

Central Bank Independence, Inflation, and Poverty in Africa

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Agyapomaa Gyeke-Dako¹,
Elikplimi Komla Agbloyor¹,
Abel Mawuko Agoba² ,
Festus Turkson³ and Emmanuel Abbey³

Abstract

This article discusses the extent to which central bank independence (CBI) can be used to mitigate the regressive nature of inflation. Using 44 Sub-Saharan African (SSA) countries from the period 1970–2012, the article first examines whether CBI has any influence on inflation by distinguishing between legal independence and governor turnover rates. The evidence shows that CBI helps control inflation, and that inflation generally reduces poverty, and this effect is even stronger, in an environment of low CBI.

Keywords

Central bank independence, inflation, poverty, Africa

JEL Codes: E02, E58, E31, I32

1. Introduction

This study examines the extent to which central bank independence (CBI) can be used to mitigate the regressive nature of inflation in

¹ Department of Finance, University of Ghana, Accra, Ghana

² University of Professional Studies, Accra, Ghana

³ Department of Economics, University of Ghana, Accra, Ghana

Corresponding author:

Elikplimi Komla Agbloyor, Department of Finance, University of Ghana, P.O. Box 2305, Accra, Ghana.

E-mail: prince.abel.agoba@gmail.com

Sub-Saharan African (SSA) countries. This study is particularly important because inflation has significantly impacted many African countries, with recently documented rates as high as 150.3% in Sudan and 557.2% in Zimbabwe (IMF, 2021).

The negative impact of inflation in Africa is reflected in the high cost of borrowing (Agoba et al., 2020b; Ikeda, 2021), high cost of living (Breinlich et al., 2017), and high levels of poverty (Meo et al., 2018). Many scholars have found that high inflation negatively affects poverty. For example, Meo et al. (2018) found a significant positive effect of inflation on poverty and unemployment in Pakistan. Yolanda (2017) also established that inflation had a significant impact on the human development index and poverty. However, Cutler et al. (1991) propose a contrary view, which suggests that inflation is a panacea for poverty in Africa. They argue that inflation reduces real wages, which, in turn, can create more jobs and other income-earning opportunities for workers. In less developed countries, where unemployment rates and poverty rates are high, this outcome is particularly important. Regardless of the nature of the relationship between inflation and poverty, a central bank that strictly prioritizes price stability (an independent central bank) and having no direct responsibility for employment or output will influence this relationship.

Theoretically, an independent central bank is thought to promote transparency and accountability, curb the dynamic inconsistency problem, and lower inflationary pressures. Independent central banks also could minimize fiscal deficits (Agoba et al., 2019; Bodea & Hicks, 2015) and reduce poverty by restricting lending to governments and increasing interest rates. Although these characteristics can ultimately help the economy, they also can further burden an already stressed economy and heighten poverty levels. Consequently, the cost of having an independent central bank may be high in locations like African countries that are already struggling with high unemployment and poverty levels. There are a few studies that have examined the relationship between CBI and inflation in Africa (see Agoba et al., 2019; Kasseeah, 2011; Presnak, 2005). However, none of these studies examined the impact of this relationship on poverty. The main objective of the current study is to address this gap by specifically examining, for the first time, the relationship between inflation, CBI, and poverty in Africa. To carry out this objective, the current study includes two forms of CBI: *de facto* (central bank president turnover) and *de jure* (legal). *De jure* CBI focuses on indices obtained from legal provisions that describe the extent to which a central bank is independent of political control. These provisions are usually found in central bank charters. *De facto* CBI focuses on how often central bank presidents are changed (also known as the

turnover rates of central bank governors). Distinguishing between these two measures is relevant because, although the law may prevent the ruling government from terminating the appointment of the central bank governor, the ruling government can put pressure on the incumbent governor to resign. Thus, *de facto* independence may be able to better capture the relationship between inflation and poverty.

This study concentrates on SSA countries for several reasons. First, despite improvements in reducing poverty, SSA and other developing countries still lag behind developed countries concerning the poverty gap, which measures the mean shortfall in consumption or income from a poverty rate of US \$3.20 per day (counting the non-poor as having zero shortfalls), stated as a proportion of the poverty rate (see Table 1). In Table 1, it is evident that among the three country groupings, poverty is highest in SSA, followed by the other developing countries. Thus, examining macroeconomic policies that are geared toward reducing poverty in Africa is of great importance. Second, the average inflation in Africa compared to developed countries is highly volatile and remains above that of developed countries and the world average; therefore, the findings of this study may help provide recommendations on how African countries can tackle the effects of inflation. In addition, most African countries' central banks are not independent compared to developed countries where CBI is well established (Figures 2 and 3). Figures 2 and 3 further show that while in the statutes (*de jure* CBI), the gap between African countries and developed countries seems very narrow; however, in practice, developed countries seem very much ahead of African countries and other developing countries in terms of CBI. Thus, if *de facto* CBI is not very prevalent in African countries, then, in principle, the moderating effect of CBI on the relationship between inflation and poverty in African countries may not necessarily be observed even if *de jure* CBI is apparent. Hence, this study examines the need for having both *de facto* and *de jure* CBI.

