	0,0001

level of development of the financial sector (df)	-1,743	-2,716	0,0071
annual growth rate of economic activity (y)	0,125	1,193	0,2339
Inflation $(\inf l)$	-0,0579	0,5505	0,5824
$R^2 = 0{,}8845$			
$AdjR^2 = 0{,}8821$			
$DW = 2{,}613$			
$J-stat = 16{,}72$, $\Pr(J-stat) = 0{,}010348$			
Number of observations : 243			

Source: The Author.

The fixed exchange rate regime therefore has the most important positive effect on the external competitiveness of CEMAC member economies compared to the intermediate and flexible exchange rate regimes. The effect of the fixed exchange rate regime is statistically significant and positive on the external competitiveness of the member economies of the monetary area with a coefficient of 20.122, compared with the intermediate and flexible exchange rate regimes, which have a coefficient of 7.402 and 2.723 respectively. The working hypothesis is thus confirmed. With regard to the other explanatory variables of the model, only the level of development of the financial sector has a statistically significant and negative effect (-1.74) on the external competitiveness of each CEMAC member economy. Economic growth and the inflation rate do not have a statistically significant effect on the external competitiveness of each member economy, since the values (t=1.193 and t=0.5505 respectively) of their individual significance tests (Student's t-test) reject the acceptance hypothesis with respect to their respective p-values (p=0.2339 and p=0.5824).

II- Interpretation of the results: Although the results obtained clearly show that the fixed exchange rate regime allows for a significant improvement in the external competitiveness of CEMAC member economies, it is not, however, the best solution for managing the national disparities of CEMAC member countries.

2.1- The fixed exchange rate regime, a means of improving competitiveness in the CEMAC zone: One of the advantages of a fixed exchange rate regime is that it allows the development of international trade. This is indeed the situation of the member economies of the CEMAC zone, when considering their degree of openness. It is sufficient to refer to the values (average, maximum and minimum) of their trade openness rate between 1990 and 2019 (table 4).

Table 4: The rate of trade openness of CEMAC member countries

	Average	**Maximum**	**Minimum**
Cameroun	43,1	52	31
Centrafrique	41,7	55	33
Congo	278,1	495	55
Gabon	87,7	101	76
Guinée Equatoriale	331	531	131
Tchad	69,59	126	35

***Source*:** The Author.

Thus, three situations characterize the degree of trade openness of CEMAC member countries, in particular:
- an average degree of openness per country over the entire period of 43.1% for Cameroon, 41.7% for the Central African Republic, 278.1% for Congo, 87.7% for Gabon, 331% for Equatorial Guinea and 69.59% for Chad;
- a high degree of openness of 52% for Cameroon achieved in 2018, 55% for the Central African Republic recorded in 1997, 495% for Congo in 2011, 101% for Gabon in 2000, 531% for Equatorial Guinea and 126% for Chad achieved in 2002 ;

- a low degree of openness of 31% for Cameroon achieved in 1993, 33% for the Central African Republic recorded in 2009, 55% for Congo in 1992, 76% for Gabon in 1990, 131% for Equatorial Guinea in 2005 and 35% for Chad in 1992.However, an examination of the external trade of CEMAC member countries reveals rather a strong concentration of their international trade on a small number of traded products on the one hand and partners on the other. In relation to traded products, the structure of their exports does indeed indicate that they are essentially composed of commodities, with oil accounting for about 60% of the share of traded products for most of the countries under consideration. Moreover, the prices of these commodities are determined on international markets, which necessarily leads to fluctuations in export revenues, and therefore budget revenues, because of their high exposure to speculation on these markets. The structure of exports then tends to suggest that the price elasticity of exports is not significant, since the oligopolistic structure of international commodity markets reveals that the volume of raw materials exported depends more on demand conditions in partner countries (Ondo Ossa, 1999). As for the structure of their imports, it is dominated by manufactured goods and consumer goods because their local industrial sector is poorly developed. Domestic demand for manufactured goods is then incompressible because of the low import substitution by domestic production. In this respect, three major groups of products, constituting all imports from this monetary zone can be distinguished, namely manufactured goods (between 40 and 70 percent), food goods (between 20 and 30 percent), textiles and other supplies (between 5 and 10 percent) (Essiane and Ngomba Bodi, 2018). The structure of imports of CEMAC member countries reveals that they are essentially driven by domestic demand.The main advantage of the fixed exchange rate regime for CEMAC member economies is undeniably the development of their international trade. However, their economic performance is dependent on the activities of vulnerable sectors and, in general, on the production of one or a few raw materials. These are all disadvantages that make the choice of a fixed exchange rate regime a suboptimal solution.

