Responsiveness of GDP toward changes in inflation and exchange rate in the CFA zone

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Abstract

This paper examines the responsiveness of GDP toward changes in inflation and exchange rate in the CFA zone, to understand how each of these variables react to each over if any change occur. The study employed panel unit root tests to establish stationarity of the variables. The study utilized the econometric frameworks of GMM style panel VAR model to investigate the phenomenon. Panel granger causality test, impulse response graph and variance error decomposition were estimated.

The results from panel VAR estimates shows that both exchange rate and inflation have significant and positive impacts on GDP growth at 10% significant level. In addition, the granger causality results shows that there is bidirectional causality between inflation and GDP growth but in negative direction for GDP and positive direction for inflation. Finally, the impulse response graph shows that GDP react positively to exchange rate in the first few years and become zero in period 4 to 10. Similarly, the result shows that one standard deviation shock in inflation lead to positive response to GDP growth for all the period used in the study with the maximum impacts felt in the first few years.

Keywords: GDP, CFA zone, Exchange rate, Inflation, Economic growth, Panel VAR

1. Introduction

The Franc zone in Africa is a unique institution in the developing world. 14 sovereign countries are engaged in two monetary unions with France. Membership in the union involves pooled foreign reserves, a common currency (whose convertibility is guaranteed by France) and a fixed exchange rate with the French Franc. The zone is constitute of two subgroups with two central banks, WAEMU and CMAC.

In 2006, the growth rate of the WAEMU member countries was 3% compared to 4.1% in 2005, a level barely equal to that of the population growth of the Zone. significantly lower than the performance of sub-Saharan

Africa as a whole, which had been 5.5% in 2006; The deceleration of growth is mainly due to the persistent difficulties of certain agricultural sectors, the consequences of the rise in oil prices and the socio-political situation still delicate in several countries of the region. WAEMU's main business sectors remain fragile in comparison with external shocks, notably the high price of oil, which has continued to penalize countries traditionally net oil importers.

In 2006, the inflation rate fell to 2.3% on average annual against 4.3% in 2005; this decline in the rate of price increases affected all countries except Senegal. The deceleration in price increases can be explained by the increase in food production and cereal supply. It has been tempered by the increase in oil prices. Higher prices at the pump have spread to other sectors of the economy, including transportation, whose prices rose by + 10.7% in 2006; Inflation rates varied from one country to another between 3.8% in Benin and 0% in Niger, only three countries in the sub region met the 2% target set in the framework of the program. Monetary policy of the BCEAO.

The year 2006 is marked by the continued growth observed in 2005. The increase in GDP, in real terms stood at 3.2% against 3.7% in 2005; This slowdown in economic activity occurred in an international context marked by a significant improvement in the terms of trade (+ 18.4%) in connection with the good performance of oil prices and other commodities exported (wood, coffee) results mainly from the decline in oil production in the CEMAC Zone. After the renewed inflationary pressures observed in 2005, the year 2006 was characterized by a further rise in the inflation rate. On an annual average, the consumer price index for households rose by 5.3% after the 2.9% in 2005.

The countries of the zone have their currency connected to the Euro with the value of 1 Euro for 655.957 franc CFA. It's also known that these countries among the greatest exporter of the Continent. So as much of these countries rely on agriculture, therefore exportation of resources the fixed exchange rate is to be questioned when dealing at the international level.

The aim of this research is to examine the responsiveness of GDP toward changes in inflation and exchange rate in the CFA zone from 1990 – 2017. This study contribute to the literature in several ways. First, this study extend literature by providing empirical evidence of how GDP reacts a shock from inflation and exchange rate over a long period of time which is missing in literature. Methodologically, the study employed (Im 2003) and Fisher type and Levin-Chu tests for unit roots in the dataset. In addition, this study implemented econometric framework of Generalized Method of Moment (GMM) style panel Vector Autoregressive (panel VAR) to examine the reaction of GDP to a shock in inflation and exchange rate. This estimator is among the class of estimators in current econometric literature, which provide valid, consistent and reliable results and also proving to be useful for dealing with endogeneity problems compared to OLS and other estimators .(zicchino 2006)

The rest of the paper is organized as follows: Section 2 deals with the literature review. Section 3 focuses on the materials and methods. It covers variables and data, the test of normality, and econometric modelling. Section 4 deals with results and discussions. It presents the results based on the objectives of the study. Finally, section 5 present the conclusion and potential policy recommendations.

