Do African Monetary Arrangements Make Sense? Evidence Based on Business Cycles Symmetry

Francis M. Kemegue*
Ousmane Seck†
Patrick T. Kanda ‡

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Abstract

The idea of complete monetary unification in Africa is theoretically supported by the existence of ex-post endogeneity benefits of currency areas. If benefits to currency unions are in fact endogenous, decades old existing african monetary unions, created without meeting optimum currency areas criteria, offer a natural laboratory for testing the validity of the endogeneity concept. This study redefines benefits of regional arrangements as increased benefits relative to third countries and investigates such benefits by analysing the transmission of business cycles between countries in a three-step process. First we test classical business cycles for increased similarity, using a sample of 60 countries with no a priori on the connection between those countries. Second, we analyze the transmission of deviation cycles among mix of countries using a stuctural vector autoregressive model. Finally, we check the strenght of the bond among countries by looking at the link between pairs of series of deviation cycles. Our results provide an insight on the transmission of macroeconomic shocks and on the strenght of the links among countries in African monetary unions. We find that business cycles of countries in a monetary union have not grown more homogenous, and that the bond among members

*Framingham State University and University of Pretoria, Department of Economics, Pretoria 0002, R.S.A., Phone: +27 (0) 12 420 3461, Email: *francis.kemegue@up.ac.za*

†University of Texas El Paso, College of Business Administration, El Paso 79968, U.S.A., Phone: +1 915 747 5590, Email: *oseck@utep.edu*

‡University of Pretoria, Department of Economics, Pretoria 0002, R.S.A., Phone: +27 (0) 12 420 3470, Email: *patrick.kanda@up.ac.za*

of existing unions in Africa has mostly grown weaker than that between these same individual countries and their major trade partners.

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1 Introduction

The launch of the European Union in the early 2000, sparked interest in the creation and expansion of monetary unions across the world. The African union set the creation and expansion of regional economic communities (REC) to be the intermediate phase towards a single African currency area. The Economic community of West Africa (ECOWAS), was to build a single currency zone by 2025(Honohan and Lane, 2000; Carmignani, 2003; Masson and Pattillo, 2005), Other single currency areas were to emerge from REC in Eastern Africa, and in Southern Africa. Ultimately the regional currency zones were to be merged.

This large monetary unification project essentially absorbs long standing existing monetary projects; that are, the West African Economic and Monetary Union (WAEMU), the Central African Economic and Monetary Union (CAEMU) and the Comon Monetary Area (CMA) of Southern Africa. These three zones have similar original characteristics in that they were set up for easy currency management among members of colonial empires. Attempts to expand these original monetary zones have largely failed (Masson and Pattillo, 2001, 2005; Bayoumi and Ostry, 1997); questioning, on the one hand, the chances of success of the single currency project in the whole of Africa (Masson and Pattillo, 2005) and on the other hand the reasons for the survival of existing zones (Yehoue, 2006). Existing currency areas in Africa are of a particular attention here because their creation did not follow proper economic integration, rather most countries inherited their membership from colonial legacy. The idea of endogeneity behind a vialble larger monetary unification project supposes that the post independence years should have witnessed substantial increase in trade among members of the unions, increased capital and migration flows and better integration among economies[1]. The fate of the three curency areas have been subject to extensive analysis that widely follows two theoretical directions. The first is the test of the optimality of these areas in themselves, which would be questionning whether countries that got together to form the union presented criterias for optimal currency area (Fielding, Lee, and Shields, 2004; Carmignani, 2003; Karras, 2007; Agbeyegbe, 2008; Bangake, 2008; Tapsoba, 2009). The second perspective is that of endogeneity of the benefits of the currency area, that is whether the bond in terms of criterias for optimal currency areas got stronger with time(Khamfula and Huizinga, 2004; Buigut and Valev, 2005; Houssa, 2008). The

[1]An extensive discussion of the migration, trade and capital flows can be found in Masson and Pattillo (2005) and Masson 2006

current debate on monetary unification in Africa alludes more to the endogeneity idea, as it is commonly reported that trade intensity has not substantially increased in Africa, and business cycles are not known to be synchronized(Masson and Pattillo, 2005) and Masson 2006. An extensive literature adresses the optimality or the opportunity of the union for member countries, however very few specific project adress the endogeneity issue. Of the few specific studies that adresses the endogeneity idea, all get to the conclusion that endogenous benefits are small but increasing over time (Carmignani, 2009; Tapsoba, 2009), thus marginally validating the endogeneity idea.

As endogeneity suggests that over time the bond between members to a monetary union gets stronger than the bond between members and third countries, it is not just the absolute idea of connection that should increase (which can just be a matter of increased globalization) but the bond relative to third countries that has to get stronger. Most studies on currency unions in Africa usually apply a set of criteria to countries already members to a union with very little possibility of comparing the obtained results to third countries. Tapsoba (2009) and Carmignani (2009) compare their results of absolute intensity of integration to that of advanced nations, but do not compare the relative strenght of the bond of the same group of countries among themselves and the bond with third countries. This paper attempts to fill this void by using business cycles to take an a-priori-less approach to the bond between countries in a three step process. We first test for symmetry on Log GDP data in a sample of 60 countries,which is an approach to the similarity of classical cycles(Carmignani, 2009), then we check for transmission of deviation cycles among countries in two ways: We look at the significance of their relationship in a vector autoregressive model that captures asynchronous relationships, and check the strenght of their relationship in paired regressions. This paper improves on current research by redefining endogeneity benefits as increased relative benefits compared to third countries, thus allows the possibility of transmission among countries that are not members to a monetary union, and comparing the bond between union and non union members. This provides a clear and more robust alternative explanation to the significance and the strength of monetary unions in Africa.

The rest of the paper is organized as follows: in section 2 we review the literature on currency areas in Africa as it pertains to business cycles and the endogeneity of the benefits of currency areas, then we review the methodology used in this paper(Section 3). Section 4 presents the results and section 5 concludes the paper.

2 Currency Areas in Africa and their Optimality

The current functionning monetary zones in a Africa are the WAEMU,the CAEMC and the CMA. The WAEMU and the CAEMC are part of the Franc Zone (CFA zone). All three zones have colonial origins implying specifically that their creation was not guided by OCA criteria. These zones are nonetheless original as they have existed for decades and are expected to be joined by other zones that are subject of a booming literature that adress their optimality, mostly in terms of similarity of shocks,intensity of trade the use of various empirical strategies.

2.1 Originality of the Existing Currency Zones

The CFA zone, grouping the WAEMU and the CAEMC was created in 1948 to allow France to guarantee the convertibility of the currency issued by its former colonies in exchange of a pooling of currency reserves into an account located at the french treasury. It also allowed these former colonies to take adavantage of low inflation rates and stable exchange rates provided by the peg (currently to the Euro) and a common central bank. The monetary arrangements were parts of many other trade and military arrangements linking France to its former African colonies. A long standing literature describes the ex-post functions of the monetary arrangemnts; for Yehoue (2006) the CFA zone works as an aid substitute during good times; In times of crisis aid from France helps guaranteeing the survival of the Union. In a sense, the union's important sponsor and stakeholder guarantees the existence of the union on the offer side.On the demand side, benefits of its existence of the CFA zone have included lower inflation compared with pairs African countries (Devarajan and de Melo, 1987) and Devarajan and Rodrik (1991).

The CMA zone predates the CFA zone in that at the creation of the South African Reserve Bank in 1921, the South African currency was used in all the countries currently member of the CMA (Masha, Shirono, Harris, and Wang, 2007) creating a de-facto currency area. The curency area was formalized in 1974 with the creation of the Rand Monetary Area to which Botswana widrew in 1975. The current standing agreement is the Multilateral Monetary Agreement of 1986, wich Namibia joined in 1992.Countries members (Namibia, Lesotho and Swaziland also known as NLS countries) issue their own currency pegged to the South African Rand, and the agremment is supposed to fairly suport the economy of all participating nations.

