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## Is Banking Concentration in CEMAC Socially Optimal?

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### Authors' contributions

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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### ABSTRACT

The objective of this paper is to verify whether the structure of the CEMAC banking market tends towards a socially optimal concentration. The theoretical basis of this study is built around the debate between *structuralists* and *Chicago School advocates*. In order to carry out this work, we draw on the models of Chauveau and Saidane (1991) and Mirzaei and Moore (2014). The study covers all CEMAC countries over the period 2002-2019. The selected model is estimated by the lagged OLS of its explanatory variables and the 2SLS. We obtain the robust result that the structure of the CEMAC banking market does not tend towards a socially optimal concentration. In fact, banking concentration and control of corruption hinder competition among banks and hence, reduce satisfaction of customers. This occurs because CEMAC banking concentration was achieved through external growth instead of banks' efficiency. To this end, economic policy recommendations for further bank restructuring in CEMAC are proposed.

*Keywords: Banking concentration; social optimum; credit market; restructuring.*

**JEL Classification:** D41; D69; L11; G34; I31.

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## 1. INTRODUCTION

The concentration-banking performance relationship has been widely analyzed in the literature. The pioneering work on this relationship dates back to the early 1960s in the United States within the SCP paradigm. This paradigm states that in a concentrated banking market, banks perform well. This performance is exclusively financial and does not take into account other stakeholders. Recent work has brought limits to this perception of performance by highlighting the concept of sustainable performance [2]. According to this work, performance must take into account not only the financial dimension, but also the non-financial dimension. In such a way that performance simultaneously takes into account the interests of banks and all other stakeholders (customers, governments, regulators, etc). Consequently, the concentration-banking performance relationship needs to be reviewed. To this end, this paper analyzes the sustainable concentration-performance relationship of banks. In other words, we assess the sustainability of bank concentration in the CEMAC. It is no longer a question of verifying that there is a causal relationship between concentration and financial performance, but of verifying whether bank concentration favors the sustainable performance of banks.

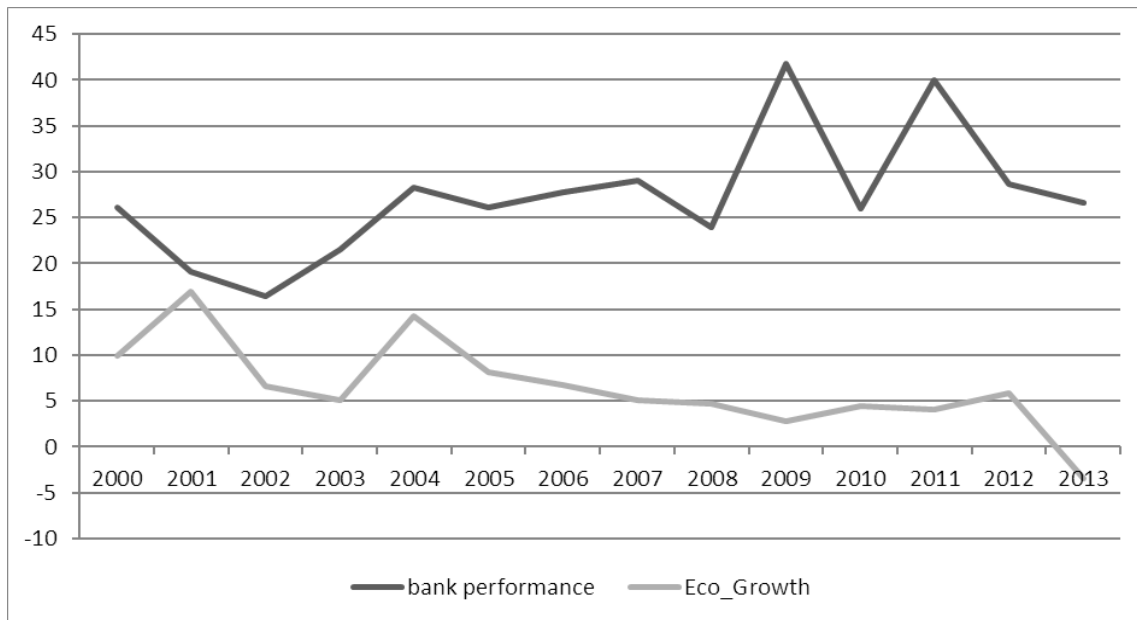
CEMAC banks<sup>1</sup> are profitable but remain unable to finance development [2]. This situation is a paradox, as the banks are doing well while the CEMAC economies suffer from the problem of bank underfunding. Indeed, these banks do not offer quality services, yet they collect excessive agios, commissions and interest from their customers [3]. This reflects the inefficient functioning of the CEMAC banking market, of which banking concentration is an important factor [3]. This inefficiency of the banking market can have negative effects on the macroeconomic performance of CEMAC countries. This is justified by the fact that bank output (bank credit) is an essential input for other sectors of the economy. Thus, a sub-optimal Pareto equilibrium in the banking market, characterized by abnormally high lending rates and relatively low credit quantity, can have negative repercussions in other sectors of the economy, while banks are

recording high profits. In such a situation, economic growth suffers, as companies have difficulties in financing their investments on the one hand, and the debt burden of households can reduce their disposable income and thus their consumption level.

Fig.1 shows that, on average, the banking sector in CEMAC is performing well financially while the economic situation in the sub-region is stagnating or even deteriorating continuously<sup>2</sup>. This situation in CEMAC corroborates Saidane's [4] expression that banks are doing well, while the economy is suffering. This situation is not beneficial for any stakeholder in the long run, neither for the banks' shareholders nor for other stakeholders. Indeed, a boomerang effect may appear in the long term, as a persistent slowdown in the growth rate in CEMAC may drag down the financial performance of banks with it. Consequently, banks have an interest in ensuring the well-being of the surrounding economic environment in order to achieve long-term performance. The objective of the bank must now go beyond financial performance to pursue the goal of sustainable performance. Our paper tries to contribute to the identification of the main determinants of sustainable bank performance. To this end, we analyze the effect of bank concentration on the sustainable performance of banks in the CEMAC zone. Bank concentration can have two ambivalent effects on the sustainable performance of banks. On the one hand, it can negatively affect the sustainable performance of banks by favoring only bank shareholders to the detriment of other stakeholders. Indeed, banking concentration, through the market power it provides, increases the ability of banks to set abnormally high lending rates and low deposit rates. Furthermore, bank concentration can limit the effectiveness of monetary policy by allowing banks to maintain high lending rates even when the central bank cuts its policy rate drastically in order to boost activity. On the other hand, it can positively affect the sustainable performance of banks through the cost-efficiency gains it generates. The objective of this paper is to assess the sustainability of the concentration of the CEMAC banking market structure. To achieve this objective, we estimate a model inspired from

<sup>1</sup>The Economic and Monetary Community of Central African States (CEMAC) is composed of six countries: Cameroon, Chad, Congo, Equatorial Guinea and Gabon. It was created in 1994, replacing the Customs and Economic Union of Central Africa (UDEAC) which had existed since 1964.

