Does Participation in the CFA Currency Zone Influences the Rate of Inflation Among ECOWAS Countries?

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Introduction

The question of whether monetary unions influence inflation rates with countries remains a subject of debate in the academic literature. Monetary unions like the European Union have been able to use monetary unification to reduce inflation in member countries (Beetsma & Bovenberg, 1998). However, reduction in inflation can only take place given there is good fiscal leadership and benevolent policymakers in place (Beetsma & Bovenberg, 1998). In Western Africa, there has been evidence that countries within the Communauté Financière Africaine (African Financial Community, as known as CFA) tends to be lower than non-member countries in Western African countries (Lohi, 2014).

This paper examines whether, among Economic Community of West African States (ECOWAS) members, participation in the CFA currency zone from 2002 to 2012 significantly influenced the rate of inflation when compared to ECOWAS countries not in the CFA currency zone. This paper aims to update previous analysis to examine if membership in the CFA continued to result in a lower rate of inflation relative to non-CFA members. We want to examine if the CFA zone monetary union causes a negative relationship with inflation.

The remainder of the paper is structured as follows. In the next section, we briefly review the literature on monetary unions, the CFA currency zone, particularly in ECOWAS countries, and inflation. The third section develops the stylized facts and testable hypotheses regarding this relationship. The fourth section reviews the data and empirical strategy. The fifth section discusses the results of our analysis while the last section concludes.

Literature Review

      The purpose of this literature review is to discuss inflation between participating members and non-participating CFA zone ECOWAS members. To discuss inflation within this membership, we must first discuss monetary unions, inflation within monetary unions, and the background of the CFA zone. After reviewing these topics, we can examine differing opinions of inflation concerning the CFA monetary union.

      Monetary unions, also known as currency unions, are areas or partnerships between countries to share one currency (Ng, T. H., 2002; Masson & Pattillo, 2001). Monetary unions imply the full centralization of monetary authority/policy in a single institution, usually with a central bank (Amadou & Initiative, 2016). The European Union is the most notable example of a monetary union between multiple countries. There is a consensus for reasons why countries would choose to participate in a monetary union. Consensus benefits include a reduction in exchange rate fluctuations between member countries and the transaction cost between countries, a lower risk for an economic crisis, and a higher level of economic stability (Coleman, 1999; Ng, 2002; Artis, 2006; Devarajan & Melo, 1987). Therefore, this will lead to countries increasing trade and investment amounts for countries in the union (Ng, 2002). Lastly, monetary unions can help fight inflation within their member countries, particularly in inflation-prone countries (Giavazzi, & Pagano, 1988; Ng, 2002). This last advantage is one we want to investigate with the CFA zone, as the literature on monetary union has predominantly focused on developed countries.

      The advantage of controlling inflation within a monetary union is of interest. Inflation can be described as the decrease of purchasing power of money. An increase in inflation usually causes a fall in the exchange rate, increases in prices, and a decrease in economic stability

(Prasad & Songwe, 2021). The consensus in economics is inflation can be controlled by monetary policy, which introduces the idea that a central bank can control or reduce inflation within a particular area. This idea is enhanced by the consensus that inflation is usually lower in monetary unions than in independent countries (Couharde et al, 2013; Masson et al, 2001; Giavazzi, 1998). Couharde et al (2013) cites that allowing an outside entity to handle monetary policy allows countries to have outside discipline on members of the union. In relation to inflation with the CFA monetary union, we must understand the history of the zone and its similarities to monetary union theory to discuss the unique arguments for the rate of inflation among such countries.

In between the 1930s and the 1940s, the French created currencies for each colony that was pegged to the France franc (Taylor, 2019). After the conclusion of the Second World War, France created the CFA franc for French African colonies, having it pegged to the French franc (later being pegged to euro) (Couharde & Coulibaly & Guerreiro & Mignon 2013; Strong, 2021; Healy, 2003). The reason France installed the currencies was to protect them from devaluation, and for exports between France and its African colonies for post-war rebuilding (Taylor, 2019). In the modern-day, the CFA zone is split up into two zones, being the Central African Economic and Monetary Union (CAEMC), making up of Chad, Cameroon, Central African Republic, Republic of Congo, Equatorial Guinea, and Gabon. The West African Economic and Monetary Union (WAEMU) makes up the second zone, including Benin, Burkina Faso, Ivory Coast, Guinea-Bissau, Mali, Niger, Senegal, and Togo. For the rest of the paper, the CFA zone will only be referencing the ECOWAS (WAEMU) participating members. CFA zone operates much like the conventional monetary union ideal but has some distinct advantages unique to the zone. The consensus for benefits include "…(i) a fixed parity against the euro, adjustable if needed, but

only after consultation with Paris and the unanimous decision of all members within each monetary area; (ii) convertibility of the CFA franc into the euro; (iii) the guaranteeing of such convertibility by France through each regional central bank holding an operating account with the French Treasury in Paris; (iv) free capital mobility between the two CFA zones and France; and (v) the sharing of foreign exchange reserves of each regional monetary area." (Taylor, 2019). France also benefits from the CFA zone, as the currency union provides a post-colonial influence in its CFA countries and maintains the easy access of materials of its colonies (Couharde et al, 2013; Taylor, 2019).