2. Literature

2.1 Inflation and economic growth

The relationship between inflation and growth has been the subject of much theoretical and empirical input. There have been a lot of theories discussing the connection between inflation and growth, however some are very effective in contrary to the other. This review of literature is also discussing some of the most prominent theories on the matter.

In theoretical terms, some authors predict a positive relationship between inflation and capital accumulation, which ultimately implies a positive impact on growth. What the economic literature calls the Mundell-Tobin effect states that, given the substitutability between money and capital, an increase in inflation erodes the purchasing power of money balances, resulting in a substitution between resources in favour of real assets. In this way, capital accumulation will stimulate the rate of economic growth.

Considered a necessary boost for a better economic, inflation can be positively correlated with growth. From this perspective, in the case of price and wage rigidity, a certain level of inflation can allow relative prices to adjust in response to structural changes in output during periods of economic transition.). (Saxegaard 2006)

The main conclusion of these studies is that inflation hinders the efficient allocation of resources by distorting

the signalling of price changes and causing various inefficiencies in reducing output. On the contrary, studies focusing on the sample of developing countries have shown a positive relationship between inflation and economic growth. (Ghosh 2008)

Although some authors such (Onaran 2012) argue that inflation can stimulate positively the economies of developing countries by boosting investment and savings.

The most notable performance difference is the much stronger control over the rate of inflation in franc zone countries sustained over long periods. Although loopholes exist through which credit can be rapidly expanded, for example to agricultural marketing boards, the requirement to monitor and report back to the regional central bank has served to restrict long run monetary expansions which have pushed up inflation rates in the rest of Africa. However, inflation has also been suppressed by the accumulation of public sector arrears to the private which amount to several percentage points of G D P in Cote d'lvoire, Benin, Chad and Senegal.

A stable exchange rate system is generally associated with lower inflation as it is the case in the CFA zone.

Scholar's shows that from one side countries using a stable exchange rate system have less money supply while from another perspective these countries enjoy greater monetary credibility and insurance from the currency to which the CFA is linked. According to (Dramani 2012), the countries in Africa with the lowest inflation rate are the countries of the CFA zone.

In other words, it's good to once more recall that the CFA currency is attached to the Euro currency but this attachment is for nothing in the low inflation. Similarly; (Fiodendji 2013) show that membership in the CEMAC and WAEMU respectively is associated with 8 and 10 percentage points lower inflation compared to other low and lower-middle income countries.

(Ndoricimpa 2017) conducts a study on the countries of the CEMAC zone, using a panel model, it shows that monetary policy has expansionary effects on economic activity contrary to fiscal policy thus validating the existence of anti-Keynesian effects in CEMAC zone.

The careful reading of the literature on the relationship: monetary policy - economic growth has allowed us to discover that there are very few studies in this field concerning the CEMAC and WAEMU countries in the light of our readings.

Most of the scholar agreed to say that there is indeed a connection between the inflation rate and economy growth, mostly a lower inflation rate is sign of stability as we can notice all over the CFA zone, then this leads to the question to know of this stability is always a good thing in a very uncertain global economic environment.

2.2 Exchange Rate and economic growth

An exchange rate is defined as the rate at which one currency may be converted into another. Among other things, the exchange rate determines how much the residents of a country pay for imported goods, and services, and how much they receive as payment for exported goods, and services. It can be expressed in nominal or real terms.

All the members' countries of the CFA zone are all under the fixed exchange rate regime which is one of the main characteristic of this monetary zone. (Nubukpo 2002)

However being under a fixed exchange rate regime has a certain numbers of benefits compare to some African countries with float exchange rate.

Hence, (Chudik 2006) maintain that a fixed exchange rate is more suitable to undertake better fiscal policy compare to the countries with floating exchange rate. Most of the CFA zone countries are relying on export of their resources for developing, therefore the fixed exchange rate can limit these countries in their attempts to deal with the rest of the world.

The CFA zone countries are countries with different resources, some are oil exporter other are cocoa and so and so, when it comes to trade then we can observe different reaction of the fixed exchange rate in the different countries of the zone which are directly link with their economic performance.