There is an intricate connection between the CMA zone and the South African Custom unions (SACU)as the revenues from SACU managed by South Africa are an important source of funding for CMA participating countries.Nonetheless, the currency issued by the smaller NLS nations are legal tender only in their countries whereas the South African rand is legal tender all over the area.

2.2 The optimality of the projects of currency areas

Studies looked upon verifying the optimality of expanded existing monetary areas and the optimality of creating new areas using REC's. Ideas here are based on either ex ante benefits(as for unions to be created) or ex ante benefits of expansions of existing zones. Expansion of older zones involve West Africa where Fielding and Shields (2003); Fielding et al. (2004) investigate factors that determine the extent of macroeconomic integration in West Africa by looking at whether having a common currency provides an additional degree of macroeconomic integration in contrast with having a common peg as well as whether the peg enhances more integration than floating exchange rates. The authors conclude that the exchange rate peg yields more integration than a floating one.

The optimality of currency areas to be created is essentially an important concern in east of Africa and to a certain extend in Southern Africa. To this effect, Buigut and Valev (2005) assess the applicability of a monetary union for East African countries by investigating the symmetry of structural shocks and reveals a currency union in East Africa would be too premature based on the findings that demand and supply shocks are usually asymmetric. Against the background that Africa is the continent with the greatest number of countries and therefore the biggest number of potential monetary arrangements, Bayoumi and Eichengreen (1997) analyse the extent of intra-regional trade, the correlation and size of real disturbances across countries in order to ascertain whether the current highly split monetary arrangements in sub-Saharan Africa is a reflection of the prediction of the theory of optimum currency areas. Their results do not support the proposition that sub-Saharan countries stand to gain from larger monetary unions. A larger REC, The Comensa is subject of the Carmignani (2003)

2.3 The similarity in business cycles and the endogeneity idea

Checking OCA crietria, has almost always involved similarity of some measure of economic activity. Nevertheless, talking about business cycles for developing countries leads to at least three dimensions of problems. the first dimension involves measuring business cycles for developing country. It is still somewhat of an esoteric issue. In the case of Africa specifically, there is the unavailability of high frequency data and the innexistence of various data describing economic activity. The second involves comparing cycles from developing countries to the cycles in advanced nations; There is a considerable difference between developed and developing countries as far as the features of short-run macroeconomic fluctuations are concerned. There are shorter business cycles with diverse stylized facts across countries as opposed to the uniform developed countries Rand and Tarp (2002). However, Nyembwe and Kholodilin (2005) analyze the relationship between EU countries and Sub-Saharan countries to ascertain whether the materialization of a European business cycle could possibly be of importance to these African countries and conclude that there is a strong relationship between some sub-Saharan African countries and monetary policies in the EU. However, the sub-Saharan countries are somehow insulated from direct impact of the EU monetary shocks due to the lagged impact. Fiess (2007) investigates the synchronization between the US and Central American business cycles to evaluate the costs and benefits associated with macroeconomic coordination. The author concludes among others that macroeconomic coordination is not likely to enhance the synchronization of business cycles as institutional structures and responses in Central American and U.S. markets are not symmetrical enough. Eickmeier (2007) uses a large dimensional structural dynamic factor model to analyse the diffusion of US macroeconomic shocks to Germany and finds that there is a symmetrical transmission of US macroeconomic shocks to Germany with trade being the most significant transmission channel. Diebold and Rudebusch (1996) argue that a model featuring factor structure as well as regime switching is practical in the study of business cycles. The third dimension is comparing cycles from african country. On top of their difficulty to measure there is the lack of alternative variable to measure economic activity that makes authors to emplement various methodology in extracting cycles essentially from GDP data. The empirical strategy involves extractig cycles using some filters and describing then comparing the obtained cycles across countries. On extracting cycles in themselves Baxter and Kouparitsas (2005) use Leamer's (1983) Extreme Bounds Analysis to

investigate the determinants of business cycles co-movements between countries. This approach is applied to band-pass-filtered data in order to detach business-cycle components of the data. Mink, Jacobs, and de Haan (2007) propose a new multivariate measure of business cycle synchronicity and a multivariate measure of cycle co-movement that take into consideration deviations between cycle amplitudes. Kose, Otrok, and Whiteman (2008) use a Bayesian dynamic latent factor model to assess the common and country-specific factors in the G7's major macroeconomic aggregates and further determine the relative significance of the common and country-specific factors in accounting for co-movements in each observable aggregate for three different periods of time.

2.4 Empirical review

The seminal work on testing the endogeneity of currency unions is Frankel and Rose (1996) and Rose (2000) where they show in a panel data setting that the intensity of cross country bilateral trade increases the bilateral correlation measure of economic activity; In essence they show that currency unions increase a measure of comovement of economic activity. Nonetheless, panel data calculation often suffers the criticism of pooling poor and rich countries in a large dataset. Under that light, most subsequent studies have borrowed the seminal idea but have gone the time series route that have often involved checking the connection between a measure of synchronicity and a different measure of regional economic activity (Tapsoba, 2009; Carmignani, 2009). However, simple times series often fail to capture the behavior of the multiplicity of stakeholders in a currency union process. Simple times series also fail to capture changing behavior of participants over time. Therefore, more dynamic framework have also been used; Houssa (2008); Moneta and Ruffer (2009); Eickmeier (2007); Kose et al. (2008) use dynamic factor models to investigate African monetary unions and the issue of business cycle synchronization. Houssa (2008) analyzes the costs associated with a monetary union in West Africa by considering variations in aggregate supply and aggregate demand shocks across countries using a method based on dynamic factor models.Houssa (2008) reveals that West African countries could hardly adjust to supply shocks in the event they formed a currency union. Nonetheless, the study also finds that demand shocks are more comparable in the French-speaking countries. To investigate the degree of co-movement of South Africa's business cycle with those of other countries in the Southern African Development Community (SADC) and find evidence of synchro-

nization of South Africa's business cycle with those of the DRC, Lesotho, Angola, Zimbabwe, Botswana and Swaziland. Moneta and Ruffer (2009) look at the degree and character of synchronization of business cycles in East Asia using a dynamic common factor model for output growth. Moneta and Ruffer (2009) finds evidence of robust export synchronization as well as the importance of external factors such as the yen-US dollar exchange rate and the oil price in determining the synchronizing activity. Some other studies focus on factors explaining synchronization: Tapsoba (2009) finds that bilateral trade integration increases synchronization of business cycles among african countries and Carmignani (2009) checks whether the measure of synchronization in the CAEMU increases over time.

The approach in the paper is closer to that of Carmignani (2009) as we differentiate between classical cycles and deviation cycles extracted using an HP filter, but we differ from Carmignani (2009) in the ways of analyzing classical cycles, and for deviation cycles, we do not only capture their comovements differently, but we also compare the strenght of the bond with union members to the bond of the countries with non union members.