<sup>2</sup> It is true that almost all CEMAC economies are heavily dependent on oil prices, but an efficient banking market would have significantly reduced this heavy dependence. Indeed, when banks fully ensure their function of financing the economy, they create the necessary and sufficient conditions for the emergence of the economies in which they operate.



**Graph 1. Evolution of banks' financial performance and economic growth in CEMAC**

*Source: Authors based on World Bank data*

Chauveau and Saidane [5] and Mirzaei and Moore [6] by the lagged OLS and 2SLS techniques. We obtain the robust result that CEMAC banking concentration and control of corruption hinder competition among banks and hence, reduce satisfaction of customers. Our study appears timely for at least two reasons. On the one hand, it allows us to enlighten the banking commission on how to organize and regulate the banking market; on the other hand, it allows us to make concrete proposals to strengthen the role of the banking system as a reliable tool for financing development in CEMAC.

The remainder of the article is organized around four main sections. The first section defines the concept of sustainable banking. The second section provides an overview of the CEMAC banking system. The third section presents a state of the art on the concentration-sustainable

performance relationship. The methodology, results and interpretations are presented in the last section.

**The concept of sustainable banking and its relation to banking concentration:** Since the subprime crisis, several banks have reviewed their global strategies. As a result, they are now integrating the issue of sustainable development or social responsibility into their strategies. To such an extent that several studies are interested in the notion of sustainable banking (Saidane and Pauget, 2010; Rebai et al., 2012) [1,7]. According to this work, a sustainable bank is defined as "a strong institution that offers stable services, is aware of its responsibility towards society and the environment, and values its relationships with all stakeholders more". The following box gives us more details on what sustainable banking is.

**Box 1: What is a sustainable bank?**

A sustainable bank can be delineated by four non-exhaustive characteristics. The first two relate to activity and performance and the last two relate to safety and financial stability.

**Characteristic 1: Ensuring the basis for financial intermediation over time:** A sustainable bank must continue to provide financial intermediation. It must satisfy its customers while maintaining a level of return that guarantees a good position on the financial market. It must provide its customers with simple and traceable products.

**Characteristic 2: Good performance in the short, medium and long term:** A sustainable bank must not only have a short-term vision, but must also deploy medium- and long-term intermediation to ensure its sustainability.

**Characteristic 3: Need for security for all economic actors and society in general:** A sustainable bank must simultaneously protect the interests of shareholders and all stakeholders (customers, government, employees, etc.). It must integrate the expectations of all stakeholders.

**Characteristic 4: Contribution to financial stability:** A sustainable bank should not only perform the task of intermediation, but also contribute to the stability of the financial system through traceable financial activities based on a controlled level of risk.

Source: Ben Abdallah et al, [1]

As the concept of sustainable banking is well defined, we must now analyze the sustainability of CEMAC banks. To do so, we analyze the sustainability of banks' performance and their contribution to financial stability in CEMAC.

Fig. (1) shows that CEMAC banks are financially successful, but it is important to analyze whether other stakeholders in the banking market are satisfied. On the customer side, banks have difficulty accessing bank credit due to, for example, high funding costs [8,9]. This difficult access to bank credit by customers tends to decrease customer satisfaction. On the regulatory side, CEMAC banks do not always comply with regulatory standards. In 2014, nine out of fifty banks were in breach of the risk coverage ratio [3].

In fact, banks are economically satisfied to the detriment of other stakeholders (customers and regulators, etc.), so much so that one tends to argue that CEMAC banks are not sustainable. We therefore attempt to identify the main determinants of the sustainable performance of CEMAC banks. To this end, we formulate the hypothesis that bank concentration constitutes an important determinant of the sustainable performance of banks in CEMAC. Indeed, it can first of all allow banks to record greater profitability through the economies of scale it provides, while better remunerating its employees. It can then allow for a pricing of banking services favorable to the customers through the cost efficiency gains achieved thanks to economies of scale and scope. Finally, it can promote the stability of the banking system by limiting excessive risk-taking.

From the above, it is necessary to analyze banking concentration in CEMAC and to present some stylized facts relating banking concentration to some explanatory variables of economic satisfaction of different stakeholders in the banking market.

**Banking concentration in CEMAC:** In general, concentration in a banking industry can be defined according to two main approaches,

namely, a market share approach and a geographical approach. According to the market share approach, concentration is a process in which the size of banks increases and the market is controlled by a few (oligopoly) or even one (monopoly) of them. According to the geographical approach, banking concentration refers to a clustering of banks around a specific location.

In CEMAC, the banking market is highly concentrated. The following boxes justify the high concentration of the CEMAC banking industry, both in terms of market share and in geographical terms. Under the market share approach, two main concentration indices justify banking concentration in CEMAC. These are the Herfindhal-Hirshman Index (HHI) and the ratio of the market share of the  $k$  largest banks in the banking market ( $CR_k$ )<sup>3</sup>.

According to available COBAC statistics [3], banking market structures in CEMAC are highly concentrated<sup>4</sup>.

**According to the  $CR_k$  index, the data show that:** In the Central African Republic and Equatorial Guinea, where there are four (4) and five (5) banks respectively, the top three (3) banks account for 90.7% and 86.4% of the total balance sheet, 91.6% and 86.3% of the market share in deposits, and 90.7% and 92% in loans.

In Gabon, three (3) of the ten (10) banks in operation have 67.3% of the market share in terms of total assets, 68.6% of deposits and 67.1% of loans. Three (3) banks out of the ten (10) banks in the Congolese banking system have 73.3% of the market share in terms of total assets, 77.4% of deposits and 76.5% of loans.

<sup>3</sup>A banking market is said to be highly concentrated when its HHI is above 1800, and moderately concentrated when the HHI is between 1200 and 1800. The market is low concentrated when its HHI is below 1200.

<sup>4</sup>As the different banking markets in the CEMAC are well delimited, concentration can only be measured on a country-by-country basis. A concentration indicator measured at the Community level would not be relevant.

In Chad, of the eight (8) banks in operation at the end of December 2014, the top three (3) have 57.1% of the total balance sheet, 61% of deposits and 58.2% of loans.

Finally, in the Cameroonian banking system which had thirteen (13) banks in operation, the top three (3) banks share 50.5% of the market share in terms of total assets, 49.8% of the market share in terms of total deposits and 54.5% of the market share in terms of total loans. According to the HHI, almost all CEMAC banking markets have an index of 1800 or above. Only the Cameroonian banking market has an index below 1800.

It is therefore clear that the CEMAC banking market is highly concentrated in terms of market share. However, in addition to this concentration, there is also a geographical concentration of banks in CEMAC.

Most CEMAC banks are located in the economic and political capitals of CEMAC. Furthermore, within these capitals, banks are clustered in city centres. This geographical concentration is likely to have an impact on access to financial services. This is because transaction costs are too high for the populations on the periphery. As a result, according to available statistics for 2014, the number of bank branches per 100,000 adults is 1.95 (GFDD, 2016). This banking density is relatively low compared to Côte d'Ivoire, for example, which had 4.73 bank branches per 100,000 adults at the same time. This huge gap could further degrade the welfare of banking consumers. Indeed, while they already have to bear the high financing costs, they still have to bear the high transaction costs. Moreover, in a situation of low banking density, spatial competition is weak and the market tends towards a local monopoly resulting in higher costs of banking services.

