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Effect of Financial Sector Development on Monetary Stability Objective in CEMAC

CEMAC'ta Finansal Sektör Gelişiminin Parasal İstikrar Hedefine Etkisi

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ABSTRACT

The paper determines the role played by banking stabilization policies over the relationship between financial sector development and monetary stability objective. Applying generalised method of the moments (GMM) system of Blundell and Bond (1998) over the inflation equation constructed by Gallic and al (2017), we found that undesirable effects of financial sector development (credit risk) increase inflation rate in CEMAC. Besides, the negative relationship between financial sector development and monetary stability objective quoted in the literature is not reversed in CEMAC. The credit risks, the main cause of monetary instability and the main undesirable effects of financial sector development increase the inflation rate in CEMAC. Therefore, policymakers need to curb any increased of credit risks associated with financial sector development as this risk increase inflation in CEMAC.

Anahtar Kelimeler:

Finansal Sektör Gelişimi,

Parasal İstikrar,

Enflasyon,

CEMAC

Jel Kodları:
E02, E52, F45

ÖZET

Araştırma, finansal sektör gelişimi ile parasal istikrar hedefi arasındaki ilişki üzerinde bankacılık istikrar politikalarının oynadığı rolü belirlemektedir. Gallic ve diğerleri (2017) tarafından oluşturulan enflasyon denklemi üzerinde Blundell ve Bond'un (1998) genelleştirilmiş momentler (GMM) sistemini uygulandığı araştırmada finansal sektör gelişiminin (kredi riski) istenmeyen etkilerinin CEMAC'ta enflasyon oranını artırdığını bulunmuştur. Bunun yanı sıra, literatürde alıntılanan finansal sektör gelişimi ile parasal istikrar hedefi arasındaki negatif ilişki CEMAC'ta tersine çevrilmemiştir. Parasal istikrarsızlığın temel nedeni olan kredi riskleri ve finansal sektör gelişiminin başlıca istenmeyen etkileri CEMAC'ta enflasyon oranını yükseltmektedir. Bu nedenle, CEMAC'ta bu risk enflasyonu artırdığından, politika yapıcıların finansal sektör gelişimiyle ilişkili artan kredi risklerini engellemeleri gerekmektedir.

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1. INTRODUCTION

Determine the nature of the link between financial sector development and monetary stability has been subject to many studies. The reason of this interest derives from the fact that, during the process of the financial sector development, changes are observed in the sector and outbreak stability (Korinek and Sandri, 2015) especially monetary stability (Scialom, 2013). The source of this instability is clear for Almarzoqi et al (2015), the combination of the increasing volume of liquidity, diversification of the range of financial services and the increase of actors involved in the financial activities change the environment. Thus changes increase therefore instability because of the changing behaviour of financial actors towards liquidity (Scialom, 2013).

After the 2007-2008 crises, the echo of economic news suggested the consolidation of financial stabilisation policies, specifically those directed at the banking sector as an approach to contain the negative effect of financial development. The main motivation behind this choice is that tools provided by this prudential policy can play an important role to reduce perverse choices of financial actors toward liquidity (Boissay et al, 2021) as, the connection and permeability between different actors in the financial sector inhibit central bank from anticipating deviant choices that are a source of risk and monetary instability (Gaffard and Napoletano, 2018).

The need to provide stability by controlling actors of the financial system who have the capacity to create money can reduce any risk associated with this capacity to create money that the monetary stability objective has been hard to contain. In fact, monetary stability has been targeted to reduce price fluctuation and contain some negative effects of perverse choices adopted by financial actors producing instability toward liquidity (Scialom, 2013). Whether independent or not, monetary stability is the priority policy objective sought by all central banks (Bikai and Essiane, 2017; Nyanda, 2021). Central banks generally confine this monetary stability objective to the control of price fluctuations (Aglietta and Scialom, 2009).

For Issing (2003), monetary stability is all about price stability or inflation target, conditions the behaviour of financial intermediaries. Minegishi and Cournède (2010) explain that in spite of being straightforward to condition behaviour toward liquidity, this objective allows the central bank to anticipate risk attached to financial sector development for example credit volatility. The recent financial crises beyond their intensity have unfortunately shown the weakness of the monetary stability objective. Thus, the financial system experience has also shown that the relationship between financial sector development and monetary stability is not so easy.

This paper wants to measure the improvement of the relationship between financial sector development and monetary stability in CEMAC produced by the banking sector stabilisation policy. The case of the CEMAC sub-region receives particular attention for the simple reason that, in the first Article of its statutes, the central bank of this sub-region has included the promotion of financial stability as one of its main tasks. The study will help to highlighted factors hindering monetary stability objective from two aspects (determinants of monetary instability and influence of the undesirable effects of financial sector development). The credit risks consider as the main cause of monetary instability and the main undesirable effects of financial sector development in CEMAC, it is needed to explain how it increase the inflation rate. The result will provide insight to policymakers as they need to curb any increased of credit risks associated with financial sector development as this risk increase inflation in CEMAC.

The reminder of the article is as follows: the next section proposes a brief overview of financial sector development indicators in CEMAC and their implications for risk and inflation. Section 3 provides a literature review link between financial sector development and monetary stability objective considering the role of stabilisation policies and their implications in this relationship. Section 4 describes data and econometric methodology. Section 5 report results making suggestions and the last section concluded.

2. OVERVIEW of FINANCIAL SECTOR DEVELOPMENT in CEMAC and IMPLICATIONS for STABILITY

The development of the financial sector in CEMAC has been consolidated in the years following the liberalisation policies of the 1990s. This development marked by changes both in the formulation of intermediation activity, organisation of the financial sector and organisation of monetary policy instruments made it possible to regulate

the banking profession and restored the image of banks in the minds of the population. The main objective of the monetary policy actor, the Bank of Central African States (BEAC) is to ensure monetary stability[1].

This main objective is defined into two sub-objectives: internal stability (low inflation) and external stability (sufficient external coverage of the currency). BEAC's statutes also allow the central bank, without prejudice to its monetary stability objective, to support economic policies developed by the States. BEAC's monetary policy aims to maintain monetary stability and support the general economic policies of the States. To achieve its objectives, the BEAC uses several instruments, including (i) refinancing policy through the manipulation of interest rates and the setting of refinancing ceilings per State (ii) mandatory reserves policy.

The central bank of the CEMAC subs region uses two main tools (i) Interest Rate on Tenders (TIAO) and (ii) reserve ratios, it acts through this by refinancing quantities ceiling per country. In addition, measures taken by the Monetary Policy Committee since the mid-2000s show that the BEAC's monetary policy is accommodating because it works to facilitate the financing of economies. This central bank seems to be more concerned with the stability of its payment system and its banking sector stability.

The increasing number of financial institutions[2] followed with mix types of finance bank finance, market finance and informal finance confronted the necessity for the BEAC to know whether its action affects its main variables namely: inflation, foreign exchange reserves (rank with the currency's external cover ratio), and activity (rank with the Gross Domestic Product). The increases in financial intermediaries and mixed types of finance hosts in the financial system have driven an important role in the financial sector development in CEMAC. The expansion of liquidity flows and volume of credit in CEMAC countries confirm the positive impact of the previous financial sector policies (liberalisation policies of the 1990s). The volume of liquidity is located around 16% of GDP, and the credit share to the private sector around 10% of GDP moves closer to 25% of GDP and 20% of GDP respectively in CEMAC. While this level of credit remained under the 35% GDP observed in sub-Saharan African countries, this moderate improvement has been accompanied by undesirable effects (Onomo[3], 2021). During 2000-2018 three (03) main trends are observed. Over 2000-2005, the moderate pace is observed.