3 Methodology

Two approaches to dealing with cycles are commonly used(Carmignani, 2009; Savva, Neanidis, and 2010; Darvas and Szapry, 2008). The first approach is the analysis of classical cycles obtained from log GDP data whereas deviation cycles,the second approach, are obtained from extracting cyclical components from GDP data with the use of a filter. Additionally many recent work do extract measure of cyclical behavior of economic activity from other data such as unemployment or industrial production(Frankel and Rose, 1996) We decide following Carmignani (2009) to use the two different concepts of cycles but with a totally different approach to analyzing classical and deviation cycles. On the classical cycles we test log real GDP for symmetry using the Triples test proposed by Randles, Fligner, Policello, and Wolfe (1980) and used in Razzak (2001). The test consists of creating from the time series a set of Xi, Xj, Xk, combinations of three observations (a set of triples) and computing a statistic η

from a function f defined respectively as follows:

$$f(X_i, X_j, X_k) = \frac{[sign((X_i + Xj - 2 \times X_k) + sign((X_i + X_k - 2 \times X_j) + sign((X_k + X_j - 2 \times X_i)]}{3}$$

And

$$\eta = \binom{N}{3}^{(-1)} \sum_{i<j<k} f(X_i, X_j, X_k)$$

Where $sign(u) = -1, 0, 1$ respectively if u is $< 0, = 0, > 0$ respectively, and N is the number of triples. The f function only takes values of $-1/3$, 0, and $1/3$. When the distribution is symmetric, the expected value of η is zero. Otherwise it is different from zero(that is when the distribution is asymmetric). We test symmetry versus asymmetry as $H_0 : \eta = 0$ vs $H_A : \eta 0$. Under the null hypothesis, the statistic is asymptotically normal with mean zero and standard errors $\frac{\sigma_N}{N^5}$ (see Randles et al. (1980), p.169 for the proofs and the expression of the standard errors).

Then for deviation cylces, the first step in our methodology is to disentangle the cyclical component of the real GDP series from their trend. We employ the Hodrick-Prescott filter, which is robust when using annual data. One major constraint for African countries is that only annual GDP data are available. Fortunately despite the esoteric character of extracting cyles from annual data, similar attempts are carried out in Carmignani (2003) and Tapsoba (2009). We follow **?** in adjusting parameters fo annual frequency of data in the HP filter. Then we test the transmission of the cyclical components of GDP from country j to country i using the following model:

$$\Delta y_i = \alpha + \beta \Delta y_j + \epsilon$$

where Δy_k is the change in the cyclical component of the GDP of country k. In the above equation, the transmission of business cycles is between countries i and j. We also tested for unit roots in real GDP, proper lag length selections and the direction of the transmission. An initial phase in this second part was to allow asynchronous relationship between country cycles in a vector autoregressive model.

At the end we apply a simple regression to each pair of countries and extract the R2 of the regression as the measure of the strenght of the connection between the cyclical components of real GDP between the two countries. To measure the bond between countries, we compare the average R2 within a monetary union and the major trade partners.

4 Results

The obtained cycles do show up and down movement as expected. Table 1 displays the test of symmetry performed on cyclical components of the series. We see that all three mone-

tary zones include countries with series that are symmetric and series that are asymmetric, suggesting that monetary policies aplied in the zone are likely not to be optimal. The CFA zone from central Africa includes oil producing countries mostly with asymmetric series, whereas the CFA zone from west Africa has countries that have mostly symmetric series. The CMA has hal of its countries with symmetric series. Specifically with South Africa and Namibia presenting symmetric series. In substance, the heterogeneity in the charateristics of cycles series suppose possible imperfection in the implementation of common monetary policy.

Results from the vector autoregressive model show that there seems to be more similarity in the cycles of mostly oil producing countries in the central African CFA zone that in the more diverse west African CFA zone. In the CFA zone from central Africa, countries with minority cycles characteristics (Central African Republic and Congo) show no contemporaneous relationship with other countries. The magnitude of the relationship between the other countries is quite small, but nonetheless significant. This may just be due to the fact that they are exposed to similar external shocks as oil producing countries. The results from the West African CFA zone are quite shoking given the more advanced level of economic integration among those countries. It seems that the difference in trade profile (oil exporters, agricultural product exporters) plays a role here and again countries may just be affected by different external shocks. The VAR results including CMA zone countries are equally shocking with very little connection among countries, and again apparently exports economies with very little itra zone trade.

The last three tables show the attempt to extract the strenght of comovement in the cycles of countries. We see that most countries from all monetary zones comove more significantly with their major trade partners than with they fellow zone members.

5 Conclusion

In this paper we set to review the idea of endogeneity of the benefits of currency unions usually advanced for the relevance of monetary unions in Africa, We used cycles extracted following the real business cycles literature, and compared the movements of these cycles across countries that are part of these various monetary arrangements. Comparing similarly extracted movement across a group of countries gives room for checking the relevance of strenght among the countries part of monetary zones. We find that among countries currently members of monetary unions, the links in terms of macroeconomic fluctuations are substantially low. These countries have stronger links with their major trade partners. This observation seems to be equally valid across all of the years considered. In abscence of conditions for optimal currency area, endogenous benefits to monetary unions

are not guaranteed. The fact that most countries may be affected mostly by external shocks casts a serious doubt on the abilities of these countries to make a common front during international negociations.

Our conclusion is that African Union should exert caution towards monetary union by ensuring proper trade integration among countries before monetary integration. The experience of existing monetary unions show that increased ties shall not be automatically expected after monetary unions

Devarajan and Rodrik (1991), and Devarajan and de Melo (1987) and the deliberately european perspective in Cobham and Robson (1994) give other reasons for the existence of some of the currency areas, but. In addition to the business cycles looked at this time I believe it would be good to consider trade networks discussed in Meissner and Oomes (2009), or the transmission of interest rates discussed in Frankel, Schmukler, and Serven (2004). In essence a full traditional perspective of why currency unions would be beneficial would not only include the transmission of growth (Baxter and Kouparitsas, 2005; Baxter and Stockman, 1989; Diebold and Rudebusch, 1996), but also of trade and interest rates. Ultimately it is a matter of strenght of fundamental linckages (trade and financial). The endogeneity idea is discussed in papers such as Guillaumont, Guillaumont, and Plane (1988). It is a good idea to review the paper of Houssa (2008). Finally spend some time on the reinterpretation in Reinhart and Rogoff (2004)