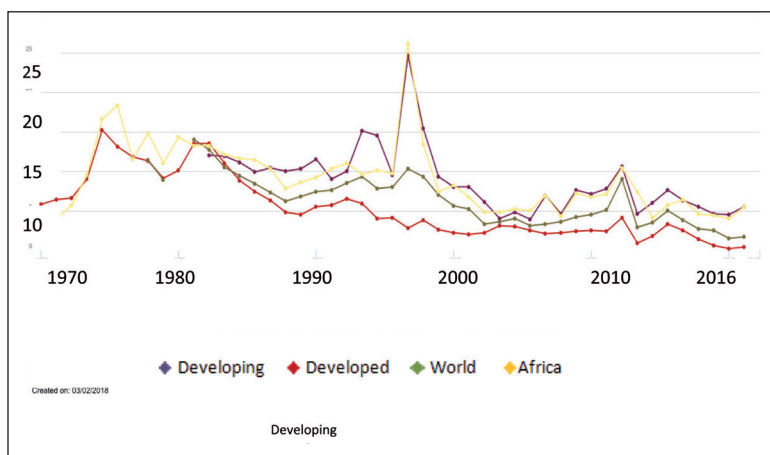
The findings of this study confirm our hypothesis that dependent central banks in SSA would minimize the impact of inflation on poverty, as governments control spending in a bid to boost employment and output; therefore, minimizing poverty rates. This contradicts the theoretical argument that having independent central banks is the only way to minimize inflationary pressure and increase income levels.

The remainder of this article is organized as follows: the relevant literature is reviewed in Section 2, the methodology is discussed in Section 3, the analysis and results are presented in Section 4, and conclusions are provided in Section 5.

Table I. Poverty Rates in Sub-Saharan Africa, Other Developing, and Developed Countries 1990–2018

Country Grouping	Poverty Measure/Year	1990	2000	2005	2010	2018
Other developing	Poverty gap at US \$1.90 a day (2011 PPP) (%)	49.8	24.5	25.1	12	10.1
Other developing	Poverty headcount ratio at US \$3.20 a day (2011 PPP) (% of population)	37.5	20.1	20.8	11.1	10.8
Developed	Poverty gap at \$1.90 a day (2011 PPP) (%)	0.6	0.5	48.1	0.6	0.2
Developed	Poverty headcount ratio at \$3.20 a day (2011 PPP) (% of population)	0.5	0.5	0.3	0.6	0.2
Sub-Saharan Africa	Poverty gap at \$1.90 a day (2011 PPP) (%)	71.1	43	64	67.1	67.1
Sub-Saharan Africa	Poverty headcount ratio at \$3.20 a day (2011 PPP) (% of population)	50.8	35.1	48.2	49.6	49.6

Source: The authors.

**Figure I.** Inflation Rate from 1970 to 2017

Source: World Development Indicators (2018).

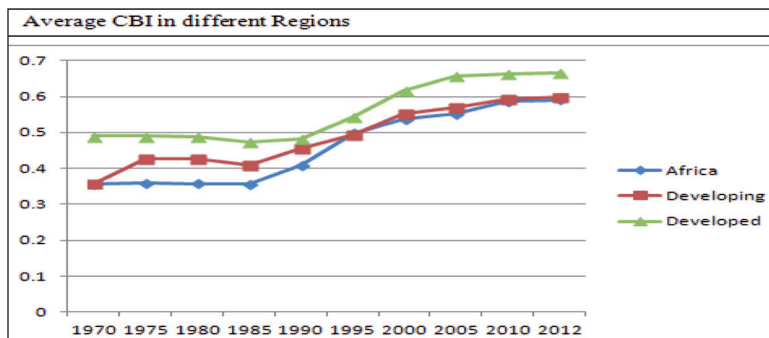


Figure 2. Averages of De Jure CBI in Africa, Other Developing and Developed Countries

Source: Garriga (2016) (CBI Index).

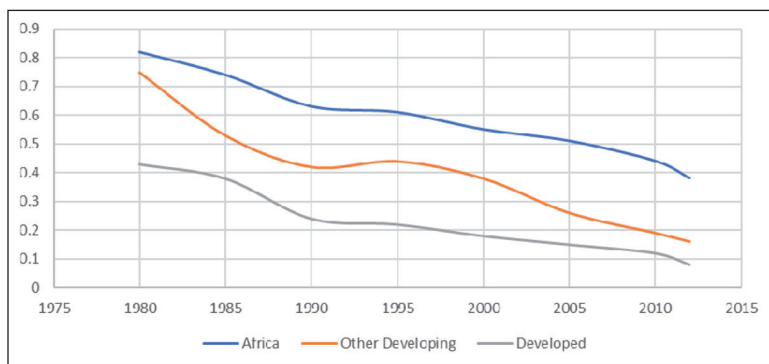


Figure 3. Annualised 5 Year Average Central Bank Governor Turnover Rate 1980–2015

Source: Garriga (2016) (CBI Index).

2. Literature Review

2.1 Central Bank Independence and Inflation

According to Agoba et al. (2017), the impact of inflation on society and governments is significant. This is because persistent inflation leads to a distortion in the distribution of income and uncertainty in the development and implementation of business and economic decisions. In addition, inflation lowers businesses' investments, outputs, and profits (Agoba et al., 2017). As a result, tax revenues dwindle and fiscal deficits

widen. Further, money balance values diminish with high inflation, thus resulting in lower real balances being held in the economy. Thus, ensuring price stability is key for many governments, and one such mechanism is through the promotion of independent central banks.

Theoretical arguments backing CBI are anchored by its ability to counter inflationary biases present in the absence of an independent central bank (De Hann et al., 2018). The first reason for this is widely ascribed to political pressures where the central bank would boost output in the short term to increase chances of an electoral victory for the government in power, even though this may come at longer-term costs (Drazen, 2002). The second is hinged on the tendency of politicians to leverage the central bank's power for issuing currency to finance the government's expenditures. The third reason is ascribed to what is termed, "Time Inconsistency due to the Problem of Monetary Policymaking," which means that monetary policymakers are not credible, and cannot be trusted to abide by agreed upon inflation targets (Kydland & Prescott, 1977; Rogoff, 1985).

