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## Does Central Bank Independence have any effect on inflation in Sub-Saharan African Economies?

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### ABSTRACT

This paper aims at assessing the potential effect of central bank independence on inflation in the Sub-Saharan countries. It suggests an extended empirical approach that distinguishes various measures of *de jure* and *de facto* independence. Results based on a panel data model of inflation clearly indicate that greater independence does indeed translate into decreased inflation. More specifically, *de jure* independence tends to matter more than *de facto* independence, and all of the political, legal and economic aspects of independence seem to be equally important. These results could further convince political authorities in the sub-continent about the necessity of less interference with the monetary authorities for the benefit of more stable dynamics of their economy.

**Keywords:** Central Bank Independence, Inflation, Sub-Saharan Africa

### 1. INTRODUCTION

A great deal of advanced economies has implemented, starting in the 1980s, reforms aiming at providing their central banks with greater autonomy in the conduct of the monetary policy. This is for instance the case of New Zealand (1990), France (1994), Italy (1993), or England (1998). The notion of independence as applied to the central bank refers to direct and indirect autonomy of the monetary authorities with respect to political authorities in the design

and implementation of the monetary policy. These institutional reforms occurred in the period of excessive inflation in the 1970s.

A large body of research has tried to explain these relatively high levels of inflation which appeared to be indicative of an ineffectiveness of the monetary policy which main objective is to control inflation in low level. One important line of arguments was that the conduct of the monetary policy was in the hand of political authorities whose agenda may not always be aligned with monetary discipline (Kydland and Prescott, 1977; Barro and Gordon, 1983). For reasons that have more to do with politics, for example at the venue of elections, governments may be tempted to engage in monetary expansion to stimulate the economic activity in the short run, at the expense of a more likely long term inflation. Therefore, countries in which monetary policy is free from such political contingencies in terms of greater central bank independence are more likely to enjoy stable, low inflation. Some success stories along these lines involve the Switzerland's central bank and the former Bundesbank.

Sub-Saharan African (SSA) countries have also embarked into similar institutional reforms, as documented by Arnone et al. (2006) who indicated a significant improvement of central banks independence in these countries in the period of 1980-1993. This general trend towards greater central bank autonomy has been accompanied with various experiences in terms of inflation in SSA. Between 1980 and 1993, the average inflation rate across the region was 16 percent, up from 13.8 percent in the 1970s (Chibber, 1991). The rates were higher in countries such as Ghana with 122.9 percent in 1983 or The Democratic Republic of Congo (former Zaire) with 105.3 percent in 1989. By the end of the 1990s, inflation has started to decline significantly across Sub-Saharan African countries. The regional average was 13.3 percent between 1997 and 2002, ultimately falling to a single digit rate of 7.2 percent in 2007. By juxtaposing both institutional and inflation trends in SSA, it is tempting to attribute part of the decrease in inflation to greater independence of central banks. Going beyond what appears to be a historical correlation, can one reasonably argue that the falling of inflation rates is due to more autonomy to monetary authorities?

This paper sets out to analyze the relationship between central bank independence and inflation in SSA economies. More specifically, it is about to measure the evolution of the degree of independence of central bankers from political authorities on one hand and it impacts on inflation on the other hand. The empirical methodology is based on a panel data model of 25 countries from 1990 to 2010. Three measures of central bank independence are considered. One is a *de facto* measure and is based on the turnover of governors. Two *de jure* measures are also used: one developed by Cukierman et al. (1992) which focuses on the legal aspects of independence; another one constructed by Grilli et al (1991) and which encompasses broader economic and political aspects.

The estimation results clearly indicate that central bank independence matters for the effectiveness of monetary policy in terms of reduced inflation. There is also a clear indication that *de jure* independence is more relevant than *de facto* independence, and the notion of independence needs to be approached in its broader sense by taking account for all of its economic, political, and legal components. Given that the institutional changes have moved the SSA countries half-way towards "full" independence, the results suggest that there is still room for reforming the institutional framework in which central banks operate in the sub-continent.

The remainder of the paper is organized as follows. Section 2 presents the African perspective on central bank independence. Section 3 discusses the empirical literature. Section

4 details the empirical model. Section 5 describes the data. Section 6 discusses the results. Section 7 offers a conclusion and some research perspectives.