According to the structuralist view, the market structure determines the behaviour of suppliers. A concentrated banking market structure favours collusive behaviour on the part of banks. They set abnormally high financing costs in order to make super-profits at the expense of customers [10]. These high financing costs discourage investment and negatively affect economic growth. This is because the marginal efficiency of capital is likely to be insufficient to cover these high marginal financing costs [11].

However, banking concentration is not always harmful to the economy. Indeed, greater banking

concentration can promote the efficient financing of CEMAC economies. Indeed, the economies of scale generated by this strong concentration can contribute to the reduction of bank financing costs. In addition, banks can better control and limit the problems of information asymmetry. Indeed, the presence of bad and good clients neutralizes risk and improves the average quality of the portfolio [12].

From these two contradictory perceptions on the status of banking concentration, the problem of the optimality of concentration arises. It is not a question of analyzing whether greater banking concentration would be beneficial to the various CEMAC economies. For the size of the CEMAC banking system must inevitably increase. Given that the economies of this sub-region have enormous development financing needs. The question is therefore whether banking concentration in CEMAC is tending towards an optimal banking market structure<sup>5</sup>. Thus, the paradox that banks are doing well while the economy is suffering reflects a serious problem that needs to be addressed.

**The banking market in CEMAC:** As at 31 December 2016, the CEMAC banking system was made up of 52 banks headed by a central bank, the BEAC<sup>6</sup>. These banks are licensed under the universal banking model. They carry out both deposit and investment banking activities (COBAC Regulation R-2009). In other words, on the one hand they are authorized to carry out what is known as the "core business", i.e. they receive deposits and grant loans. On the other hand, they are active in the financial markets, carrying out financial operations such as bond issues, share subscriptions, stock exchange listings, etc. However, the embryonic situation of the CEMAC financial markets forces them to carry out mainly deposit banking activities, such that 85% of financial assets and liabilities are held by banks [3]. With only three companies listed on the Central Africa Exchange (BVMAC), most of the market activities carried out by CEMAC banks are related to the bond issues of the various member states. The universal banking model therefore becomes problematic in terms of financial intermediation.

<sup>5</sup> The market structure is socially optimal when it is in favour of both suppliers and demanders.

<sup>6</sup> On 22 November 1972 the Bank of Central African States (BEAC) was created to replace the Central Bank of Equatorial African States and Cameroon (BCEAEC) and to create the Central African Financial Cooperation Franc (FCFA).

Indeed, banks would use customer deposits to buy more and more profitable but low-risk government bonds. This would have a crowding-out effect on private agents, especially SMEs, which are already suffering from excessive credit rationing. Moreover, this universal banking model may be at least partially responsible for the total absence of private development banks whose main vocation is to finance development through long term credits. It is therefore almost obvious that banks finance development very marginally in CEMAC [2].

The Graph 2 shows that customer loans of all CEMAC banks are almost exclusively short and medium term. The share of long-term loans in the cumulative outstanding loans represents only 2% in 2014 [3]. This worrying situation could be explained by the shape of the curve in terms of rates in the CEMAC. This curve is inverted from five years of maturity [13]. This means that investors in the CEMAC zone prefer to invest their liquidities in the medium term instead of the long term. It is therefore not surprising that medium-term loans dominate customer loans.

However, if it is true that the rate curve reflects the expectations of economic agents on the evolution of the various interest rates, it remains to be seen whether these rates are always set by the fundamentals of the economy (risk premium, maturity premium, etc.). These rates may be based on the exercise of monopoly power by banks and not on the assessment of risk. For example, a highly concentrated banking market structure may encourage banks to set relatively high lending rates on short maturities, as long loans may be the preserve of less risky borrowers (government, large companies). Thus, the structure of the banking market reduces the relevance of a term curve by distorting expectations of different interest rates.

It is true that the banking industry in CEMAC is concentrated, but this would be a bad concentration. Indeed, while the profitability of banks is quite high, customers have difficulty accessing bank credit because of, for example, high financing costs [8,9]. As a result, the restructuring<sup>7</sup> of the CEMAC banking industry, in

<sup>7</sup> Bank restructuring is a public decision or reform to review the structure of the domestic banking market and the business models of the banks operating in it in order to improve the way the economy is financed. It is an excellent opportunity to review the cost structure of banks and thus reduce the cost of financing for businesses.

order to move towards a good concentration, is necessary but not sufficient.

In the CEMAC and elsewhere, an optimal banking market would ultimately be one that is simply beneficial to all banking stakeholders.

## 2. REVIEW OF THE LITERATURE

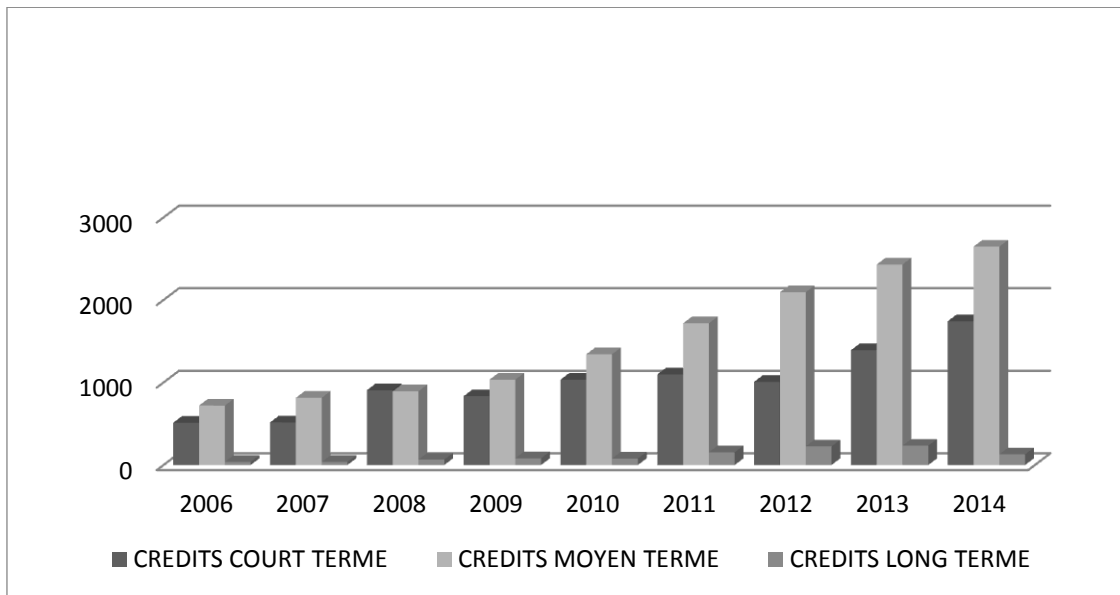
According to the first welfare theorem, a general equilibrium in perfect competition is a Pareto optimum. Therefore, any deviation from this purely competitive equilibrium generally implies welfare losses. Of all the factors that impede competition, industry concentration is the one that has received most attention in the economic literature. The issue at stake in this topical debate is whether concentration hinders competition and therefore implies the loss of welfare of demanders to suppliers.