As a result of these theoretical arguments, there have been widespread reformations of central banks worldwide to make them more independent (Klomp & De Haan, 2010). The credibility granted to central banks by monetary policy can be viewed as independent central banks have the independence to choose policy goals and/or instruments to achieve these goals. Further, the appointment/dismissal of central bank governors is largely insulated from political authorities. In addition, there are limits on central banks financing of governments, which is necessary to limit money supply and control inflation. Empirically, there was a negative correlation for the CBI–inflation relationship, that is, higher levels of CBI led to lower inflation. This was particularly true in developed countries (Alesina & Summers, 1993; Cukierman et al., 1992). However, Hillman (1999) found that CBI had the opposite effect on inflation, while others, such as Alesina and Summers (1993) and Campillo and Miron (1997), found no statistically significant impact of CBI on inflation. Some studies also have found no impact of CBI on inflation in developing countries using *de jure* CBI measures (Cukierman et al., 1992). This is potentially a consequence of political authorities' tendency to disregard CBI provisions in their charters. Given this situation, there is a wide disparity between *de jure* CBI and *de facto* CBI.

According to evidence from more recent studies, such as Crowe and Meade (2008), Jácome and Vázquez (2008), Klomp and De Haan (2010), and Arnone and Romelli (2013), the CBI–inflation relationship is ambiguous. In fact, some studies indicate that price stability is achieved by countries preceding the reformation of their central banks (Siklos, 2008). Hielscher and Markwardt (2012) call for a limit on the degree of

independence of central banks based on the discovery of a non-linear relationship between CBI and inflation. The promotion of CBI in Africa is largely propelled by the Economic Community of West African States (ECOWAS), the African Monetary Union (AMU), and the South African Development Community (SADC). However, this has not achieved the desired results. For example, many African countries are unable to meet the goals for convergence of ECO (the proposed currency of the ECOWAS region), including single-digit inflation (Agoba et al., 2019). Empirical studies on the CBI–inflation relationship in Africa are scant and report ambiguous relationships (Agoba et al., 2017; Neyapti, 2012; Strong, 2021). In a study by Presnak (2005), using data from 1960 to 1989, on the relationship between *de jure* and *de facto* CBI, and inflation in less than a dozen African countries, there was no statistically significant impact of *de facto* CBI on inflation. This is contradictory to established previous findings that *de facto* CBI had a significant impact on inflation in developing countries. Kasseeah (2011) invalidated the results of Presnak (2005), using two proxies for CBI: (turnover rate of central bank presidents) TOR and the relative size of the government budget deficit, using data from 20 African countries over the period of 1988–2007. Studies by Bodea and Hicks (2015) and Agoba et al. (2017) identified the conditions under which CBI would be effective for achieving price stability in Africa. Bodea and Hicks (2015) identified press freedom as the necessary condition, while Agoba et al. (2017) identified financial development and institutional quality as the necessary conditions to make CBI more effective. The current study expands on these by examining the impact of the relationship between CBI and inflation on poverty, which is theoretically a consequence of high inflation levels.

2.2 *Inflation and Poverty*

Poverty can be defined in terms of absolute poverty and relative poverty. A unified definition of absolute poverty, based on the United Nations (1995), has been embraced by every country in the world. The United Nations (1995) posits that absolute poverty is a state associated with a severe lack of basic human essentials, including food, drinking water, education, health, information, shelter, and sanitation facilities. Thus, absolute poverty hinges on inadequate access to services and income. In monetary terms, it is when an individual depends on less than US\$1.90 per day (World Bank, 2012). However, relative poverty is described as a condition in which a person does not have the minimum wage that allows him/her to have an essential standard of living in his/her society (Lipton & Ravallion, 1995). Despite the difference in the description of absolute

and relative poverty, policymakers around the world agree that poverty has an unfavorable influence on economic development. Thus, poverty alleviation remains a key issue globally and an important constituent of the sustainable development goals (SDGs). This is because it restricts people's access to the essentials of life, such as shelter, clothing, and food. It denies individuals in poverty the basic rights to act and make life choices, makes them more prone to exploitation by the state and society, and gives them less political control and influence in decision-making processes that have a direct effect on their lives.

In addition, poverty leads to increased exposure to economic shocks, such as an unprecedented rise in inflation. The main argument here is that because the poor spend a significant proportion of their wages on life essentials, increased food prices will lead to lower aggregate demand for other goods. Another argument raised is that unlike the rich, who have enough resources and are able to divert their resources into investments in products, such as gold and other interest-bearing assets during periods of high inflation, the poor are unable to do so with the limited resources they possess. Moreover, other major benefits, such as unemployment benefits, which the poor are entitled to, are not indexed to inflation, making inflation a worse outcome for the poor.

Accordingly, inflation is described as the "cruellest tax" in poor households. The empirical findings of Braumann (2004), Cardoso (1992), Chaudhry and Chaudhry (2008), Powers (1995), and Ravallion (1998) support the view that inflation adversely affects poverty. Although these findings support the perspective that inflation worsens poverty, the UN Report on the World Social Situation 2010, "Rethinking Poverty," poses that if inflation decreases real incomes, then employment should increase, producing more wage-earning prospects for laborers. Hence, the effect of inflation on employment (yielding more employment because of lower labor costs) can be greater than the real income effect (lower wages) on poverty. This is expected to be the situation when the real income (inflation) elasticity of poverty is established to be considerably lower than the employment (output) elasticity of poverty (United Nations, 2010). While Cutler et al. (1991) revealed that a rise in inflation caused poverty levels to decline in the United States, Romer and Romer (1998) concluded that inflation had a positive effect on poverty.