Indeed,(M.S. 2006) tried to determine the rate of the CFA franc currency in WAEMU and to quantify its impact on competitiveness. They conclude that in many cases, the behaviour of the exchange rate in UEMOA is explained by fluctuations in fundamentals such as terms of trade (TDE), government spending, investment and productivity. In addition, the estimation by the single-equation model gives different results according to WAEMU countries.

In substance, a study of (Couharde C. 2011) assessed the impact of the appreciation of the euro on the CFA franc and the economies of the two zones, including CEMAC and WAEMU. To achieve this he uses the PPA theory on panel data with the single-equation model. It leads to the conclusions that the Franc CFA currency has appreciated by 8% in WAEMU against 7% in CEMAC. These assessments are due in particular to the appreciation of the euro compared to the American dollar and the maintenance of the monetary policy in the two zones.

This result shows clearly that even belonging to the same monetary union with the same fixed exchange rate, the outcomes are not the same in the two areas of the CFA zone.

Based on that it's undeniable to attest the exchange does not impact economic growth the same way within the two zones.

This observation leads to what is called misalignment of the currencies of the CFA zone.

(Banga 2013) estimated the misalignment of the currencies of the CFA zone countries and analysed how their real effective exchange rates converge to their equilibrium level.

To take into account the phenomena of nonlinearities in the real effective exchange rate convergence process, they use a smooth-transition error correction model in a panel. As a result, they find that the appreciation of the real exchange rates of the CFA zone countries.

However, some countries undergo significant overvaluations, this reflects a strong heterogeneity and the absence of a convergence process within the CFA zone. Finally, they show that the convergence process towards fundamentals is characterized by non-linearity depending on whether countries are in under or over-valuation regimes.

3. Materials and Methods

3.1 Variables and Data

The key variables used in this study are Gross Domestic Product (GDP), Inflation (Inf) and Exchange rate (exch.rate). All these variables were transformed into their natural logarithm which a common practice in econometrics to improve linearity the data (Charfeddine 2016) and (Vogelvang 2005).

Table 1. Description of Variables of this Study

Variable	Description	Source
Gross Domestic Product	GDP is a monetary measure of the market value of all good and service produce in a given country over a period of time.	WDI database
Inflation, consumer prices (INF)	INF (lnlinf) is a general increase in prices and fall of the purchasing value of money.	WDI database
Exchange rate	Exchange rate, can be define in finance as the rate at which one currency can be exchange for another. It's also measure the value of a given country currency compare to another currency.	WDI database

World Development Indicators (WDI)

The sample of this study comprises annual data from 14 CFA Zone countries from 1990 – 2017. We retrieved all the data from World Development Indicators database (Group 2019).

Table 2 presents the descriptive statistics of the data. According to Table 2, the standard deviations of the variables are relatively small which implies that the error variances are closer to the mean. Thus, heteroscedasticity is minimized. In addition, the correlation among the regressors are relatively low indicating that multi-collinearity is not a problem in our explanatory variables.

Table 2. Descriptive Statistics

Variable	Mean and Standard deviation					Correlation		
	Obs	Mean	SD	Min	Max	gdp	Inf	Exch.rate
gdp	280	4.4128	7.0329	-36.7000	63.3799	1		
Inf	280	111.4337	22.8770	68.7171	260.8000	-0.1849	1	
Exch.rate	267	99.6211	16.6491	51.7277	139.4470	-0.1229	0.3725	1

Obs. means observation; Std. Dev. means Standard Deviation; Min means Minimum; and Max means Maximum.

3.2 Econometric Model

3.2.1 Panel Vector Autoregressive (panel VAR) Model

This study used the econometric framework of the GMM style panel vector autoregressive (panel VAR) model implemented by (Love 2006) and (zicchino 2006) . This model is found to be appropriate to investigate the topic under investigation because this model allowed us to account for unobserved individual heterogeneity for the entire series via the introduction of fixed effects that improve the coherence and the consistency of the measurement. In addition, the GMM style panel VAR approach has several practical benefits that make it a more suitable technique to investigate macroeconomic dynamics. First, being neutral with regard to a particular theory of growth or development, the statistical model of panel VAR is more based on the contemporary movements of a series than on a particular concept of macroeconomics, which, if not approved, can be distorting (Kireyev 2000). Second, in line with the interdependence realities, the present PVAR model does not make a distinction between endogenous and exogenous variables; instead, all variables are mutually treated as endogenous. Each PVAR variable relies not only on its historical realization but also on other variables, indicating a real simultaneity between the variables and their treatment. Third, panel VAR provides a model for endogenous and exogenous shocks, which are unquestionably the most important sources of macroeconomic dynamics for small open economies. In addition, PVAR is relatively uncomplicated for coherent and efficient estimations for both cases: a single country or a panel composed of different countries. Finally, panel VAR has obvious realistic value as a practical instrument for exploring the mutual impact of the inflation and exchange rate on gdp.

