

The impact of banking intermediation from the perspective of financing activity on the cost efficiency of Al Baraka Bank of Algeria during the period (1993-2023)

- *Meryem belazzouz*¹: PhD, Hassiba Benbouali University of Chlef (Algeria)

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Abstract

Through this research paper, we are trying to examine the level of contribution of banking intermediation from the perspective of financial activity efficiency of Al Baraka Islamic Bank in Algeria during the period from 1993 to 2023, by building a model through which we can determine the relationship.

Using the ARDL model, we found that both profitability and the growth of financing volumes, along with risk, positively affect the cost efficiency of Al Baraka Bank in Algeria. This indicates that the bank balances its financial resources and the size of its financing in an acceptable manner.

Key words: Banking intermediation, cost efficiency, banking efficiency, bank financing volume, ARDL model.

Jel Codes Classification : E50, C21, C32

1 - **Meryem Belazzouz**, Laboratory of Financial and Banking Systems and Macroeconomic Policies in the Light of Global Transformations, University of Chlef (Algeria), m.belazzouz94@univ-chlef.dz

أثر مساهمة الوساطة المصرفية من منظور نشاط التمويل على كفاءة بنك البركة الجزائري خلال الفترة (1993-2023)

– مريم بلعزوز¹: دكتورة، جامعة حسيبة بن بوعلي الشلف، الجزائر.

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ملخص

تهدف ضمن مضمون هذه الدراسة إلى قياس أثر مساهمة الوساطة المصرفية من منظور نشاط التمويل على كفاءة بنك البركة الجزائري خلال الفترة (1993-2023)، لذلك، اعتمدنا نموذجًا قياسيًّا تكون فيه متغيرات الوساطة هي المحددات الأساسية للكفاءة المصرفية.

بالاستعانة بطريقة ARDL لتقدير معاملات النموذج المقترح توصلنا إلى أن مؤشرات الربحية المصرفية ونمو حجم التمويلات الممنوحة من قبل البنك للاقتصاد ومخاطرته لها تأثير موجب على كفاءة تكاليف بنك البركة، هذا ما يعني أن البنك يوازن بين موارده المالية وحجم تمويلاته بطريقة مقبولة

الكلمات المفتاحية: الوساطة المصرفية، كفاءة التكاليف، الكفاءة المصرفية، حجم التمويلات المصرفية، نموذج ARDL.

التصنيف JEL: C32، C21، E50

¹ - مريم بلعزوز، مخبر الأنظمة المالية والمصرفية والسياسات الاقتصادية الكلية في ظل التحولات العالمية، جامعة الشلف، (الشلف) الجزائر،
m.belazzouz94@univ-chlef.dz

Introduction:

Al Baraka Algerian Bank entered the Algerian banking market after the issuance of the Monetary and Credit Law 90-10 to provide financing services and formulas that are compatible with Islamic law and conflict with the various services framed by the Monetary and Credit Law to create a unique experience that can be summed up in its ability to achieve profits and control the various costs resulting from its activity, and in view of the difficulties that accompanied its experience, especially from the perspective of banking efficiency in general and cost efficiency in particular, Accordingly, In light of the above, we decided to ask the following question: In view of the above, we decided to ask the following question: How do the indicators of the intermediation of the Algerian Baraka Bank affect its cost efficiency during the period (1993-2023)?

Sub-questions: To clarify the content of the question asked above, we ask the following questions:

- What is the role of banking intermediation in the economy? ;
- What do we mean by the efficiency of intermediation costs in Islamic banks? ;
- How do the profitability and risks of Islamic financing affect the efficiency of intermediation costs at Al Baraka Bank?.

Hypotheses: To analyze posed above and to answer it, we can formulate the following hypotheses:

- The decrease in banking profitability levels results in a decline in the efficiency of intermediation costs at Al Baraka Bank in Algeria;
- A reduction in the volume of financing provided by Al Baraka Bank in Algeria leads to a decrease in its cost efficiency.