Two main schools of thought provide competing frameworks for analyzing the economic models that structure banking markets. These are the Harvard School, which advocates the Structure-Behavior-Performance paradigm, and the Chicago School, which supports the Structure Efficiency (SE) paradigm<sup>8</sup>.

The thesis of the Harvard school<sup>9</sup>, established around Bain and Masson, is that there is a positive relationship between the structure of the market (the number of sellers, the degree of product homogeneity, the cost structure, etc.) which determines the behavior of the firm (its pricing policy, the intensity of its research and development, etc.) and, by this means, influences the firm's performance (commercial margin, profits, etc.). For this school of thought, a concentrated banking market leads banks to behave collusively by setting abnormally high lending rates. In this configuration, banks make substantial profits at the expense of consumer satisfaction. Thus, the concentration of the

<sup>8</sup> The ES paradigm is based on two assumptions according to Berger (1995). X-efficiency and scale efficiency. X-efficiency, implemented by Leibenstein (1966), states that firms with superior production and technology management have relatively low costs and consequently higher performance. In the logic of scale efficiency, firms tend to have the same levels of management and technology but some produce at more efficient scales than others.

<sup>9</sup> Still called structuralists, this current of thought has an essentially empirical dimension, its theoretical underpinnings being inherited from the earlier work on imperfect competition by Cournot, Stackelberg, Edgeworth and Chamberlin.



**Graph 2. Evolution of sound loans to customers according to the initial duration in CEMAC**

*Source: Authors based on COBAC reports*

banking market accounts for low competition in the sector and consequently for a loss of social welfare. However, such a view has been shown to be fallacious as market power and concentration are endogenous, as they are simultaneously influenced by the behavior of firms [14]. Thus, the causal relationship between concentration and market power is no longer necessarily established.

It is under this criticism that the Chicago school, established around Demsetz and Stigler, is forged. For the proponents of this school of thought, the chains of the SCP triptych are reversed. It is the behavior and performance of firms that influence market structures. Indeed, the more efficient a firm is, the better its performance and the more it gains market share. Concentration is therefore the result of a dynamic selection process at the end of which inefficient firms disappear in favor of more efficient firms. This difference in efficiency may be due to management, know-how or staff motivation. Firms with comparative advantages in production obtain higher market shares. For example, in a concentrated banking sector, the cost efficiencies achieved through economies of scale and scope allow banks to offer higher returns on deposits and to charge lower lending rates. In this case, greater concentration tends towards a socially optimal structure. Thus, concentration and competition are two concepts that are not systematically linked. In other words, atomicity is no longer necessarily a necessary condition for

competition. The theory of contestable markets of Baumol et al (1982) is a relevant justification for this hypothesis. This theory states that despite concentration in a sector, in the absence of barriers to entry, pressure from potential competitor's forces established firms to behave competitively in terms of price and quantity. Under the pressure of these potential competitors, a contestable market achieves stability and competitive equilibrium regardless of its structure. In this view, market power cannot be approximated by the level of concentration, but must be estimated from the behavior of the firm, derived from the microeconomic models of imperfect competition of Klein [15] and Monti [16]. Several indicators meet this characteristic, including the Lerner index [17]. In sum, these two main competing schools of thought provide information on the status of concentration. For structuralists, concentration leads to a socially sub-optimal equilibrium because it unilaterally favors the suppliers to the detriment of the customers. However, for the Chicago school, market power is not harmful to competition, but rather expresses that a competitive market functions efficiently. However, other theoretical debates underlying this precedent discuss the appropriateness of bank concentration in relation to financial stability and the effectiveness of monetary policy for example.

With respect to the effect of concentration on financial stability, two distinct paradigms provide competing frameworks for analysis of the effect

of bank concentration on financial stability. These are the *concentration stability view* and the *concentration fragility view*.

For the proponents of the *concentration-stability view*, the strengthening of the market power of banks, i.e. a higher concentration of the market, generally improves the stability of the system. In other words, a weakening of the banking market and an increase in competition weakens banks' pricing power, increases banks' risk-taking and thus compromises financial stability. This result is in line with the existing literature that also uses the Lerner index as an indicator of market power (e.g. [18]). Furthermore, since Markowitz's [19] modern portfolio theory, the economic literature agrees<sup>10</sup> that bank diversification guarantees greater financial stability. Also, the literature considers that the capacity of banks to diversify is a function of the size of the banks, and therefore potentially of the concentration of the system [20-23]. Thus, bank concentration would be a guarantee of financial stability through diversification.

However, the other paradigm, known as the *concentration fragility view*, sees bank concentration as a source of financial fragility. Indeed, when the banking system is concentrated, banks use their market power to set high lending rates, leading to higher interest margins. These high rates increase the probability of default by borrowers who respond by taking on more risk [24]. This reduces financial stability. In addition, *Too Big To Fail* (TBTF) insurance, implemented in the United States since 1984, has led banks to increase their size and take excessive risk. This illustrates the problems of time inconsistency on the part of banks. Indeed, because it is ex-post optimal for the regulator to intervene and large banks are aware of this, they will ex-ante modify their behavior [25]. As a result, this bank concentration would lead to more financial instability.

From the theoretical divide above, we note that concentration is not necessarily a factor of financial fragility. Since it seems that the effect of concentration on financial stability would depend on the status of the concentration. Thus, a good concentration, resulting from a dynamic selection process at the end of which inefficient banks

disappear in favor of the most efficient ones, would lead to a stable banking system. Moreover, in such a banking market structure, banks do not necessarily use their monopoly power to set abnormally high lending rates, which are a source of adverse selection and financial instability. In the end, the relationship between concentration and stability depends on whether concentration is good or bad. Good bank concentration generally leads to system stability. However, the identification of a good banking market structure can also be done by analyzing the effect of concentration on the efficiency of monetary policy transmission channels.

Two paradigms (SCP and ES) in industrial economics presented above allow us to derive lessons on the impact of bank concentration on the effectiveness of monetary policy. Although these two paradigms offer contrasting interpretations of market structure, they predict the same effect of concentration on the effectiveness of monetary policy with one nuance. Indeed, it can be deduced from both the *Efficient Structure Hypothesis* and the *SCP* model that, other things being equal, the less concentrated the banking industry is, the more important the credit channel is. However, the Chicago school still argues that, when concentration and competition are not dissociable, concentration would therefore not be a hindrance to the efficiency of monetary policy. Similarly, a concentrated and contestable banking market does not weaken the credit channel.

Several empirical evidences continue to animate this theoretical debate. Some works support the PCS paradigm while others justify the ES hypothesis. To this end, Mirzaei and Moore [6] conducted a study on the determinants of bank competition in 146 countries over the period 1999-2011. Using the Lerner and Boone indices to capture competition, they find that concentrated banking systems worsen banking competition in developing countries while they do not affect competition in advanced and emerging countries. Banking concentration in developed countries seems to lead to a socially optimal equilibrium while concentration in developing countries does not. Mirzaei and Moore provide empirical evidence of the existence of good bank concentration in the developed countries in their sample. This banking concentration would therefore be beneficial to all stakeholders. However, the concentration of banking systems

<sup>10</sup> Although dominant, this doctrine is not unanimous, as others see diversification as destabilising (Stiroh and Rumble, 2006).



in developing countries is disadvantageous to customers. However, this study conducts its analysis on all segments of the banking market and does not focus on a segment-by-segment analysis as it does on the bank credit market.