The proposed panel VAR is given by the following formula:

$$Y_{it} = \mu_i + A(L)Y_{it} + \alpha_i + \delta_t + \varepsilon_{it} \quad (1)$$

Where Y_{it} is a vector of the endogenous stationary series[10] $(Exch.rate, Inf, GDP)$ and μ_i represents the matrix of country-specific fixed effect. The subscripts, which are defined as i and t, refer to country and time, respectively. A (L) represents the matrix polynomial in the lag operator with $A(L) = A_1 L^1 + A_2 L^2 + \ldots + A_p L^p$, α_i indicates the vector that determines the specific effects of the country found in this regression.

δ_t Represents the dummy variables for the country's specific time and ε_{it} denotes the residual vector.

The matrix form of the PVAR model can also be rewritten in 3 equations as follows:

$$\Delta \ln gdp_{it} = \mu_{1i} + \sum_{j=1}^{P} \beta_{1j} \Delta \ln gdp_{it-j} + \sum_{j=1}^{P} \phi_{1j} \Delta \ln Inf_{it-j} + \sum_{j=1}^{P} \varphi_{1j} \Delta \ln exch.rate_{it-j} + \alpha_{1i} + \delta_{1t} + \varepsilon_{1it}$$
$$(1.1)$$

$$\Delta \ln inf_{it} = \mu_{2i} + \sum_{j=1}^{P} \beta_{2j} \Delta \ln gdp_{it-j} + \sum_{j=1}^{P} \phi_{2j} \Delta \ln Inf_{it-j} + \sum_{j=1}^{P} \varphi_{2j} \Delta \ln exch.rate + \alpha_{2i} + \delta_{2t} + \varepsilon_{2it}$$
$$(1.2)$$

$$\Delta \ln exch.rate_{it} = \mu_{3i} + \sum_{j=1}^{P} \beta_{3j} \Delta \ln gdp_{it-j} + \sum_{j=1}^{P} \phi_{3j} \Delta \ln Inf_{it-j} + \sum_{j=1}^{P} \varphi_{3j} \Delta \ln exch.rate + \alpha_{3i} + \delta_{3t} + \varepsilon_{3it}$$
$$(1.3)$$

During the estimation process of this model, the Schwarz information criterion (SIC) is used to determine the optimal autoregressive lag-length, <, where < ∈ (1..., p). To surmount the constraints on the parameters because of their violation in practice, fixed effects are incorporated in the specification to allow for individual

heterogeneity in the levels of the entire series. The panel VAR model allows the inclusion of country fixed effects, which accounts for all constant time factors unobserved at the country level. However, the inclusion of country fixed effects causes an estimation challenge, which occurs in any specification that incorporates lags of the dependent variables: the fixed effects are associated with the regressors, and hence, the mean-differencing method frequently applied to remove the fixed effects of countries may generate biased and subjective coefficients. One technique to overcome this challenge is to apply the forward mean-differencing or explicitly 'Helmert procedure' (Arellano 1995), which consequently conserves the orthogonality between transformed and lagged independent variables (zicchino 2006), allowing the lagged independent variables to be used to more consistently estimate the coefficient using the GMM system. Another advantage of the panel VAR model is allowing for common time effects that are included in the regression (1) to capture any global macroeconomic shock that possibly will have an effect on all countries correspondingly. To deal with time effects, we distinguished all variables before inclusion in the model, and these variables correspond to setting dummies in the system. Furthermore, evaluating the effect of orthogonal shocks, describing the impact of the shock of one variable to another variable while keeping all other variables invariant, is the principal advantage of the PVAR approach. This is achieved with the use of the panel impulse response functions (IRFs), which describe the reaction of one variable in response to changes in another variable in the system, since all other shocks are maintained equal to zero. To examine the impulse response functions, we required an estimation of their confidence intervals, which were generated using Monte Carlo simulations with 1000 bootstraps. In addition, we evaluated the variance decomposition, which shows the percentage change in a variable which is explained by the shock to another variable accumulated over time. The variance decomposition shows the magnitude of the total effect. We declare the total accumulated effect over 10 annual periods, but longer horizons (20 periods) provided equivalent results (zicchino 2006)