2.2- The fixed exchange rate regime, a sub-optimal solution for the management of CEMAC's heterogeneities

Despite the increasing degree of trade openness of CEMAC member economies, another characteristic is their low level of diversification; diversification is measured here by the Grubel and Liyod (11) (1971) index (Table 5).

Table 5: The intra-industry trade index of CEMAC member countries from 1990 to 2019

	Average (%)	Maximal (%)	Minimal (%)
Cameroun	50,76	85,59	17,12
Centrafrique	44,21	99,45	0,69
Congo	11,58	85,88	0,21
Gabon	44,90	96,94	0,42
Guinée Equatoriale	15,31	82,74	0,03
Tchad	31,68	98,92	0,25

Source: Calculated by the author using World Bank data.

This shows that the average performance of intra-branch trade is 50.76% for Cameroon, 44.21% for the Central African Republic, 11.58 % for Congo, 44.90 % for Gabon, 15.31 % for Equatorial Guinea and 31.68 % for Chad between 1990 and 2019.The peak performance of intra-industry trade was 85.59 % in 1992 for Cameroon, 99.45 % in 2009 for the Central African Republic, 85.88 % in 1998 for Congo, 96.94 % in 2000 for Gabon, 82.74 % in 1994 for Equatorial Guinea and 98.92 % in 2009 for Chad.The lowest intra-industry trade performance was 17.12% in 2001 for Cameroon, 0.69 % in 1990 for the Central African Republic, 0.21 % in 1990 for Congo, 0.42 % in 1993 for Gabon, 0.03 % in 2011 for Equatorial Guinea, and 0.25 % in 1991 for Chad.In this respect, the development of international trade as an asset of the fixed exchange rate regime is relativized in the case of CEMAC member economies, since their low level of diversification accentuates the propensity to favor exposure to exchange rate risk (12).Moreover, the choice of a fixed exchange rate regime is a way of tying the hands of the governments of member countries in the region. This is the case with the loss of monetary policy autonomy due to the low mobility of capital induced by foreign direct investment (FDI) flows.Table 6 below shows the significant values of the evolution of capital flows, particularly FDI flows between 1990 and 2019.

Table 6: Foreign Direct Investment of CEMAC Member Countries (in % GDP)

	Average	**Maximum**	**Minimum**
Cameroun	1,20	5,53	-1,01
Centrafrique	1,11	5,89	-0,78
Congo	10,96	38,80	-0,18
Gabon	0,89	5,50	-8,58
Guinée Equatoriale	27,38	161,82	-4,95
Tchad	6,00	46,49	-3,75

***Source*:** The Author.

For example:
- The average stock of foreign direct investment accumulated between 1990 and 2014 represents 1.20 % of GDP in Cameroon, 1.11 % in the Central African Republic, 10.96 % in Congo, 0.89 % in Gabon, 27.38% in Equatorial Guinea and 6 % in Chad;
- the highest stock of foreign direct investment is 5.53 % of GDP for Cameroon in 2002, 5.89 % in 2008 for the Central African Republic, 38.80 % in 2014 in Congo, 5.50 % in 2013 in Gabon, 161.82 % in 1996 in Equatorial Guinea and 46.49 % in 2002 in Chad;
- the minimum stock of foreign direct investment was -1.01 % of GDP in 1990 in Cameroon, -0.78 % in 1993 in the Central African Republic, -0.18 % in 2004 in Congo, -8.58 % in 1996 in Gabon, -4.95 % in 2008 in Equatorial Guinea and -3.75 % in 2006 in Chad.The low capital mobility could be explained by the loss of autonomy of the monetary policy of the Bank of Central African States (BEAC), due in particular, on the one hand, to the existence of national financial cycles that are strongly influenced by the persistent instability of the international financial cycle, with the corollary of the ability to promote speculation in this monetary zone, and, on the other hand, the "fear of floating", which encourages the central bank to import the policies of the central banks of the major economies, particularly in the phase of loosening financing conditions. The risk is the overvaluation of the sub-regional currency, likely to deteriorate competitiveness and generate external imbalances in member countries.

