The impact of Islamic finance on Financial Inclusion Evidence from Algeria

Hadj Ali Amina [1] ♦, Bidi Aissaoui Soraya [2]

[1] MCLDL Laboratory, University of Mascara (Algeria), amina.hadjali@univ-mascara.dz

[2] University of Mascara (Algeria), soria.bidi.aissaoui@univ-mascara.dz

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Abstract:

The study aims to highlight the impact of Islamic finance on financial inclusion in Algeria over the period (2004 – 2021) using a multiple linear regression model. The total deposits of Al Baraka Bank Algeria were used as a measure of Islamic finance (dependent variable), and the number of ATMs was used as an indicator of financial inclusion (independent variable). The study concluded that there is a significant effect and positive relationship between Islamic finance and financial inclusion. However, the impact of Islamic finance on financial inclusion is weak in Algeria. This is attributed to the small number of Islamic bank branches and the high costs of Islamic financial services. And The Islamic financial industry in Algeria is still in its early stages.

Keywords: Islamic Finance, Financial Inclusion, Algeria, Regression Model.

♦ **Corresponding author.**

I- Introduction:

Many indicators issued by international bodies and organizations indicate the increasing importance of financial inclusion and placing it among the priorities of policymakers, such as: the inclusion of the issue of financial inclusion in the global development agenda of the Group of Twenty and the establishment of the International Association for Financial Inclusion to study the financial services actually available and their suitability with the needs of different groups of society, as well as the services that must be applied in the future despite the different definitions of financial inclusion according to ideological and intellectual trends, and therefore Algeria is still continuing its financial reform efforts to liberate The banking sector is part of the comprehensive economic reforms initiated at the end of the eighties, where the financial and banking sector received special attention from government authorities that worked to develop laws and legislation to accelerate reforms and enhance the capabilities of the sector and oblige it to apply international standards to ensure banking safety and financial stability and increase levels of financial inclusion, as the accredited financial institutions in Algeria supervise the financial inclusion initiative, including the role of Islamic finance in the increase in Islamic banks and insurance companies Takaful . Our study examines the relationship between Islamic finance and financial inclusion in Algeria.

Problematic:

- To what extent does the Islamic finance affect financial inclusion in Algeria?

Hypothesis:

- There is a significant effect and positive relationship between Islamic finance and financial inclusion in Algeria.

Research Objectives: The research aims at clarifying the impact of Islamic finance on financial inclusion, studying the reality of financial inclusion in Algeria, and showing the role of Islamic finance in promoting financial inclusion in Algeria.

1. Literature Review:

There are many studies that have focused on the relationship between Islamic finance and financial inclusion in several countries, especially Islamic countries and OIC member states. The study of **Demirguc-Kunt** et **al (**2014) addressed the impact of financial inclusion on Islamic finance by studying the demand for formal financial services among Muslim adults for a sample of more than 65,000 adults, and the study has found that Muslims are less likely than non-Muslims to own an official account and save in a formal financial institution. Moreover, in a survey realized in 50 countries of North Africa and the Middle East with an emerging Islamic financial industry, a vast majority of respondents deal with Shariah-compliant products despite the high costs of these products, this shows the importance of Islamic finance in promoting financial inclusion for Muslim individuals who refuse to deal with usury.

Khmous and **Besim** (2020) have checked the impact of Islamic banking on financial inclusion in 14 countries in the MENA region with different income levels based on

probability regression estimation. The study has found that the impact of Islamic banking on financial inclusion is the greatest in middle-income countries in the Middle East and North Africa. Islamic banking institutions have a major role in promoting financial inclusion in the Middle East and North Africa (MENA) countries by providing products that are compatible with the provisions of Islamic Sharia. According to the needs of individuals, **Kamalu** and **Ibrahim** (2021) have identified the impact of the development of Islamic banking on financial inclusion in the OIC Member States, The Generalized Method of Moments (GMM) was employed for panel data analysis of 30 OIC members during the period (2013-2018). The study has found that the existence of an inverse relationship between the development of Islamic banking and quality institutions, which means that the development of Islamic banking contributes to enhancing the financial inclusion of countries with low-quality institutions.