3.2.2 Unit root test

A key pre-condition for the implementation of the panel VAR model is by establishing stationarity of the variables. Therefore, the study employ unit root tests to establish the stationarity of the variables. The study used the most commonly unit root tests - (Im 2003) et al; Fisher type and Levin-Chu tests to check the stationarity of the series. In addition, these tests are suitable for our dataset because they allow for heterogeneous panels.

Table 3. The results unit roots.

tests	At Level				First Difference		
	Exch.rate	Inf.		GDP	$\triangle$exch.rate	$\triangle$Inf	$\triangle$GDP
LLC	-	-1.6528 (0.0492)	**	-3.2581*** {0.0006}	-	-7.9469*** (0.0000)	-8.3569*** (0.0000)
IPS	-0.8799 (0.1895)	5.8669 (1.0000)		-6.9555 *** (0.0000)	-7.9961 *** (0.0000)	-7.5798 *** (0.0000)	-8.0273*** (0.0000)
ADF	-0.2507 (0.5990)	-2.5860 (0.9951)		-2.1705 ** (0.0166)	-5.6773*** (0.0000)	-12.0179 *** (0.0000)	-9.4151 0.0000

***, **, * indicate significant at 1%, 5% and 10% level respectively. $\triangle$ represents first difference operator

The panel unit roots results in Table 3 show that, GDP is stationarity at the level, while exchange rate and inflation are stationary at first difference. Thus, the unit root roots results shows the panel VAR model can be implemented by estimating panel VAR equations with GDP as a level variable while inflation and exchange rate should be estimated with their first difference.

3.3. Optimal Lag Selection

After satisfying the pre-condition for implementing panel VAR model, the next step is identifying the optimal lag to be used. Following the three sequence selection criteria introduced by (Andrews 2001) - Bayesian information criteria (MBIC), Akaike information criteria (MAIC), and Quinn information criteria (MQIC) optimal lag selecting order, the optimal lag order for the panel VAR model is one (1). This is because, it is at lag on that all the three criteria has the highest figure in absolute terms.

Table 4. Optimal lag

lag	CD	J	J value	MBIC	MAIC	MQIC
1	0.9882	43.7070	0.0222	-98.9395	-10.2930	-46.1778
2	0.9873	29.1565	0.0465	-65.9412	-6.8435	-30.7667
3	0.9730	23.8927	0.0045	-23.6561	5.8927	-6.0689

4. Results and Discussion

4.1. Panel VAR

Based on Eqs. 1.1 - 1.3 and the optimal lag selected, we estimate the first-order lag panel VAR model through GMM style. Table 6 presents the estimated first-order lag of the panel VAR equation

Table 5. Panel Vector Auto regression Estimates

Variable	GDP gr	Inflation	Exchange rate
GDP $(_{t-1})$	0.0049	-0.0143***	0.0067
	(0.0063)	(0.0035)	(0.0185)
Inflation $(_{t-1})$	0.0419*	1.0312***	-0.0436
	(0.0238)	(0.0170)	(0.0269)
Exch.rate $(_{t-1})$	0.1475*	0.0367	0.1261
	(0.0817)	(0.0225)	(0.0616)

***, * indicate significant at 1% and 10% level respectively

Table 6. Granger causality test

	GDP	Inf	Exch.rate
GDP		16.472**	0.131
Inf	3.083*		2.627
Exch.rate	3.264*	2.668	
All	4.526	19.955**	2.651

Notes: ** and * indicate significance at 5% and 10%

Looking at the Granger causality test results, we found:

• A bidirectional causality between inflation and economic growth, with a negative signal in economic growth and positive in inflation. Which means that not only one variable influence the other…but it is also influenced by the other variables within the model.

Ultimately it shows that a change in GDP influence inflation while an increase in inflation can also influence GDPA.

● A unidirectional causality running from economic growth to exchange rate. This result supports the hypothesis of the fixed exchange rate. Which means that a change in exchange rate does not affect the economic growth of the CFA zone countries. The positive sign of this relationship tells us that economic growth is still capable of promoting exchange rate.