II. CONCLUSION

The purpose of this study was to identify, between the fixed exchange rate regime, the intermediate exchange rate regime and the flexible exchange rate regime, the exchange rate regime best suited to improving the competitiveness of CEMAC member economies.The empirical model tested for this purpose revealed that the fixed exchange rate regime is the one that allows such an improvement, compared to the other two regimes, even if the choice of such a regime is sub-optimal, due to its inability to smooth out national disparities within the zone. This is why the intermediate exchange rate regime seems the most likely to promote competitiveness, while guaranteeing the economic development of CEMAC member countries.

Notes

(1) Member countries undertake to intervene when their currencies threaten to leave the zone.
(2) The fixed exchange rate regime is characterized by the definition of a reference parity between the currency of the country concerned and a currency (or a basket of currencies) to which the central bank undertakes to exchange the national currency. Thus, when the foreign exchange market is liberalized, compliance with such a commitment requires the central bank to intervene as soon as the exchange rate moves away from the established parity.
To the extent that the foreign exchange market is controlled, the national currency is inconvertible, the parity is defined arbitrarily and artificially supported.
(3) Under a flexible exchange rate regime, no commitment is made regarding the exchange rate, which then floats freely (pure floating), according to supply and demand in the foreign exchange market (Friedman, 1953).
(4) The intermediate exchange rate regime, on the other hand, is characterized by a crawling peg, i.e. the exchange rate is in principle fixed, but the reference parity is modified regularly according to predetermined parameters or on a discretionary basis in order to compensate at least partially for inflation differentials with the anchor country (McKinnon, 1984, 1988; Williamson, 1985, 1986; Eichengreen, 1995 and Branson, 2001).

(5) The CEMAC zone is made up of six member countries, namely Cameroon, Central African Republic, Chad, Congo, Gabon and Equatorial Guinea.
(6) In particular
- a fixed parity between the Central African Financial Cooperation Franc (CFA Franc) and the Euro;
- a convertibility of the CFA Franc guaranteed by France;
- total freedom of transfers between Franc Zone countries;
- the pooling of foreign exchange reserves.