Effective management of Islamic financing risks enhances the efficiency of intermediation costs at Al Baraka Bank in Algeria.

The reduction in the volume of funding granted by Al Baraka Bank in Algeria results in lower cost effectiveness;

- Controlling the risks of Islamic financing leads to an improvement in the efficiency of intermediation costs at Al Baraka Bank in Algeria.

Importance of the Research:The significance of this study lies in the critical role that the volume of Islamic financing plays in the economy, particularly amid ongoing challenges in traditional financing. By lowering financing costs through improved cost efficiency, this research contributes to the expansion of Islamic banks' activities within a conventional environment. Furthermore, it boosts customer confidence in this type of financing, offering a comprehensive overview of the various performance levels of Islamic banks and clarifying their role in the national economy and community service.

Research objective: Through our analysis of this study's content, we aim to achieve several objectives, including understanding the theoretical foundations of banking intermediation and cost efficiency, as well as assessing cost efficiency at Al Baraka Bank of Algeria within the context of Islamic finance in the Algerian banking environment.

Spatial Framework :The questions raised and the hypotheses formulated outline the framework of this study. To achieve its objectives, the spatial and temporal framework is defined from 1993 to 2023, covering the period during which Al Baraka Bank has been active in the banking market.

Methodology: To clarify and interpret the relationship between banking intermediation indicators in Islamic banks and their cost efficiency, we adopt a descriptive approach for analyzing the relationship between the study variables, along with an inductive approach to estimate the nature of this relationship. This will be accomplished through the application of statistical tests

I- Cost efficiency of Islamic banking intermediation.

Banks work to achieve many goals that overlap between the economic and social aspects by raising the efficiency of banking mediation operations by searching for investment

opportunities characterized by high profits and low costs compared to costs. This efficiency is known as cost efficiency, which aims to optimally exploit resources. In order to determine the nature of this type of banking efficiency, we will discuss the following:

I-1-Banking intermediation

There are many common points between Islamic banks and conventional banks regarding the content of financial mediation, but the controls of banking operations can distinguish the first type from the second.

I-1-1-Definition of banking mediation

It means institutions that are concerned with collecting financial savings and granting them in the form of credit. (Laraj, 2019-2020, p. 120)(Ilifi & Belghalem, 2022, p. 150), Accordingly, we find that the essence of banking intermediation is based on two elements (Koueider Kochieh & Barish, 2016, pp. 176-177):

Surplus owners: It includes all units that have the financial ability to manage their affairs without resorting to others to manage their projects.

Financially Deficit Owners: It includes all units that suffer from an abundance of liquidity in managing their projects, so this category is forced to search for owners of the surplus.

banking mediation in the economy also provides several advantages, including:

- Improving economic growth rates, due to the availability of liquidity for those with financial deficits;
- Providing financial resources for the economy, by granting loans.

I-1-2 Advantages of banking mediation

The advantages of mediation, according to many researchers specializing in finance and economics, are (Al-Arabi, 2008, p. 52):

- Bank guarantees provided by banking institutions allow savers to protect their money from the types of risks they are exposed to during their investment activities, especially credit risks.
- Banking institutions provide opportunities for small investors to benefit from the services
- financial instruments banks include a liquidity element, meaning the ease of owned assets into ready cash without incurring losses ;
- Financial institutions allow for the provision of the best possible services in a manner that is convenient for customers.

I-2 Banking cost efficiency

The topic of banking cost efficiency is one of the most important topics that has been the subject of study and research by bank officials and researchers alike, especially in light of the fierce competition between banks, because it is considered a good indicator in judging the evaluation of the bank's activity performance.

I-2-1 Basic Concepts of Banking Cost Efficiency

Efficiency is defined as the state in which outputs (results achieved) are greater than inputs. Thus, increasing the ratio of output to input will lead to higher levels of efficiency banking assets in a manner that leads to reducing costs, It can also be defined as the optimal use of available banking assets in a way that leads to reducing costs. (Ali, 2013, p. 93), In other words, efficiency is defined as an indicator for studying the optimal use of available resources that achieves the lowest cost level without sacrificing the quality of the system's outputs (fayiz, Fadel Al-Mawla, & Batal, 2018, p. 9).