Then the result demonstrate clearly an interdependence among these variable, in change in one cause a change in the other.

4.2. Model stability

Since our interest is to establish the reaction of each of the endogenous variables to a shock of exogenous changes in other variables in the panel VAR system, it is appropriate to check the stability condition of the

estimated panel VAR results. As depicted in Fig. 6, the calculated modulus of each eigenvalue of the estimated model is strictly less than one (or lies inside the outer circle). This indicates that the model is stable (Hamilton 1994, Lütkepohl 2005). Therefore, we proceed to estimates IRF and forecast-error variance decomposition.
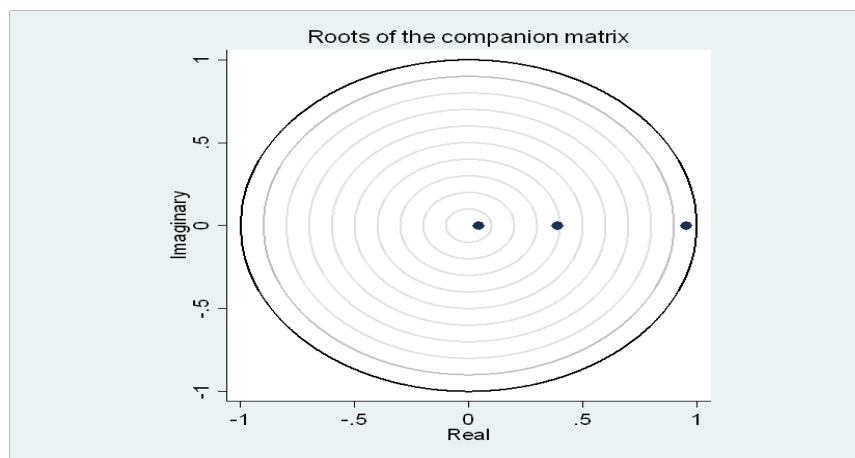

Fig. 1: Model Stability

The 3 variables lies inside the circle indicates that the relevance and significance of the model.

4.3. Impulse Response Function

The impulse response graph shows that GDP react positively to exchange rate in the first few years and become zero in period 4 to 10. Similarly, the result shows that one standard deviation shock in inflation lead to positive response to GDP growth for all the period used in the study with the maximum impacts felt in the first few years.
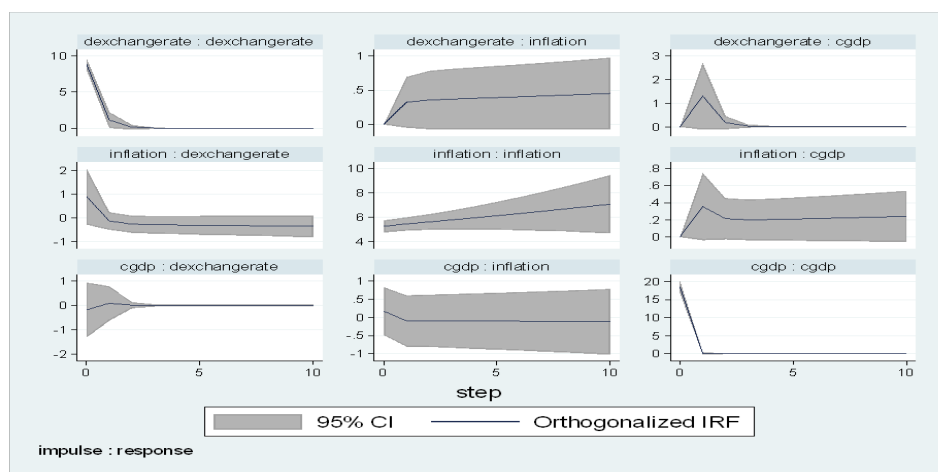