Table 1: Triples test results

	n	nnmin1c2	eta	Ksi1	Ksi2	Ksi3	Variance	stat	Interpretation
Algeria	39	703	0.0111	0.0015	0.0161	0.1110	0.0005	0.4910	Symmetry
Angola	39	703	0.1577	0.0022	0.0130	0.0862	0.0006	6.3759	Asymmetry
Benin	39	703	0.0777	0.0024	0.0129	0.1051	0.0007	3.0462	Asymmetry
Botswana	39	703	0.0847	0.0038	0.0148	0.1039	0.0010	2.7123	Asymmetry
Brazil	39	703	0.0028	0.0025	0.0131	0.1111	0.0007	0.1071	Symmetry
Burkina Faso	39	703	0.1087	0.0015	0.0120	0.0993	0.0005	5.0322	Asymmetry
Burundi	39	703	-0.0546	0.0021	0.0128	0.1081	0.0006	-2.2523	Asymmetry
Cameroon	39	703	-0.0119	0.0018	0.0162	0.1110	0.0006	-0.4984	Symmetry
Canada	39	703	0.0491	0.0025	0.0130	0.1087	0.0007	1.8750	Symmetry
Cape Verde	39	703	0.1264	0.0021	0.0128	0.0951	0.0006	5.1437	Asymmetry
Central African Republic	39	703	0.0296	0.0019	0.0136	0.1102	0.0006	1.2344	Symmetry
Chad	39	703	0.1346	0.0014	0.0132	0.0930	0.0004	6.3578	Asymmetry
China	39	703	0.1429	0.0025	0.0132	0.0907	0.0007	5.4609	Asymmetry
Congo	39	703	-0.0278	0.0011	0.0155	0.1103	0.0004	-1.3604	Symmetry
Cote divoire	39	703	-0.0158	0.0038	0.0155	0.1109	0.0010	-0.5032	Symmetry
DR congo	39	703	-0.0440	0.0037	0.0134	0.1092	0.0009	-1.4338	Symmetry
Djibouti	39	703	0.0680	0.0020	0.0132	0.1065	0.0006	2.7952	Asymmetry
Egypt	39	703	0.0577	0.0035	0.0139	0.1078	0.0009	1.9119	Symmetry
Equatorial Guinea	39	703	0.1940	0.0011	0.0130	0.0735	0.0004	9.8902	Asymmetry
Eritrea	19	153	-0.1806	0.0018	0.0143	0.0785	0.0015	-4.7382	Asymmetry
Ethiopia	19	153	0.1042	0.0015	0.0127	0.1002	0.0013	2.9161	Asymmetry
France	39	703	0.0443	0.0051	0.0160	0.1091	0.0013	1.2523	Symmetry
Gabon	39	703	-0.0173	0.0070	0.0199	0.1108	0.0017	-0.4198	Symmetry
Gambia	39	703	0.0513	0.0029	0.0128	0.1085	0.0008	1.8593	Symmetry
Germany	39	703	0.0058	0.0054	0.0142	0.1111	0.0013	0.1619	Symmetry
Ghana	39	703	0.1259	0.0028	0.0132	0.0953	0.0007	4.6072	Asymmetry
Guinea	39	703	0.0764	0.0040	0.0141	0.1053	0.0010	2.4146	Asymmetry
Guinea Bissau	39	703	-0.0143	0.0050	0.0140	0.1109	0.0012	-0.4112	Symmetry
Japan	39	703	-0.0296	0.0055	0.0146	0.1102	0.0013	-0.8121	Symmetry
Kenya	39	703	0.0235	0.0037	0.0133	0.1106	0.0009	0.7715	Symmetry
Lesotho	39	703	0.0559	0.0034	0.0125	0.1080	0.0009	1.9072	Symmetry
Liberia	39	703	-0.0157	0.0066	0.0152	0.1109	0.0015	-0.3984	Symmetry
Madagascar	39	703	0.1397	0.0014	0.0123	0.0916	0.0004	6.5938	Asymmetry
Malawi	39	703	0.0491	0.0025	0.0128	0.1087	0.0007	1.8961	Symmetry
Maldives	39	703	0.1117	0.0040	0.0153	0.0986	0.0010	3.4888	Asymmetry
Mali	39	703	0.0906	0.0019	0.0121	0.1029	0.0006	3.8463	Asymmetry
Mauritania	39	703	0.1073	0.0020	0.0135	0.0996	0.0006	4.4563	Asymmetry
Mauritius	39	703	0.0671	0.0038	0.0133	0.1066	0.0009	2.1783	Asymmetry
Morocco	39	703	0.0487	0.0027	0.0126	0.1087	0.0007	1.8278	Symmetry
Mozambique	39	703	0.1388	0.0010	0.0132	0.0919	0.0004	7.2052	Asymmetry
Namibia	39	703	0.0958	0.0027	0.0128	0.1019	0.0007	3.5784	Asymmetry
Niger	39	703	0.1133	0.0008	0.0132	0.0983	0.0003	6.1308	Asymmetry
Nigeria	39	703	0.0989	0.0031	0.0176	0.1013	0.0009	3.3735	Asymmetry
Rwanda	39	703	0.0223	0.0032	0.0182	0.1106	0.0009	0.7485	Symmetry
SaoTome	39	703	0.0557	0.0028	0.0215	0.1080	0.0008	1.9172	Symmetry
Senegal	39	703	0.0912	0.0014	0.0124	0.1028	0.0005	4.2795	Asymmetry
Seychelles	39	703	0.0268	0.0048	0.0141	0.1104	0.0012	0.7805	Symmetry
Sierra Leone	39	703	-0.0328	0.0027	0.0125	0.1100	0.0007	-1.2293	Symmetry
Somalia	39	703	-0.0137	0.0028	0.0130	0.1109	0.0007	-0.5031	Symmetry
South Africa	39	703	0.0591	0.0014	0.0139	0.1076	0.0005	2.7660	Asymmetry
Sudan	39	703	0.1334	0.0005	0.0131	0.0933	0.0003	8.0050	Asymmetry
Swaziland	39	703	-0.0027	0.0051	0.0135	0.1111	0.0012	-0.0762	Symmetry
Togo	39	703	0.0341	0.0047	0.0134	0.1099	0.0012	1.0045	Symmetry
Tunisia	39	703	0.0727	0.0020	0.0118	0.1058	0.0006	3.0330	Asymmetry
Uganda	39	703	0.1339	0.0022	0.0138	0.0932	0.0006	5.3790	Asymmetry
UnitedKingdom	39	703	0.0686	0.0034	0.0134	0.1064	0.0009	2.3277	Asymmetry
Tanzania	39	703	0.1162	0.0014	0.0115	0.0976	0.0004	5.5861	Asymmetry
United States	39	703	0.0512	0.0038	0.0138	0.1085	0.0010	1.6532	Symmetry
Zambia	39	703	0.1027	0.0027	0.0163	0.1006	0.0008	3.7359	Asymmetry
Zimbabwe	39	703	0.0158	0.0039	0.0134	0.1109	0.0010	0.5033	Symmetry

