Measuring the Technical Efficiency of Commercial Banks in the Democratic Republic of the Congo using the Non - Parametric Data Envelopment Method

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Abstract: *The objective of this study is to assess the technical efficiency of commercial banks in the Democratic Republic of Congo; then to look for the explanatory factors of this level of technical efficiency of these banks. We carried out this study on a sample of 7 banks drawn at random from the 15 commercial banks in the DRC. The main hypothesis is: the technical efficiency of commercial banks in the DRC would depend on the optimal combination of endogenous factors (inputs) for any level of outputs. These factors would be moderated by determining factors. The hypothesis adopted for the secondary question is: commercial banks in the DRC would be technically inefficient in transforming their entries. First, the results of our study let us see that on a sample of 7 commercial banks operating in the DRC, 6 banks (TMB, RAWBANK, ACCESS, BGFI, SOFIBANK, and BOA) are technically efficient in the combination of their resources, and BCDC is technically inefficient in combining its resources. Second, based on various statistical tests, the results show us that the technical efficiency of our sample is explained by the labor factor (number of employees), the deposits collected; basic equity and operating expenses.*

Keywords: Technical efficiency, data envelopment analysis, net banking income, exchange rate, credit, deposit, number of employees, basic equity, operating expenses.

1. Introduction

In a constantly changing world, it is imperative for an organization to be concerned about its performance relative to that of other organizations working in the same sector of economic activity and which are recognized for the importance of their efficiency (best practices) all the more so as the economic performance of emerging countries is increasingly conditioned by the efficiency of their banking systems.

The Congolese banking market is experiencing an increasing influx of foreign - invested banks, which reinforces competition in the sector. To date, the Congolese banking sector has 15 operational commercial banks (4 local banks, 8 pan - African and 3 international) including BIAC under the supervision of the Central Bank of Congo (BCC, 2019).

Faced with the internationalization of economies and the intensification of competition, one would expect that banks would work to increase their level of production (of services and loans) because at the same selling price, the increase in quantities produced increase profits. Failing to increase this production (lack of resources), they should optimize the management of the resources at their disposal, particularly in terms of banking intermediation. It should be remembered that economic and financial theory recognizes credit as the main source of profit for banks (Bashir, 2000) (Ben Naceur, 2003).

Conversely, the behavior of Congolese banking intermediation does not conform to the above principle, while the natural mission of banks is to serve as intermediary between agents with financing capacity and those in need of financing. In other words, they collect savings in the form of deposits and distribute them in the form of loans.

From the second half of 2010, the Congolese banking sector experienced strong growth, thus exhibiting 13% average annual growth for total assets, + 16% annual for loans and + 13% annual for deposits. . And the trend was accentuated in 2018: + 30% for the total balance sheet which reached USD 6, 879 million; + 28% for deposits collected which reached USD 4, 660 million and + 44% for gross disbursement loans (Finactu, 2019).

Table 1: Evolution of bank deposits (in billions of CDF)

	2015	2016	2017	2018	2019
Sight deposits	2 546, 80	2 965, 40	4 348, 40	5 868, 40	7 943, 70
Term deposits	989, 2	1248, 7	1 830, 80	1 476, 60	2 529, 10
Total	3 536, 00	4 214, 10	6 179, 20	7 345, 00	10 472, 80

Source: Central Bank of Congo (2019)