Fig. 2: Impulse response graph

Table 7: Forecast-error variance decomposition

horizon		cgdp	inflation	dexchangerate
cgdp				
	1	1	0	0
	2	0.994689	0.000366	0.004945
	3	0.994459	0.000498	0.005043
	4	0.99434	0.000614	0.005046
	5	0.994221	0.000733	0.005046
	6	0.994095	0.000859	0.005046
	7	0.993962	0.000992	0.005046
	8	0.993822	0.001133	0.005046
	9	0.993673	0.001282	0.005046
	10	0.993515	0.001440	0.005045
inflation				
	1	0.001061	0.998939	0
	2	0.000661	0.997517	0.001822
	3	0.000524	0.996878	0.002597
	4	0.000456	0.996543	0.003001
	5	0.000416	0.996341	0.003243
	6	0.000388	0.996207	0.003405
	7	0.000369	0.996112	0.003519
	8	0.000355	0.99604	0.003605
	9	0.000344	0.995985	0.003671
	10	0.000335	0.995941	0.003724
dexchangera	te			
	1	0.000396	0.010496	0.989108
	2	0.000501	0.010494	0.989005
	3	0.000504	0.011262	0.988234
	4	0.000504	0.012193	0.987303
	5	0.000504	0.013193	0.986303
	6	0.000504	0.014252	0.985244
	7	0.000503	0.015372	0.984125
	8	0.000503	0.016555	0.982943
	9	0.000503	0.017804	0.981694
	10	0.000502	0.019123	0.980375

Regarding GDP, the results show that its forecast error variance is mainly explained by shocks to itself (99.4%

In the second year, 99.3% in the 10th year). Although, we also observe that shocks to exchange rate explain around 0.03% of the forecast error variance in the 10th year, which reinforce the idea that exchange rate is able to impact GDP in the CFA zone franc countries. In other hand shocks in inflation and exchange rate reveal to have small influence on the explanation of the GDP forecast error variance, that is, about 0.3% and 0.5%, respectively at the end of the 10th year. In this case, we can conclude that both inflation and exchange rate do not influence these countries' growth. As in the previous case the forecast error variance of inflation starts for being largely explained by itself around 99% in the first and second years but the impact of this shock loses some of its

strength as we move forward in time. At the 10th year, shocks to inflation and exchange rate explain around 99% and 3%, respectively, of the inflation forecast error variance. This means that changes in inflation levels affect the economic growth in CFA countries. In the same line, we see that exchange rate is also important for the convergence of inflation to equilibrium, meaning that GDP can, in fact, influence inflation in these countries. In an opposite sense the shock to GDP did not shown to be relevant to the explanation of the inflation forecast error variance. Lastly, considering Exchange rate, we see that the shock to gdp explains a great part of the forecast error variance of exchange rate (about 3% in the second year; 5% in the fifth year; and 5% in the 10th year), which indicates that economic growth largely contributes to the value of exchange rate. In addition we notice that a change in inflation explain around 2% of the forecast error variance of exchange rate in the 10th period, meaning that inflation is also able to influence exchange rate.

Given this result, some inferences can be drawn on the Granger causality that runs from inflation and exchange rate that was found at a 10% level of significance. This negative effect can possibly be related to the decrease of inflation and stability of the exchange rate in the CFA zone.

5. Conclusion

The CFA zone countries are engaged in a monetary cooperation with France and must agree to some rules and regulations that constitute the background of the CFA franc operating mechanism.

For years the 14 countries members of this monetary zone have seen for some their economic prosper and others regressing. The choice of our variable for this paper is based on the economic profile of these countries.

Most of the CFA can measure their economic growth with some indicators that are most suitable among many other to reflect the state of their economic performance. Indeed these variable relies not only on its historical realization but also on other variables, indicating a real simultaneity between the variables and their treatment.

Although the outcome of the data analysis reveal that GDP is stationarity at the level but become significant at first difference, while exchange rate and inflation are stationary at first difference.

Also demonstrate that exchange rate and GDP responds positively to inflation, only in the short term.

Although, we also observe that shocks to exchange rate explain around 0.03% of the forecast error variance in the 10th year, which reinforce the idea that exchange rate is able to impact GDP in the CFA zone franc countries. GDP react positively to exchange rate in the first few years before become stable.

Result from the granger causality shown a bidirectional causality between inflation and economic growth, with a negative signal in economic growth and positive in inflation. Which means that not only one variable influence the other…but it is also influenced by the other variables, a unidirectional causality running from economic growth to exchange rate. This result supports the hypothesis of the fixed exchange rate

However Reverse estimation of the variables shows that change in inflation doesn't not impact exchange rate and estimate clearly long run and short run relationship among variables.

To conclude its well to say that theses variables helped to asses clearly the measurement of economic performance in this region, and highlight the fact that the economic performance in the CFA zone are stable but can be much better with appropriate changes in policy and economic diversification in the CFA countries.

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