Table 2: Regressions of Countries Cycles

	DZA	AGO	BEN	BWA	BRA	BFA	BDI	CMR	CAN	CPV	CAF	TCD	CHN	COG	CIV	COD	DJI	EGY	GNQ	E
DZA	1.00	0.18	0.04	0.18	0.04	0.20	0.00	0.01	0.17	0.01	0.00	0.23	0.00	0.16	0.09	0.30	0.02	0.05	0.02	0.
AGO	0.18	1.00	0.07	0.01	0.00	0.15	0.00	0.05	0.20	0.00	0.00	0.00	0.00	0.18	0.06	0.25	0.00	0.02	0.01	0.
BEN	0.04	0.07	1.00	0.03	0.04	0.23	0.05	0.12	0.35	0.08	0.16	0.00	0.12	0.25	0.37	0.14	0.32	0.22	0.05	0.
BWA	0.18	0.01	0.03	1.00	0.06	0.19	0.39	0.07	0.17	0.09	0.07	0.07	0.01	0.19	0.17	0.08	0.09	0.18	0.03	0.
BRA	0.04	0.00	0.04	0.06	1.00	0.06	0.00	0.44	0.29	0.48	0.38	0.10	0.64	0.31	0.18	0.34	0.34	0.36	0.39	0.
BFA	0.20	0.15	0.23	0.19	0.06	1.00	0.15	0.11	0.52	0.14	0.19	0.25	0.25	0.56	0.46	0.47	0.21	0.44	0.31	0.
BDI	0.00	0.00	0.05	0.39	0.00	0.15	1.00	0.19	0.20	0.17	0.19	0.10	0.11	0.21	0.23	0.06	0.27	0.31	0.14	0.
CMR	0.01	0.05	0.12	0.07	0.44	0.11	0.19	1.00	0.45	0.68	0.72	0.02	0.40	0.56	0.28	0.38	0.46	0.56	0.36	0.
CAN	0.17	0.20	0.35	0.17	0.29	0.52	0.20	0.45	1.00	0.61	0.55	0.17	0.50	0.91	0.63	0.80	0.61	0.78	0.56	0.
CPV	0.01	0.00	0.08	0.09	0.48	0.14	0.17	0.68	0.61	1.00	0.85	0.12	0.67	0.64	0.43	0.50	0.74	0.83	0.54	0.
CAF	0.00	0.00	0.16	0.07	0.38	0.19	0.19	0.72	0.55	0.85	1.00	0.01	0.66	0.61	0.40	0.38	0.69	0.80	0.44	0.
TCD	0.23	0.00	0.00	0.07	0.10	0.25	0.10	0.02	0.17	0.12	0.01	1.00	0.19	0.22	0.18	0.29	0.17	0.20	0.28	0.
CHN	0.00	0.00	0.12	0.01	0.64	0.25	0.11	0.40	0.50	0.67	0.66	0.19	1.00	0.54	0.44	0.45	0.72	0.76	0.58	0.
COG	0.16	0.18	0.25	0.19	0.31	0.56	0.21	0.56	0.91	0.64	0.61	0.22	0.54	1.00	0.60	0.83	0.62	0.83	0.63	0.
CIV	0.09	0.06	0.37	0.17	0.18	0.46	0.23	0.28	0.63	0.43	0.40	0.18	0.44	0.60	1.00	0.45	0.57	0.69	0.32	0.
COD	0.30	0.25	0.14	0.08	0.34	0.47	0.06	0.38	0.80	0.50	0.38	0.29	0.45	0.83	0.45	1.00	0.44	0.63	0.61	0.
DJI	0.02	0.00	0.32	0.09	0.34	0.21	0.27	0.46	0.61	0.74	0.69	0.17	0.72	0.62	0.57	0.44	1.00	0.82	0.52	0.
EGY	0.05	0.02	0.22	0.18	0.36	0.44	0.31	0.56	0.78	0.83	0.80	0.20	0.76	0.83	0.69	0.63	0.82	1.00	0.62	0.
GNQ	0.02	0.01	0.05	0.03	0.39	0.31	0.14	0.36	0.56	0.54	0.44	0.28	0.58	0.63	0.32	0.61	0.52	0.62	1.00	0.
ERI	0.00	0.05	0.20	0.00	0.56	0.18	0.01	0.53	0.55	0.62	0.60	0.05	0.48	0.61	0.42	0.47	0.48	0.58	0.52	1.
ETH	0.04	0.02	0.22	0.21	0.37	0.38	0.34	0.60	0.80	0.85	0.77	0.21	0.69	0.80	0.70	0.61	0.82	0.97	0.60	0.
FRA	0.08	0.08	0.22	0.14	0.41	0.48	0.20	0.44	0.81	0.56	0.45	0.28	0.56	0.79	0.61	0.74	0.61	0.76	0.71	0.
GAB	0.01	0.01	0.40	0.17	0.29	0.36	0.28	0.49	0.71	0.71	0.80	0.07	0.68	0.67	0.72	0.43	0.81	0.90	0.44	0.
GMB	0.00	0.06	0.23	0.00	0.43	0.20	0.01	0.25	0.48	0.45	0.41	0.07	0.45	0.41	0.44	0.35	0.43	0.50	0.32	0.
DEU	0.03	0.02	0.24	0.21	0.36	0.41	0.37	0.56	0.78	0.79	0.75	0.20	0.70	0.77	0.73	0.58	0.81	0.96	0.58	0.
GHA	0.04	0.01	0.25	0.15	0.41	0.44	0.30	0.50	0.78	0.79	0.74	0.24	0.79	0.79	0.72	0.61	0.85	0.97	0.65	0.
GIN	0.04	0.01	0.25	0.14	0.42	0.40	0.28	0.53	0.80	0.82	0.76	0.21	0.76	0.80	0.71	0.63	0.86	0.96	0.69	0.
GNB	0.00	0.00	0.13	0.09	0.00	0.15	0.29	0.01	0.18	0.03	0.02	0.16	0.07	0.15	0.14	0.04	0.19	0.13	0.25	0.
JPN	0.05	0.03	0.26	0.15	0.41	0.43	0.25	0.49	0.83	0.78	0.68	0.25	0.71	0.80	0.75	0.65	0.80	0.95	0.62	0.
KEN	0.06	0.04	0.24	0.17	0.41	0.45	0.24	0.58	0.83	0.81	0.75	0.23	0.72	0.86	0.70	0.71	0.79	0.97	0.68	0.
LSO	0.05	0.05	0.28	0.12	0.40	0.46	0.24	0.45	0.86	0.73	0.68	0.21	0.71	0.82	0.73	0.65	0.79	0.92	0.63	0.

Table 3: Regressions of CDEAO Countries Cycles

	BEN	BFA	CIV	GNB	MLI	SEN	CAN	CHN	FRA	DEU	NGA	GBR	ZAF
BEN	1.00	0.10	0.17	0.01	0.02	0.03	0.00	0.01	0.00	0.06	0.07	0.03	0.06
BFA	0.10	1.00	0.00	0.02	0.18	0.09	0.06	0.08	0.03	0.10	0.07	0.10	0.09
CIV	0.17	0.00	1.00	0.06	0.09	0.24	0.03	0.03	0.12	0.22	0.22	0.22	0.28
GNB	0.01	0.02	0.06	1.00	0.15	0.14	0.02	0.05	0.08	0.13	0.17	0.14	0.15
MLI	0.02	0.18	0.09	0.15	1.00	0.80	0.06	0.36	0.20	0.71	0.57	0.76	0.70
SEN	0.03	0.09	0.24	0.14	0.80	1.00	0.09	0.36	0.29	0.79	0.69	0.86	0.84
CAN	0.00	0.06	0.03	0.02	0.06	0.09	1.00	0.25	0.00	0.16	0.18	0.17	0.14
CHN	0.01	0.08	0.03	0.05	0.36	0.36	0.25	1.00	0.00	0.46	0.30	0.57	0.50
FRA	0.00	0.03	0.12	0.08	0.20	0.29	0.00	0.00	1.00	0.15	0.27	0.15	0.23
DEU	0.06	0.10	0.22	0.13	0.71	0.79	0.16	0.46	0.15	1.00	0.76	0.94	0.90
NGA	0.07	0.07	0.22	0.17	0.57	0.69	0.18	0.30	0.27	0.76	1.00	0.74	0.74
GBR	0.03	0.10	0.22	0.14	0.76	0.86	0.17	0.57	0.15	0.94	0.74	1.00	0.95
ZAF	0.06	0.09	0.28	0.15	0.70	0.84	0.14	0.50	0.23	0.90	0.74	0.95	1.00

Table 4: Regressions of SADEC Countries Cycles

	BWA	LSO	NAM	ZAF	SWZ	CAN	CHN	FRA	DEU	NGA	GBR	USA
BWA	1.00	0.09	0.02	0.05	0.00	0.00	0.00	0.00	0.12	0.07	0.06	0.05
LSO	0.09	1.00	0.43	0.50	0.03	0.18	0.30	0.03	0.57	0.49	0.58	0.50
NAM	0.02	0.43	1.00	0.91	0.18	0.09	0.50	0.14	0.83	0.63	0.87	0.80
ZAF	0.05	0.50	0.91	1.00	0.12	0.14	0.50	0.23	0.90	0.74	0.95	0.89
SWZ	0.00	0.03	0.18	0.12	1.00	0.01	0.01	0.03	0.08	0.01	0.11	0.13
CAN	0.00	0.18	0.09	0.14	0.01	1.00	0.25	0.00	0.16	0.18	0.17	0.15
CHN	0.00	0.30	0.50	0.50	0.01	0.25	1.00	0.00	0.46	0.30	0.57	0.41
FRA	0.00	0.03	0.14	0.23	0.03	0.00	0.00	1.00	0.15	0.27	0.15	0.22
DEU	0.12	0.57	0.83	0.90	0.08	0.16	0.46	0.15	1.00	0.76	0.94	0.83
NGA	0.07	0.49	0.63	0.74	0.01	0.18	0.30	0.27	0.76	1.00	0.74	0.73
GBR	0.06	0.58	0.87	0.95	0.11	0.17	0.57	0.15	0.94	0.74	1.00	0.91
USA	0.05	0.50	0.80	0.89	0.13	0.15	0.41	0.22	0.83	0.73	0.91	1.00