At this stage of the observation, the various observations let us see that the Congolese commercial banks collect enough resources in terms of deposits, i. e. an average growth rate of 31.81% between 2015 and 2019. Contrary to the trend loans, the total outstanding loans to the economy stood at CDF 3, 034 billion with an average annual growth rate of 16.2% since 2012. The loans granted are mainly disbursement loans, and short term. As a result, only 7% of companies go through banks to finance their investments (BCC, 2019).
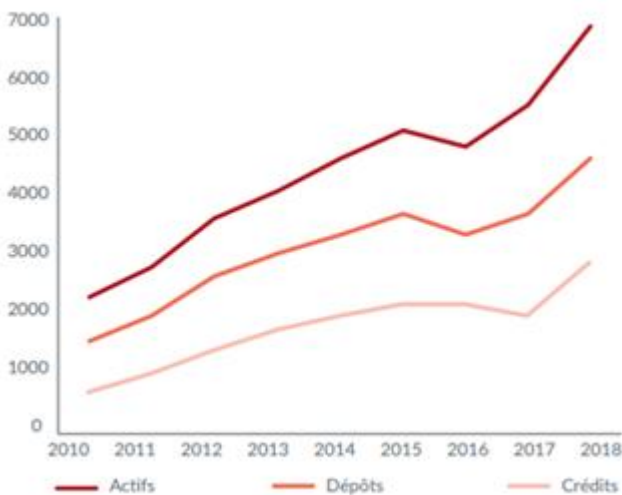
Figure 1: Evolution of the main aggregates of the banking sector (USD millions)
Source: Central Bank of Congo (2019)

Established at CDF 7, 943.7 billion, sight deposits represented 75.9% of the total volume of bank deposits. Year over year, sight and term deposits increased by 35.4% and 71.3% respectively. On the other hand, there has been a decrease of 10% in the volume of net loans over the period 2016 - 2017. The share of customer loans in banks' balance sheets increased from 45% in 2016 to 36% in 2017 (Deloitte, 2018).

In view of the evolution of deposits and loans granted in recent years, Congolese commercial banks thus benefit from significant resources that can allow them to become more involved in the financing of economic activity than to orient their preference towards the offer of customer services for which they charge large commissions.

If so, to what extent do banks provide an optimal mix of financial services from a given set of inputs?

To understand the phenomenon of technical (in) efficiency in the transformation of inputs into outputs (credit) of commercial banks in the DRC, we briefly present the context in which commercial banks operate.

The economic context of the DRC

The country's economic growth, which reached 4.4% in 2019, before the COVID - 19 pandemic, fell to 0.8% in 2020. The main engine of growth, the mining industry grew by 6.9% in 2020 (compared to 1% in 2019) thanks to the strength of Chinese demand. In contrast, other economic sectors contracted 1.6% (down from 5.7% in 2019) following travel restrictions linked to the pandemic, brakes on business activity. Private consumption and public investment fell by 1% and 10.2% respectively in 2020 (World Bank, 2020).

The social context and development issues

On February 7, 2021, the Ebola virus reappeared in Butembo (North Kivu) where a previous epidemic had been defeated in June 2020. As of March 2021, 12 cases had been confirmed in four provinces: Biena, Butembo, Katwa and Musienene. A total of four deaths and four recoveries were recorded. The DRC had officially announced the end of the Ebola epidemic in November 2020, with a death toll of 55 for 119 confirmed cases (World Bank, 2020).

The DRC ranks 175th out of 189 countries in the 2020 HDI. Its human capital index stands at 0.37, below the sub - Saharan African country average of 0.40. This means that a child born in the DRC today will achieve in adulthood only 37% of the productive potential that he could have achieved if he had benefited from full schooling and optimal health conditions during his first years. years of life. (World Bank, 2020).

Commercial banks in the DRC
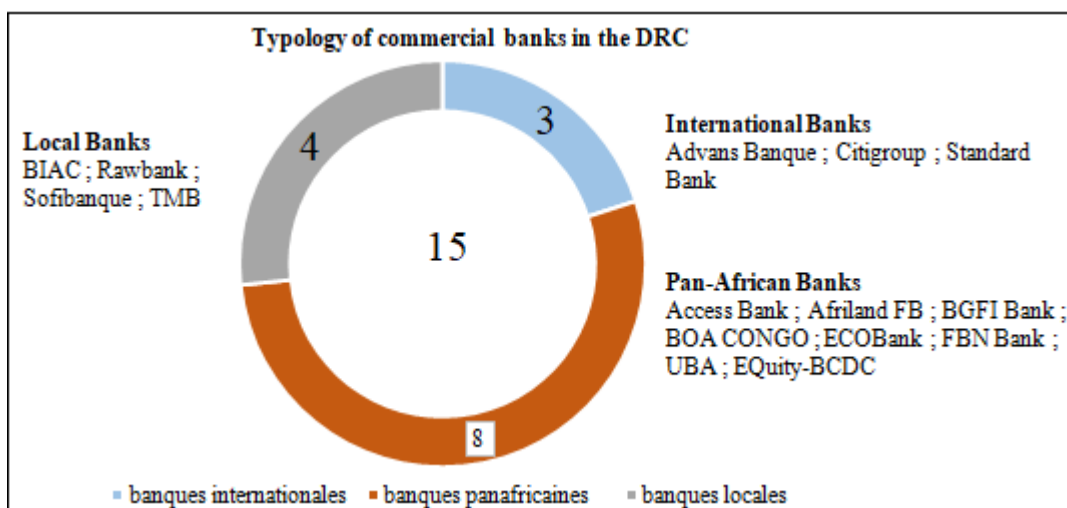
Figure 2: Typology of commercial banks in DRC
Source: Author, based on the 2019 BCC Report