The study of **Suseno** and **Fitriyani** (2019) also has shown the level of financial inclusion in the OIC countries and the role of Islamic finance on financial inclusion, the regression model was based on panel data to determine the relationship between the growth of Islamic finance and financial inclusion ; the study has concluded that there is a negative impact between the growth of Islamic finance and financial inclusion, meaning that the growth of Islamic finance does not help individuals to access the financial sector.

As for **Siddiqui** et **al** (2021) study, It has verified whether the Islamic financial system can address financial exclusion in India. The data was collected through a questionnaire distributed to 635 customers of conventional and Islamic financial institutions in Kerala, India, because it is considered the center of Islamic finance in India ; the data was analyzed and conclusions were drawn using descriptive statistics, the study has found that there are a set of factors that affect the choice of financial institution's type, which is function, religion and income, and that Islamic finance has been chosen by Muslims and those who do not have enough income. Work has also brought to light that it must be an intensive official start of Islamic finance in India to promote financial inclusion.

Rahman et **al** (2022) have tried to look at the aspect of gender inequality in financial inclusion in OIC member countries identifying the role of Islamic banking in promoting financial inclusion among women based on the estimation of the ordinary least squares method from 2011-2014. The study has revealed a significant improvement and increase in women's accounts in 2014 and this indicates that the development of Islamic banking has a positive impact on financial inclusion and that Islamic banking works to promote equality between genders in terms of financial inclusion and financial inclusion of Muslim women in OIC countries. **Nacer** et **al** (2017) have found a positive correlation between Islamic banking and financial inclusion in OIC Member States. Another study **Mustafa** et **al** (2018) have also analyzed the impact of Islamic finance on financial inclusion and economic growth in selected Muslim countries by coming up with lessons for Nigeria and how it can effectively use Islamic finance to promote financial inclusion and economic growth with its vast resources.

The study of **Akhtar** et **al** (2020) aimed to investigate the impact of Islamic finance on financial inclusion as well as the role of financial inclusion in achieving technical efficiency in Islamic banks in Pakistan during the period 2007–2016. The study used a composite

financial inclusion index and adopted the ARDL model. The study concluded that there is a potential relationship between Islamic finance and financial inclusion in Pakistan.

2. The theoretical framework of the study.

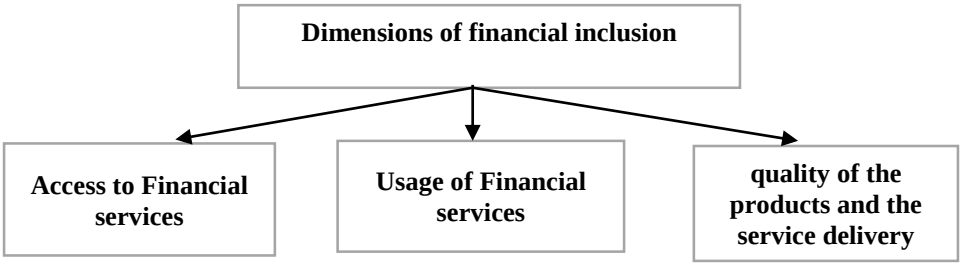
2.1 Financial Inclusion:

Financial inclusion means that individuals and businesses have access to affordable and appropriate financial services and products that meet their needs (transactions, payments, savings, credit and insurance) delivered in a responsible and sustainable manner (World Bank Group, 2022). Their needs, which are presented transparently and simply allowing good understanding and decision-making for the client. The ultimate goal of financial inclusion is to enhance the livelihoods of beneficiaries while contributing to the overall well-being of the community (Islamic Financial Services Board, 2019).