Table 5: Regressions of CEMAC Countries Cycles

	CMR	CAF	TCD	COG	GNQ	GAB	CAN	CHN	FRA	DEU	NGA	GBR	ZAF	USA
CMR	1.00	0.72	0.02	0.56	0.36	0.49	0.45	0.40	0.44	0.56	0.39	0.53	0.53	0.56
CAF	0.72	1.00	0.01	0.61	0.44	0.80	0.55	0.66	0.45	0.75	0.51	0.76	0.74	0.76
TCD	0.02	0.01	1.00	0.22	0.28	0.07	0.17	0.19	0.28	0.20	0.43	0.23	0.23	0.22
COG	0.56	0.61	0.22	1.00	0.63	0.67	0.91	0.54	0.79	0.77	0.76	0.78	0.80	0.80
GNQ	0.36	0.44	0.28	0.63	1.00	0.44	0.56	0.58	0.71	0.58	0.60	0.67	0.67	0.68
GAB	0.49	0.80	0.07	0.67	0.44	1.00	0.71	0.68	0.62	0.91	0.69	0.89	0.88	0.89
CAN	0.45	0.55	0.17	0.91	0.56	0.71	1.00	0.50	0.81	0.78	0.74	0.79	0.81	0.79
CHN	0.40	0.66	0.19	0.54	0.58	0.68	0.50	1.00	0.56	0.70	0.59	0.78	0.77	0.78
FRA	0.44	0.45	0.28	0.79	0.71	0.62	0.81	0.56	1.00	0.77	0.76	0.79	0.82	0.80
DEU	0.56	0.75	0.20	0.77	0.58	0.91	0.78	0.70	0.77	1.00	0.84	0.97	0.97	0.97
NGA	0.39	0.51	0.43	0.76	0.60	0.69	0.74	0.59	0.76	0.84	1.00	0.86	0.87	0.85
GBR	0.53	0.76	0.23	0.78	0.67	0.89	0.79	0.78	0.79	0.97	0.86	1.00	0.99	0.99
ZAF	0.53	0.74	0.23	0.80	0.67	0.88	0.81	0.77	0.82	0.97	0.87	0.99	1.00	0.99
USA	0.56	0.76	0.22	0.80	0.68	0.89	0.79	0.78	0.80	0.97	0.85	0.99	0.99	1.00

VAR CEMAC

	(1)					
	CMR	CAF	TCD	COG	GNQ	GAB
L.CMR	-0.932***	-0.999***	-3.559***	-1.890***	-3.148***	-2.262***
	(-1.06e+14)	(-1.51e+14)	(-3.06e+14)	(-2.04e+14)	(-2.54e+14)	(-1.58e+14)
L2.CMR	-3.238***	-2.434***	-4.433***	-3.379***	-5.039***	-4.709***
	(-3.07e+14)	(-3.08e+14)	(-3.18e+14)	(-3.05e+14)	(-3.40e+14)	(-2.75e+14)
L3.CMR	-2.941***	-2.721***	-2.915***	-2.945***	-4.751***	-4.976***
	(-2.37e+14)	(-2.92e+14)	(-1.78e+14)	(-2.26e+14)	(-2.72e+14)	(-2.47e+14)
L.CAF	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)
L2.CAF	2.029***	1.721***	5.358***	4.611***	4.271***	6.702***
	(8.00e+13)	(9.05e+13)	(1.60e+14)	(1.73e+14)	(1.20e+14)	(1.63e+14)
L3.CAF	8.233***	7.213***	10.68***	9.760***	10.30***	18.19***
	(2.94e+14)	(3.43e+14)	(2.89e+14)	(3.31e+14)	(2.61e+14)	(3.99e+14)
L.TCD	-0.0913***	0.265***	0.409***	0.687***	0.354***	1.753***
	(-1.35e+13)	(5.21e+13)	(4.58e+13)	(9.67e+13)	(3.72e+13)	(1.59e+14)
L2.TCD	0.640***	0.527***	0.660***	0.872***	0.280***	1.909***
	(8.45e+13)	(9.28e+13)	(6.60e+13)	(1.10e+14)	(2.63e+13)	(1.55e+14)
L3.TCD	0.841***	0.630***	1.207***	1.203***	1.550***	1.832***
	(2.01e+14)	(2.01e+14)	(2.18e+14)	(2.73e+14)	(2.63e+14)	(2.69e+14)
L.COG	-1.088***	-0.819***	-1.419***	-0.658***	2.987***	-4.819***
	(-6.07e+13)	(-6.09e+13)	(-6.00e+13)	(-3.49e+13)	(1.18e+14)	(-1.65e+14)
L2.COG	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)
L3.COG	1.400***	1.461***	0.942***	1.108***	-0.391***	3.838***
	(1.46e+14)	(2.03e+14)	(7.43e+13)	(1.10e+14)	(-2.90e+13)	(2.46e+14)
L.GNQ	0.996***	0.806***	1.235***	1.172***	-0.176***	2.610***
	(1.34e+14)	(1.44e+14)	(1.25e+14)	(1.50e+14)	(-1.68e+13)	(2.15e+14)
L2.GNQ	1.897***	1.892***	2.846***	2.576***	2.051***	5.112***
	(2.36e+14)	(3.14e+14)	(2.68e+14)	(3.05e+14)	(1.82e+14)	(3.92e+14)
L3.GNQ	0.777***	0.0973***	0.119***	0.106***	-0.639***	0.209***
	(1.08e+14)	(1.81e+13)	(1.26e+13)	(1.40e+13)	(-6.34e+13)	(1.79e+13)
L.GAB	1.977***	2.609***	3.227***	3.453***	5.123***	6.650***
	(1.59e+14)	(2.80e+14)	(1.97e+14)	(2.64e+14)	(2.93e+14)	(3.30e+14)
L2.GAB	2.274***	1.895***	0.949***	2.122***	3.542***	3.959***
	(1.37e+14)	(1.53e+14)	(4.34e+13)	(1.22e+14)	(1.52e+14)	(1.47e+14)
L3.GAB	-1.995***	-1.990***	-1.747***	-1.790***	-1.228***	-4.381***
	(-1.07e+14)	(-1.42e+14)	(-7.11e+13)	(-9.14e+13)	(-4.69e+13)	(-1.45e+14)
_cons	2.076***	1.988***	2.419***	3.423***	3.061***	6.440***
	(1.55e+14)	(1.97e+14)	(1.36e+14)	(2.42e+14)	(1.62e+14)	(2.95e+14)