Looking within the CFA zone, some monetary union literature states that in theory, the CFA zone may not provide inflation reduction. Beetsma & Bovenburg (1998) stated that reduction in inflation can only take place given good fiscal leadership and benevolent policymakers in place. Leadership in Africa tends to have issues with the independence of the Central Bank from the government officials (known as CBI) (Strong, 2021; Masson et al, 2001). Thus, many politicians may not share the social inflation objectives as a central bank (Beetsma et al, 1998; Strong, 2021). The literature also states that countries with a lower CBI on average experience higher rates of inflation (Strong, 2021). For central banks to do proper monetary policy, there must be a great deal of independence between the central bank and the policy makers (Masson et al, 2001).

However, literature with empirical evidence has shown that the CFA zone influences a lower inflation rate within ECOWAS participating members than non-participating members (Couharde et al, 2013; Masson et al, 2001; Ajayi, 2005, Ogunkola, 2005). An evaluation of the viability of a single monetary zone in ECOWAS. Yehoue (2007) has also shown from 1960 to 2004 that the inflation in CFA members (including CAEMC CFA zone members) were lower

than non-CFA members of Sub-Saharan Africa. Other empirical findings have provided similar results regarding inflation (Strong, 2021; Masson et al, 2001; Couharde et al, 2013). The literature supports this, stating that a fixed exchange rate to the euro promotes economic stability. Also, there being one central bank for CFA zone members than helps decrease influence of policymakers on the central bank, maintaining a higher CBI (Strong, 2021).

Thus, from theory, we see that previous authors have stated that CFA zone members in the ECOWAS would naturally experience lower inflation rates than non-participating CFA zone members. Empirical evidence from different authors also agrees with theory literature, showing that the inflation in CFA zone members tends to be lower than its non-CFA zone participating members. This paper chooses to re-examine both theory and empirical analysis conclusions on inflation within the membership status within the ECOWAS.

Stylized Facts

The consensus from both theoretical literature and empirical literature states that monetary unions tend to provide a lower rate of inflation for member countries. This also applies to CFA zone members of ECOWAS. However, literature also states that inflation can only be controlled when the policymakers are benevolent (Beetsma et al, 1998). We have interest in seeing whether the CFA zone still maintains theory and empirical analysis conclusions despite Beetsma and Bovenburg's stance.

We observe three main ideas from the literature. First, good leadership from policymakers leads to low inflation within monetary unions. This assumption also implies that inflation cannot be controlled if the leadership is not good. Second, we also see that inflation is controlled by monetary policy from the central bank of a country. Lastly, an increase in inflation

causes a decrease in the exchange rate, an increase in price, and a decrease in economic stability. We want to observe all these theories in action with the CFA zone.

To see if the CFA zone influences a lower inflation rate, we assume that inflation is a function of whether you are a member of the CFA monetary union or not. We also want to add control variables that may influence inflation based on the literature. This includes CBI, exchange rate, GDP growth (economic stability), unemployment, and population. These variables are all considered determinants of inflation. All variables will be used to see if there is an influence on inflation.

The estimated model that will be used is:

$$I_{rate} = B_0 + B_1 CFA + B_2 CBI + B_3 er + B_4 GDP_{growth} + B_5 \mu + B_6 pop + \varepsilon$$

The CFA dummy variable represents whether each country is a member of the CFA zone or not. CBI represents the level of central bank independence a country's central bank has. The *Er* represents the country's exchange rate, while GDP_{growth} represents each country's GDP growth per year. The variable μ represents the unemployment rate of a country. Lastly, *pop* represents the country's population.

The hypothesis we are interested in is whether the CFA zone has an influence on inflation between participating and non-participating members.

$$B_{1=0}$$

$$B_1 \neq 0$$

<u>Data and Methodology</u>

To test the model at hand, we had to collect data from various sources to evaluate the premise of our estimable model; being whether the CFA zone has an influence on inflation rates among ECOWAS member countries. We collected from two main sources; 1) the World Development Indicators from World Bank; 2) Central Bank Independence in the World: A New Dataset by Garriga (2016). The World Bank is an international organization that provides a "unique global partnership: five institutions working for sustainable solutions that reduce poverty and build shared prosperity in developing countries" (World Bank, n.d.). They provide the World Development Indicators dataset, which are various indicators of economic factors of multiple countries. The Central Bank Independence in the World: A New Dataset is a dataset provided by Ana Carolina Garriga. The information provided is a comprehensive dataset on central bank independence between 182 countries from 1970 to 2012.

We will be testing the variables using the Ordinary Least Squares (OLS) model. There is an issue of heteroskedasticity in the data that we are interested in testing for. There is also the issue of missing data, as Gambia was missing a CBI measure for the years 2002 to 2004.

We check for heteroskedasticity by using Breusch-Pagan test. We fail to reject the null heteroskedasticity (provided in Table 1.4). We see that the errors are not heteroskedastic. For the missing data, we assign the Gambia's 2002 to 2004 CBI 0.54939 from 2005's CBI measure.