## **2. AFRICAN EXPERIENCE OF CENTRAL BANK INDEPENDENCE**

Over the 1980s, some remarkable changes have profoundly modified the institutional framework in which African central banks operate. Some of these changes have to do with the way in which monetary authorities are elected or appointed and the duration of their mandate, while others are related to the legal setting.

### **2. 1. Appointment and mandate of governors**

In SSA, there are two ways in which governors are appointed (Bararuzunza, 2010). The first way, the president or head of the state has the exclusive power to appoint and to dismiss the governor. In some countries, this executive prerogative goes beyond the governor, for the president also appoints and dismisses other members of the whole monetary authority board through a decree. This is the case in almost all the countries in SSA, except those that are in monetary unions. The latter tend to favor the second way to appointing governors which involves in general some concerting among member countries. This is the case in countries that make up the French monetary zone (in West and Central Africa). In the case of the governor of the Central Bank of West African States (or BCEAO), the governor is appointed by the Conference of Heads of States and Governments of the West African Economic and Monetary Union (WAEMU). In principle, he cannot be dismissed any other political authority.

In the Central Africa monetary zone, there were the Fort-Lamy agreements that determined the regional composition of the monetary authority board. The governor had to be a Gabonese national, while the vice-governor was from either Congo or Chad. Cameroon had the privilege to host the headquarters of the Bank of Central African States (or BEAC). This situation was to change during a Summit of Heads of States. Since then, the governorship would have to rotate among member countries, according to an alphabetical order.

Across the sub-continent, there is a wide dispersion of the length of the governor's mandate. In general, it ranges from three to seven years. In French monetary unions, the mandate tends to be longer. This is the case in WAEMU where the mandate of the Central Bank governor, is six years and is renewable. The mandate of the governor of the BEAC is seven years and is non-renewable.

Outside these French monetary zones, governors tend to enjoy a short span in their position. Both the duration of governor's mandate and the appointment mechanisms could inform about the level of political influence on the monetary policy, if any. When governors and their collaborators are appointed by the head of the executive and can be dismissed at any time by him, one can expect the monetary authorities to behave accordingly.

This is particularly the case when they care more about lasting in their posts or being reelected. Monetary policies could be used as an instrument to gain the favor of the political authorities. In French monetary unions, this is less likely to be the case, for the very reason that the political authority tend to be disperse and no single State could dictate a rule to the rest. The more the monetary authorities are protected from the pressure of the political authorities, the more they will tend to produce excellent results in terms of control of inflation.

## **2. 2. Evolution of the central banks legal framework**

During the 1950s and 1960s, central banks in SSA were operating as providers of public services. They were in many ways like public agencies under the authority of the political establishment which had a direct and effective control over their organization and functioning. This discretionary control extends to the definition and use of monetary policy instruments as well as to the policy objectives. For instance, some of the main tasks of the central banks involved the financing of government expenditures and public and external deficits.

Starting from early 1990s, there has been a major shift in the legal architecture of central banks with the prime aim to shield them from any political interference and move them away from government-oriented targets and towards stabilizing the economy (price stability for instance). A great majority of SSA countries have amended the statutory framework of their central banks (see Table A.1 in the annexes). In the case for instance of countries that make up WAEMU, which turn out to be far ahead of the others in the sub-continent, broad reforms have been introduced in January 2003.

The aim was to endow the central banker with greater independence when it comes to the conduct of the monetary policy, the primary objective now being inflation control (Guillaumont, 2006). These reforms have gone such a way to make the central bank comparable to the European Central Bank as far as independence is concerned. In the Central African monetary zone, however, the extent of such reforms is very limited, and the central banker does not enjoy similar independence from the political authorities.

It is noticeable that the statutes of the central banks are guaranteed by laws rather by the constitution. This spells some vulnerabilities of their independence, since such arrangements still offer some levies to the political authorities who can relatively more easily amend these laws than it would have been for the constitution. Only in countries such as Uganda and South Africa has the independence as spelled out in their Statutes been guaranteed by the constitution, respectively in 1993 and 1996. With various levels of success, central banks in Africa seem to be significantly embarked in reforms towards greater independence from the political authorities. These gradual institutional shifts could have the potential to increase the effectiveness of the monetary policy when it comes to stabilizing price dynamics, as suggested in the theoretical and empirical literature.