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

	(1)						
	BEN	BFA	CIV	GNB	MLI	SEN	TGO
L.BEN	-0.726***	0.386	-0.460	1.325	-0.648	-0.671	-0.505
	(-3.71)	(1.94)	(-0.93)	(1.43)	(-0.85)	(-0.66)	(-0.41)
L2.BEN	-0.591**	-0.233	-0.701	2.527*	-0.837	-0.730	-1.503
	(-2.62)	(-1.01)	(-1.23)	(2.37)	(-0.95)	(-0.62)	(-1.06)
L3.BEN	-0.602***	-0.470*	-1.199**	-0.588	-2.037**	-2.524**	-3.475**
	(-3.34)	(-2.56)	(-2.64)	(-0.69)	(-2.89)	(-2.67)	(-3.06)
L.BFA	0.185	-0.171	0.546	-0.307	0.466	0.376	0.112
	(1.26)	(-1.14)	(1.47)	(-0.44)	(0.81)	(0.49)	(0.12)
L2.BFA	0.0911	-0.171	-0.288	0.157	0.0113	0.199	0.473
	(0.82)	(-1.52)	(-1.03)	(0.30)	(0.03)	(0.34)	(0.68)
L3.BFA	0.491**	0.196	1.144**	0.562	1.743**	2.378**	2.753**
	(3.05)	(1.20)	(2.82)	(0.74)	(2.77)	(2.82)	(2.72)
L.CIV	0.710***	0.0198	1.259***	0.259	0.705	1.347*	1.296
	(5.59)	(0.15)	(3.93)	(0.43)	(1.42)	(2.03)	(1.62)
L2.CIV	-0.138	-0.404**	-0.527	-0.732	-0.917	-1.269	-0.861
	(-1.05)	(-3.01)	(-1.59)	(-1.18)	(-1.78)	(-1.84)	(-1.04)
L3.CIV	0.374**	0.432**	0.964**	0.233	2.098***	2.688***	3.092***
	(2.81)	(3.18)	(2.87)	(0.37)	(4.02)	(3.85)	(3.68)
L.GNB	0.0349	0.0600	0.260*	-0.0670	0.192	0.245	0.273
	(0.81)	(1.37)	(2.40)	(-0.33)	(1.14)	(1.08)	(1.01)
L2.GNB	-0.153***	-0.0574	-0.256*	-0.324	-0.223	-0.339	-0.393
	(-3.76)	(-1.38)	(-2.49)	(-1.68)	(-1.40)	(-1.59)	(-1.53)
L3.GNB	0.0151	-0.0786*	0.0502	-0.130	-0.266	-0.170	-0.266
	(0.42)	(-2.13)	(0.55)	(-0.76)	(-1.88)	(-0.89)	(-1.17)
L.MLI	0.547***	0.0497	0.706	0.404	0.552	1.307	1.973*
	(3.52)	(0.31)	(1.80)	(0.55)	(0.91)	(1.61)	(2.02)
L2.MLI	0.282*	0.200	0.252	-0.133	-0.273	0.103	0.290
	(2.33)	(1.62)	(0.83)	(-0.23)	(-0.58)	(0.16)	(0.38)
L3.MLI	0.208	0.0198	0.592	0.244	0.0879	0.369	1.088
	(1.51)	(0.14)	(1.71)	(0.37)	(0.16)	(0.51)	(1.26)
L.SEN	-0.627***	0.0970	-0.372	1.569*	0.274	0.255	0.0872
	(-4.38)	(0.66)	(-1.03)	(2.31)	(0.49)	(0.34)	(0.10)
L2.SEN	-0.462**	-0.127	-0.668	1.403	-0.905	-1.428	-1.314
	(-2.83)	(-0.76)	(-1.62)	(1.81)	(-1.41)	(-1.67)	(-1.27)
L3.SEN	-0.131	0.253	-1.191**	1.565*	-0.302	-0.602	-1.029
	(-0.87)	(1.65)	(-3.14)	(2.20)	(-0.51)	(-0.76)	(-1.09)
L.TGO	-0.588	-0.235	-1.615	3.012	-0.0594	-1.092	-0.599
	(-1.29)	(-0.51)	(-1.41)	(1.40)	(-0.03)	(-0.46)	(-0.21)
L2.TGO	-0.0911	0.754*	0.205	-1.603	1.703	1.463	0.680
	(-0.26)	(2.14)	(0.23)	(-0.98)	(1.26)	(0.81)	(0.31)
L3.TGO	-1.479***	-0.631	0.0313	0.0776	-0.320	0.678	0.402
	(-4.59)	(-1.92)	(0.04)	(0.05)	(-0.25)	(0.40)	(0.20)
_cons	0.215	0.0649	0.469	1.218	1.012	1.596	2.168
	(1.08)	(0.32)	(0.93)	(1.28)	(1.29)	(1.52)	(1.72)

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

	(1)				
	BWA	LSO	NAM	ZAF	SWZ
L.BWA	-0.0822	-0.165	-0.0688	-0.00820	-0.257
	(-0.54)	(-0.44)	(-0.15)	(-0.01)	(-0.20)
L2.BWA	0.0669	0.0634	0.123	0.0814	-0.831
	(0.48)	(0.19)	(0.29)	(0.16)	(-0.71)
L3.BWA	-0.368**	-0.697*	-0.138	-0.315	1.047
	(-2.80)	(-2.17)	(-0.34)	(-0.64)	(0.95)
L.LSO	0.141	0.290	0.399	0.242	1.369
	(1.03)	(0.87)	(0.94)	(0.48)	(1.20)
L2.LSO	0.0233	-0.585**	0.121	0.148	1.220
	(0.25)	(-2.60)	(0.42)	(0.43)	(1.58)
L3.LSO	0.198	0.127	0.352	0.324	-0.225
	(1.70)	(0.45)	(0.98)	(0.75)	(-0.23)
L.NAM	0.0417	-0.694	-0.340	-0.344	5.257*
	(0.16)	(-1.11)	(-0.43)	(-0.36)	(2.44)
L2.NAM	0.0689	0.0666	0.292	0.638	2.679
	(0.29)	(0.12)	(0.40)	(0.73)	(1.35)
L3.NAM	-0.119	-0.424	-0.127	0.237	1.637
	(-0.53)	(-0.77)	(-0.18)	(0.28)	(0.87)
L.ZAF	-0.580	-1.128	-0.729	-0.523	-9.333**
	(-1.51)	(-1.20)	(-0.61)	(-0.37)	(-2.90)
L2.ZAF	0.502	1.377	1.066	0.665	9.474**
	(1.32)	(1.47)	(0.90)	(0.47)	(2.95)
L3.ZAF	0.164	-0.764	-0.574	-0.535	-5.868
	(0.41)	(-0.78)	(-0.46)	(-0.36)	(-1.73)
L.SWZ	0.0229	0.0741	0.0267	0.00591	-0.233
	(0.99)	(1.30)	(0.37)	(0.07)	(-1.19)
L2.SWZ	0.0481*	0.0317	-0.0551	-0.0257	-0.310
	(2.38)	(0.64)	(-0.88)	(-0.34)	(-1.83)
L3.SWZ	0.0357	-0.00462	-0.0423	-0.0503	-0.0123
	(1.63)	(-0.09)	(-0.62)	(-0.62)	(-0.07)
_cons	0.433	0.800	1.024	1.297	-1.830
	(1.18)	(0.89)	(0.90)	(0.95)	(-0.59)