African countries currently operate with high poverty rates, so that, fiscal dominance threatens the balance of power between the fiscal and monetary authorities as countries strive for more output and income with the goal of eradicating poverty. However, independent central banks will not entertain measures to benefit the poor; therefore, the current study posits that a high CBI will worsen the impact of inflation on poverty.

While a few studies have examined the relationship between inflation and poverty, and inflation and CBI, none have examined the role that CBI plays in the relationship between inflation and poverty. This study fills this gap and examines how CBI contributes to the progressive role of inflation.

3. Data and Estimation

3.1 Data

To examine the relationship between inflation and poverty, and the influence of CBI on this relationship, this study employs panel data from 1970 to 2012 on 44 SSA countries. The choice of countries and period of study was determined by data accessibility as CBI data are restricted to 1970–2012 for all 44 SSA countries included in this study.

3.2 Model and Estimation techniques

3.2.1 Model

First, the study assesses the link between CBI and inflation to justify the use of CBI as a moderator for inflation and poverty. The theoretical basis for the link between inflation and CBI is modelled as:

$$\begin{aligned} \text{Inflation}_{it} = & \beta_0 + \beta_1 \text{Inflation}_{it-1} + \beta_2 \text{CBI}_{it} + \\ & \beta_3 \text{Interest Rate}_{it} + \beta_4 \text{Broad Money Supply}_{it} + \\ & + \beta_5 \text{Unemployment}_{it} + \beta_6 \text{GDP Per Capita}_{it} + \varepsilon_{it} \end{aligned} \quad (1)$$

To examine the influence of the interaction between inflation and CBI on poverty, the models of Kelbore (2015) and Kraay (2006) were adapted for the current study. We assess the effects of inflation on poverty in the presence of CBI by introducing an interaction between inflation and CBI.

$$\begin{aligned} \text{POV}_{it} = & \beta_1 \text{POV}_{it-1} + \beta_2 \text{CBI}_{it} + \beta_3 \text{Inflations}_{it} + \\ & \beta_4 (\text{Inflations} * \text{CBI})_{it} + \beta_5 \text{Agriculture}_{it} + \\ & \beta_6 \text{GDP Per Capita}_{it} + \beta_7 \text{Interest Rate}_{it} \\ & + \beta_8 \text{Trade Openness}_{it} + \beta_9 \text{CFA} * \text{CBI} \\ & + \beta_{10} \text{Unemployment}_{it} + \varepsilon_{it} \end{aligned} \quad (2)$$

To properly interpret the interaction terms, the effect of a change in inflation on poverty is given by:

$$\frac{\partial \text{POV}}{\partial \text{Inflation}_{it}} = \beta_3 + \beta_3 \text{CBI}_{it} + \beta_4 \text{CBI}_{it} \quad (3)$$

Poverty (POV) is measured using the poverty gap. A poverty gap of US\$3.20 per day (2011 purchasing power parity [PPP]) is the average shortfall in consumption or income from the poverty rate, including the non-poor as having zero shortfalls, represented as a proportion of the poverty rate. We also use a poverty gap at US\$1.90 to check for consistency in our results. This measure reflects the depth of poverty and its incidence. Poverty data were obtained from the World Bank. Lower levels represent lower poverty.

We add the first lag of the poverty gap to the model. This is to address the idea that the previous year's poverty levels influence current poverty levels.

We include inflation measured by CBI, which is sourced from the World Bank. Studies on the impact of inflation on poverty argue that inflation increases poverty in two ways. First, inflation tax can decrease disposable real income. Second, if nominal wages rise less than the price of goods consumed by wage earners, the real income of workers decreases (Erosa & Ventura, 2002, Fujii, 2013; Meo et al., 2018). Cardoso (1992) found that poor people in Latin America were affected by inflation through inflation tax, but the effect was not statistically significant. Although some argue that inflation negatively affects poverty, there are opposing viewpoints. According to the UN Report on the World Social Situation 2010, if inflation decreases real incomes, then employment should increase, producing more wage-earning prospects for labor. Hence, the employment effect of inflation (yielding more employment because of lower labor costs) can be more than the real income effect (lower wages) on poverty. Moreover, the majority of the poor are net debtors, and inflation decreases the real value of their debt. In such a situation, inflation may have a beneficial impact on poverty. Consequently, the influence of inflation is not clear-cut as findings demonstrate that poverty may be positively or negatively associated with inflation.

CBI is measured in two ways: *de jure* CBI, an index of legal CBI based on Garriga (2016), and *de facto* CBI, which is the rate of turnover for the central bank governor. The index of legal CBI (used to proxy *de jure* CBI) computes an updated Cukierman, Webb, and Neyapti (CWN) index for several countries using the database on Central Bank Law from the International Monetary Fund. The index of legal CBI is constructed on a weighted summation of 16 legal indicators in four groups relating to the central bank governor's tenure in office, formation of policy,

limitations on lending to the government, and employment of weights and criteria used by the CWN index. A central bank is very independent legally when the governor's tenure in office is longer, the appointment and removal processes are more separated from the government, the development of monetary policy is solely the authority of the central bank, the obligation is more directed at price stability, and the provisions on direct central bank lending are limiting. The index ranges from 0 to 1, with higher values indicating greater CBI. We also measured *de facto* CBI, as defined by Garriga (2016). Higher turnover rates of the central bank governor indicate lower CBI.