The objective of this study is to assess the level of technical efficiency of banks in the DRC using the non - parametric approach induced by (Charnes and al, 1978), which focuses on the inputs - outputs relationship, and to provide useful information for managers in order to improve the managerial performance of a bank. By building a Benchmark frontier, banks located on the "Best - practice" efficient frontier can share certain similarities in their managerial practices. Banks

located far from the efficient frontier are considered "worst - practice". It combines a complementary entry to previous studies: (Gunther and Chauveau, 2004); (Nodjitidjé, 2010); (Martial, 2009).

Literature review

The question of the technical efficiency of banks by the data envelopment method has been the subject of little research in Africa in general and in the DRC in particular. At the international level, however, this question has given rise to abundant literature in economics ((Berger and Humprey, 1997); (al and COOPER, 2000); (Samir and sahut, 2015); (Gunther and Chauveau, 2004); (Duarte, Castelo & Alexandra, 2020); (Ralph, Belke&Haskamp, 2016)).

The various internal determinants of the technical (in) efficiency of banks identified in the literature can be grouped into two families: figures from accounting, and other non - accounting elements, linked for example to the strategic choices of the bank. Accounting factors include the risk of default (assessed by the bad debt rate, excess cash, the proportion of equity in total loans and total assets, and even return on assets). On the other hand, the non - accounting factors noted are for example the duration of the deposits, the volume of the deposits collected, the size, the mergers, the composition of the shareholders, the managerial and commercial policy. . .

Theoretical models then became progressively more complex and took into consideration the external determinants, grouped in two: the factors resulting from state action and the factors resulting from the configuration of the market. Among the factors resulting from state action, we have mainly identified monetary policy or financial liberalization (Hao, Hunter and Young, 1999), (Dahmane, 2002), (Dannon, 2009) etc.). And among the factors resulting from the configuration of the market, we have identified factors such as banking competition (Grigorian and Manole, 2006), (Lapteacru and Nys, 2011), concentration and accessibility to banking services (Lahyani and Salah, 2009).