Through the previous definitions, it becomes clear to us that efficiency is a characteristic associated with the optimal use of the institution's assets.

Banking efficiency means the optimal utilization of available human and material resources, which enables the bank to achieve optimal management of all financial flows and transactions. Here, it is necessary to have an effective regulatory body in addition to a management characterized by tight organization and division of specific tasks according to schedules and at all levels of the bank. Rational management works to optimally link the bank's inputs and outputs. Efficiency is reflected in selecting the least costly set of resources to produce and deliver the maximum amount of financial and banking services in a highly

competitive environment. Therefore, high levels of efficiency in a bank indicate effective control over these elements. Additionally, the effectiveness of human and managerial factors significantly contributes to increasing productivity and reducing inefficiencies in management. (Miftah, 2018, p. 75), Cost efficiency is a type of banking efficiency. We can define cost efficiency as the change in the bank's expenses compared We can define cost efficiency as the change in the bank's expenses compared to the planned expenses to produce a set of outputs. To achieve this, the banking institution seeks to control costs and optimize and rationalize the level of inputs or uses in a manner consistent with the objectives of this institution. costs and make optimal use of inputs at low in quantities that are proportional to the amount needed for the optimal operation of the bank. Cost efficiency can also result from the bank's management's good reliance on production techniques and technology that achieve costs at their minimum (ainous, mimouni, & midoun, 2020).

I-2-2 Determinants of bank cost efficiency

The determinants of the cost efficiency of banking services can be summarized as follows: (Mohammed Al-Hashemi & Hussein Al-Jabouri, 2017, p. 5):

-Internal determinants: These are represented by the strategies followed by bank officials in managing their assets. The strategies followed at the administrative and financial levels include levels of competition between banks, the level of administrative efficiency in the bank, and other determinants that are primarily related to the elements of liquidity and profitability.

-External determinants: are those that are beyond the control of bank managers in managing their assets, represented by the regulations and laws that determine the work of the banking institution.,

Through our study, we will try to test the importance of a set of internal factors on the efficiency of banking costs. These factors are(Foudouf, Mimouni, & Benkadour, 2020):

-Bank financing cost: Express the price that the bank receives as a result of providing services, and the higher this price, the higher levels of efficiency will be achieved;

-Operating expenses: These include all the equipment and management expenses necessary to run the bank's activity. These expenses can be limited to (employee salaries, real estate expenses, expenses directed to purchasing technological;

-The small size of the bank impedes the activity of banking institutions to perform their tasks in the economy. Indeed, what is known in the literature is that there is a minimum for the bank's size, after which the economy of size can be used, which leaves positive effects on operational efficiency.

-capital Cost: Lower cost of capital contributes to increasing profit margin levels, as it collects the total depreciation and provisions, the decrease which leads to an net income increase in profit margin levels banks.

III-Determinants of the efficiency of Al Baraka Bank Algeria

To ascertain how al baraka bank of Algeria's banking intermediation metrics relate to the effectiveness of its expenses from 1993-2023 We need to build a standard model. In order to build it or for this model to be constructed we follow:

III-1- Study variables

To illustrate the impact of banking intermediation activity on cost efficiency, it can be explained:

Table n°1: variables

symbol	index	variables	Explanation
dependent variable			
y	Public operating banks/net banking income	Banking costefficiency	This indicator represents a measure of efficiency, as a decrease in this indicator means the bank's ability to balance inputs and, thus increasing efficiency and vice;
independent variables			
x₁	Net Result/Total Assets	Profitability	This indicator expresses the bank's ability to improve the net result resulting investment activity. A rise in this indicator means a decrease in the size of total costs, and thus an increase in cost efficiency.
x₂	Funding growth rate	Islamic Finance Indicators	The growth rate of financing is linked to the bank's ability to direct financing towards profitable and inexpensive investments, which means increasing cost efficiency.
x₃	Total Financing/Total Assets	Islamic finance risks	An increase in this indicator leads to a decrease in the bank's profits, indicating the bank's inability to effectively manage risks. This results in higher costs associated with risk and, consequently, a decrease in cost efficiency.