The diminution of those financial sector development indicators during 2006-2012 has moderated the level of the unintended effect of financial sector development. The last period 2013-2018 is marked by the easing his interest rates, promotion of medium-term loans, the halving of mandatory reserve ratios, widening refinancing conditions for banks finally can explain the improvement of liquidity flows extending to the expansion of credit in CEMAC (see figure 1).

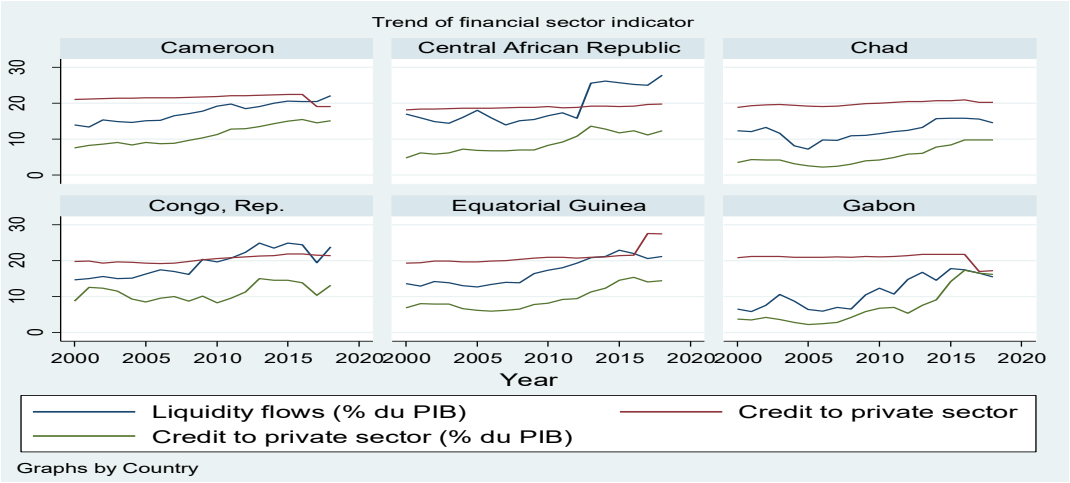

Figure 1. Trend of Financial Development Indicator in CEMAC
Source: constructed by authors under Stata 14.2 with WDI 2021 database.

[1] The selected community standard adopted for multilateral surveillance is 3% of inflation this is the target for internal monetary stability. The external coverage ratio is the ratio of the central bank's external assets to its liabilities to the banking sector and governments. To preserve this external monetary stability, the BEAC also adopted in 2017 a reserve target equivalent to three months of imports and short-term public debt coverage.

[2] Today, the range of financial institutions instead of 30 financial institutions (only commercials banks meet in the 1990s) financial institutions is nearly1000 institution. It is made up of banks (54 commercial banks), financial institutions (11 credit institutions), microfinance institutions (790), insurance companies (58) and social security institutions (8). These financial institutions are supplemented by a market infrastructure that includes a bond market and an equity market.

[3] Financial Analyst at the Directorate of Studies, Research and Statistics - BEAC, comment extracted from the Research Letter of the Central Bank of African States n°10 1st semester 2021, Pp 11-13 "Non-performing loans, indicators of financial stability in the CEMAC zone

Following Fofack (2005) this increase in liquidity flows and credit supply went along with a reduction in the quality of the asset. These undesirable effects lay hold to an increase in non-performing loans (see Figure 2). This source of monetary instability associated with the high level of risk entered reduces automatically the expected gains of financial sector development in CEMAC. Fofack (2005) argues that the level of credit risk related to the development of the financial sector rises above what was observed at the height of the Asian crisis (25% of non-performing loans) the progression of this risk grown above 30% in the CEMAC.

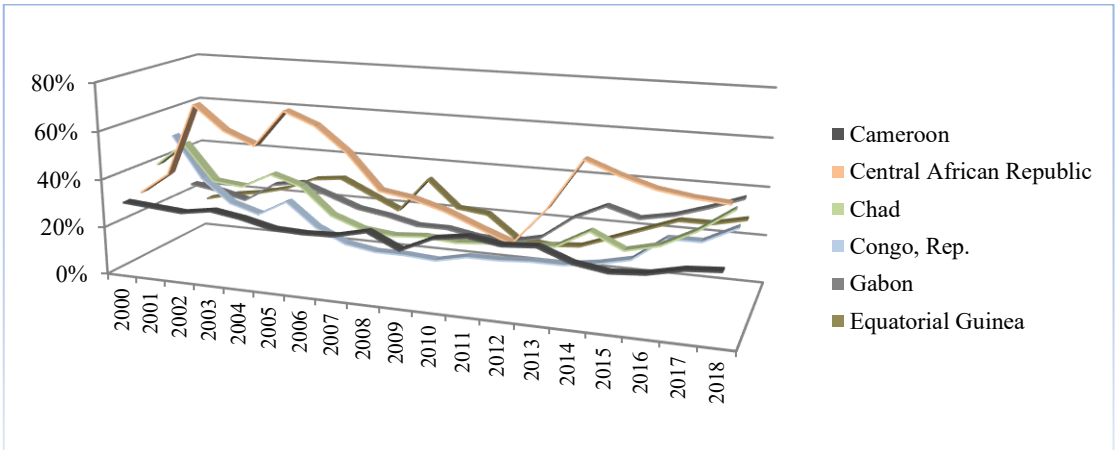

Figure 2. Trend of Non-performing Loans

Source: constructed by authors with BEAC 2021 database.

The batch reading of figures 1 and 2 disclose three (03) main trends of the negative effects of financial sector development. From 2000 to 2005 marked by a moderate increase in credit growth, during this period low level of 15.7% instability is observed over the sub-region. The decline in credit supply during the period 2006-2012, was followed by a downward trend in the level of credit risk standing around 13.8% over the sub-region. The level of risk remained significant. The increase in credit over the period 2013-2018 went along with an increase in credit risk as to the level of non-performing loans reached on average 32% in CEMAC (see Figure 2).

Even though a direct link has never been established between those consequences of financial sector development and monetary stability in CEMAC, observing the trend of inflation (see figure 3) shows how the financial sector development has affected the central banker's objective of internal monetary stability. While the impact is not homogeneous within the countries, Cameroon with its sustained financial sector development put forward low variability inflation. Apart from this country, the rest of the CEMAC countries confirm that an increase in credit volume and liquidity flow breeding an increase in credit risk impact the internal monetary stability objective.