Two combinations allow us to measure the level of technical efficiency of a production unit. The first "output - oriented", it measures the ability of a production unit to obtain the maximum possible outputs from a combination of inputs and a given production technology, in other words it answers question: by how much can the quantities of outputs be increased without modifying or varying the quantities of inputs used? (Coelli& al, 1999). The second "oriented towards the input", it measures the ability to achieve a given level of output from the small quantities of possible inputs, in other words, it in turn answers the question: by how much are the quantities of Can inputs be proportionately reduced, without changing the quantities of outputs produced? (Coelli& al, 1999). Technical inefficiency therefore corresponds either to production below what is technically possible for a given quantity of inputs and a given technology, or to the use of quantities of inputs above what is necessary for an output level given.
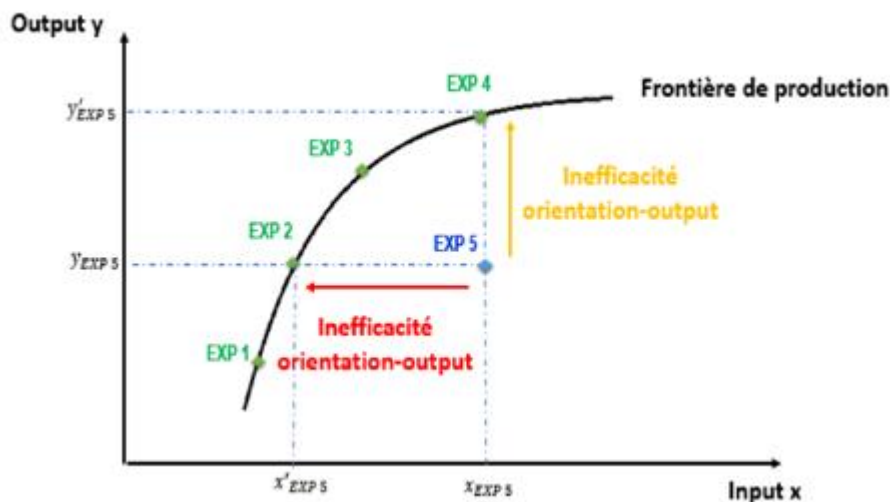
Figure 3: Graphic illustration of the concept of efficiency from a production function (oriented inputs / oriented outputs) Source: taken from de Farrell, Miri, 2014

The production function is defined as being a function connecting the combination of all the effective points. The deviation from best practice provides the degree of (in) efficiency of a firm. Figure 3 shows that the farms numbered 1, 2, 3, and 4 are technically efficient since they are located directly on the frontier production curve. However, Farm 5 is inefficient since it is located below the production frontier. Therefore, the producer would have the possibility of using fewer inputs used without reducing the level of output produced by going from xEXP 5 to x′EXP 5 (orientation - input) or else increasing the level of output obtained by keeping the same constant input levels by going from yEXP 5 to yEXP 5 ′ (orientation - output).

The links between these variables find a theoretical basis: 1) in the theory of efficiency X. This theory considers that, two identical companies which use the same factors of production do not lead to the same results; this stems from the quality of the organization (Liebenstein, 1966). In a famous article, he sets out the thesis that factor allocation and the state of technology are not entirely sufficient to explain the production of a company. Something more is

involved, which can be called effort, not in a strictly physical sense, but in a broader sense, in part psychological. Most of the time, there is a gap between the optimal behavior of a company as predicted by economic theory and its actual behavior, a gap due, among other things, to the absence of competitive pressure. Efficiency - X aims to account for this missing factor ".

2) In the theory of financial repression, it finds its origin in the work of (McKinnon, 1973) and (Show, 1979), and is part of the problematic of the mobilization of domestic savings for economic development. Financial repression manifests itself in a number of restrictive measures imposed by public authorities on the exercise of financial activity. These restrictions consist mainly of the administrative fixing of interest rates; in the constitution of the coefficients of the compulsory reserves; exchange control. The governments of developing countries apply, often through the central bank, a selective credit policy in favor of so - called priority sectors. To do this, they set lending interest rates low for the entire national economy.3) In the experience effect theory which states that the total unit cost of a product decreases by a constant percentage each time the cumulative output of that product by the firm is doubled. The considered cost is a full cost which includes, in addition to the direct cost of manufacturing a unit of product, the costs of design, distribution, administrative costs, as well as the costs of capital employed. The cost is measured in constant currency units, that is, by canceling out the effects of inflation. The experience effect stems mainly from three causes: economies of scale; the learning effect; innovation and capital / labor substitution.

The originality of this study lies on the empirical and methodological level. Empirically, it is about exploiting new ground not known in the existing literature; methodologically, combining the DEA method with that of statistical analysis.

Problem and Hypotheses
Despite the magnitude of the financing needs, savings remain insufficiently used to finance the economy. Banks in the DRC have enormous liquidity and do not distribute enough credit. As a result, they do not participate as they should in the financing of the economy. However, in the process of money creation, it is the "loans that make the deposits" and that by strengthening their intermediation activities, banks can increase their profits through interest on loans. At this stage of the observation, the various findings lead us to believe that banks that do not distribute enough credit are inefficient in their transformation of resources into credits. However, in order to speak with certainty on this question, it is necessary to measure the technical efficiency of these banks using an appropriate technique.