Thus, Chauveau and Saidane [5] assess the importance of competition in credit markets in France, Germany and the USA. They develop a theoretical and empirical approach to measuring the power of banks in the credit market. They find that the US appears to be close to the archetype of pure and perfect competition, while French and German banks have quite a lot of market power in the retail credit markets, but none in the corporate credit market.

In the same vein, Ahokpossi [26]; Prao and Kamalan [27] analyse the determinants of interest margins using 456 banks in 41 Sub-Saharan African countries. His results show that bank concentration is positively related to interest margins, but the impact depends on the level of efficiency of each bank. In highly concentrated markets, the most efficient banks have higher interest margins, for example because of reputation. Indeed, since customers are sensitive to reputation, these firms benefit from a less elastic demand curve than their competitors and can therefore offer their products at higher prices. This is bad concentration. Ahokpossi thus suggests a reduction in banking concentration. However, more concentration in the African banking industry is desirable. For African banks are generally small in relation to the financing needs of the economies. However, alongside this work, others have analyzed the relationship between market structure and bank competition by taking into account the shareholding structure of banks. Jeon et al [28] conducted a study in this vein. They used the dynamic H-statistic, for a sample of 17 low developed countries over the period 1997-2008. They find that competition in low-income countries is negatively affected by the presence of state-owned banks. Similarly, Jeon et al [28] and Claessens and Laeven (2004), find that foreign bank penetration increases competition in the system. The results of Mirzaei et al, [6] are in line with these previous works. Like the above work, several others support the SCP thesis of a concentration exclusively beneficial to banks at the expense of borrowers [29-32]. However, some works are reluctant to consolidate the PCS paradigm. Demirguc-Kunt et al. [33] show, for example, that the positive relationship between concentration and interest margin disappears

when institutional variables are included in the model. Similarly, Mirzaei et al [34] study the effects of market power on a sample of 1929 banks in 40 emerging and developed countries over the period 1999-2008. While they were able to find that greater market power leads to higher bank performance, they do not find a significant effect of concentration on profitability in emerging countries.

In fact, relatively fewer empirical studies have supported the ES paradigm. Smirlock [35] is the first to test the ES paradigm in the banking field. He tests and offers an alternative explanation to the PCS paradigm on the basis of a sample of 2700 commercial banks operating in seven states under the jurisdiction of the Federal Reserve Bank of Kansas City. His study covered the period from 1973 to 1978. He found that there is a positive and significant relationship between market share and profitability and not between concentration and profitability. Recently, Park [36] examined whether the consolidation of Korean commercial banks has reduced competition during the period 1992-2004. He finds that increased concentration did not hinder competition. These results support the idea that it is possible to observe a spurious relationship between concentration and unilateral bank satisfaction. Therefore, concentration can tend towards a socially optimal market structure. In the same vein, Staikouras and Koutsomanoli-Fillipaki [37] report that European banking systems experienced a substantial increase in competition (measured by the H-statistic) during the period 1998-2002 with a relatively high level of concentration. Concentration does not necessarily reflect the exercise of monopoly power, but can coexist with a high level of competition. In this case, concentration is beneficial to all. On the one hand, it implies lower financing costs and cost-efficiency allowing banks to be more efficient.

### 3. MODEL SPECIFICATION AND ESTIMATION

**Model specification:** The structure of the banking market has often been the subject of analyses based on the SCP paradigm. However, criticisms of this approach have emerged through the New Industrial Economy. These criticisms suggest that market structure should be endogenized and that market power should be measured using non-structural indicators. These indicators include the estimation of the Bresnahan [38] mark-up test, the Panzar and

Rosse test, or instruments derived from models of imperfect competition of the Monti-Klein type, such as the Lerner index. The latter has the absolute advantage that it can be determined individually and dynamically. Thus, following the example of several studies [14,18,39-41], we opt for the Lerner index to measure the degree of bank competition and, consequently, the level of collective welfare of the actors on the credit market. A bank concentration is socially optimal when it satisfies both shareholders and customers. In other words, it does not result in the exercise of monopoly power by banks, but in their increased efficiency. In this configuration, concentration could coexist with fair competition and thus lead to maximum social welfare. It does not hinder competition but preserves it [37].

**Theoretical model:** Following the Monti-Klein model, let us consider a market where the endogenous variables are the price of the traded good (P) and the quantities (Q<sub>j</sub>) produced by each firm. The profit of firm j is equal to the following expression.

$$PRO_j = P \cdot Q_j - C(Q_j) \tag{1}$$

With, P = f(Q) is the inverse demand function. It comes,

$$PRO_j = f(Q) \cdot Q_j - C(Q_j) \tag{2}$$

The search for maximum profit leads to the following first order condition:

$$0 = \frac{\partial f(Q)}{\partial Q_j} Q_j + f(Q) - C'_j(Q_j) \tag{3}$$

We know that the output of the whole industry is written as follows:

$$Q = Q_j + \bar{Q} \tag{4}$$

With Q the quantity produced by the whole industry and  $\bar{Q}$  the output of other firms outside firm J.

Thus,  $\frac{\partial Q}{\partial Q_j} = 1 + \frac{\partial \bar{Q}}{\partial Q_j}$  with  $\frac{\partial \bar{Q}}{\partial Q_j} = a_j$  (conjectural variation of firm j).

We can thus rewrite relation (3) as follows:

$$0 = f(Q) + \left( \frac{\partial f(Q)}{\partial Q} \times \frac{\partial Q}{\partial Q_j} \right) Q_j - C'_j(Q_j) \tag{5}$$

Knowing that,  $P = f(Q)$ , it comes to  $0 = P + \left( \frac{\partial P}{\partial Q} \times \frac{\partial Q}{\partial Q_j} \right) Q_j - C'_j(Q_j)$

The Lerner index is extracted from this relationship as follows:

$$\frac{P - C'_j(Q_j)}{P} = - \frac{Q_j}{P} \left[ \frac{\partial P}{\partial Q} \times (1 + a_j) \right] \tag{6}$$

$$\frac{P - C'_j(Q_j)}{P} = - \frac{Q_j}{Q} \left[ \left( \frac{Q}{P} \times \frac{\partial P}{\partial Q} \right) \times (1 + a_j) \right] \tag{7}$$

It therefore becomes trivial to note that  $\frac{Q_j}{Q}$  is the market share of firm j in relation to the entire industry. This ratio refers to an indicator of market concentration. The expression  $\left( \frac{Q}{P} \times \frac{\partial P}{\partial Q} \right)$  is nothing more than the inverse of the price elasticity of demand ( $\varepsilon$ ). Also, the expression  $\frac{Q_j}{Q} \times (1 + a_j)$  corresponds to the market power ( $\theta_j$ ) of firm j.