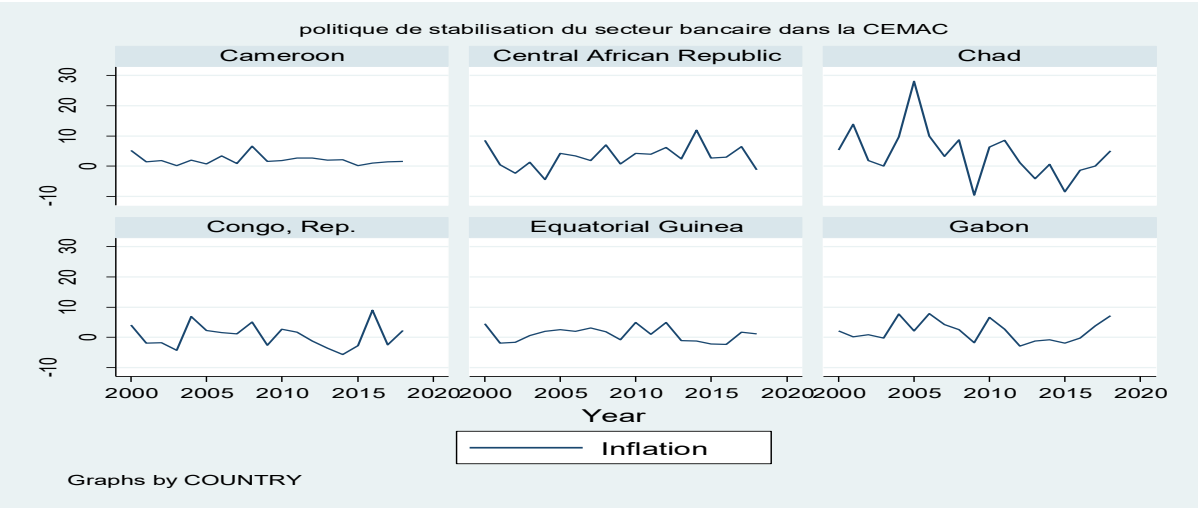

Figure 3. Trend of Inflation by Country

Source: Authors own construction under Stata 14.2 with BEAC 2021 dataset

Even if, the visual examination of the different figures (1, 2 and 3) remains weak to justify the existence of a causal relationship between the negative effect of financial sector development and inflation, at least those figures show that an increase in financial sector development indicators in the CEMAC is correlated with the variability inflation and increase of credit risk. This figure suggests it is essential to examine the impact of financial sector development on the monetary stability objective at least as the risk attached to financial sector development in CEMAC can affect the objectives of the central banker, especially inflation.

3. LITERATUR REVIEW

In the financial sector, only two actors have the capacity to condition behaviour toward liquidity: commercial bank and central bank. The easiest explanation is that those financial actors have the ability to change the volume of liquidity in circulation through their capacity to create money (Scialom, 2013). Despite the fact that the central bank remains the money-issuing institution, this actor is subordinate to the commercial banks in this money creation from a quantitative point of view (Scialom, 2013). Scialom statement implies that the money issued by commercial banks dominates in quantity the one issued by central banks. However, it stands to be the main cause of monetary instability (Spyromitros ve Tsintzos, 2019).

Facing the question of how financial sector development affects monetary stability huge work pay attention to the literature to answer this question. While some works examine the link between financial sector development and monetary stability, other works try to determine the factors involved affecting this relationship. For the first strand of this literature, Rousseau and Wachtel (2002) are the first to detect an inverse relationship between financial sector development and monetary stability. Authors tried to understand why inflation negatively affects the development of the financial sector. According to them, price variability is associated with high inflation rates and this high level of inflation has a negative effect on financial depth.

While their comments do not say whether the development of the financial system restricts the action of the central banker, Ganley (2004) does not answer the question but establishes a positive relationship between excess liquidity and inefficiency of the central banker's action. For Ganley (2004), financial sector development leads to a reduction in the potential influence of the central bank by weakening: (i) the instruments of monetary policy (ii) intervention in the money market and (iii) control of balance sheet and income of banks. This Ganley statement suggests that instruments used by the central banker to achieve its monetary policy and reached its monetary stability objective can be inoperative because of the excess liquidity observed as a result of the evolution of financial intermediation activity.

For Driscoll (2004) unintended factors are the origin of this negative relationship. Ganley (2004) may be the one opening a door to the set-up of those unintended factors that affect the relationship between financial sector development and monetary stability. Two approaches facilitate this examination, the microeconomic view and the macroeconomic view. While the second strand finds that risk management is the appropriate way to combat the undesired effects of financial sector development, the first strand states that the explanatory factors of this instability are always faced during the phases of financial sector development.

The microeconomic view has been interested in the questioning process of resource allocation and banking crises (Barth et al. 2004; Driscoll, 2004; Nyborg, 2016). The macroeconomic view has focused on volatility issues and risk management (Minsky, 1986; Kindleberger, 2000; Bernanke, 2009; Rajan, 2009; Altunbas, 2010 and 2012; Boissay et al, 2021). Over the recent decade's macroeconomic views have been more developed in literature than the microeconomic view. For this second strand, the main challenge is to propose strategies that may increase the central banker's room of action and thereby act to preserve its monetary stability objective, absorb all range of risk (Criste and Lupu, 2014). This approach appears an appropriate way of fighting the undesirable effects of financial sector development namely monetary instability, management risk, operational risk, credit risk and above all this challenges systemic risk (Bech et al, 2014).

The empirical studies working to shape the link between financial sector development and inflation are opened up by Rousseau and Wachtel (2002) studies. Rousseau and Wachtel (2002) choose the rolling regression technique over 84 countries to analyse interactions between inflation and financial depth, thus their incidence over economic growth. Their results suggest that, when inflation falls below the threshold of 6% to 8%, financial depth affect positively economic growth. However, when inflation is around 15% to 20%, financial depth does increase growth, they conclude expressly that inflation has a negative effect on financial sector development. Batayneh et al (2021), Effiong (2020), Kim et al (2010), even Keho (2009) expand this analysis. If Batayneh et al (2021) and Kim et al (2010) have in common their approach, while the first author focuses on the case of Jordan country, the

second construct a panel of 87 countries. Batayneh et al (2021) study the relationship over the period 1993-to 2018 while Kim et al (2010) study the same relationship over the period 1960–2005.

The Autoregressive distributed lag model (ARDL) gave to authors the advantage of differentiating long-run effects from short-run effects. Opposed to Batayneh et al (2021) who found a negative and significant impact of price stability on financial sector development in the short and long run, Kim et al (2010) find a differentiated impact over time. Kim et al (2010) state that in the short run, the relationship between financial sector development and inflation is positive and insignificant. It becomes negative but significant in the long run. The other group of authors focused on African countries' cases. Keho (2009) uses time-series data techniques and examines the causal relationship between inflation and financial sector development in the long run. The cointegration test proposed by Pesaran et al (2001) and the Granger causality test suggested by Toda and Yamamoto (1995) the author uses allow him to control the type of causality. The study is made up of a sample of WAEMU countries. Keho (2009) finds that in six countries in his sample, no evidence of the long-run relationship between inflation and financial sector development exists. The two countries' results provide a lack of causality between inflation and financial sector development. Further, the evidence of reverse causality in two countries of his sample allowed him to say that financial sector development affects monetary stability objectives differently in WAEMU countries.

Effiong et al (2020) use different techniques from that of Keho (2009) and the focus of their study is quite different from the one proposed by the other authors. Effiong et al (2020) using Generalized Method Moment –GMM in the system, analyse the influence of financial sector development on the effectiveness of the monetary policy. Over the period 1990-to 2015, his sample is made up of 39 African countries. The main advantage quoted by Effiong et al (2020) in regard to the relevance of its chosen approach is the ability to easily detect direct effects in the relationship. However, like previous authors, Effiong et al (2020) find a negative relationship between financial sector development and monetary stability objective.