In the context of this study, the research question is: What are the factors that explain the level of technical efficiency of commercial banks in the DRC?

The secondary question is: What is the level of technical efficiency of commercial banks in the DRC over the period from 2015 to 2019?

In this study, we made the following assumptions: H1) The technical efficiency of commercial banks in the DRC would depend on the optimal combination of endogenous factors (inputs) for any level of outputs. These factors are moderated by macroeconomic factors. The hypothesis retained for the secondary question is: H2) Commercial banks in the DRC are technically inefficient in transforming their inputs into outputs.
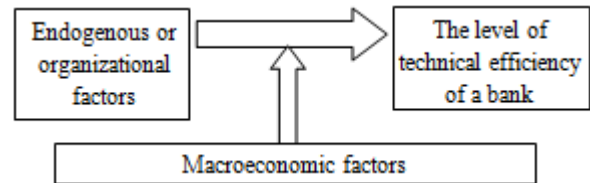

Figure 4: Conceptual model
Source: designed by ourselves

The previous figure 4 presents the theoretical explanatory model of the research. In its first dimension it predicts a relationship between endogenous or internal factors of commercial banks and the level of technical efficiency. Then, he predicts this link by considering the moderating variable which is the economic factors. It follows that the relationship between endogenous factors and the level of technical efficiency can be strong or weak depending on whether the economic factors are favorable or unfavorable.

Five indicators were retained as endogenous factors:
1) Collected deposits (sight, term, and public deposits): amount of money that a depositor entrusts to a bank for it to carry to its account.
2) The number of employees: the number of employees working under an employment contract.
3) Basic equity: financial resources provided by shareholders.
4) Operating expenses: These correspond to the expenses incurred by the company which can be recognized as expenses and which relate to what the company currently spends in the course of its operations in order to achieve its turnover.

Three outputs were retained:
a) Credits granted (on sight, term, and to the State): the provision of money in the form of a loan, granted by a creditor (lender) to a debtor (borrower).
b) Net banking income: this is the sum of the intermediation margin and net commissions. It is a measure of the specific contribution of banks to increasing the national product and can in this sense be compared to the added value generated by non - financial companies.
c) Provision: this is an item appearing in the liabilities of a company. It represents an expense recorded for the current financial year but for which the due date and / or the amount are not yet known in other words, it is the accounting finding of a probable but uncertain risk.

The moderating variable used is the macroeconomic factors represented by:
• Economic growth: it refers to the positive variation in the production of goods and services in an economy

over a given period. In practice, the most widely used indicator to measure it is gross domestic product.

- The exchange rate.: The exchange rate of one currency is the cost of that currency against another. We also speak of the "parity of a currency".

2. Research Methodology

In this study, the approach adopted is quantitative in the sense that we collected observable and quantifiable data (numbers) and our research relies on quantitative research techniques of data collection (questionnaire, and secondary data). The approach used is cursive or abductive (Peirce, 2007) in the sense that we started from the observation of facts through the literature review to build the research question and thus formulate the hypothesis, which then has been field tested (Dumez, 2012).

It is a case study, in the sense that we seek to observe the possible interrelationships between the variables, and we study a limited number of cases considered significant (Yin, 2017), and a statistical method, in the sense that we have gathered quantified data on numerous sets (population), then we analyzed or processed using the MDeap2 and XLSTAT 2021 software, then commented on these quantitative data. This study is also a documentary research, in the sense that we studied and analyzed the documents to enrich our research question, and this technique allowed us to identify the already existing data, that is to say the secondary data (Gavard et al, 2012), these data are in the annual reports of the different banks in our sample.

First, at the scientific level, this study is motivated by the need to enrich the very limited literature on the analysis of efficiency in the banking sector for the case of the DRC. Indeed, the majority of previous studies have focused on European countries and a few studies on African countries, mainly Cameroon, Algeria and Morocco. Secondly, at the managerial level, the drafting of this study is fueled by the need to assess the level of technical efficiency of commercial banks in the DRC, in order to allow bank managers to know on which lever (s) (s) they will be able to rely on each other to improve their level of efficiency.