In the end, we obtain

$$\frac{P - C'_j(Q_j)}{P} = -\varepsilon \theta_j \tag{8}$$

This leaves the transposition of the NIS approach, as presented above, to the banking firm. It should be noted that Chauveau and Saidane [5] have already developed this transposition<sup>11</sup>. Thus, equation (8) serves as a basis for transposing the NIS approach to the banking firm. We obtain the following relationship:

$$\frac{r - r_r}{r} = -\varepsilon \theta_j \tag{9}$$

Where: r = the lending rate on the credit market; r<sub>r</sub> = the bank refinancing rate on the money market;

It is important to note that banks are price-takers in the CEMAC money market.

A complete analysis requires that we take risk into account. To this end, we rewrite relation (9), giving each bank a probability P<sub>i</sub> of debtor default, hence

$$\frac{r - r_r}{r} = -\varepsilon \theta_j + \text{RISQUE} \tag{10}$$

Relationship (10) shows that the gap between the rate of credit distributed and the rate at which banks refinance themselves on the money market or the financial market reflects, firstly, the risk incurred by the lender and, secondly, the

<sup>11</sup> See their article for more details.

degree of imperfection of the market in question. The latter depends, in turn, on the elasticity of demand for credit to the interest rate and the market power of the banks and, in turn, on the market structure (equation 7). Thus, the concentration of the banking market would increase the ability of banks to set lending rates above the cost of refinancing. Therefore, concentration allows banks in a market to capture monopoly rents while customers bear high funding costs. This concentration is therefore not good, as it is socially sub-optimal. However, concentration is not always dissociable from social welfare. Theoretical arguments and empirical evidence based on the theory of contestable markets and the logic of the Chicago school have shown that it is possible for concentration to lead to a socially optimal equilibrium.

Having developed the recent theoretical model, the next step is to identify an empirical model that will allow us to determine whether the structures of the CEMAC banking markets are tending towards a social optimum. In other words, the aim is to select a model that relates concentration and competition in the CEMAC credit markets.

- **The empirical model, description of variables and data**

**The empirical model and description of the variables**<sup>12</sup>: At the risk of repetition, several studies have empirically assessed the relationship between bank concentration and competition [6,41] (Claessens and Laeven, 2004). However, their endogenous variable, capturing the degree of competition, takes into account all bank assets and liabilities. Our model focuses mainly on bank credit, as CEMAC economies suffer from the thorny problem of credit rationing even though banks are said to be overliquid. Thus, following Stiglitz and Weiss [24], we insert in our model a variable that takes into account the credit risk following the example of Chauveau and Saidane [5]. In light of the above, our model adapts Mirzaei and Moore's [6] model to the CEMAC banking industries. Indeed, we use the Lerner index<sup>13</sup> to capture the social

optimum in the credit market. Several studies have also used this competition indicator (e.g. [18, 41,42]).

In sum, our empirical model is as follows:

$$Lerner_{it} = \beta_0 + \beta_1 Market\_structure_{it} + \beta_2 Interindustry_{it} + \beta_3 Institution_{it} + \beta_4 Risque + \beta_5 Variables\_Macro_{it} + \varepsilon_{it} \quad (11)$$

With :

- The *Lerner* variable measured by the LERNER index in the bank credit market. It is captured by the relative spread between the lending rate and the refinancing rate on the money market. This average apparent lending rate is captured by a proxy measured by the ratio of income and similar interest to total loans granted. The LERNER index can also be seen as a proxy for present and future profits from price power Beck et al. [42]. A high value of this index corresponds to a loss of social welfare, as it would mainly benefit the banks at the expense of the customers. We use two differently calculated LERNER indices. One (*Lerner*<sub>1</sub>) is constructed from the Tender Interest Rate (TIAO), while the other (*Lerner*<sub>2</sub>) is constructed from the Repo Interest Rate (RIR).
- **Market\_structure**: A set of structural variables of the banking market including:
  - The variable *Bank\_concentration (Log HHI)*: captured by the Herfindhal-Hirschman Index (HHI), in logarithm, of each national banking industry in the CEMAC. This index is measured by the sum of the ratio of each bank's total assets to the total assets of the entire banking market of a squared country  $\sum_i \left(\frac{TA_i}{TA}\right)^2$  where *TA<sub>i</sub>* is the total assets of each bank and *TA* is the total assets of the entire banking market of a country. We use the HHI as an indicator of concentration, as it has the advantage of taking into account all firms in the industry whereas the ratio of the market share of the k largest banks (*CR<sub>k</sub>*) does not [35,43]. The expected sign of the coefficient on our variable of interest is ambiguous. Indeed, it depends on whether the concentration is good or not<sup>14</sup>. Thus, while for the Harvard School, high concentration drives the banking market

<sup>12</sup> Descriptive statistics for the variables can be found in the annex.

<sup>13</sup> This index is defined as the relative difference between the price of banking outputs and their marginal costs. This index is between 0 and 1. The value 0 corresponds to a total absence of monopoly power, while the value 1 reflects a monopoly. At this value there is a loss of social welfare.

<sup>14</sup> See literature review.

towards a monopoly equilibrium, the Chicago School argues that banking concentration can coincide with a competitive equilibrium. Consequently, for the Harvard School, banking concentration positively influences the monopoly power of banks which guarantees a socially sub-optimal equilibrium. This is because it allows banks to make superprofits at the expense of their customers.

- The variable *Bank\_density*: represents the number of bank branches in the country per 100,000 inhabitants. This variable is used in several works such as Mirzaei and Moore [6]. A high bank density improves spatial competition between banks. We therefore expect a negative sign.
- The *Foreign\_bank* variable represents the fraction of a country's banks that are at least 50% foreign-owned. Several works have shown that foreign bank penetration improves banking competition in the host country [6,28,44]. As a result, we expect the sign associated with this coefficient to be negative.
- The *Inter-industry* variable represented by *Insurance\_Penetration* (ratio of insurance premium to GDP). This variable reflects the competition of Non-Bank Financial Institutions in the banking market. This variable is crucial for the present study because banks are not the only institutions that grant credit. Microfinance institutions, for example, are indirect competitors of banks. Similarly, banks do not only grant loans but also carry out activities that are reserved for insurance companies. The measurement of competition in the credit market is therefore complex, as it includes heterogeneous financial institutions. The expected sign of the coefficient of this variable is therefore indeterminate.
- The *Institution* variable, a vector of three institutional variables. This variable is very important in this study. This is because good institutional quality reflects the ability of political authorities to identify anti-competitive behaviour and to impose appropriate sanctions. Good institutional quality ensures competition and social welfare of credit market participants. The *institution* vector has the following coordinates:
  - The variable *Property\_Rights*: This measures the degree to which a country's laws protect private property rights and the degree to which the government enforces these laws as well as the likelihood of private expropriation. It also measures the degree of independence of the judiciary and corruption in the justice system. It ranges from 0 to 100. A high score on this variable indicates better protection of private property rights.
  - The variable *Financial\_Freedom*: This measures the independence of government control and interference in the financial sector. This variable contains at least five characteristics. (i) government regulation of financial services; (ii) the degree of government intervention in banks and other financial institutions through direct and indirect ownership; (iii) the level of development of financial markets; (iv) government influence over financial services; and (v) openness to foreign competition. On a scale of 0 to 100, a high score on this variable indicates high financial freedom.
  - The variable *Corruption\_control* captures the control of corruption which is an indicator of governance vulnerability. This variable ranges from -2.5 to 2.5. The larger it is, the more transparency there is. Its expected theoretical sign is therefore negative. Corruption in general, and financial corruption in particular, makes banking markets less efficient by generating network effects that lead to anti-competitive behaviour by banks (Amidu and Wilson, 2014).
- The *Risk* variable captures credit risk. It is measured by the gross portfolio deterioration rate, which is the ratio of outstanding loans to total loans offered to customers. Its theoretical sign is ambiguous because two antagonistic effects can be highlighted. On the one hand, a direct (positive) effect that leads to an increase in the cost of credit. Indeed, banks will tend to increase lending rates in the face of an increased deterioration of their portfolios by increasing the risk premium. On the other hand, the *Risk* variable can have an indirect (negative) effect on the dependent variable through the credit rationing channel. In this situation, banks will tend to favour less risky credit