As Keho findings expose the existence of varied results and causality patterns across countries, especially among countries members of the same sub-region or monetary union, the additional range of empirical studies extended this analysis to expand central bankers' room for manoeuvre. The concern for those authors is not the negative link between inflation and financial sector developments is more the need to fulfil central banker objectives and contain undesirable effects of financial sector development.

Boissay et al (2021) have recourse to the Dynamic Stochastic General Equilibrium (DSGE) to explain how undesirable effects of financial sector development can be contained. The sample used by the authors is made up of European Union countries and the United States. Running their studies over the period 2003-2013, enabling them to argue that fragility of the financial sector occurs when the central bank commits itself to a backstop economy.

For Boissay et al (2021), following the strict inflation target does enable the central bank to reduce the probability of risk attached to financial sector development. Moreover, the authors discover that the trade-off between price stability and financial stability is starker when the central bank responds mildly to its monetary stability objective. Boissay et al (2021) do not only expose a trade-off between monetary stability objective and financial stability, authors show how the central bank can forestall risk attached to financial sector development.

Ngouabi (2021) in the same vein work on the case of CEMAC countries and use the Generalized Method of Moments-GMM in the first difference. The author treated the problem differently. Instead of directly introducing the instruments of the banking sector stabilisation Ngouabi (2021) constructs a policy mix frame between monetary policy objective and financial sector stabilisation policy. Focus on inflation targeting perspective Ngouabi (2021) finds that it is difficult for the central banker to mix both prudential and monetary policy. Ngouabi (2021) found a trade-off between financial stability and monetary stability objectives. He concludes that central bankers cannot follow the objective of monetary stability and the objective of financial stability.

Creel et al's (2013 and 2015) work seems to be the main attempt to analyse this relationship. In fact, those authors have been more interested in raising the contribution of banking sector stabilisation policy (prudential tool) in the relationship between financial sector development and monetary stability objective. Using a similar technique to that of Ngouabi (2021), the Generalized Method of Moments-GMM in the first difference, Creel et al (2015) work over the period 1996- 2011 for the case of European Union countries analysing the link between the financial sector development and monetary stability objective. Creel et al (2015) detect that banking sector stabilisation policy goes along with the fulfilment of monetary stability objective.

Accordingly, the authors explain that these banking stabilisation instruments reduce the asymmetry problem main source of the negative link. Furthermore, Creel et al (2015) state that stabilisation instruments assist monetary policy instruments because they limit the deviation of financial intermediaries and the other actor in the financial sector. In spite of the absence, a clear theoretical model where the monetary stability objective interacts with prudential tools as Boissay et al (2021) or Ngouabi (2021) frame the relation in their studies, Creel et al (2015) exploit Beck (2004) equation and directly rely on prudential tools to inflation. Facing this main limit of Creel et al (2015) this contribution is an open door to frame the contribution of stabilisation policies.

4. THE EMPIRICAL FRAMEWORK

The empirical framework is made up of three axes. The first axis concerns the theoretical model. The second axis concerns the econometric methodology, and the last axis concerns the data.

4.1. Theoretical Model

Following Gallic et al (2017) central bank function, monetary stability exposes the objective function followed by the central banker. This function is written as follows:

$$P_t = E[\lambda(\pi_t - \pi_t^*)^2 + (1-\lambda)(y_t - y_t^*)^2] \quad (1)$$

Gallic et al. (2017) suggest to the central banker consider all the exogenous movements (shocks) that influence his objective function.

In this vein, Effiong et al, (2020) explain that changes in the financial system are not an exogenous movement for the monetary policy but can be caused by exogenous movements. Therefore, central bankers must consider the impact of different shocks (Effiong et al, 2020). For Gallic et al, (2017) including supply and demand shocks[4] in their performance function are the right direction for the central banker as these are the main phenomena influencing his action. Effects of supply (equation 2) and demand (equation 3) shocks reducing central banker action can be written in the following form:

$$\pi_t - \pi_t^* = -1/\varphi\,(y_t - y_t^*) - \theta\varepsilon^s \quad (2)$$

$$\pi_t - \pi_t^* = -\omega(y_t - y_t^*) - \delta\left(r - \varepsilon^d\right) \quad (3)$$

Parameters $\boldsymbol{\pi_t}$ and $\boldsymbol{y_t}$ in the different equations (1, 2, 3) refer to the inflation rate and growth rate respectively and parameters $\boldsymbol{\pi_t^*}$ and $\boldsymbol{y_t^*}$ refer to the target. The parameters λ and 1-λ measure respectively the degree of reaction of monetary policy to the variation of the inflation rate and the degree of reaction of this policy to the variation of growth rate. And parameter r provides information on the interest rate policy; ω and φ are structural coefficients that also act as slope coefficients; ε^s and ε^d refer respectively to supply and demand shocks respectively.

The central bank money is stable that is not the case for the commercial bank (Scialom, 2013; Mishkin, 2010). Through the creation of deposits (components of money), commercial banks increase their intervention in the money creation chain is very common after a demand shock (Gallic et al, 2017). Those commercial banks change their balance sheet's structure (Nyborg, 2016 and 2017), their ability to lend more credit to firms and households without pre-existing resources modify the central banker's equilibrium (Effiong et al, 2020).

Despite the use of different reference models, Effiong et al, (2020) employ Karras (1999) model while Gallic (2017) work with Cecchetti and Krause (2001) model, Effiong et al, (2020) one paraphrasing of demand shocks shows how this shock affects policy rule (r). The incidence of a demand shock on policy rules can be written as follows:

$$\pi_t - \pi_t^* = -\omega y_t + \omega y_t^* - \delta r + \delta\varepsilon^d \quad (4)$$

[4] For Gallic et al (2017) those shocks are Auto-regressive process of order 1, $\boldsymbol{\theta^S}$ **and** $\boldsymbol{\theta^D}$ terms are between 0 and 1

The equilibrium pursued by the central banker is contained in is policy rule (Cecchetti, 2001; Cecchetti and Kraus, 2001); Gallic (2017) illustrates as follows:

$$r = r^* + a\varepsilon^d + b\varepsilon^s \quad (5)$$

The r* refers to the Taylor standard rule written as follows:

$$r^* = i^* + a\acute{\pi}^* + b\acute{y}^* \quad (6)$$

The introduction of the Taylor rule standard (equation 6) in Gallic et al (2017) monetary policy rule (equation 5) produces this monetary policy response facing changing environment.

$$r = i^* + a\acute{\pi}^* + b\acute{y}^* + a\varepsilon^d + b\varepsilon^s \quad (7)$$

In quite simplified form, this relationship shows the complex problem that the central banker faces constantly. The fact is that the issue for the monetary policy authority is to shift its interest rate (downwards or upwards) while keeping up its desired equilibrium (inflation target and stability of economic activity). Cecchetti (2001) indicates that the central banker has two alternatives to improve his manoeuvre room: an alternative targeting rule or a targeting rule vs an instrument rule. Cecchetti and Kraus (2001), even Krause and Roja (2006) following Cecchetti (2001) explain that it seems to be the way for the monetary policy authority to limit incentives for excessive risk-taking observed during the financial sector development.