It is the provision of financial services and access to them for all members of society, especially poor classes and other excluded individuals (Ozili, 2020, p. 3) These definitions share that everyone must have access to available financial services, and financial inclusion can be defined as the ability to enable all segments of society to benefit from financial services and product that meet their needs at reasonable costs.

Financial inclusion is measured in three dimensions: access to financial services, usage of financial services and quality of the products and the service delivery (The World Bank Group, 2022).

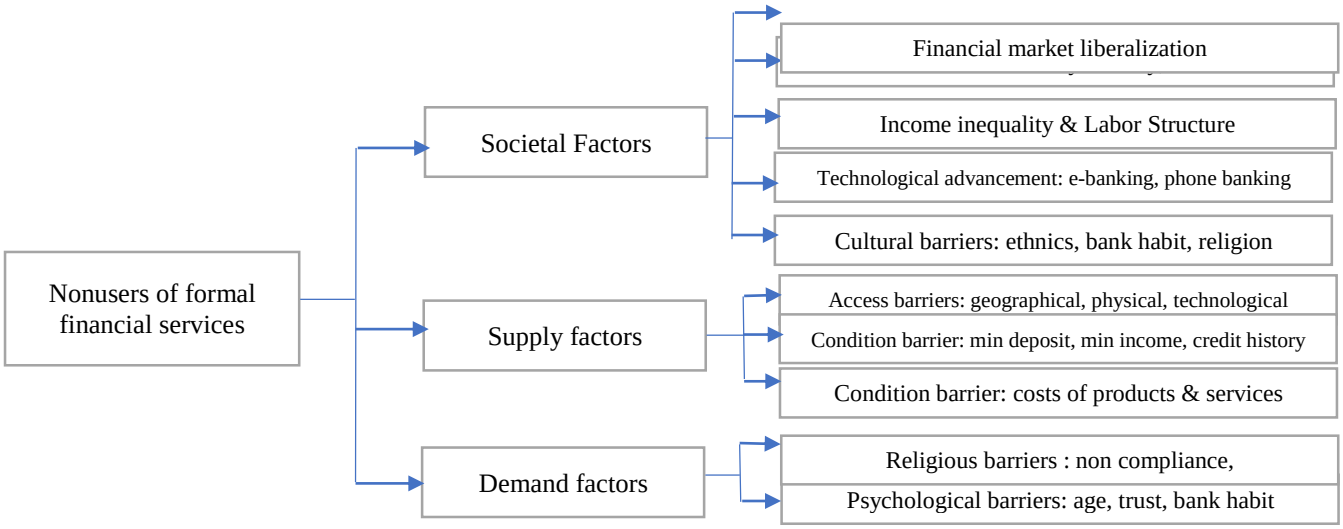
Figure (1): Dimensions of financial inclusion



Source: Prepared by researchers based on World Bank Group.

Financial Exclusion is defined as the inability of some segments of society to access appropriate, low-cost financial services in a fair and safe manner. Financial exclusion may be due to several reasons. The most important of them are: the main reasons on the demand side may be the lack of awareness, low income, poverty and illiteracy, while on the supply side it may be the distance from branches, branch timing, cumbersome documents and procedures for opening a bank account, inappropriate products, language, employee attitudes, etc.… All these reasons make the individual feel that it is easy for him to borrow money from informal sources of credit such as family and friends.

Figure (2): Causes of Financial Exclusion



Source: (Suseno & Fitriyani, 2019, p 3).

2.2 Islamic Finance:

Islamic finance is based on the principles of Islamic law, where Islamic banks and other Islamic financial institutions deal with Islamic financing forms and take the following forms**:**

Mudaraba is a contract between two parties: An investor (individual or bank) that provides financial resources to the second party (the owner) to finance a specific project, and profits are shared between the two parties according to agreed ratio. If there is a loss, the investor bears the financial loss and the worker bears the loss of his effort (Gait & Worthington, 2007, p.15).