Collection of data
We first used traditional data sources, that is to say primary and secondary documents from various sources, then we administered a questionnaire to the 7 commercial banks in order to obtain data that were not available. in the annual report. Two surveys were carried out. The first in the form of a survey, i. e. part of the population of our study was questioned from a sample by reasoned choice (non - probabilistic) of 7 banks drawn in a random manner out of the 15 commercial banks in the sector, or 47% of the statistical population.

We went down in person to distribute and collect the questionnaires for a period of six weeks. The second is semi - structured interviews lasting an average of 10 minutes. The aim was to learn, at the same time to verify, with the help of questions, specific points related to the impact of economic factors on the banking sector.
Efficiency measurement scales

The DEA method is an edifying example of the non - parametric approach (Joumady, 2000). A first advantage of this method is that it does not require any a priori assumption concerning the functional form of the estimated border. It is therefore a particularly suitable method in case of uncertainty about the functional form of the production technique studied. This detail widens the field of the measurement of technical efficiency to firms which have production functions not yet known, like the banks in our environment. Indeed, these banks manufacture complex products and services based on multiple inputs and outputs, at very disparate scales. All this clearly complicates the theoretical determination of their efficient frontier. In addition, the DEA method opens the door to measuring the technical efficiency of firms combining several inputs to produce several different outputs. Once again the banks are concerned: they combine the savings collected - on sight, short, medium and long term, their own funds, loans to generate loans - in the short, medium and long term, commitments by signature, investments and other types of products. Finally, the DEA method is suitable for the case of small samples (Ludwin, 1989): in our case, which concerns the banking market in the DRC, we only have 7 DMU (banks).

Figure 5: The banks in our sample
Source: designed by the author

3. Results

The choice of the orientation of our model is turned towards "the inputs". We justify this choice on the basis of the variables (deposits, operating expenses, basic equity, number of employees) over which decision - makers (banks) exercise the greatest management power.

Table 2: Efficiency scores

	θrévr	Eff	θréct	θéchl	Rendements
TMB	1,000000	*	1,000000	1,000000	-
BCDC	0,930020		0,868865	0,934243	irs
RAWBANK	1,000000	*	1,000000	1,000000	-
ACCESS	1,000000	*	1,000000	1,000000	-
BGFI	1,000000	*	1,000000	1,000000	-
SOFIBANK	1,000000	*	1,000000	1,000000	-
BOA	1,000000	*	0,685237	0,685237	irs

Source: ourselves, based on processing with MDeap2 software

Table 2 illustrates that the TMB, RAWBANK, ACCESS, BGFI, SOFIBANK, and BOA banks have an efficiency score equal to 1 (100%). These banks can be (relatively) qualified as efficient in terms of input allocation, because they are on the efficiency frontier. Furthermore, the BCDC has a relatively high score of 86.9% and needs 13.1% room for improvement to be effective in terms of optimizing its inputs. BCDC and BOA banks operate in a situation of increasing returns to scale (IRS for short). This situation occurs when the average consumption of resources decreases with an increase in the output produced.

Table 3: Reference banks

	TMB	RAWBANK	ACCESS	BGFI	SOFIBANK	BOA
BCDC	0,812		0,077	0,110		

Source: ourselves, based on processing with MDeap2 software

For the purposes of Benchmarking or best practices, Table 3 above indicates that the BCDC, representing an efficiency score below the border, or 86.9%, is modeled on the TMB, ACCESS, BGFI. It should observe the managerial practices of the latter respectively up to 81.2%; 7.7%; 11%.