## **3. EMPIRICAL LITERATURE**

Over the last decade, an increasing number of countries have given their central banks greater independence from governments. This tendency to grant greater independence of central bankers is based on the conclusions of the series of theoretical developments during the 1980s whose starting point is the problem of temporal inconsistency and its application in the monetary policy field (Kydland and Prescott 1977; Barro and Gordon, 1983). The argument is based on the fact that monetary policy left "in the hands of governments" would be ineffective and would result in high levels of inflation. For political reasons, for example, in the run-up to elections, governments may be tempted to pursue a short-term expansionary monetary policy to stimulate economic activity and generate political gains (for example, reelection). The latter generates in the medium or long term an increased inflation. Then countries whose central banks have independence status should experience low inflation rates.

To these theoretical conclusions has followed by a large number of empirical works aimed at apprehending this concept of independence of the central bank by using a number of various indicators in order to be able to appreciate its impact on inflation. These different indicators can be classified as *de jure* and *de facto* indicators. The *de jure* indicator is based on the interpretation of legal text of the central bank and the *de facto* indicator attempts to grasp the effective independence of a central bank as translated into reality. Early empirical works in developed countries has revealed a significant negative effect of the degree of independence of central bankers on inflation based on *de jure* indicators (Grilli et al. 1991, Cukierman et al. 1992, Neyapti, 2003; Diana and Sidiropoulos, 2003; Down, 2004).

However, empirical studies in developing countries show mixed results. Some authors point out that in developing countries the independence measured by *de jure* indicators does not seem to play a significant role in inflation (Barro 1995, Campillo and Miron 1997, Mangano 1998). Other authors come to a conclusion that the independence measured by the *de facto* indicators makes it possible to obtain convincing results in terms of controlling inflation. This suggests that *de jure* indicators are more reliable for measuring the degree of autonomy of monetary authorities for developed countries. However, recent studies, based on an update of the *de jure* independence indicators taking into account the latest amendments to central bank legal texts, has established a negative relationship between the degree to which a central bank is autonomous and inflation in developing economies (, De Haan and Sturm 2001, Jacom and Vazquez 2005, Brum 2006, De Haan and Klomp 2010).

Empirical studies in the particular context of SSA countries exist in a limited number (Presnak, 1996), Fouda (1998), Wessels (2006), Kasseeah et al (2012). They cover a small sample of countries in generally very short periods of study. Fouda (1998) and Kasseeah et al (2012), using turnover as an index of independence for sub-Saharan African countries, find a positive relationship between this indicator and inflation respectively in a sample of 10 and 20 countries. Wessels (2006) limits itself to classifying central banks according to their degree of *de jure* autonomy, while Presnak (1996) concludes that independence has no effect on inflation.

#### 4. METHODOLOGY

The empirical approach consists of two parts. First, we consider various measures of central bank independence. Second, a regression model is developed to analyze the extent to which the degree of independence could translate into lower inflation. Two series of measures are considered which capture two broad approaches of central bank independence: *de jure* indices developed by Cukierman (1992) and Grilli et al. (1991), and *de facto* indices. Most of the studies in the SSA context tend to favor the latter measure, which is simply the turnover of governor. A high frequency is viewed as an indication of low level of independence. While this measure could tell how far various reforms have gone to actually endow monetary authorities, it does not tell about the reforms themselves.

This is similar in the trade-growth literature to measuring openness by looking at the ratio of trade volume to GDP (*de facto* measure) instead of trade restrictiveness based on actual protectionist policies (an equivalent to *de jure* measure). In this analysis, both measures will be used to tell about the extent of the institutional reforms as well as their effectiveness.

The specification of the model is as follows (following De Hann and Sturn, 2001):

$$Y_{it} = \beta_0 + \beta_1 \text{turnover index}_{it} + \beta_2 \text{GMT index}_{it} + \beta_3 \text{CUK index}_{it} + \sum_{k=4}^K \beta_k X_{k,it} + \varepsilon_{it}$$

$Y_{it}$  is a measure of inflation, namely  $Y_{it} = \frac{\pi_{it}}{\pi_{it} + 1}$  with  $\pi$  the inflation rate measured by consumer price index.