The first option, the alternative targeting rule is a purely technical option (Cecchetti, 2001). The option implies that the central banker preserves his objective of monetary stability by assuming an expected inflation path as close as possible to the target level; unfortunately, the realisation of this decision is unlikely (Cecchetti, 2001). Moreover, as it is difficult for him to reach the target, controlling liquidity flow (monetary base or monetary aggregates) which are neither a direct target nor an instrument does not guarantee any ability to absorb the effects of changes (Mishkin, 2009). The central bank has to turn to the second option, this second option, targeting rule vs instrument rule opposed in particular target to an instrument rule.

It's not a policy in itself (Cecchetti, 2001), however undesirable effect of changes in monetary policy rules is certainly contained through this option (Cecchetti and Kraus, 2001; Krause and Roja, 2006). In practice, the targeting rule allows the head of monetary policy to adjust its instruments to follow the path to its target (Cecchetti, 2001) while the instrument rule defines how the interest rate should be raised or lowered (i.e. how the central banker can raise or lower its interest rate (in a certain amount) to offset shock (in demand or supply-side)). Therefore, the monetary policy reaction $\boldsymbol{\delta r}$ to demand shock can be done in the following way:

$$\varphi r = \vartheta_0 - \vartheta_1 m \quad (8)$$

The $\boldsymbol{\vartheta_0}$ **the** precise simplified form of the complex problem faced by central bankers (equation 7); the term $\boldsymbol{m}$ rank spillover effects of changes especially those caused by the financial sector development. At this level, Rieu-Foucault's (2018) comment relating prudential tools as the increased room for manoeuvre offered to the central bankers makes an increased capacity for central bankers to contain these spillover effects. This suggestion intuitively assumes that in equation **8**, the prudential tools can be introduced as follows:

$$\varphi r = \vartheta_0 - \vartheta_1 m - isf \quad (9)$$

The term reflects the backup brought by prudential policy (the solvability of banks and the liquidity of banks). The incentive to take this stabilisation policy or regulation of the banking sector is looking toward limiting spillover effects of financial development (credit risk and market risk). This article restricted its analysis to credit risk (see Figure 2). This choice is due to the fact that in the CEMAC sub-region the financial market is not well developed. Compilation of equations 7 and 9 into equation 4 gives the reference equation written as follows:

$$\pi_t = (1-a)\pi_t^* - \omega y_t - i^* + \vartheta_1 m + \vartheta_2 isf + (\delta - a)\varepsilon^d - b\varepsilon^s \quad (10)$$

Here, $\boldsymbol{\pi_t}$ inflation rate (dependent variable), explained by $\boldsymbol{\pi_t^*}$ is the lagged value of inflation. This variable provides information on the rate of inflation achieved. $\boldsymbol{y_t}$**,** the growth rate of gross domestic product, $\boldsymbol{i}^*$ the interest rate of the central banker, $\boldsymbol{m}$ rank spillover effects cause by financial changes, ***isf*** rank policy stabilisation, ε^s and ε^d measure changes in the economic environment. This theoretical framework leads to the following assumption: *dealing with the adverse effect of financial sector development, policy stabilisation ensures the attainment of monetary stability objectives*.

4.2. Econometric Methodology

After formalising how the monetary stability objective deals with shocks Gallic et al, (2017) use the VAR model to estimate the impact of these shocks on this monetary stability objective. In the same line, while using the different econometric methods, Effiong (2020) seems to us more appropriate than the method of Gallic et al (2017) because no restrictions are imposed on the variables. The econometric framework of Effiong (2020) allows a better understanding of the effects of financial sector development on the objective of monetary stability. Contrary to a single econometric method as Effiong (2020) did, two econometric methods can be used to estimate this relationship: The ordinary Least Squares method with fixed effects and the Generalized Method of Moments in the system. Estimation with the ordinary least squares method with fixed effects facilitates the control of country heterogeneity and stable structural variables over time that may have been omitted. Two tests are associated with this method: the Fisher test and the Hausman test. The Fisher test reports the overall significance of the specific effects introduced.

The Hausman test allows the choice between specifications[5].The second method, Blundell and Bond's (1998) estimator is a double advantage shared with GMMs in the first difference method makes it easy to estimate equations with a dynamic structure (presence of a lagged dependent variable present in the equation). This econometric approach has the answer to the question of statistical inference of a regression faced with OLS. Thus, its ability to handle the delicate treatment of instrument choice makes this technique more interesting.

The Blundell and Bond (1998) estimator combines for each period a first difference equation with the level equation, this allows the estimation of a system of equations simultaneously by the method of generalized moments. The characteristic of this system assures the convergence of the estimator even if the number of observations is of finite size (Effiong, 2020), Blundell and Bond's (1998) approach allows the level model and the first difference model to be stacked in the system of equations is as follows:

$$\begin{pmatrix} Y_{it} \\ \Delta Y_{i,t} \end{pmatrix} = \partial \begin{pmatrix} Y_{i,t-1} \\ \Delta Y_{i,t-1} \end{pmatrix} + \begin{pmatrix} X_{i,t} \\ \Delta X_{i,t} \end{pmatrix} \beta + \begin{pmatrix} \varepsilon_{i,t} \\ \Delta \varepsilon_{i,t} \end{pmatrix} \qquad (11)$$

The instruments provide in Blundell and Bond's (1998) systems are relevant because even a correlation between the level variables and the country-specific effects in the second equation exists, no correlation between differentiated variables and specific effects can be found. Thus, Blundell and Bond (1998) introduce additional conditions to the Arellano and Bond (1991) condition. These complement conditions introduced concerns especially the level equation in the system. The condition of the moments is written as follows:

$$E[X_{i,t-s}(\varepsilon_{i,t} - \varepsilon_{i,t-s-1}).(\eta_i + \varepsilon_{i,t})] = 0 \; pour \; s = 1; \;\; t = 2, \dots, T. \qquad (i)$$

$$E[y_{i,t-s}(\varepsilon_{i,t} - \varepsilon_{i,t-s-1}).(\eta_i + \varepsilon_{i,t})\,] = 0 \; pour \; s = 1; \; t = 2, \dots, T. \qquad (ii)$$

$$E[y_{i,t-s}(\varepsilon_{i,t} - \varepsilon_{i,t-1})\,] = 0 \; pour \; s \geq 2; t = 2, \dots, T \qquad (iii)$$

$$E[X_{i,t-s}(\varepsilon_{i,t} - \varepsilon_{i,t-1})] = 0 \; pour \; s \geq 2; t = 2, \dots, T \qquad (iv)$$

The identification of the solution set by the GMM system technique depends on the validity of the following assumptions: -error terms are not self-correlated, -instrumental variables used are valid. To make sure that these assumptions are met, Blundell and Bond (1998) introduced two other tests: the Sargan/Hansen tests (check for over-identification and the validity of the instruments used in the estimation) and the absence of autocorrelation of error terms test (this test implies that the estimator of the instrumental variables, i.e. the number of instruments (p), is greater than the number of explanatory variables (k) included in the model).