Table 1: Target inputs and outputs

	DEPOTS	CHARGES	FPB	EFFECTIF	PNB	CREDITS	PROV
TMB	509015474	21774251	10474372	1177	46180006	203002455	58821893
BCDC	387362995,317	30729698,3953	48719652,7155	1086,56723586	74302577	235322166	102207960,172
RAWBANK	674621112	58542075	74987207	1315	84907637	408791813	57949237
ACCESS	384607416	361046211	217427471	993	616917679	765472123	149537061
BGFI	126395761	52153915	13038457	1006	15832388	102942454	169268754
SOFIBANK	647429413	323195045	725000000	1109	123720696	678765537	907460230
BOA	814635932	767750069	212334131	969	158765399	112941691	200174460

Source: ourselves, based on processing with MDeap2 software

Table 4 above offers solutions to the 7 banks in our sample; these are solutions related to the inputs and outputs on which each bank should play in order to become more and more efficient.

Econometric analysis

Table 5: Summary for all Y (dependent variables)

	Credits	PNB	Provision
R^2	0, 974	0, 984	0, 421
F	3845, 013	6212, 973	75, 527
Pr > F	<0, 0001	<0, 0001	<0, 0001

Source: Author, results obtained from the XLSTAT software

Table 5 above shows us a coefficient of determination of the credit variable of 97.4%, which means that our economic reasoning stands firm or the model responds to economic reasoning at 97.4%, that is to say the technical efficiency of commercial banks is explained by basic equity, number of employees, operating expenses and deposits at 97.4%, with credits as output, and 3.6% represent the random error that is, the variables that we have not taken into account. This is the case of the variable net banking income explained at 98.4% and at 42.1% for the provision variable.

We present below the equations of the models (credits, GNP, and provision):

Crédits = 41449175, 09+0, 30*Depots - 18388, 28*Eff Empl+0, 50*FPB+1, 96*charges d'expl

PNB = 828411872, 82+ - 02*Depots+2168986, 53*Eff empl - 02*FPB+0, 80*charges d'expl

Provision = - 11676184, 18 - 03*Depots - 223090, 11*Eff empl+0, 33*FPB - 0, 07*charges d'expl

These three equations show us how much Y (credits, GNP, provision) varies if the X (inputs) vary by one unit.

Fisher's test
For the variable credits, it follows from this result that the model establishes is globally significant because the Fisher statistic gives a P - value (which is tolerable) of 0.0001 <3845.013 that is to say that our the alternative hypothesis (H_1) is accepted, in other words the null hypothesis (H_0) is rejected, with an adjusted R^2 of 97.3%. This is the case for the GNP variable globally significant because the Fisher statistic gives a P - value (which is tolerable) of 0.0001 <6212.973 and for the provision variable globally significant because the Fisher statistic gives a P - value (which is tolerable) of 0.0001 <75.527.
Econometric analysis of variables with moderation effect

Table 6: Summary for all Y (dependent variables)

	credits	PNB	provision
R^2	0, 946	0, 971	0, 383
F	902, 707	1734, 281	31, 837
Pr > F	<0, 0001	<0, 0001	<0, 0001

Source: Author, results obtained from the XLSTAT software

With the interaction effect, we find that the coefficient of determination of the credit variables is 94.6% which means that despite the interaction of the moderating variable (economic factors), the economic reasoning holds firm or the model responds economic reasoning at 94.6%, i. e. with the interaction effect the technical efficiency of banks is explained by basic equity, number of employees, operating

expenses and deposits at 94.6%, with credits as output, and 5.4% represent the random error. This is the case for the variable net banking income explained at 97.1% with interaction effect and the provision variable at 38.3% with interaction effect.

We present below the equations of the moderating models:

Crédits = 6256358780, 25 - 04*dépôts *tx de change - 0, 10*dépôts*PIB+27228, 85*effempl * tx de chng - 43832660, 25*effempl * PIB - 04*FPB * tx de change+2, 02*FPB * PIB - 04*chrg d'expl * tx de change+3, 69*chrg d'expl * PIB

PNB = 1199971, 17 - 05*dépôts *tx de change - 02*dépôts*PIB+7759, 87*effempl * tx de chng+151853, 52*effempl * PIB - 05*FPB * tx de change - 0, 17*FPB * PIB - 04*chrg d'expl * tx de change+0, 64*chrg d'expl * PIB

Provision = 1579442, 44 - 05*dépôts *tx de change+0, 10*dépôts*PIB+3930, 92*effempl * tx de chng - 236492, 57*effempl * PIB - 04*FPB * tx de change - 0, 272*FPB * PIB - 04*chrg d'expl * tx de change - 1, 06*chrg d'expl * PIB

These three equations show us how much Y (credits, GNP, provision) varies if the X (inputs) vary by one unit multiplied by the moderating variable.