According to the theory, the effect of the interest rate on inflation is inconclusive. A rising interest rate increases the cost of capital for borrowers (Branson, 1979) and leads to higher production costs for businesses. In turn, the increase in production costs causes inflation to rise by moving the aggregate supply curve to the left. In addition, an increased interest rate impacts inflation by influencing investment. Increases in the interest rate reduce investments, which eventually reduce inflation.

Money supply is positively correlated with inflation. Walsh (2003) confirms that growth in money supply results in an equal rise in the price level. Similarly, McCandless and Weber (1995) show that there is a high positive correlation (almost unity) between the money supply growth rate and inflation.

In model 2, which examines the determinants of poverty, we retain CBI, inflation, lending rates, unemployment, and GDP per capita as independent variables. As discussed in the literature review, the relationship between inflation and poverty is ambiguous. We also expect a high lending rate, unemployment, and CBI to increase poverty. The association between GDP per capita and poverty is expected to be negative. Where countries have high GDP per capita, we expect poverty to be low. Squire (1993) found that a 10% rise in the growth rate decreased poverty across a sample of countries by 24 percentage points. Similarly, Bruno et al. (1996) found that a 10% increase in growth was linked with a 21.2% decrease in the poverty level for a sample of 20 countries from 1984 to 1993.

We also incorporate a measure of trade openness. A country's trade openness is the degree to which its business regulatory environment improves or prevents businesses from investing, increasing productivity, and creating jobs (Asiedu, 2006). We proxy trade openness as the sum of imports and exports as a proportion of GDP (expressed as a percentage), and is obtained from the World Development indicators. We anticipate that increasing trade openness will result in lower levels of poverty as people are given access to a wider range of products through imports,

raw materials, and inputs, and also are able to export their products. Thus, a negative coefficient was expected for trade openness.

3.2.2 Descriptive Statistics and Correlation Analysis

Summary statistics are shown in Table 2, including the observation, mean, standard deviation, and minimum and maximum values for each of the variables included in the study. The average inflation over the study period is 41.66. The reason for the high standard deviation is the hyperinflation that occurred in the Democratic Republic of Congo (DRC), Zimbabwe, South Sudan, and Angola. The maximum inflation of 23,773 was experienced in the DRC in 1994.

The average poverty gaps, US\$3.20 and US\$1.90, are US\$36.70 and US\$20.83, respectively. This shows that poverty in the SSA countries was high during the study period. The average de facto CBI is 0.15,

Table 2. Descriptive Statistics of Variables

Variable	No. of Obs.	Mean	Std. Dev.	Min.	Max.
Inflation	1,471	41.659	648.123	-17.64	23,773.13
Poverty gap (\$3.2)	1,061	36.704	16.782	0.4	77.4
Poverty gap (\$1.9)	1,061	20.826	14.173	0	64.1
Poverty headcount (\$1.9)	1,061	47.758	22.51	0.2	94.3
Poverty headcount (\$3.2)	1,061	69.467	20.943	1.1	98.5
De facto CBI	1,395	0.15	0.15	0	0.8
De jure CBI	1,434	0.523	0.18	0.137	0.867
Money supply (annual growth)	1,702	32.245	237.013	-99.864	6,968.922
Lending rate (%)	1,010	18.612	14.913	4.737	217.875
GDP per capita (2010 constant)	1,770	1,981.592	2,768.991	164.337	20,532.95
Trade openness (% of GDP)	1,627	67.892	35.376	6.32	311.354
Real interest rate (%)	983	5.85	13.335	-93.513	61.883
Unemployment (% of labor force)	1,363	8.315	7.379	0.3	37.97
Agriculture (annual growth)	1,543	2.954	10.363	-44.491	91.606

Source: The authors.

while the average de jure CBI is 0.52. A critical examination of the data shows that most of the countries in the CFA zone are leaders in CBI (Appendix A). The average annual growth in money supply during the study period was 32.24. The maximum annual growth in money supply is 6,968.92%. This was recorded in the DRC in the same year that maximum inflation was recorded. Table 2 also shows that the average lending rate is 18.61%; the average GDP per capita is 1,981.58; the average trade openness is 67.89% of the GDP; and the average unemployment rate is 8.3%.

3.2.3 Estimation Technique

Before estimating the regression models, a correlation analysis was performed to check for any possible issues of multicollinearity among the independent variables (see Table 3 for results). The correlation matrix shows that there is no issue of multicollinearity because the pairwise correlations between the independent variables are all below 0.50, which is the accepted threshold. The high correlations observed in the correlation matrix are either between the dependent and independent variables, or between the dependent variables. Because there were no multicollinearity issues, the regression models were estimated.

Equation 1 is used to examine the relationship between inflation and CBI, while Equation 2 examines how de facto and de jure CBI influence the relationship between inflation and poverty. Both poverty and inflation are persistent variables. Aside from these variables being persistent, we expect GDP per capita to be endogenous. Thus, the models are estimated using a dynamic system generalized method of moments (GMM) estimator. The system GMM also controls for firm-specific and time-invariant effects (Arellano & Bond, 1991; Arellano & Bover, 1995; Blundell & Bond, 1998; Blackwell et al., 2017). Two lags for each of the regressors are used as instruments. To evaluate whether the model is correctly specified, the study uses two standard tests: Sargan's test, which checks the validity of the instruments, and the test for second-order autocorrelation. Sargan's test is asymptotically distributed as a chi-square with degrees of freedom equal to the number of instruments minus the number of parameters. The AR(2) test checks whether the model has been correctly specified. If the model is correctly specified, the variables used as instruments should not be correlated with the error term. Thus, the AR(2) test is distributed as a standard normal under the null of no second-order autocorrelation and the residuals, and it provides an additional check on the validity of the lagged variables used as instruments in the equation.