Source: EViews 12 .

Before conducting the necessary tests to determine the mathematical relationship between banking intermediation and the cost efficiency index, we assume that the model estimated in our study takes the following linear form: $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon_t$

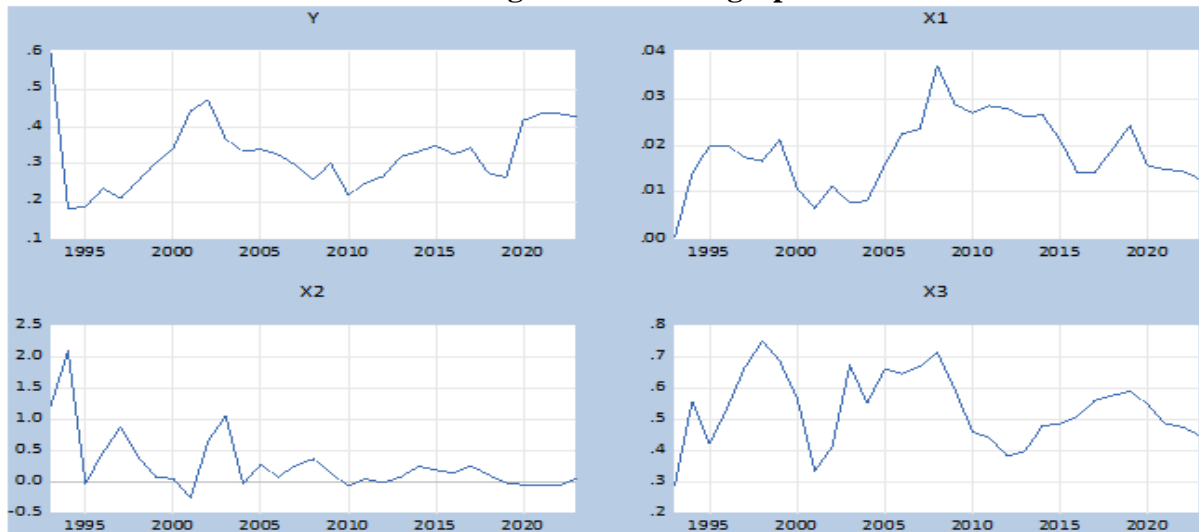
III-2- Standard Model Estimation

In the field of economic measurement, researchers typically rely on methodologies that examine the stability and consistency of time series data. Models estimated using the ordinary least squares method have often failed to adequately explain various economic phenomena due to the presence of non-random components in the time series. Therefore, it is essential for researchers to analyze these components in order to select the most suitable model that accurately represents the phenomenon being studied while also avoiding issues related to incorrect estimations.

III -2-1- stationarity

We generally study stationarity to assess the degree of integration of time series and to ensure that they are free from non-random effects. In this context, we will focus on the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests, as they are the most commonly used methods based on the Dickey-Fuller approach to confirm that the time series do not contain unit roots or trends. Since the time series utilized in this study are annual, we employed Eviews 12 to conduct these tests, yielding the following results:

Figure n°1: series graph



Source: EViews 12.

the above figure, we resort to ADF and PP tests to ensure the instability of the chain follows:

Table n°2: Unit root test

At level										
time series	ADF test					PP test				
	With Constant & Trend		With Constant		Without Constant & Trend	With Constant & Trend		With Constant		Without Constant & Trend
	b=0	λ=0	c=0	λ=0	λ=0	b=0	λ=0	c=0	λ=0	λ=0
y	0,0162	0,001	0,000	0,001	0.181	0,016	0,001	0,000	0,001	0.178
x ₁	0,5529	0,3248	0,008	0,060	0.4318	0,552	0,2366	0,008	0,043	0,420
x ₂	0,0028	0,0363	0,0887	0,0027	0,0006	0,037	0,0018	0,0887	0,003	0,000
x ₃	0,157	0,042	0,001	0,015	0,547	0,157	0,046	0,001	0,012	0,570
At First Difference										
y	0,8398	0,000	0,386	0,000	0,000	0,839	0,000	0,366	0,000	0,000
x ₁	0,5256	0,000	0,953	0,0001	0,000	0,525	0,000	0,953	0,000	0,000
x ₃	0,7562	0,000	0,857	0,000	0,000	0,756	0,000	0,857	0,000	0,000

Source: EViews 12.

By examining the table outputs and relying on Dickey-Fuller, we can clarify the stability of the study variables as follows:

- Series (Y) that expresses stable cost efficiency at level $Y \rightarrow I(1)$
- (X1) is stable at the first difference.: $X1 \rightarrow I(1)$
- (X2) is stable at the level: $X2 \rightarrow I(0)$
- The financing risk series (X3) is stationary at the first difference, $X3 \rightarrow I(1)$

III-2-2- Co-integration test

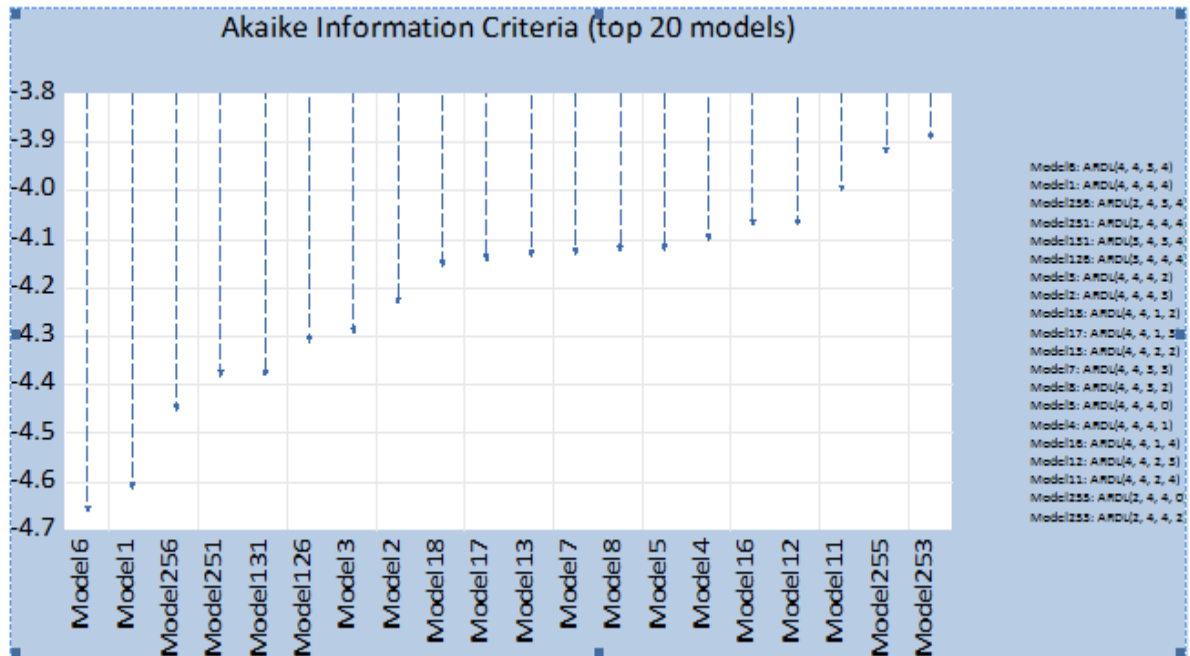
We can utilize the Johansen test to assess the feasibility of simultaneously integrating the school chains, given that they are integrated in the same sequence. This involves examining the relationship between long-term estimations and time series, followed by the estimation of the error correction model. However, for the time being, we prefer to adopt the

established approach in this field due to its advantages in identifying integration links and forecasting both short- and long-term outcomes.(Belghalem, 2023, pp. 279-280):

- Identifying the lag period for UECM variables

The outcomes of the two tests—particularly the Akaike criterion—are crucial to the selection process. Here, we will adopt an empirical estimation approach by estimating several models with varying lag orders and comparing these models based on the two criteria mentioned. Using Eviews 12, the results were as follows:

Figure n°2: Optimal ARDL model among 20 selected models



Source: Eviews 12.