The ratio addresses issues associated with extreme values (Cukierman et al., 1992). The Turnover index measures the number of central bank governors over a given time period. A value of 0 (no renewal over the considered period) is an indication of greater autonomy of the monetary authority. This index indicates the *de facto* independence. Then there is the *de jure* measure developed by Grilli, Masciandaro and Tabellini (1991) or  $\text{GMT}_{it}$ . It encompasses broad political and economic aspects of independence. Finally, there is another *de jure* measure which focuses more on legal aspects and was developed by Cukierman et al. (1992), that is,  $\text{CUK}_{it}$ . These measures can be found in Arnone et al. (2008) and in De Haan et Klomp (2010).

X represents the control variables included in the model as in the literature review. They are: Debt\_GDP ratio Fixed\_Exchange\_Regime GDP per capital (US\$) and Openness.

## 5. DATA ANALYSIS

Overall there has been an improvement in the price trajectory over the past two decades. There has been across the sub-continent a noticeable transition from episodes of two- to three-digit figure inflation rates in the 1990s to one-digit inflation rate for most part of the 2000. Another sign of improvement is a reduced volatility of the price dynamics. For instance, the standard deviation has gone from 299.0 to 12.3.

**Table 1.** Summary statistics.

Years	1990	2000	2010
Inflation	24.7	41.6	9.5
Turnover index	0.25	0.11	0.06
GMT index	0.47	0.47	0.50
Cukierman index	0.43	0.47	0.50
Debt_GDP ratio	109.8	124.4	45.3
Fixed_Exchange_Regime	8.0	8.0	8.0
GDP per capita (US\$)	127813.1	124325.6	161592.0
Openness	54.8	66.3	71.5

Source: Author calculation

This performance happened to coincide with greater autonomy of central banks, as indicated by the measures of independence. For instance, the declining turnover rates suggest that central bank governors have enjoyed longer time in their post. Such an actual improvement is the manifestation of institutional reforms that are captured by the *de jure* measures. They both indicate greater economic, political, and legal independence. But given that the average country is halfway towards "full" independence, they are still room to further improve the institutional framework in which monetary authorities do operate, provided that there are indeed significant returns in terms of greater effectiveness of monetary policies.

These two positive trends towards more stable price dynamics and greater independence have occurred in a context of improved macroeconomic performance. Economic growth has been relatively remarkable in the 2000s, making the sub-continent the second fastest growing region in the world, after a quite dismal growth profile in the 1990. Countries are more and more opened to international trade, as shown by a steady rise in the trade-to-GDP ratio. While this may have favored economic in the continent, it has also undoubtedly come with greater uncertainty and exposure to foreign shocks, such as the price hike in 2008 which reversed the declining trend started in 2000 when the rate was 41.6 percent. Average inflation rate went from 7.9 percent in 2007 to 13.3 percent in 2008, and then to 37.1 percent in 2009.

It eventually fell to 9.6 percent in 2010. While it could well be the case that these institutional reforms towards greater independence, as hypothesized above, have played a significant role in the effectiveness of the monetary policies in stabilizing the price dynamics, other parallel events could contribute to blur the strength of such a relationship. A formal empirical analysis in the form of a rigorous regression analysis could help clearly separate the contribution of each factor in explaining the inflation profile of the sub- continent.

## 6. RESULTS AND DISCUSSIONS

A series of tests regarding the specification of the effects point to the superiority of the random- effect GLS estimation. In addition, a relatively high degree of correlation between the measures of independence (especially between CUK and GMT: 0.65) suggests that such variables have to be included in the regression one at a time. The estimation results are shown in Table 2.