Table 3. Pairwise Correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Inflation	1.0													
Poverty gap (3.2)	0.0*	1.00												
Poverty gap (1.9)	0.0*	0.9*	1.0											
Poverty headcount (1.9)	0.1*	0.9*	0.9*	1.0										
Poverty headcount (3.2)	0.075*	0.930*	0.808*	0.945*	1.000									
De facto CBI	0.2*	-0.1	-0.1*	-0.04	-0.01	1.000								
De jure CBI	-0.03	0.14*	0.109*	0.146*	0.162*	-0.132*	1.000							
Money supply	0.87*	0.09*	0.096*	0.09*	0.099*	0.120*	-0.06	1.00						
Lending rate	0.64*	0.29*	0.32*	0.26*	0.22*	0.09*	-0.20*	0.54*	1.00					
GDP per capita (2010 constant)	-0.03	-0.59*	-0.47*	-0.59*	-0.73*	-0.08*	-0.23*	-0.03	-0.16*	1.000				
Trade openness	-0.02	-0.30*	-0.25*	-0.31*	-0.36*	-0.05	-0.03	-0.02	-0.08*	0.46*	1.0			
Real interest rate	-0.42*	0.08*	0.07*	0.08*	0.06	-0.15*	0.12*	-0.323*	-0.093*	-0.02	-0.01	1.00		
Unemployment	-0.04	-0.34*	-0.26*	-0.35*	-0.41*	-0.03	-0.3*	-0.05	-0.09*	0.45*	0.391*	-0.05	1.000	
Agriculture (% of GDP)	-0.01	0.04	0.02	0.04	0.05	0.01	0.03	-0.00	0.04	-0.03	-0.05*	0.024	-0.06*	1.00

Source: The authors.

Note: *Shows significance at the 0.05 level.

4. Results and Discussion

4.1 Baseline Results on Central Bank Independence and Inflation

In this section, we justify the use of CBI as an influential factor in the relationship between inflation and poverty by examining how CBI influences inflation (see Table 4). We employed two CBI proxies, namely, legal CBI (*de jure*) as indicated in the central bank charter employing the CWN index criteria, and *de facto* CBI, which estimates the turnover rate of the central bank governor. The estimations provided in Table 4, column 1, show findings for *de jure* CBI, and the estimations provided in Table 4, column 2, show findings for *de facto* CBI.

From the findings, we can see that CBI is important in controlling inflation. Specifically, there is a significant negative relationship between *de jure* CBI and inflation, while *de facto* CBI, which relies on central

Table 4. Inflation and CBI

Variables	(1)	(2)
	Inflation	Inflation
De jure CBI	-80.86*** (10.88)	
De facto CBI		5.931* (3.316)
Money supply growth	0.119*** (0.0301)	0.146*** (0.0315)
Lending interest rate	0.412*** (0.0758)	0.486*** (0.0762)
GDP per capita	0.00403** (0.00159)	0.000143 (0.00101)
Unemployment	0.845** (0.333)	0.506* (0.267)
Constant	32.21*** (6.733)	-7.796** (3.796)
Model	FE	FE
Model Summary		
No. of observations	417	441
R-squared	0.277	0.183
No. of countries	33	30

Source: The authors.

Note: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$.

bank turnover, has a significant positive relationship with inflation. The findings suggest that a more credible, consistent, conservative, and efficient monetary policy, as stipulated by a central bank charter and exhibited in the practical sense, can curb inflation. These results confirm studies by Banaian et al. (1983) and Cukierman et al. (1993). The results also support the arguments of Barro and Gordon (1983) and Kydland and Prescott (1977), who express their preference for rule-based over discretionary policymaking because a discretionary policy does not typically result in maximization of the social objective function.

In relation to the included control variables, money supply and interest rates are significant determinants of inflation. There is a significant positive relationship with inflation, suggesting that higher money supply growth and interest rates mean higher inflation. This is in line with our a priori expectations. The GDP per capita is negative for both specifications. Conversely, unemployment negatively correlates with *de jure* CBI. This is again in accordance with our a priori expectations.

4.2 Impact of CBI on the Inflation-Poverty Nexus

Table 5 presents the results of the relationship between CBI, inflation, and poverty. In Table 5, we can see that the interaction between inflation and *de facto* CBI is negative and statistically significant. This suggests that high inflation reduces poverty in the presence of high central bank turnover (low *de facto* CBI). On the one hand, this argument makes it sound as if fiscal dominance is a good thing, but on the other hand, the results show that most SSAs with an already stressed economy pursue the short-term objective of expanding their economy instead focusing on controlling inflation.