- applicants (the State for example) that benefit from relatively low lending rates.
- Macroeconomic variables (**Variables\_Macro**), a vector of macroeconomic variables including:
    - 
    - The variable **LogGDP/head** which is a proxy for the level of wealth of economic agents. The sign of this coefficient is indeterminate. Indeed, an increase in per capita income can have two ambivalent effects: (i) either increase the supply of loanable funds, which results in a decrease in the cost of credit, (ii) or increase consumption to the detriment of savings, which is reflected in the increase in the lending rate through the increase in demand for credit.
    - The variable **GDP\_growth\_rate** is a proxy for the economic development of a country. The sign of the coefficient associated with this variable is expected to be positive. Indeed, periods of strong growth coincide with a high self-financing capacity and, consequently, less recourse to credit. This drop in demand for credit can lower the lending rate and thus reduce the spread between this rate and the refinancing rate.
    - The variable **Inflation** captured by the annual variation of the consumer price index. It directly affects the financial situation of economic agents (real income, purchasing power). Its theoretical sign is positive because the inflation premium tends to increase the cost of credit in countries where the price level is unstable. High inflation thus increases the relative gap between lending rate and refinancing rate.
    - The variable **Bank\_credit\_growth** reports the evolution of credit to the economy. Its theoretical sign is negative because an increase in credit results in a decrease in lending rates.
  - $\varepsilon_t$  represents the error term.

The indices  $i$  and  $t$  represent countries and time respectively.

**Data:** The study concerns all CEMAC countries and covers the period 2002-2019. The data used are essentially secondary data from different sources depending on the variables. The dependent variable *Lerner* is constructed from BEAC databases. The variable of interest, *Concentration\_bancaire*, is taken from the

COBAC annual reports. The variables *Bank\_Density*, *Foreign\_Banks* and *Insurance\_Penetration* are taken from the *Global Financial Development* (GFD, 2019). The Institutional variables such as, *Property\_Rights*, *Financial\_Freedom* and *Corruption\_Control* are taken from *Heritage Foundation* and *Worldwide Governance Indicators* respectively. The variables *Risk\_Growth\_Credit\_Bank*, on the other hand, are taken from the BEAC Financial Analyses (2001-2019). All macroeconomic variables are taken from *World Development Indicators* (WDI).

#### • Estimation technique, presentation and interpretation of results

**Estimation technique:** Before doing so, it is necessary to carry out some standard tests in order to adopt an appropriate estimation method. Two main tests are needed. These are the individual specific effect test and the endogeneity test.

**Test for the absence of individual specific effects: The Breusch-Pagan test [45]:** This test states that under the null hypothesis ( $H_0$ ) of no specific effects, the statistic associated with this test asymptotically follows a Chi-square with one degree of freedom. Thus, if the probability associated with this statistic is greater than 0.1, we cannot reject  $H_0$ .

The execution of this test, on STATA version 13, shows that there are no specific individual effects.

**The endogeneity test:** The empirical model presented above contains suspected endogenous variables. Indeed, we suspect at least three variables subject to reverse causality with the dependent variable. First, concentration can be derived from competition in the credit market [6]. Strong competition in the credit market leads to the crowding out of non-performing banks and an increase in the size of performing banks, and consequently to increased concentration in the banking market. Conversely, high concentration in the banking market may reduce competition in the system. Second, while changes in the quantity of credit offered affect the relative spread between lending and refinancing rates, conversely, a high lending rate may induce banks to offer an increased level of credit. Thirdly, a high LERNER index in the credit market, reflecting a high cost of bank credit, may have a negative effect on economic growth. Indeed, abnormally high lending rates lead to

poor project screening. The most deserving, innovative and productive projects are not selected in favor of non-productive projects. Thus, economic growth will not be achieved. Conversely, periods of strong growth coincide with a high self-financing capacity and consequently less recourse to bank credit. This low demand for bank credit can be translated into lower lending rates and thus into increased competition in the credit market.

In order to check the endogeneity of these variables and possibly others<sup>15</sup>, the Nakamura Nakamura test is highlighted. This test is carried out in two steps:

- (i) Each endogenous predicted variable is regressed on the exogenous variables and its instruments;
- (ii) My residuals from the first step are recovered and included in the initial model. If the coefficients of the residuals are jointly significant, then the endogenous nature of the variables tested cannot be rejected.

The execution of this test allows us to observe the presence of the following endogenous variables *Concentration (LogHHI)*, *Growth\_rate\_GDP*, *Bank\_credit\_growth*. We therefore retain the dynamic approach of the panel model. An *ad-hoc* solution to correct this endogeneity problem could consist in shifting all the independent variables of the model by one period and estimating the model with a *Within* estimator. However, this approach does not always guarantee the total absence of bias due to these endogeneity problems. Consequently, we also use the instrumental variables approach for robustness purposes. In particular, we opt for the double ordinary least squares (2SLS) method<sup>16</sup>. To this end, we choose to instrument our endogenous variables with their lagged values. However, in order to validate our instruments by the Sargan test, we add to the previous instruments the trade opening rate<sup>17</sup>. Indeed, a necessary condition to perform the Sargan test is that the model is overidentified: the number of instruments must be strictly higher

than the number of endogenous variables. The realization of this Sargan test validates our instruments.

#### **Presentation and interpretation of results:**

Table 2 presents the results of the estimations of equation (11) which relates bank concentration to competition in the CEMAC bank credit market.

The robust regression results of our empirical model give rise to important comments.

Firstly, the positive sign and significance at 5% of the coefficient associated with Concentration (LogHHI), show that banking concentration in CEMAC is not good. It favors the banks to the detriment of the clientele, as it moves the bank credit market away from a competitive equilibrium (LERNER=0) and towards a monopoly equilibrium (LERNER=1). In other words, it widens the gap between the price at which banks offer credit to customers and the marginal cost corresponding to the rate at which banks refinance themselves with the Central Bank. This result is in line with the thesis supported by the SCP paradigm. Several empirical results like Mirzaei et al (2014), on developing countries, are similar to our results. Bank concentration tends to bring us closer to a monopoly. As a result, it causes welfare losses. However, banking concentration in CEMAC is desirable. The banking system should therefore be restructured in order to move towards socially optimal banking concentration in the CEMAC.