Musharaka is a partnership agreement whereby the client and the financier both share the cost of capital and the management of the project, and the profits are distributed according to the predetermined ratios, and the loss is measured according to the percentage of the contribution to the capital (Abu Omar, 2007, p. 199).

Murabaha is the sale of a commodity with the addition of a profit margin agreed upon in advance between the two parties. (Puspitasari, Hidayat, & Kusmawati, 2019, p. 47).

Salam is the sale of the commodity according to the required specifications between the seller and the buyer, and that agreement is reached between them on the price of the commodity, which is paid immediately with the postponement of the delivery of the commodity to a specific period (Zahro & Mursid, 2022, p. 42).

Istisna'a is a contract of sale through which a person asks another person to produce an asset at the prices and quality specifications agreed upon between them (Zamer, 2018, p. 118).

Ijarah is a contract between two parties (lessor and lessee) in which the lessor provides the benefit of the asset to the lessee in exchange for a price that is previously agreed upon between them and for a specified period (Yusuf & Isa, 2022, p. 50).

3. The reality of financial inclusion in Algeria:

Some indicators of financial inclusion in Algeria will be presented (ownership of an account for individuals over 15 years, sources of borrowing, reasons for not having a bank account,

number of people who own a mobile phone, access to the Internet, number of people who own a credit card...) based on the World Bank's Global Findex Data Base, which represents the most credible data base.

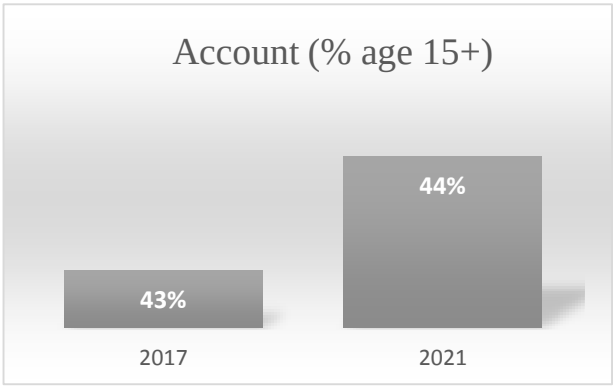
Table (1): Reasons for unbaked population in Algeria 2021

No account because:	%
financial institutions are too far away (% age 15+)	6
financial services are too expensive (% age 15+)	13
of insufficient funds (% age 15+)	39
lack of necessary documentation (% age 15+)	23
a lack of trust in financial institutions (% age 15+)	11
religious reasons (% age 15+)	10
someone in the family has one (% age 15+)	19

Source: Prepared by researchers from Global Findex Data Base.

From the table, we notice that the reasons for not having a bank account or not dealing with banks and financial institutions in Algeria are multiple. According to the Global Findex Data Base, financial institutions are to far away for 6% of the respondents, financial services are expensive for 13% of them, 39% are poor and do not have enough money, 23% do not have the necessary documents, 11% of them do not trust financial institutions, 10% do not deal with financial institutions for religious reasons because traditional financial institutions deal with usury, 19% of respondents do not need a bank account because a family member has one**.**

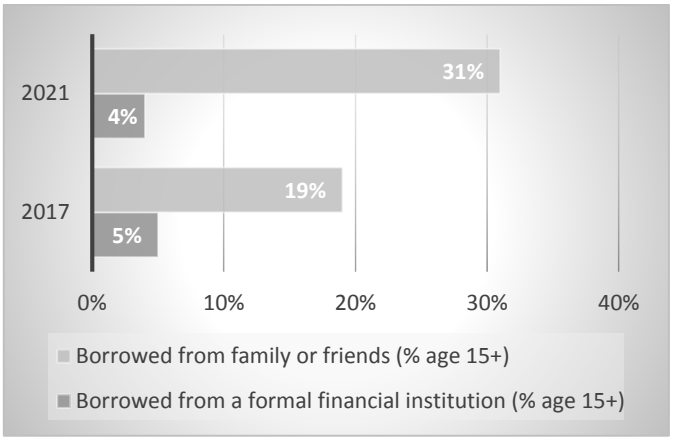
Figure (3): Account ownership in Algeria (2017, 2021)



Source: Prepared by researchers from Global Findex Data Base.