The main variables of interest are inflation and the CFA zone. Inflation is sourced from the World Bank and the CFA zone is sourced by the author creating a dummy for participating and non-participating members. Other variables that we add include GDP growth, Exchange rate, unemployment, and population from the World Bank. We also add the CBI variable from the Garriga dataset and merge it with the World Bank dataset. Further description of the variables is given in Table 1.1. The descriptive statistics of the dataset collected are provided in Table 1.3.

Results

After running our OLS regression, we gain our results in Table 1.4. Looking at each of the variables, only two tested for significance; population and the CFA zone dummy. Looking at our variable of interest, CFA, we reject the null hypothesis at a 1% level of significance. We see on average holding all else equal, that being in the CFA decreases inflation by 7.610. This result is in line with empirical and theoretical findings on monetary unions and inflation. Looking at the other significant variable, population, we reject the null hypothesis at a 5% level of significance. Holding all else equal, as the population increases by 1 million, inflation also increases by 1.833 percent. Thus, the inference we can make is that there is a positive relationship between population and inflation.

Regarding the rest of the control variables used, we fail to reject the null hypothesis of how each of them influences inflation, while the rest have no significance. One control variable of interest that did not have significance was the CBI variable. Beetsma and Bovenburg's stance of inflation not being reduced when the fiscal policymakers are not benevolent does not hold in the ECOWAS. While the coefficient relationship is in line with the theory that a high CBI will result in a lower inflation rate, there is no empirical proof from the regression to verify that.

Conclusion

      In our paper, we are interested in whether monetary unions, in particular the CFA zone, influence inflation. Both empirical and theoretical literature has a consensus that would suggest the CFA zone would have an inverse effect on inflation. We wanted to replicate the results to see if our findings matched the consensus. We utilized the OLS regression to achieve these results.

      In our analysis, we find the variable of interest, CFA, is significant. We see on average holding all else equal, that being in the CFA has an inverse relationship with inflation. Looking at the other control variables, only one other variable that is determined to be significant is population. The results show that as the population increases, inflation will increase as well.

      The results of the OLS regression were in accordance with previous literature. Most other control variables were in line with theory in terms of sign relationships but have no real significance on inflation. However, the effects of the CFA zone along with population, have a significance on inflation. One suggested policy recommendation to reduce inflation would be to encourage all countries of ECOWAS join as a monetary union. Having a similar monetary policy could help with lowering inflation within ECOWAS member countries.

      In conclusion, we learned the WAEMU CFA zone members of ECOWAS have lower rates of inflation than non-CFA zone members of ECOWAS. This paper does two things; First, it adds a developing country's perspective to the monetary union discussion; second, it validates the discussion of how monetary unions can help control inflation.

Tables

<u>Table 1.1</u>

Variable	Description	Units	Source
Year	Year of observations	Year	World Development Index
CFA	Dummy variable for CFA countries.	Dummy	Author created
inf	Inflation Rate	Percent	World Development Index
GDPGROWTH	GDP Growth per year	Percent	World Development Index
Log(EXCRATE)	Exchange rate	Dollars	World Development Index
UNEMP	Unemployment rate	Percent	World Development Index
Log(POP)	Total Population	Millions	World Development Index
lvaw_garriga	Measure of CBI	Percent	Garriga

Table 1.2

studentized Breusch-Pagan test

data: ols
BP = 5.1036, df = 6, p-value = 0.5306

Table 1.3

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Statistic    N      Mean        St. Dev.       Min    Pctl(25)   Pctl(75)     Max
---------------------------------------------------------------------------------
year         165  2,007.000       3.172       2,002    2,004      2,010      2,012
inf          165      7.897       13.345      -7.594    1.585     10.923    100.608
GDPGROWTH    165      4.498        4.772     -30.145    2.827      6.598     26.417
EXCRATE      165    801.477    1,297.723       0.792   88.748    527.338  6,985.829
UNEMP        165      5.380        2.996       0.320    3.388      7.220     11.710
CFA          165      0.533        0.500           0        0          1          1
POP          165 18,721,188.000 35,140,751.000 442,955 3,891,357 15,514,593 167,228,803
lvaw_garriga 165      0.559        0.135       0.390    0.452      0.626      0.867
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Table 1.4

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                       Dependent variable:
                   ---------------------------
                               inf
-----------------------------------------------
CFA                         -7.610***
                             (2.355)

GDPGROWTH                     0.040
                             (0.213)

log(EXCRATE)                 -0.373
                             (0.625)

UNEMP                         0.117
                             (0.377)

lvaw_garriga                 -0.426
                             (7.489)

log(POP)                      1.833**
                             (0.838)

Constant                    -15.634
                            (15.137)

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Observations                   165
R2                            0.123
Adjusted R2                   0.090
Residual Std. Error    12.733 (df = 158)
F Statistic           3.692*** (df = 6; 158)
===============================================
Note:               *p<0.1; **p<0.05; ***p<0.01
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