Secondly, the negative and significant coefficient at 1% associated with the variable *Risk* testifies to the indirect effect of risk on competition in the bank credit market. Indeed, banks in CEMAC tend to favor less risky credit applicants (mainly the state) who benefit from relatively low lending rates. This is to the detriment of the private sector. In fact, in search of an easy rent (through low-risk but liquid loans), banks in CEMAC are moving away from their original business, financial intermediation [4]. This situation is clearly unfavorable to the CEMAC economies. This facility increases the securities portfolio to the detriment of financing the economy. In the long term, this will have direct negative effects on growth and employment.

Third, the negative and significant coefficient at the 10% level associated with the variable *Corruption\_control* shows that controlling corruption reduces the relative spread between the average lending rate and the refinancing rate.

<sup>15</sup> As the assumption of strict exogeneity of the explanatory variables is a hypothesis considered strong and difficult to test, an estimate of the lagged model will be made regardless of the outcome of the test.

<sup>16</sup> According to Roodman (2007), when the number of individuals (N) is smaller than the time horizon (T), the 2SLS is more consistent than the Generalized Moment Method (GMM).

<sup>17</sup> This variable is strongly correlated with economic growth, but not with the relative spread of lending and refinancing rates.

**Table 2. Bank concentration and competition in the bank credit market in CEMAC**

Variables	(MCO)	(MCO)	(2SLS)	(2SLS)
	Lerner1	Lerner2	Lerner1	Lerner2
Concentration (Log HHI)	0.0641** (0.0260)	0.0853** (0.0351)	0.0460** (0.0203)	0.0584** (0.0266)
Bank_Density	-0.00750 (0.00627)	-0.0110 (0.00868)	-0.00347 (0.00384)	-0.00535 (0.00539)
Foreign_banks	0.000154 (0.000546)	0.000174 (0.000835)	-0.00140 (0.00126)	-0.00194 (0.00173)
Insurance_penetration	-0.0847 (0.0508)	-0.0925 (0.0658)	0.0105 (0.0703)	0.00455 (0.0923)
Right_of_ownership	0.000326 (0.00225)	0.000353 (0.00311)	0.000331 (0.00187)	0.000390 (0.00245)
Financial_freedom	0.000368 (0.000385)	0.000485 (0.000515)	0.000204 (0.000694)	0.000131 (0.000928)
Corruption_control	-0.0802* (0.0473)	-0.117* (0.0662)	-0.0473 (0.0589)	-0.0727 (0.0779)
LogPIB/head	-0.0457 (0.0346)	-0.0553 (0.0452)	-0.0561 (0.0563)	-0.0791 (0.0709)
GDP_growth_rate	0.000460 (0.000571)	0.000563 (0.000795)	-0.00268 (0.00218)	-0.00345 (0.00290)
Bank_credit_growth	0.000486 (0.000302)	0.000287 (0.000412)	-0.000389 (0.000850)	-0.00116 (0.00125)
Inflation	0.00212 (0.00189)	0.00319 (0.00239)	-0.00153 (0.00154)	-0.00176 (0.00203)
Risk	-0.293*** (0.0978)	-0.370** (0.137)	-0.370*** (0.101)	-0.472*** (0.138)
Constant	0.332* (0.175)	0.104 (0.236)	0.481*** (0.144)	0.324* (0.187)
Observations	90	90	96	96
R-squared	0.350	0.333	0.366	0.344

Note: Values in brackets are robust standard deviations. \*\*\*, \*\*, \* represent significance at 1%, 5%, 10% ( $p < 0.01$ \*\*\*,  $p < 0.05$ \*\* ,  $p < 0.1$ ) respectively.

Source: Authors based on STATA version 13.

This result shows that corruption weakens banking competition in the CEMAC. Indeed, there is a positive relationship between laxity of regulators and collusive behavior among banks. (i) The negative coefficient associated with the variable *Bank\_Density* shows that spatial competition would be effective in the banking industries in CEMAC. (ii) The negative sign of the variable *Foreign\_banks* indicates that foreign banks, generally of a large size, possess relatively more financial resources that allow them to compete with local banks. They thus guide local banks to greater efficiency. In fact, their presence leads the banking structure towards a social optimum. (iii) The negative coefficient associated with the variable *LogGDP/head* can be interpreted in two ways. On the one hand, an increase in the real income of economic agents can result in an increase in the loanable funds of households. This may reduce the average lending rate and lower the

relative spread between lending and refinancing rates, all other things being equal. However, the excess bank liquidity in the CEMAC weakens the relevance of this reasoning. Indeed, the increase in loanable funds, resulting from the rise in the real income of economic agents, will not necessarily have an effect on the supply of credit, since banks are a priori overliquid. On the other hand, the increase in the real income of economic agents increases their solvency. This lowers lending rates and consequently the relative spread between lending and refinancing rates [46-54].

#### 4. CONCLUSION AND POLICY IMPLICATIONS

The objective of this article was to assess the tendency of the market structure towards a social optimum in the credit market. Indeed, the literature on market structures presents two

contradictory theses. While structuralists argue that bank concentration unilaterally guarantees the welfare of banks at the expense of customers, the Chicago school argues that bank concentration can guarantee the welfare of all. By estimating a panel OLS model inspired by Chauveau and Saidane [5] and Mirzaei and Moore [6], we arrived at the result that banking concentration in CEMAC is not good because it does not tend towards a social optimum. It is favorable to banks at the expense of private customers mainly. These results lead us to propose elements of a solution in order to transform the current bad concentration into a socially optimal one.

From a confiscatory concentration we must then move to a distributive concentration taking into account all stakeholders. Today's banks are built on different business models. A miscibility of their cultures, based on alliances and mergers of business lines with the key to achieving economies of scale, must be advocated. What sequential approach? Without going into detail, it is advisable to consider pre-merger, i.e.: -the bringing together of successful activities. This would be complex but should be considered.

Traditional isolation of non-performing activities in hive-off vehicles.

In the first sequence, the aim is to pool efficient activities to reduce average costs by avoiding duplication while learning to work together.

This method and this stage are essential. They have proved their worth in other countries (Crédit Agricole + Crédit Lyonnais, BPCE (Banque Populaire + Caisse d'Épargne), Amundi entity created by Crédit Agricole + Société Générale...).

Pooling networks, equipment (ATMs, counters, multi-channel, commercial tools, marketing, etc.), retail banking skills, risk management skills, etc. In short, learning to work together gradually by creating common vehicles and entities. This can be envisaged in various fields to be identified: in the management of exports-imports, in the financing of companies, in the accompaniment of young entrepreneurs... It is a question of learning to share and to evolve towards a miscibility of banking cultures before merging because each vehicle has its own history and its own culture.

The idea is to evolve progressively and in the long term towards an optimal concentration and

an efficient and beneficial banking market for the economy. The reorganization of the banking markets in CEMAC through greater concentration of banks is a necessity. An increase in the minimum capital beyond the current threshold is necessary.

It should be remembered that these restructurings are an opportunity to reduce funding costs, improve the quality of services and the availability of funds, and to better respond to the growing need for funding, encourage innovation and provide greater stability to the banking system.

On the other hand, we suggest that the various CEMAC governments reduce corrupt practices so that the application of anti-trust laws is effective by avoiding collusive agreements between banks.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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