**Table 2.** Estimation Results.

<b>Variable</b>	<b>I</b>	<b>II</b>	<b>III</b>
Turnover index	-0.077 (0.05)		
CUK index		-0.202 (0.17)	
GMT index			-0.342 (0.01) ***
OPEN	0.058** (0.02)	0.055** (0.02)	0.050** (0.02)

LogGDP	-0.014** (0.01)	-0.013** (0.01)	-0.012 (0.01)
FIX EXHG	-0.097** (0.03)	-0.081** (0.03)	-0.047 (0.04)
DEBT/GDP	0.032* (0.01)	0.024 (0.01)	0.031** (0.02)
Constant	0.930 (0.07)	1.014 (0.11)	1.085 (0.09)
N	24	20	22
N*T	467	388	430
R2	0.59	0.70	0.73
Prob>F	0.00	0.00	0.00

Notes: The dependent variable is inflation. The standard errors are between parentheses, and significance at 1, 5, and 10% are indicated by \*\*\*, \*\*, and \*, respectively.

When it comes to analyze the effect of central bank independence on inflation, only GMT appears to have a significant effect: greater independence, materialized by the increase in the index, is translated into lower inflation. The other measures have also a negative impact, but they are not associated with a significant reduction in the inflation rate. These results indicate two important points. First, independence has to be driven by political, economic, and legal reforms to lead to real effectiveness of the monetary policy, rather than just some observed turnover of the governors. In fact, it could well be the case that a loyal governor may try to win the favor of the government, and last relatively longer in the post. The corresponding low turnover rate would be associated with greater independence, which in reality may not be the case if one were to look at the underlying legal and political framework.

Furthermore, as indicated by the results when comparing both *de jure* measures, the notion of independence needs to be approached in its broad sense. The GMT measure encompasses many more aspects of the institutional framework in which a central bank operates than the CUK measure. While the latter focuses solely on the legal side, the former includes political and economic elements, and is therefore more able to reveal the true extent of central bank independence. This result is very much in line with the empirical literature (see for instance Campillo and Miro, 1996; Barro, 1995).

As far as the control variables are concerned, their overall effects are as one would expect. Openness is synonymous to more exposure to foreign shocks, especially those that pass through price. More opened economies are therefore more prone to higher inflation than their counterparts.

More mature economies (higher GDP per capita) tends to do better jobs in controlling prices than poorer countries, which domestic supply of goods and services tend to be more vulnerable to both domestic and foreign shocks. Countries with fixed exchange rate regime enjoy lower price inflation than their counterparts. They include countries that form monetary unions, such as those in the WAEMU grouping. They tend to be less aspect by price volatility and uncertainty associated with flexible exchange rates.

Finally, more borrowing tends to translate into higher inflation, especially when the resulting increase in the demand is not accompanied by private and public capital accumulation that would increase the production capacity of the economy. The corresponding deepening gap between domestic demand and supply and the greater exposure to potential foreign are all ingredients to increased domestic inflation rates.

## **7. CONCLUSION**

The paper asked whether the improved macroeconomic environment in the recent decades in Sub-Sahara Africa in term of inflation control have to do with the institutional reforms trend aiming at providing greater autonomy to central banks. The results indicate that greater independence of the central banks has been translated into low level of price dynamics. They also suggest that the measure of the concept of independence does matter. In particular, *de jure* measures tend to matter most than *de facto* measures of independence. It means that all economic, political, and legal aspects should be factored in when envisioning reforms towards greater autonomy of monetary authorities and a more stable macroeconomic environment. For further research, it can be consider to explore mechanisms in which the degree of the central banks affect inflation. In other term, is there any indirect effect of central bank independence on inflation control?

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## **Annexes**

### **A.1. Reforms of the central bank statutory framework in Sub-Saharan Africa.**

Central Bank	Promulgation date	Latest Revision
National Bank of Angola	1975	1997
Bank of Botswana	1975	1996
National Bank of Ethiopia	1963	2008
Bank of Ghana	1957	2002
Central Bank of Kenya	1966	1997
Reserve Bank of Malawi	1964	2002
Banque Centrale de Mauritanie	1973	1994
Central Bank of Nigeria	1958	2007
Banque Nationale de Rwanda	1964	1997
Reserve Bank of South Africa	1960	2002
Bank of Sudan	1960	2002
Bank of Tanzania	1965	2006
Bank of Uganda	1966	1993
Reserve Bank of Zimbabwe	1956	2001
Bank of Zambia	1985	1996
Banque Centrale des Etats de l'Afrique de l'Ouest	1962	2010
Banque des Etats de l'Afrique Centrale	1972	

Source: Arnone et al. (2006, 2008).