Through the figure, we notice that 43% of the respondents in 2017 have a bank account, and in 2021, the number of individuals having bank accounts in Algeria increased to 44%, according to the World Bank's Global Findex Data Base.

Figure (4): Sources of borrowing money in Algeria (2017 ,2021)



Source: Prepared by researchers from Global Findex Data Base.

From the previous figure, we deduce that the main source of borrowing money for Algerians is family or friends for 31% of respondents in 2021 and 19% in 2017, while the percentage of respondents who borrow from official financial institutions is only 5% in 2017 and decreased to 4% in 2021, and this may be due to distrust in financial institutions, religious reasons and their refusal to deal with usurious interest. 12% of respondents borrow (2021) for health or illness reasons, according to the Global Findex Data Base.

Table (2): Other indicators of financial inclusion in Algeria 2021

Indicators	%
Owns a credit card (% age 15+)	3%
Owns a debit card (% age 15+)	23%
Has access to the internet (% age 15+)	83%
Owns a mobile phone (% age 15+)	95%

Source: Prepared by researchers from Global Findex Data Base.

We find through the table that 3% of the respondents have a credit card, 23% of them have a debit card, and most of the respondents have Internet access by 83%, and this shows the state's efforts by seeking to connect the Internet to all regions, and 95% of them own a mobile phone.

4. Econometric Study:

4.1 Methodology:

To achieve the objective of this study, which is to determine the impact of Islamic finance on financial inclusion in Algeria, one Islamic bank was selected, namely Al Baraka Bank Algeria. A multiple linear regression model was used with annual data from the period (2004–2021), where the variables were determined after reviewing previous studies.

Table (3): Description of the Variables

Variables	Indicator	Data sources
Financial inclusion Endogenous	Automated Teller Machines per 100,000 adults (Mustafa et al, 2018)	World Bank Data
Islamic finance Exogenous	Total deposits in Al Baraka Bank (Akhtar et al, 2020)	Annual Reports of Al Baraka Bank Algeria
Economic growth Explanatory	Real gross domestic product (Mustafa et al, 2018)	World Bank Data
Inflation Explanatory	Rate inflation	Statista

Source: Prepared by researchers.

After identifying and describing the study variables, we formulate the model based on them to determine the impact of Islamic finance on financial inclusion. The model can be expressed in the following form:

$$ATM = f(BARAKA\_DEP, RGDP, INF)$$

Where:

ATM: Number of ATMs per 100,000 adults.

BARAKA_DEP: Total deposits at Al Baraka Bank Algeria.

RGDP: Real gross domestic product.

INF: Inflation rate.

Thus, the general form of the model is as follows:

$$\mathrm{ATM} = \beta_0 + \beta 1\ \mathrm{BARAKA\_DEP}t\ + \beta 2\ \mathrm{RGDP}t + \beta 3\ \mathrm{INF}t + \varepsilon_t$$

Where:

$\beta_0, \beta_1, \beta_2, \beta_3,$:The model coefficients.

ε_t : random error term.

t :sample period.

4.2 Results:

Model estimation:

Table (4): Results of the model estimation using the least squares method during the period (2004-2021)

Dependent Variable: ATM
Method: Least Squares
Date: 07/23/23 Time: 23:05
Sample: 2004 2021
Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BARAKA_DEP	2.44E-11	3.20E-12	7.627871	0.0000
RGDP	1.49E-13	3.32E-14	4.478225	0.0005
INF	-3.489185	7.878651	-0.442866	0.6646
C	1.423493	0.378103	3.764825	0.0021

R-squared	0.966130	Mean dependent var	6.349444
Adjusted R-squared	0.958872	S.D. dependent var	2.793352
S.E. of regression	0.566494	Akaike info criterion	1.894431
Sum squared resid	4.492823	Schwarz criterion	2.092291
Log likelihood	-13.04988	Hannan-Quinn criter.	1.921713
F-statistic	133.1138	Durbin-Watson stat	1.604919
Prob(F-statistic)	0.000000		

Source: Prepared by researchers, based on EViews 12 output.