Indeed, independent central banks can become so fixated on inflation that, even when the economy improves, the fixation on controlling inflation does not allow the central bank to respond to the plight of its citizens. In SSA countries where unemployment is a huge issue, politicians may want to fulfill their promises to citizens and not succumb to this fixation, creating a more dependent central bank that exhibits dynamic inconsistency features. Countries with more dependent central banks may interfere with the operations of monetary authorities and focus on spending that will increase employment and reduce poverty, even in periods of high inflation. Such countries prefer an environment where no credible and conservative delegation of monetary-policy authorities

Table 5. De Facto CBI, Inflation and Poverty Gap

	(1)	(2)	(3)	(4)
Variables	Poverty Gap (3.20)	Poverty Gap (1.90)	Poverty Gap (3.20)	Poverty Gap (1.90)
Lag of poverty gap (3.20)	0.834*** (0.0372)		0.865*** (0.0319)	
De facto CBI	-0.521 (1.127)	-0.523 (1.193)	1.698 (1.546)	2.070 (1.751)
Trade openness	-0.0166** (0.00699)	-0.0124* (0.00747)	-0.0179*** (0.00688)	-0.0139* (0.00741)
Lending rates	0.0452*** (0.0173)	0.0548*** (0.0188)	0.0412** (0.0169)	0.0606*** (0.0189)
Unemployment	0.0534 (0.0342)	0.0287 (0.0348)	0.0515 (0.0335)	0.0442 (0.0355)
Agriculture (annual growth)	-0.00661 (0.0174)	0.00145 (0.0184)	-0.0138 (0.0160)	0.00248 (0.0184)
Inflation	-0.0397** (0.0181)	-0.0411** (0.0192)	0.0176 (0.0292)	0.0205 (0.0324)
GDP per capita (constant 2010)	-0.00091*** (0.000252)	-0.00058*** (0.000203)	-0.00073*** (0.000226)	-0.00060*** (0.000204)
Lag of poverty gap (1.90)		0.826*** (0.0374)		0.826*** (0.0371)
Inflation × de facto CBI			-0.229** (0.114)	-0.281** (0.126)
Constant	8.144*** (1.905)	4.693*** (1.178)	6.241*** (1.682)	4.048*** (1.220)
No. of observations	338	338	338	338
No. of countries	28	28	28	28
Sargan's test	0.2382	0.1796	0.0961	0.4881

Source: The authors.**Note:** Standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$.

exists, and where the instrument of commitment circumvents the dynamic inconsistency issue, resulting in an imaginary inflationary bias.

The situation is different when we consider de jure CBI. In Table 6, we see that de jure CBI interacts with inflation, but there is no

Table 6. De Jure CBI, Inflation and Poverty

Variable	(1) Poverty Gap (3.20)	(2) Poverty Gap (1.90)	(3) Poverty Gap (3.20)	(4) Poverty Gap (1.90)
Lag of poverty gap (3.20)	0.839*** (0.0395)		0.830*** (0.0397)	
De jure CBI	-1.301 (1.197)	-1.557 (1.249)	-4.397 (3.361)	-1.550 (1.527)
Trade openness	-0.0179*** (0.00655)	-0.0125* (0.00635)	-0.0174*** (0.00664)	-0.0128** (0.00637)
Lending rates	0.0282* (0.0156)	0.0387** (0.0168)	0.0194 (0.0184)	0.0383** (0.0165)
Unemployment	0.0132 (0.0297)	0.000573 (0.0309)	0.00879 (0.0303)	0.00515 (0.0313)
Agriculture (annual growth)	-0.00777 (0.0124)	0.000631 (0.0128)	-0.00791 (0.0124)	-0.00356 (0.0130)
Inflation	-0.00953 (0.0157)	-0.0138 (0.0163)	-0.0887 (0.0813)	-0.0197 (0.0550)
GDP per capita (constant 2010)	-0.000819*** (0.000222)	-0.000575*** (0.000179)	-0.000932*** (0.000242)	-0.000572*** (0.000180)
Lag of poverty gap (1.90)		0.821*** (0.0413)		0.824*** (0.0395)
Inflation × de jure CBI			0.168 (0.174)	0.0132 (0.123)
Constant	8.508*** (2.174)	5.588*** (1.554)	10.88*** (3.134)	5.493*** (1.669)
No. of observations	355	355	355	355
No. of countries	31	31	31	31
Sargan's test	0.6228	0.4955	0.3676	0.5908

Source: The authors.

Note: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$.

statistically significant relationship with poverty. Our results clearly suggest that what matters for the relationship between poverty and inflation is not the kind of independence that has been spelled out in a central bank's charter, but what a country chooses to do practically.

5. Conclusion

The current study involves an analysis of the relationship between CBI, inflation, and poverty in SSA countries. The independent status of a country's central bank determines the impact of inflation on poverty. This is because independent central banks prioritize price stability over employment, which may restrict government programs and spending that seek to boost output and employment. This could worsen the impact of inflation on poverty. On the contrary, a dependent central bank is subject to political control, so that, the government would have control over spending on social welfare and capital items that would increase liquidity and generate employment with the goal of poverty reduction in the face of high inflation. The results of the current study confirm this hypothesis, particularly for de facto CBI in SSA countries. The implementation of independent central bank reforms may have benefits for price stability in Africa, but at the expense of the fight against poverty. This implies that countries in SSA may have to balance their expectations in regard to the usefulness of CBI for improving poverty by lowering inflation, and prioritize wholesome policies that seek to achieve a balance between price stability, employment, and poverty reduction. Due to the generally high levels of unemployment in Africa, central bank charter laws should allow for situations akin to the COVID pandemic, where independent central banks allow governments to spend to boost employment, since increased output, in the long run, can limit inflationary pressures.

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ORCID iD

Abel Mawuko Agoba  <https://orcid.org/0000-0002-9473-3891>

Appendix A

Table A1. Hausman (1978) Specification Test—De Jure CBI

	Coef.
Chi-square test value	43.985
p-value	0

Source: The authors.