It is clear from the figure above that the Ardell model is consistent with (4,4,3,4).

-After identifying the optimal lag period, we proceed to estimate the ARDL (4,4,3,4) model to confirm the presence of a common cointegration among the variables. series leads us to the Wald test, the results of which can be described as:

Table n°3: Results of Wald test to confirm the existence of the simultaneous integration relationship

F-Bounds Test		Null Hypothesis : No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic k	15.06133 3	Asym ptotic: n=1000		
		10%	2.37	3.2
		5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66
Actual Sample Size	27	Finite Sample: n=35		
		10%	2.618	3.532
		5%	3.164	4.194
		1%	4.428	5.816

Source: Eviews 12 .

Looking at the data, we find that the p-value for Fisher's test is less than 5%, which means that the value is greater than the 5% , and thus we conclude that there is cointegration, which allows us to follow the ARDL approach.

III-2-3- Estimation of long-term

The presence of cointegration leads us to estimate both long and short run parameters:

A- Long-term parameter estimation: The or results of long-term parameter estimation This can be stated:

Table n°4: Results of estimating long-term parameters

Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
X1	-9.499027	0.863885	-10.99571	0.0000
X2	-0.162531	0.043997	-3.694153	0.0061
X3	-0.395325	0.131972	-2.995529	0.0172
C	0.760288	0.074493	10.20620	0.0000

EC = Y - (-9.4990*X1 -0.1625*X2 -0.3953*X3 + 0.7603)

Source: Eviews 12.

B- Estimating short-term coefficients and correcting errors: The here is on correcting errors and their economic and statistical importance. of this estimation were as follows:

Table n°5: Results of short-term parameter estimation

ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(Y(-1))	0.562879	0.100728	5.588094	0.0005
D(Y(-2))	0.116357	0.092175	1.262351	0.2424
D(Y(-3))	0.245532	0.093242	2.633281	0.0300
D(X1)	-5.582730	0.850868	-6.561218	0.0002
D(X1(-1))	9.964143	1.196442	8.328148	0.0000
D(X1(-2))	4.893638	1.129780	4.331496	0.0025
D(X1(-3))	6.164225	0.877738	7.022850	0.0001
D(X2)	0.002060	0.037754	0.054559	0.9578
D(X2(-1))	0.097483	0.042683	2.283856	0.0518
D(X2(-2))	0.135297	0.032295	4.189436	0.0030
D(X3)	-0.289216	0.104829	-2.758932	0.0247
D(X3(-1))	0.308701	0.096471	3.199923	0.0126
D(X3(-2))	-0.100969	0.106007	-0.952478	0.3687
D(X3(-3))	0.369342	0.088626	4.167434	0.0031
CointEq(-1)*	-1.186263	0.111614	-10.62826	0.0000

Source: Eviews 12.

The estimation showed that the coefficient value is statistically acceptable provided that the t-test probability value is less than 5%, while the negative sign indicates that (-1.186) It is assumed that the imbalances occurring in the short term will be It was modified in 9-month period (8 months and 25 days).

III-3-Diagnostic tests

Diagnostic usually examine the estimated standard model to ensure that it is free of standard problems. There are many tests in this field, including the following:

III-3-1-Test autocorrelation

We rely on the Breusch-Godfrey test to ensure that the residuals from estimates are independent of each other. The results were as follows:

Table n°6: Results of testing the presence of the autocorrelation problem for export residuals

Breusch-Godfrey Serial Correlation LM Test:			
Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	0.756917	Prob. F(2,6)	0.5092
Obs*R-squared	5.439768	Prob. Chi-Square(2)	0.0659

Source: Eviews 12.