(7) Due in particular to the limited range of export products (raw materials and agricultural products) that are at the root of their revenue volatility, low export capacity, low intra-zone trade (1% of CEMAC's foreign trade according to UNCTAD (2009)), poor diversification and high transport costs.
(8)There are four main reasons for this choice:
1°) it is a framework that uses a stochastic intertemporal general equilibrium model (DSGE model) that takes into account the financial frictions analyzed on the side of credit providers (Curdia and Woodford, 2016 and Gertler and Kiyotaki, 2015) following the distinction between a debt economy and a financial market economy in the sense of Hicks (1974) ;
2°) in such a framework, international trade is essentially based on the exchange between tradable and non-tradable goods (Obstfeld and Rogoff, 1995), which makes it a mechanism for the transmission of income between the national and international spheres of the economy. Thus, the existence of imbalances in the markets for tradable goods favours compensation between net imports and net exports. Indeed, the excess of consumption in one period over production results in the net import of tradable goods, which must be compensated for by net exports later on;
3°) it is a framework that highlights Dornbush's (1976) hypothesis of a "small economy open to the outside world". In other words, the prices of tradable goods are set on international markets, and the country is a price taker;
4°) such a framework considers the distinction between impact and effect. While the impact can be understood as a sensitivity corresponding to the value of the multiplier (Keynes, 1936), the effect, for its part, can be assimilated to a result, cause or consequence linked to the occurrence of two related events.
(9) Competitiveness can then be influenced either by the fixed exchange rate regime, the intermediate exchange rate regime, or the flexible exchange rate regime, leading to highlighting their respective effects in the choice of the best exchange rate regime.
(10)Most empirical work uses a binomial model that excludes the possibility of highlighting factors that would help in the choice of the intermediate exchange rate regime (IMF, 1997; Allegret, 2007; Allegret et al., 2008). For this reason, an estimation of an unordered multinomial logit model was chosen here. It offers the same status to the three categories of exchange rate regime selected.
(11)The intra-industry trade index, obtained from the Grubel and Lioyd (1975) indicator:
$IGL = 1 - \frac{|Xabi - Mabi|}{Xabi + Mabi} * 100$, with : IGL the Grubel and Lioyd indicator; , exports from country A to country B of product i; , imports from country A to country B of the same product i. The GL indicator is a static measure that measures the importance of intra-industry trade at given periods. It is equal to 1 if the weight of a product in trade between the two countries is identical, and to 0 if specialization is unambiguous. In such a case, the country is either exclusively an importer or an exporter.
(12) Indeed, according to Berthélemy (2005), the diversification of a country reduces its exposure to exchange rate risk because it is less sensitive to asymmetric shocks, especially for a country exporting raw materials, whose prices fluctuate very sharply on the international market.

Appendices:

Appendix 1: Results of the panel unit root test

Null Hypothesis: Unit root (individual unit root process)						
Series: D(COMP)						
Date: 08/24/20 Time: 18:26						
Sample: 1970 2019						
Exogenous variables: Individual effects, individual linear trends						
User-specified lags: 1						
Total number of observations: 267						
Cross-sections included: 6						
Method					Statistic	Prob.**
Im, Pesaran and Shin W-stat					-3.0E+15	0.0000

** Probabilities are computed assuming asympotic normality							
Intermediate ADF test results							
Cross						Max	
section	t-Stat	Prob.	E(t)	E(Var)	Lag	Lag	Obs
1	-5.6389	0.0001	-2.179	0.664	1	1	47
2	-6.E+15	0.0000	-2.179	0.664	1	1	47
3	-4.8061	0.0017	-2.179	0.664	1	1	47
4	-3.9210	0.0188	-2.179	0.664	1	1	47
5	-3.0011	0.1428	-2.179	0.664	1	1	47
6	-5.1486	0.0011	-2.174	0.725	1	1	32
Average	-1.E+15		-2.178	0.674			

Source: Result from Eviews 8.

Null Hypothesis: Unit root (individual unit root process)							
Series: D(Y)							
Date: 08/24/20 Time: 18:27							
Sample: 1970 2019							
Exogenous variables: Individual effects, individual linear trends							
User-specified lags: 1							
Total number of observations: 267							
Cross-sections included: 6							
Method					Statistic		Prob.**
Im, Pesaran and Shin W-stat					-14.7494		0.0000
** Probabilities are computed assuming asympotic normality							
Intermediate ADF test results							
Cross						Max	
section	t-Stat	Prob.	E(t)	E(Var)	Lag	Lag	Obs
1	-7.1654	0.0000	-2.179	0.664	1	1	47
2	-8.4709	0.0000	-2.179	0.664	1	1	47
3	-6.2656	0.0000	-2.179	0.664	1	1	47
4	-6.2275	0.0000	-2.179	0.664	1	1	47
5	-8.1073	0.0000	-2.179	0.664	1	1	47
6	-6.4936	0.0000	-2.174	0.725	1	1	32
Average	-7.1217		-2.178	0.674			

Source: Result from Eviews 8.