Table A2. Hausman (1978) Specification Test—De Facto CBI

	Coef.
Chi-square test value	457.603
p-value	0

Source: The authors.

Table A3. Pairwise Correlations

Variables	(1)	
Inflation	1.000	
Lag of inflation	0.150*	1.000

Source: The authors.

Note: *Significance at the 0.05 level.

Table A4. Pairwise Correlations

Variables	(1)	
Poverty gap (3.20)	1.000	
Lag of poverty gap (3.20)	0.979*	1.000

Source: The authors.

Note: *Significance at the 0.05 level.

Table A5. Pairwise Correlations

Variables	(1)	
Poverty gap (1.90)	1.000	
Lag of poverty gap (1.90)	0.970*	1.000

Source: The authors.

Note: *Significance at the 0.05 level.

Table A6. Pairwise Correlations

Variables	(1)	
Poverty headcount (1.90)	1.000	
Lag of poverty headcount (1.90)	0.981*	1.000

Source: The authors.**Note:** *Significance at the 0.05 level.**Table A7.** Pairwise Correlations

Variables	(1)	
Poverty headcount (3.20)	1.000	
Lag of poverty headcount (3.20)	0.987*	1.000

Source: The authors.**Note:** *Significance at the 0.05 level.**Table A8.** CBI, Inflation and Headcount Poverty

Variables	(1) Poverty Headcount (3.20)	(2) Poverty Headcount (1.90)	(3) Poverty Headcount (3.20)	(4) Poverty Headcount (1.90)
De facto CBI	-0.524 (0.898)	-0.413 (1.376)	-0.294 (1.612)	2.541 (2.054)
Trade openness	-0.0223*** (0.00619)	-0.0223** (0.00879)	-0.0171** (0.00792)	-0.0450** (0.0208)
Interest rate	0.0199 (0.0135)	0.0500** (0.0212)	0.0152 (0.0142)	0.0540 (0.0410)
Unemployment	0.109*** (0.0334)	0.0637 (0.0423)	0.0606 (0.0731)	0.0956* (0.0538)
Agriculture (annual growth)	-0.0191 (0.0142)	-0.0130 (0.0215)	-0.0276** (0.0132)	-0.0248 (0.0200)
Inflation	-0.0329** (0.0147)	-0.0515** (0.0225)	-0.0176 (0.0312)	0.0130 (0.0377)
GDP per capita (constant 2010)	-0.00156*** (0.000324)	-0.00116*** (0.000330)	-0.00125*** (0.000292)	-0.00077*** (0.000329)
De facto CBI × inflation			-0.0170 (0.135)	-0.258* (0.148)

(Table A8 continued)

(Table A8 continued)

	(1)	(2)	(3)	(4)
Variables	Poverty Headcount (3.20)	Poverty Headcount (1.90)	Poverty Headcount (3.20)	Poverty Headcount (1.90)
Lag of poverty headcount (3.20)	0.827*** (0.0356)		0.855*** (0.0333)	
Lag of poverty headcount (1.90)		0.847*** (0.0370)		0.890*** (0.0332)
Constant	15.83*** (3.248)	10.26*** (2.574)	13.23*** (3.040)	7.699*** (2.492)
No. of observations	338	338	338	338
No. of Countries	28	28	28	28
Sargan's test	0.5299	0.3936	0.6284	0.5943

Source: The authors.**Note:** Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$.**Table A9.** De Jure CBI, Inflation and Headcount Poverty

	(1)	(2)	(3)	(4)
Variable	Poverty Headcount (3.20)	Poverty Headcount (1.90)	Poverty Headcount (3.20)	Poverty Headcount (1.90)
Lag of poverty gap (3.20)				
De-jure CBI	-0.749 (1.090)	-1.498 (1.560)	-5.789* (3.051)	-5.560 (4.375)
Trade openness	-0.0257** (0.00674)	-0.0252** (0.00876)	-0.0254** (0.00684)	-0.0247** (0.00895)
Lending rates	0.00737 (0.0134)	0.0298 (0.0200)	-0.00858 (0.0163)	0.0184 (0.0238)
Unemployment	0.0495* (0.0284)	0.00865 (0.0386)	0.0467 (0.0291)	0.00436 (0.0396)
Agriculture (annual growth)	-0.0214* (0.0115)	-0.00883 (0.0161)	-0.0215* (0.0114)	-0.0147 (0.0162)
Inflation	0.00233 (0.0145)	-0.00986 (0.0205)	-0.139* (0.0736)	-0.131 (0.106)

(Table A9 continued)

(Table A9 continued)

	(1)	(2)	(3)	(4)
Variable	Poverty Headcount (3.20)	Poverty Headcount (1.90)	Poverty Headcount (3.20)	Poverty Headcount (1.90)
GDP per capita (constant 2010)	−0.00134** (0.000279)	−0.00103** (0.000289)	−0.00156** (0.000299)	−0.00117** (0.000317)
Lag of poverty gap (1.90)				
De-jure CBI × Inflation			0.305* (0.158)	0.261 (0.226)
Lag of poverty headcount (3.20)	0.839** (0.0346)		0.825** (0.0354)	
Lag of poverty headcount (1.90)		0.851** (0.0382)		0.843** (0.0388)
Constant	15.00** (3.173)	10.70** (2.857)	19.33** (3.907)	13.74** (4.094)
No. of observations	355	355	355	355
No. of countries	31	31	31	31
Sargan's test	0.5301	0.7301	0.6429	0.5311

Source: The authors.

Note: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$.

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