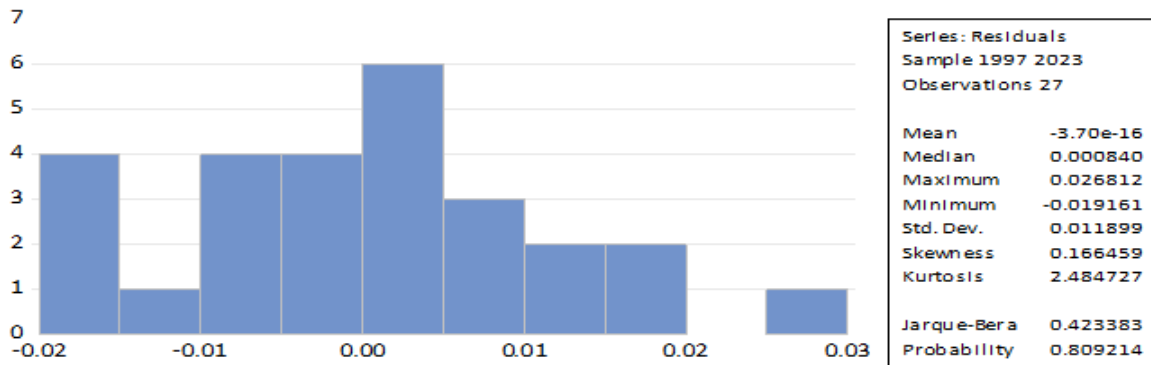
By reading the results of the table above, it becomes clear to us that the Fisher value (F-statistic = 0.75) for the mentioned test is less than 5%, meaning that there is no autocorrelation of errors.

III-3-2-Normal distribution of the residuals

To ensure that the residuals bell-shaped distribution, we use Jarque-Bera test, and its results are as follows:

We use the Jarque-Bera test to see if the errors follow a bell-shaped distribution, table below shows that.

Figure n°3: Results of the Jarque-Bera test on the estimated residuals



Source: Eviews 12.

The Jarque-Bera statistic is clearly below the 5% threshold, leading us to conclude that the estimated residuals are normally distributed.

III-3-3-Assessing the Hypothesis of Error Term Homogeneity

The Brosh-Pagan-Godfrey test was used to test the homogeneity hypothesis. The test was as follows:

Table n°7: Breusch-Pagan-Godfrey

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
Null hypothesis: Homoskedasticity			
F-statistic	1.814116	Prob. F(18,8)	0.1969
Obs*R-squared	21.68688	Prob. Chi-Square(18)	0.2462
Scaled explained SS	1.413404	Prob. Chi-Square(18)	1.0000

Source: Eviews 12.

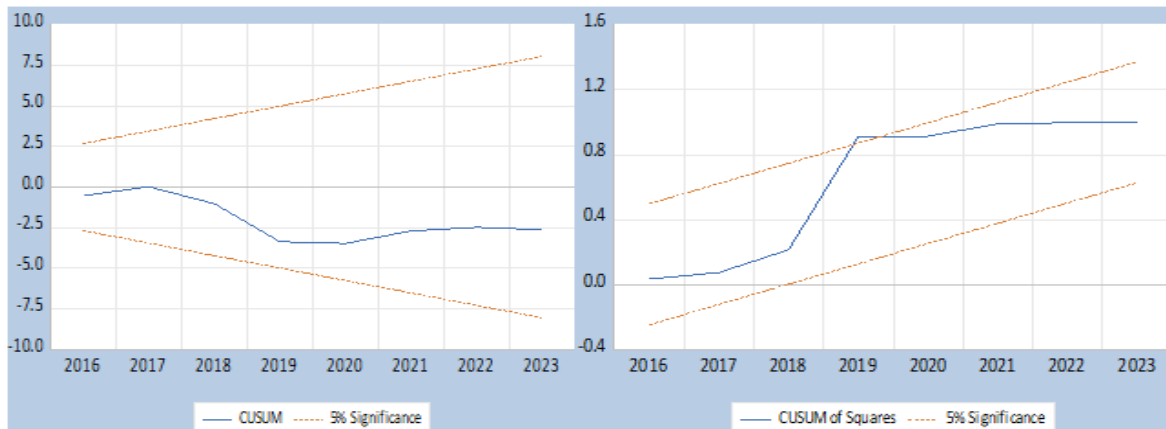
The probability value exceeds 5%, so we conclude that there is homogeneity in the errors.