4.3. Data

The sample is made up of the panel of the six CEMAC countries (Cameroon, Chad, Congo, Gabon, Equatorial Guinea and CAR) over the period between 2000-2018. The study is used annual data extracted from World Development Indicators (WDI) of the World Bank database of 2021 complemented by the data set of the Central Bank of African States (BEAC). World Development Indicators data are the main variables of the macroeconomic environment (inflation rate, growth rate, budget balance). Data on the soundness of the banking system and the quality of assets (credit to the non-financial private sector, TIAO interest rate of the central bank, risk of credit rank by non-performing loans come from the data set of the Central Bank of African States (BEAC). Thus a stabilisation policy is a rank with a banking regulation index constructed through a principal component Analysis

[5] In fact, the Hausman test facilitates the choice between fixed and random specific effects specifications, the criterion lead to decide between two types of effects (fixed (βf) or random (βa)). The approach is to compare the variance-covariance matrix between the two estimators defined as follows: $H = (\beta f - \beta a)' \; [\, var(\beta f - \beta a)^{-1} \,] \, (\beta f - \beta a)$.

(PCA) just as Creel et al (2015) did. The data used to construct this banking policy stabilisation index are: return on assets, liquidity ratio and return on equity are set by the Central African Banking Commission (COBAC). The trend of this index is contained in annex 1.

5. EMPIRICAL RESULTS AND ANALYSIS

Specifically, the empirical model obtained from the harmonisation of the parameters of equation 10 is expressed as follows:

$$\pi_{i,t} = \beta_0 + \partial\pi_{i,t-1} + \beta_1 y_{i,t} + \beta_2 I^*_{it} + \beta_3\, gM2_{i,t} + \beta_4\, DF_{i,t} + \beta_5\, ISF_{i,t} + \beta_6\, X_{i,t} + \mu_i + \lambda_t + \epsilon_{i,t} \qquad (12)$$

Here, i and t terms refer to country and time respectively; μi captures country effects and λt time effects, εit takes into account all errors related to e.g. omissions. *I** informs interest rate policy, *gM2* rank effect of the intermediate target of the monetary policy ISF_{it} rank backup provide by prudential policy to monetary policy (stabilisation policy) and finally X_{it} term is the vector of control variables. To proceed further in estimation, Balgati (2005) states that the stationarity check due to the presence of lagged value is required and Im Pesaran and Shin (IPS) test is relevant in the case of GMM techniques (table 1).

Table 1. IPS Stationary Test

Variables	Level		Indifference	
	z-stat	**prob**	**z-stat**	**prob**
Inflation	-5.0914	0.0000	-6.7247	0.0000
credit	0.1622	0. 5644	-4.8058	0.0000
Risk of credit	-0.8073	0. 2098	-5.0314	0.0000
Stabilisation policy	-3.4778	0.0003	-6.2271	0.0000
Interest rate	2.6633	0.9961	-3.8464	0.0001
gM2	-5.0801	0.0000	-6.7273	0.0000
Growth rate	-4.8986	0.0000	-6.2808	0.0000
Oil price	-0.7980	0.2124	-4.8884	0.0000
Budget balance	-1.3119	0.0948	-4.3054	0.0000

This Im Pesaran and Shin (IPS) test is based on the p-value associated with the IPS W-Stat statistic. The test opposes[6] a null hypothesis (H0) to an alternative hypothesis (H1). The decision rule used for this IPS test is as follows: if the p-value associated with the IPS statistic is less than α (Z-stat <5%) with a 5% significance level, then we accept H0. For Nyanda (2021) after running the IPS test, introduce Blundell and Bond (1998) tests: Sargan/Hansen tests and absence of autocorrelation of error terms test is required is necessary. Just like the stationarity test, which controls the integrated order of variables, those two tests determine whether the specifications of the estimated equation (number of equations depending on the author) are good. The Wald second-order autocorrelation test and the Sargan over-identification test are checked at P-value> α significance is controlled at 5%. The H0 hypothesis implies the absence of second-order autocorrelation of the first difference residuals and it gives a P-value=Prob>Z. This test is done at 5% expressly P-value> α. The over-identification test hypothesis H0 assumes the validity of the lagged variables used as instruments and gives a p-value=Prob>chi2. This test is done at 5% expressly P-value> α. For both two tests, the H0 hypothesis is verified. Summary results of these different tests are provided in the last line of table 2. The reference equation (equation 12), including all variables of the model (equation 12.1) is complete with two other specifications (equation 12.2 and 12.3).

[6] H0: All individual series in the panel contain a unit root,
H1: At least one of the individual series in the panel is stationary.

Table 2. Estimation Result Using GMM System

Dependent variable: Inflation						
Variables	**10.1**		**10.2**		**10.3**	
	Coefficient	**t-student**	**Coefficient**	**t-student**	**Coefficient**	**t-student**
L.Inflation	0.222	0.095	0.216	0.095	0.222	0.095
Credit	-0. 467	0.516	-0.292	0.509	-0. 476	0.506
Credit risk	6.057	0.638	6.091	0.632	6.078	0.642
Stabilisation policy	-0.732	0.559	-0.728	0.648	-0.749	0.645
TIAO	-0.169	0.693	-0.197	0.691	--	--
gM2	1.511	2.111	--	--	1.681*	2.111
Growth rate	-0.028	0.047	-0.059	0.048	-0.048	0.048
Oil price	0.060**	0.028	0.062**	0.028	0.059**	0.027
Budget balance	-6. 045	6.223	-6.200	5.207	-5.447	5.227
Constant	1.434	0.494	1.465	0.492	1.466	0.478
Auto-correlation test	0.650		0.687		0.640	
over-identification test	0.157		0.132		0.140	

Source: Author calculation. Note: *, ** & *** denote 10%, 5% &1% significance levels respectively values

The two equations (equations 12.2 and 12.3) make it easy to seize the opportunity of the central banker to choose a suitable instrument based on the perception of the environment's state. This approach is built on Cecchetti (2001) analysis. The shape of those two specifications was based on the main policy instruments of BEAC (interest rate TIAO and money supply (or liquidity flow)). Those tools have been instrumented jointly and separately enabling the changeover of instruments. Regarding the result, the first comment concerns the impact of the lagged inflation rate. Lagged inflation rate has a positive impact on the inflation rate of the next period. For all equations coefficients obtained are nearby 0.22 points. The result implies that the inflation rate of the previous period tends to push up the current inflation rate.

The results provided by the OLS with fixed displays in annex 1 confirm this influence. The financial sector development measured by the variable private sector credit as a percentage of GDP is extensively used in literature (Keho, 2009; Kim et al., 2010; Effiong, 2020; Batayneh et al, 2021; Nyanda, 2021) draw the negative relationship with inflation found in this literature. Inflation and capacity to supply the private sector with credit move in opposite directions. This result shows that while price instability increases in CEMAC countries, people save less money. And this reduction affects the performance of the financial sector reflected in the diminution of capacity to supply credit. It is therefore not strange to see that credit risk increases inflation.

The non-performing loans widely used in literature (Fofack, 2005; Antonin, 2018; Onomo, 2021; Foglia, 2022) draw the fact that banks extend credit to economic agents who do not return the credit on time. These adverse effects hold in credit allocation, in turn, harm the performance of the financial sector and the downside is that it increases price instability. Credit risk (non-performing loans) raises inflation nearby 6.1 per cent. This finding implies that a spillover effect of financial sector development is the main determinant that holds back the central banker's objective of monetary stability.