Interpretation of variances (Y) with interaction effect: Fisher test

With a moderating effect, it follows from this result that the model established is globally significant because the Fisher statistic gives a P - value (which is tolerable) of 0.0001 <902.70 for the credits variable; from 0.0001 <1734.281 for the variable GNP; of 0.0001 <31.837 for the variable provision. That is, our alternative hypothesis (H₁) is accepted, in other words the null hypothesis (H₀) is rejected.

4. Discussion of Results

Regarding our first hypothesis (the technical efficiency of commercial banks in the DRC would depend on the combination of exogenous factors moderated by macroeconomic factors), we confirm this hypothesis. According to our results, the factors collected deposits; number of employees, basic equity; operating expenses explain the level of technical efficiency of banks measured by indicators the loans granted; net banking income; and the provision. This relationship is moderated by macroeconomic factors (economic growth and the exchange rate) as we can see in the table below which demonstrates this relationship.

Table 7: Comparison of the relation of variables

test	variable Y	without interaction effect	with interaction effect
R² adjusted	Credits	0, 973	0, 945
	PNB	0, 983	0, 971
	Provision	0, 416	0, 371

Source: author, based on results obtained from XLSTAT

We note that with the interaction effect, the adjusted or corrected R² which counteracts the mechanical evolution of R² due to the increase in the explanatory variables, is 94.5% for the credit variable; 97.1% for the variable net banking income; and 37.1 for the provision variable. In contrast, when we do not take into account the interaction effect, the relationship between inputs and outputs responds to economic reasoning by a high percentage only when there are moderating factors.

Regarding our second hypothesis (banks are technically inefficient in transforming their inputs into outputs), we invalidate this hypothesis. According to the results obtained in the table of efficiency scores, the banks TMB, RAWBANK, ACCESS, BGFI, SOFIBANK, and BOA display an efficiency score equal to 1. These banks can be qualified as efficient in terms of allocation of 'inputs, because they are on the efficiency frontier. In addition, the BCDC posted a relatively score of 86.9% and needs 13.1% room for improvement to be effective in terms of optimizing its inputs.

Thus, in order to make banks inefficient, efficient and those which are efficient, to become more and more efficient, we suggest that the BCDC observe the set of managerial behaviors or practices that generate consensus and which are considered essential by efficient commercial banks (TMB, RAWBANK, ACCESS, BGFI, SOFIBANK, and BOA). These behaviors are generally found in the form of "good practice guides" (GBP), but also that banks which are already efficient, become more and more efficient, because it is said that the one who does not move forward retreats.

5. Conclusion

We have come to the end of our study on the technical efficiency of commercial banks. Our work was interested in a double question: that of knowing what is the level of technical efficiency of commercial banks operating in the DRC over the period from 2015 to 2019, and what are the factors that influence the technical efficiency of these banks.

First, the results of our study let us see that on a sample of 7 commercial banks operating in the DRC, our results show that 6 banks (TMB, RAWBANK, ACCESS, BGFI, SOFIBANK, and BOA) are technically efficient in the combination of their resources, and BCDC is technically inefficient in combining its resources. Second, based on various statistical tests, the results show us that the technical efficiency of our sample is explained by the labor factor (number of employees), the deposits collected; basic equity and operating expenses.

This research, despite its contributions, is not without a number of limitations. Empirically, we believe that broadening the scope by taking into account a large sample of banks would lead to more objective results. We do not feel that we have analyzed efficiency in all its complexity. We just added a stone to everything that had already been said by our predecessors. And we believe that we have led this work to constitute a source of reference for the scientific world and to serve as a guide for the technical efficiency of organizations.

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