III-3-4-stability test for the estimated ARDL model

We use this test to ensure that the model does not suffer from structural effects on the quality of the model.

We utilize this test to verify that the model is free from structural breaks that could impact its long-term quality. This test typically consists of two main components: the cumulative sum of the estimated residuals and the cumulative sum of the squared residuals. The figure below illustrates this process:

Figure n°4: Cumulative sum of residuals



Source: Eviews 12.

It is clear to us from the table that both figures representing the two mentioned complexes fall within the confidence interval at the 5% level, and this confirms to us that the model does not suffer from the problem of structural stability.

- 336 -. Results and Discussion

The result of the estimation of the long run model can be written as follows:

$$Y = 0.76029 - 9.4990x_1 - 0.16253x_2 - 0.39533x_3$$

We can accept the first hypothesis from the results of the regression equation, which states that a decrease in banking profitability levels leads to a decline in the cost efficiency of Al Baraka Bank in Algeria. Specifically, a one-unit decrease in profitability levels at Al Baraka Bank results in a 9.49-unit decrease in its cost efficiency. This can be attributed, according to the study, to (Bettioui & Bendob, 2021, pp. 296-315) to the fact that less profitable banks are less efficient;

The results of the regression equation allow us to support the second on a decrease in volume financing provided by Al Baraka Bank in Algeria leads to a decline in its cost efficiency. Specifically, for every one-unit decrease in the volume of financing granted by Al Baraka Bank, there is a corresponding decrease of 0.16 units in its cost efficiency. This explains how a reduction in financing volume leads to lower profitability levels, which in turn results in increased operating expenses and consequently a decline in cost efficiency.

-We found a regression equation to accept the third hypothesis, which states that controlling Islamic financing risks improves the cost efficiency of Al Baraka Bank of Algeria, because reducing financing risk levels cost efficiency of Al Baraka Bank of Algeria by 0.39 units, and this is due to the fact that controlling risk levels improves the performance of bank (Kadri & Khelil, 2021, pp. 729-740), which leads to an increase in banking profitability and reduces operating expenses, thus increasing cost efficiency.

- 336 - -Conclusion

Our analysis focused on the relationship between banking mediation indicators and the efficiency of Al Baraka's costs from 1993 to 2023. This analysis was framed within both theoretical and applied contexts, leading to a set of findings, which are:

-Banking mediation from the Islamic finance side ensures the achievement of acceptable levels of profitability that work to raise the degree of cost efficiency;

-The characteristics and nature of Islamic finance contracts stimulate their growth, which generally supports content of efficiency;

-Islamic finance risk management has the ability to reduce banking exploitation costs and consequently increase cost efficiency;

By extracting the above-mentioned results and in order to enhance the cost efficiency of Al Baraka Bank Algeria, we present the following set recommendations:

-Islamic financing formulas should be diversified in Al Baraka Bank Algeria so that it can benefit from the advantage of maximizing profits;

-Confidence building in the bank's clients who have investment deposits through the provision of advice, counsel and awareness of the effectiveness of various financing formulas in order to increase their growth by increasing the volume of financial resources;

Introducing various modern scientific methods that are compatible with the banking risk management approach in Islamic banks in order to control the cost of Islamic banking financing risk;

-To expand in the Algerian banking market, Al Baraka Bank Algeria will benefit from the expertise of its human resources in the field of Islamic finance., especially with the existence of a legislative framework regulating this type of financing;

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