The implications for the CEMAC sub-region is that, credit risk accompanied by an increase in price instability downside financial sector performance and prevent the central bank from achieving its objective of internal monetary stability. With regard to the impact of the banking sector stabilising policy, this banking regulation wants to contain this negative externality associated with financial sector development (growth of credit risk) reducing the performance of this sector. Its effect is still weak reduces the risk of inflation nearby 0.7. The stabilisation policies play a role by monitoring the structure and the conduct of these financial institutions.

However, the control of financial institutions must be complemented by determining the level of credit risk incurred by financial sector actors. Kobou and Ayuk (2016) emphasise this lack of consistency in policy regulation. Accordingly with authors this deficiency can be the cause of the weak impact observed in all the specification. Therefore, highlighting that lowering effect on inflation rate confirms that strengthening banking sector regulation tools in CEMAC may improve the backup to monetary stability objective. Beyond the

coefficients, policymakers should seek to promote better alignment of their transmission channel of banking sector stabilisation requirements (banking sector regulation tools).

The need to strengthen the tool is to ensure that these regulatory instruments do not vary over the economic cycle because if financial sector actors are considered as over-liquid how credit risk increases inflation to these proportions. This situation is of utmost interest because is likely to create spirals of excess liquidity, illiquidity, insolvency in CEMAC. To close this result analysis section, a positive sign of oil price and a negative sign of budget balance reflect the effect of exogenous shocks on central banker objective. The supply shock (oil price) increases the inflation rate. This positive sign is independent of the choice of rules or targets made by central bankers' implying that it holds back the achievement of the monetary stability objective.

It indicates that a different effect occurs on central banker operations when oil prices change. Controlling that shock would improve central bankers' actions. The negative sign of the budget balance shows that the fight against inflation relies on the rigour of monetary policy moving in the opposite direction from the fiscal policy instrument. This relationship implies that the combination of a restrictive monetary policy objective with expansionary budgets for the different states leads to divergent orientations. The proper action is needed because such environment can not only reduce effectiveness of central bank instruments and policies, but also hold back his target (low inflation).

6. CONCLUSION

This work determines the link between financial sector development and monetary stability in CEMAC. Facing the new challenge due to the improvement financial sector and its influence on central bank action, a growing change observe in recent years display the need to find what can be obtain from the relationship between financial sector development and central bank objective. The number of studies which have explored this question empirically still relatively limited and the results seem to be mixed. This paper adds to this literature by providing evidence on the ambiguous impact of financial sector development over the action of the central bank. The results suggest the relevance of a more active central banker.

The environment’s state on monetary policy noted by Krause and Roja (2006) has been found in the CEMAC case. In accordance with the instruments used by the BEAC, three equations were estimated. The first version integrated two main monetary policy instruments of BEAC (the TIAO and the monetary base). The other equation analysed separately the effect of these two instruments. Using panel data of 6 member countries of a monetary union over 2000 to 2018, the data used comes from the World Bank (WDI, 2021) and the Centrale Bank of African States (BEAC). A GMM-system has been performing. The key results emerge from this paper highlighted elements hindering the monetary stability objective in CEMAC.

If the analysis shows that there are two aspects determinants of monetary instability, the result highlighted the influence of the undesirable effects of financial sector development. Those undesirable effects are holding back the monetary stability in CEMAC. The credit risks appear as the main cause of monetary instability and the main undesirable effects of financial sector development. Yet, the main source of inflation rate increases in CEMAC. To deal with this problem stabilising the banking sector appears as a proper backup. This idea abides on the fact that, despite being over-liquid, how come that such level of credit risk encountered.

Moreover, how come that this credit encountered in the banking system of CEMAC increases inflation to these proportions. The raison is simple the lender will never acquire the right information from the borrower. In accordance with this comment to be surer of the relation between lender and borrower, the central banker should be involved in this transaction to reduce the negative influence of adverse effects. As for CEMAC, central banker is the relevant stakeholder its implication is needed to ensure the success of its policy and the fulfilment of its targets.

The assistance provides by prudential policy tools stabs to reduce the negative influence of adverse effects (determinants of monetary instability and influence of the undesirable effects of financial sector development). Therefore, as this stabilisation policy succeeds in mitigating the negative consequences of financial sector development, policymakers are requested to seek how to promote better alignment of their transmission channel so that those regulatory instruments offer better assistance to preserve the monetary stability objective. The banking sector stabilisation require a deeper look for its consolidation to make sure that these regulatory instruments do not vary over the economic cycle.

AUTHORS' DECLARATION
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AUTHORS' CONTRIBUTIONS

All sections are written by the author.

REFERENCES

Aglietta, M., & Scialom, L. (2009). Permanence and innovation in central banking policy for financial stability. In *Financial Institutions and Markets* (pp. 187-211). Palgrave Macmillan, New York.

Almarzoqi, R., Naceur, M. S. B., & Kotak, A. (2015). *What matters for financial development and stability?*. International Monetary Fund.

Antonin, C., Levasseur, S., & Touzé, V. (2018). L'Union bancaire face au défi des prêts non performants. *Revue de l'OFCE*, *158*(4), 227-252.

Baltagi, B. H. (2005). Econometric analysis of panel data 3rd Edition England JW &Sons.

Batayneh, K., Al Salamat, W., & Momani, M. Q. (2021). The impact of inflation on the financial sector development: Empirical evidence from Jordan. *Cogent Economics & Finance*, *9*(1),1970869.

Bikai, J. L., Essiane, P. N., & Bayesian Structural, V. A. R. (2017). *Politique monétaire, stabilité monétaire et croissance économique dans la CEMAC: Une approche SVAR bayésienne* (No. 08/17). BEAC Working Paper-BWP.

Boissay, F., Collard, F., Galí, J., & Manea, C. (2021). *Monetary policy and endogenous financial crises* (No. w29602). National Bureau of Economic Research.

Buch, C. M., & Goldberg, L. (2016). *Cross-border prudential policy spillovers: How much? How important? Evidence from the international banking research network* (No. w22874). National Bureau of Economic Research.

Cecchetti, S. (2000). Making monetary policy: Objectives and rules. *Oxford Review of Economic Policy*, *16*(4), 43-59.

Cecchetti, S. G., & Krause, S. (2001). Financial structure, macroeconomic stability and monetary policy. NBER Working Paper No. 8354.

Creel, J., Hubert, P., & Labondance, F. (2015). Financial stability and economic performance. *Economic Modelling*, *48*, 25-40.

Criste, A., & Lupu, I. (2014). The central bank policy between the price stability objective and promoting financial stability. *Procedia Economics and Finance*, *8*, 219-225.

Davoodi, M. H. R., Dixit, M. S., & Pinter, G. (2013). *Monetary transmission mechanism in the East African Community: An empirical investigation*. International Monetary Fund.

Dewatripont, M., & Freixas, X. (2012). The Crisis Aftermath: New Regulatory Paradigms. 2012. *CEPR book*.

Effiong, E. L., Esu, G. E., & Chuku, C. (2020). Financial development and monetary policy effectiveness in Africa. *Journal of Social and Economic Development*, *22*(1), 160-181.