Null Hypothesis: Unit root (individual unit root process)							
Series: D(INFL)							
Date: 08/26/20 Time: 00:42							
Sample: 1970 2019							
Exogenous variables: Individual effects, individual linear trends							
User-specified lags: 1							
Total number of observations: 267							
Cross-sections included: 6							

Method				Statistic		Prob.**
Im, Pesaran and Shin W-stat				-13.2889		0.0000
** Probabilities are computed assuming asympotic normality						
Intermediate ADF test results						
Cross section	t-Stat	Prob.	E(t)	E(Var)	Lag	Max Lag	Obs
1	-5.9214	0.0001	-2.179	0.664	1	1	47
2	-6.8314	0.0000	-2.179	0.664	1	1	47
3	-6.5582	0.0000	-2.179	0.664	1	1	47
4	-7.3317	0.0000	-2.179	0.664	1	1	47
5	-7.8538	0.0000	-2.179	0.664	1	1	47
6	-5.2966	0.0008	-2.174	0.725	1	1	32
Average	-6.6322		-2.178	0.674			

Source: Result from Eviews 8.

Null Hypothesis: Unit root (individual unit root process)						
Series: D(DF)						
Date: 08/24/20 Time: 18:26						
Sample: 1970 2019						
Exogenous variables: Individual effects, individual linear trends						
User-specified lags: 1						
Total number of observations: 267						
Cross-sections included: 6						
Method				Statistic		Prob.**
Im, Pesaran and Shin W-stat				-7.19225		0.0000
** Probabilities are computed assuming asympotic normality						
Intermediate ADF test results						
Cross section	t-Stat	Prob.	E(t)	E(Var)	Lag	Max Lag	Obs
1	-3.3024	0.0783	-2.179	0.664	1	1	47
2	-4.7858	0.0018	-2.179	0.664	1	1	47
3	-4.6535	0.0026	-2.179	0.664	1	1	47
4	-4.8461	0.0015	-2.179	0.664	1	1	47
5	-6.3969	0.0000	-2.179	0.664	1	1	47
6	-3.5482	0.0510	-2.174	0.725	1	1	32
Average	-4.5888		-2.178	0.674			

Source: Result from Eviews 8.

Appendix 2: The result of the panel cointegration test

Pedroni Residual Cointegration Test			
Series: COMP DF Y INFL			
Date: 08/26/20 Time: 01:08			

Sample: 1970 2019					
Included observations: 300					
Cross-sections included: 6					
Null Hypothesis: No cointegration					
Trend assumption: Deterministic intercept and trend					
User-specified lag length: 1					
Newey-West automatic bandwidth selection and Bartlett kernel					
Alternative hypothesis: common AR coefs. (within-dimension)					
				Weighted	
		Statistic	Prob.	Statistic	Prob.
Panel v-Statistic		-1.461980	0.9281	-0.976082	0.8355
Panel rho-Statistic		0.745732	0.7721	-0.083028	0.4669
Panel PP-Statistic		-0.533329	0.2969	-1.691627	0.0454
Panel ADF-Statistic		2.295727	0.9892	1.263912	0.8969
Alternative hypothesis: individual AR coefs. (between-dimension)					
		Statistic	Prob.		
Group rho-Statistic		0.515296	0.6968		
Group PP-Statistic		-1.635119	0.0510		
Group ADF-Statistic		1.064090	0.8564		
Cross section specific results					
Phillips-Peron results (non-parametric)					
Cross ID	AR(1)	Variance	HAC	Bandwidth	Obs
1	0.442	9.974501	9.963286	2.00	49
2	0.648	1.519652	1.561597	3.00	49
3	0.735	13.68381	15.02145	2.00	49
4	0.830	25.99804	25.79795	2.00	49
5	0.738	5.620884	6.299505	5.00	49
6	0.106	32.53404	32.53404	0.00	34
Augmented Dickey-Fuller results (parametric)					
Cross ID	AR(1)	Variance	Lag	Max lag	Obs
1	0.562	9.675681	1	--	48
2	0.579	1.485345	1	--	48
3	0.728	13.95226	1	--	48
4	0.882	23.97035	1	--	48
5	0.785	5.693011	1	--	48
6	0.112	32.87673	1	--	33

Source: Result from Eviews 8.

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