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

VAR VARIOUS COUNTRIES

	(1) CMR	BDI	CAN	TCD	FRA	DEU	NGA	GBR	CAF	GAB	CHN	COG	GNQ
L.CMR	-2.497***	-1.563***	-1.113***	-3.933***	-3.289***	-3.642***	-7.871***	-7.853***	-1.427***	-3.401***	-1.726***	-2.258***	-2.176***
	(-1.10e+15)	(-1.14e+15)	(-8.47e+14)	(-1.51e+15)	(-9.25e+14)	(-9.46e+14)	(-1.47e+15)	(-9.54e+14)	(-9.55e+14)	(-8.08e+14)	(-7.67e+14)	(-1.00e+15)	(-5.59e+14)
L2.CMR	0.192***	-0.538***	0.139***	-0.767***	-0.361***	0.0246***	-0.381***	-0.106***	0.192***	0.567***	0.0326***	0.150***	-0.352***
	(1.20e+14)	(-5.57e+14)	(1.50e+14)	(-4.20e+14)	(-1.44e+14)	(9.06e+12)	(-1.01e+14)	(-1.83e+13)	(1.82e+14)	(1.91e+14)	(2.06e+13)	(9.45e+13)	(-1.29e+14)
L.BDI	2.806***	1.435***	1.201***	2.290***	3.014***	4.118***	7.086***	9.045***	2.040***	4.537***	2.047***	2.430***	2.460***
	(1.27e+15)	(1.07e+15)	(9.36e+14)	(9.03e+14)	(8.68e+14)	(1.10e+15)	(1.36e+15)	(1.13e+15)	(1.40e+15)	(1.10e+15)	(9.31e+14)	(1.10e+15)	(6.47e+14)
L2.BDI	-0.494***	-0.213***	-0.303***	-0.448***	-1.588***	-0.603***	-0.561***	-1.638***	-0.292***	-0.918***	-0.588***	-0.635***	-0.814***
	(-2.96e+14)	(-2.10e+14)	(-3.13e+14)	(-2.34e+14)	(-6.06e+14)	(-2.13e+14)	(-1.42e+14)	(-2.70e+14)	(-2.65e+14)	(-2.96e+14)	(-3.55e+14)	(-3.82e+14)	(-2.84e+14)
L.CAN	0	0	0	0	0	0	0	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
L2.CAN	0	0	0	0	0	0	0	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
L.TCD	-1.357***	-0.939***	-0.553***	-1.637***	-2.048***	-2.249***	-3.687***	-4.499***	-0.791***	-1.846***	-1.286***	-1.060***	-1.571***
	(-8.50e+14)	(-9.72e+14)	(-5.99e+14)	(-8.96e+14)	(-8.19e+14)	(-8.30e+14)	(-9.79e+14)	(-7.77e+14)	(-7.53e+14)	(-6.23e+14)	(-8.12e+14)	(-6.69e+14)	(-5.74e+14)
L2.TCD	0.104***	0.264***	0.467***	0.263***	1.537***	1.347***	1.774***	3.422***	0.689***	1.258***	0.811***	0.804***	1.881***
	(8.14e+13)	(3.39e+14)	(6.29e+14)	(1.79e+14)	(7.64e+14)	(6.19e+14)	(5.86e+14)	(7.35e+14)	(8.15e+14)	(5.28e+14)	(6.37e+14)	(6.31e+14)	(8.55e+14)
L.FRA	-0.704***	0.327***	0.000384***	0.204***	-0.235***	-0.108***	0.0116***	-0.0843***	-0.0697***	-0.470***	-0.0266***	0.109***	1.391***
	(-4.77e+14)	(3.66e+14)	(4.50e+11)	(1.21e+14)	(-1.01e+14)	(-4.31e+13)	(3.32e+12)	(-1.58e+13)	(-7.17e+13)	(-1.72e+14)	(-1.82e+13)	(7.41e+13)	(5.50e+14)
L2.FRA	-1.709***	-0.341***	-0.220***	-0.594***	0.323***	-0.560***	-0.996***	-0.365***	-0.409***	-0.717***	0.0382***	-0.423***	0.684***
	(-7.30e+14)	(-2.41e+14)	(-1.62e+14)	(-2.22e+14)	(8.79e+13)	(-1.41e+14)	(-1.80e+14)	(-4.30e+13)	(-2.65e+14)	(-1.65e+14)	(1.64e+13)	(-1.82e+14)	(1.70e+14)
L.DEU	0	0	0	0	0	0	0	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
L2.DEU	0	0	0	0	0	0	0	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
L.NGA	1.412***	0.463***	0.349***	1.124***	1.112***	1.632***	2.462***	2.828***	0.571***	1.378***	0.847***	0.815***	0.663***
	(8.64e+14)	(4.68e+14)	(3.69e+14)	(6.01e+14)	(4.34e+14)	(5.88e+14)	(6.38e+14)	(4.77e+14)	(5.30e+14)	(4.54e+14)	(5.22e+14)	(5.02e+14)	(2.36e+14)
L2.NGA	0.673***	0.236***	0.0240***	0.470***	0.166***	0.385***	0.896***	0.449***	0.135***	0.564***	0.148***	0.181***	-0.494***
	(5.13e+14)	(2.98e+14)	(3.16e+13)	(3.13e+14)	(8.07e+13)	(1.73e+14)	(2.90e+14)	(9.44e+13)	(1.57e+14)	(2.32e+14)	(1.14e+14)	(1.39e+14)	(-2.20e+14)
L.GBR	0	0	0	0	0	0	0	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
L2.GBR	4.552***	4.157***	3.771***	7.226***	10.53***	10.59***	21.33***	23.57***	3.693***	10.47***	4.578***	6.795***	6.363***
	(8.04e+14)	(1.21e+15)	(1.15e+15)	(1.11e+15)	(1.19e+15)	(1.10e+15)	(1.60e+15)	(1.15e+15)	(9.90e+14)	(9.96e+14)	(8.14e+14)	(1.21e+15)	(6.55e+14)
L.CAF	0	0	0	0	0	0	0	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
L2.CAF	0	0	0	0	0	0	0	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
L.GAB	0	0	0	0	0	0	0	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
L2.GAB	-2.550***	-0.782***	-0.124***	-1.295***	0.393***	-0.912***	-2.286***	-0.677***	-0.550***	-0.771***	-0.398***	-0.558***	0.951***
	(-7.31e+14)	(-3.70e+14)	(-6.15e+13)	(-3.24e+14)	(7.18e+13)	(-1.54e+14)	(-2.78e+14)	(-5.35e+13)	(-2.39e+14)	(-1.19e+14)	(-1.15e+14)	(-1.61e+14)	(1.59e+14)
L.CHN	2.594***	0.835***	0.619***	1.010***	2.400***	2.091***	6.304***	3.869***	0.743***	2.865***	1.440***	1.707***	-0.409***
	(6.74e+14)	(3.59e+14)	(2.78e+14)	(2.29e+14)	(3.98e+14)	(3.20e+14)	(6.95e+14)	(2.77e+14)	(2.93e+14)	(4.01e+14)	(3.77e+14)	(4.47e+14)	(-6.20e+13)
L2.CHN	1.146***	0.261***	0.896***	1.292***	1.442***	2.317***	3.152***	6.388***	1.648***	2.083***	0.904***	1.716***	3.584***
	(3.70e+14)	(1.39e+14)	(5.00e+14)	(3.64e+14)	(2.97e+14)	(4.41e+14)	(4.31e+14)	(5.68e+14)	(8.07e+14)	(3.62e+14)	(2.94e+14)	(5.57e+14)	(6.74e+14)
L.COG	0	0	0	0	0	0	0	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
L2.COG	0.0150***	0.151***	-0.768***	-2.168***	-3.339***	-2.523***	-4.569***	-6.426***	-0.699***	-2.561***	-1.814***	-1.372***	-3.069***
	(7.65e+12)	(1.28e+14)	(-6.79e+14)	(-9.69e+14)	(-1.09e+15)	(-7.61e+14)	(-9.91e+14)	(-9.06e+14)	(-5.43e+14)	(-7.06e+14)	(-9.35e+14)	(-7.06e+14)	(-9.15e+14)
L.GNQ	0.883***	0.0741***	-0.00975***	0.106***	-0.569***	-0.00568***	-0.167***	-0.741***	0.000887***	-0.228***	-0.122***	-0.101***	-1.328***
	(5.33e+14)	(7.39e+13)	(-1.02e+13)	(5.61e+13)	(-2.19e+14)	(-2.02e+12)	(-4.26e+13)	(-1.23e+14)	(8.12e+11)	(-7.42e+13)	(-7.45e+13)	(-6.14e+13)	(-4.67e+14)
L2.GNQ	0.00579***	-0.307***	0.0623***	0.681***	0.0301***	0.0151***	0.603***	-0.196***	-0.144***	0.172***	-0.0629***	0.0824***	-0.857***
	(5.72e+12)	(-5.02e+14)	(1.06e+14)	(5.88e+14)	(1.90e+13)	(8.78e+12)	(2.53e+14)	(-5.35e+13)	(-2.16e+14)	(9.18e+13)	(-6.26e+13)	(8.19e+13)	(-4.93e+14)
_cons	0.749***	0.129***	0.618***	-0.0799***	1.028***	1.755***	2.522***	4.057***	0.879***	1.867***	0.740***	1.125***	1.257***
	(3.40e+14)	(9.64e+13)	(4.84e+14)	(-3.17e+13)	(2.97e+14)	(4.69e+14)	(4.85e+14)	(5.07e+14)	(6.05e+14)	(4.56e+14)	(3.38e+14)	(5.14e+14)	(3.32e+14)

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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