Fofack, H., & Fofack, H. L. (2005). *Nonperforming loans in Sub-Saharan Africa: causal analysis and macroeconomic implications* (Vol. 3769). World Bank Publications.

Foglia, M. (2022). Non-Performing Loans and Macroeconomics Factors: The Italian Case. *Risks*, *10*(1), 21.

Gaffard, J. L., & Napoletano, M. (2018). Hétérogénéité des agents, interconnexions financières et politique monétaire: une approche non conventionnelle. *Revue francaise d'economie*, *33*(3), 201-231.

Gallic, E., Poutineau, J. C., & Vermandel, G. (2017). L'impact de la crise financière sur la performance de la politique monétaire conventionnelle de la zone euro. *Revue économique*, *68*(HS1), 63-86.

Gauvin, M. S. (2013). *Politique monétaire et secteur bancaire: instabilité financière et mise en évidence de nouveaux canaux de transmission* (Doctoral dissertation, Université de Toulon).

Issing, O. (2003). Monetary and financial stability: is there a trade-off?. *BIS Papers*, *18*, 16-23.

Keho, Y. (2009). Inflation and financial development: Cointegration and causality analysis for the UEMOA countries. *International Research Journal of Finance and Economics*, *27*(10), 117-123.

Kim, D. H., & Lin, S. C. (2010). Dynamic relationship between inflation and financial development. *Macroeconomic Dynamics*, *14*(3), 343-364.

Kindleberger, C. P. (2000). Manias, panics, and crashes: a history of financial crises. *The Scriblerian and the Kit-Cats*, *32*(2), 379.

Kobou, G., & Ayuk, E. T. (2016). Les perspectives de la réglementation et de la supervision des institutions de microfinance en Afrique centrale. *enAfrique centrale*, 137.

Korinek, A., & Sandri, D. (2015). *Capital controls or macroprudential regulation?* (No. w20805). National Bureau of Economic Research.

Krause, S., & Rioja, F. (2006). Financial development and monetary policy efficiency. *Emory Economics*, *613*(158), 100-121.

Minegishi, M., & Cournede, B. (2010). Monetary policy responses to the crisis and exit strategies. OECD Working Papers No. 753, Economics Department.

Mishkin, F. S. (1996). The channels of monetary transmission: Lessons for monetary policy. NBER Working Paper No. 5464.

Mishkin, F. S. (2009). Is monetary policy effective during financial crises?. *American Economic Review*, *99*(2), 573-77.

Nyanda, P. G. N. (2021). Déterminants et effets économiques de l'inflation dans la CEMAC. *Journal of Academic Finance,* 12(1), 187-204

Rieu-Foucault, A. M. (2018). *Politique monétaire et stabilité financière* (No. 2018-13). University of Paris Nanterre, EconomiX.

Rousseau, P. L., & Wachtel, P. (2002). Inflation thresholds and the finance–growth nexus. *Journal of international money and finance*, *21*(6), 777-793.

Scialom, L. (2013). *Économie bancaire: La meilleure synthése actuelle sur l'économie bancaire*. la Découverte.

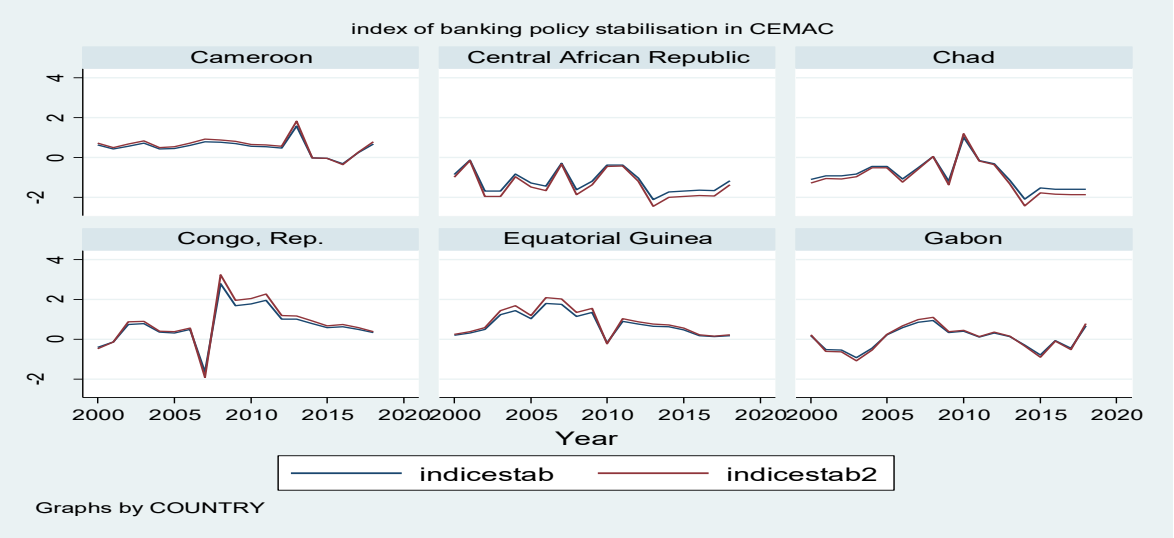
Shrestha, P. K., & Semmler, W. (2015). Monetary policy and international reserves in emerging economies: theory and empirics. In *Emerging Markets and Sovereign Risk* (pp. 213-230). Palgrave Macmillan, London.

Spyromitros, E., & Tsintzos, P. (2019). Credit expansion in a monetary policy game: Implications of the valuation haircut framework. *Finance Research Letters*, *28*, 125-129.

Stiglitz, J. E. (2013). Stable Growth in an Era of Crises: Learning from Economic Theory and History. *Ekonomi-tek*, *2*(1), 1-39.

ANNEXES

Annex1. Trend of Banking Policy Stabilisation Index by CEMAC Country



Annex 2. Effect of Financial Sector Development on Monetary Stability in the CEMAC: Fixed Effects Model

Variables	**10.1 Inflation**	**10.2 Inflation**	**10.3 Inflation**
g. inflation	0.1431603 (0.102736)	0.139219 (0.10278)	0.1380459 (0.1023431)
Credit	-0.92001 (0.7550211)	-0.34728 (0.53945)	-0.96799 (0.74259)
Credit risk	6.320645 (6.771926)	6.320736 (6.77881)	6.036948 (6.738396)
Stabilisation policy	-0.15176 (0.75313)	-0.007261 (0.750662)	0.2272288 (0.7598413)
TIAO	0.10377 (0.72131)	-0.06103 (0.72096)	--------
gM2	2.42e-13 (2.24e-13)**	-----	2.69e-13 (2.22e-13)**
Growth rate	-0.013712 (0.0501)	-0.007418 (0.04982)	0.014467 (0.049508)
Oil-price	0.06396 (0.02881)**	0.06711 (0.028694)**	0.599298 (0.284171)**
Budget balance	-6.00472 (5.32972)	-5.59934 (5.32196)	-6.780689 (5.319647)
Constante	1.7152 (0.54729)	1.766868 (0.5457607)	1.537679 (0.487426)
Observations Number of countries R^2 * within	102 6 18%	102 6 16.85%	102 6 18%

Source: Author, note: *, ** & *** denote 10%, 5% &1% significance levels respectively values