By estimating the model, the multiple linear regression equation is in the following form:

ATM = 1.423493+ 2.44e-11*BARAKA_DEP + 1.49e-13*RGDP - 3.489185*INF

Student's test: The Student statistic (T Student) is used to evaluate the significance of the model parameters, and then evaluate the effect of the explanatory variables on the dependent variable in the multiple linear regression model, by testing the hypotheses of the estimated parameters as follows:

The null hypothesis:

The parameters are not statistically significant…..H_0: $\beta_0 = \beta_1 = \beta_2 = \beta_3 = 0$

The Alternative Hypothesis:

The parameters are statistically significant…..H1: $\beta_0 \neq \beta_1 \neq \beta_2 \neq \beta_3 \neq 0$

At a significance level of 5%, we will study the value of the error probability (prob) shown. If this value is less than 0.05, we accept the alternative hypothesis and reject the null hypothesis. This means that the parameter is statistically significant.

For the parameter β1 of the independent variable (total deposits at Al Baraka Bank Algeria), we note that the probability of error is less than 0.05. Therefore, we reject the null hypothesis and accept the alternative hypothesis. This means that β1 is statistically significant and that the variable (total deposits of Baraka Bank) has a statistically significant effect at a confidence level of 95%.

For the parameter β2 associated with the control variable (real gross domestic product), we observe that the probability value is less than 0.05. Therefore, we reject the null hypothesis and accept the alternative hypothesis. This implies that β3 is statistically significant, indicating that the real gross domestic product has a statistically significant effect at a 95% confidence level.

For the parameter β3 associated with the control variable (inflation rate), we observe that the probability value is greater than 0.05. Therefore, we accept the null hypothesis and reject the

alternative hypothesis. This implies that β3 is not statistically significant, indicating that the inflation rate does not have a statistically significant effect at a 95% confidence level.

Coefficient of determination (R^2): The value of the coefficient of determination (R^2) is 0.966, which means that the explanatory variables control 96.6% of the changes in the dependent variable, financial inclusion. The remaining 3.4% is explained by other factors that are not included in the model and are included in the error term. This result is confirmed by the value of the corrected coefficient of determination, $\bar{R}^2 = 0.958872$. Additionally, the regression is not spurious (there is no other factor between the variables that leads to this result), as shown by the Durbin-Watson statistic, which is greater than the coefficient of determination $DW > R^2$.

Fisher's test: In order to test the overall significance of the obtained model, we perform the Fisher test (F) to study the significance of all parameters at the same time through the following two hypotheses:

Null Hypothesis (H0): There is no relationship between the independent variables and the dependent variable (the model is not significant).

Alternative Hypothesis (H1): There is a relationship between the independent variables and the dependent variable (the model is significant).

Through Fisher's p-value: If this value is less than 0.05, then we accept the alternative hypothesis. For the studied model, we find that prob (F-statistic) is less than 0.05, hence we accept the alternative hypothesis (the model is significant).

Model diagnostics:

To perform a standard evaluation of the model's parameters, we will perform the stability of the residuals, the Durbin-Watson test, the normality test of the residuals, and the heteroscedasticity test.

Study of the stability of the residuals: Through the table (5), which represents the evolution of the autocorrelation parameters of squared residuals, we observe that all these parameters fall within the confidence interval, and also that the probability of Q-Stat is greater than 0.05. Therefore, we conclude that the squared residuals are stable.

Table (5): The evolution of the autocorrelation coefficients of the squared residuals

Date: 08/09/23 Time: 11:33
Sample: 2004 2021
Included observations: 18

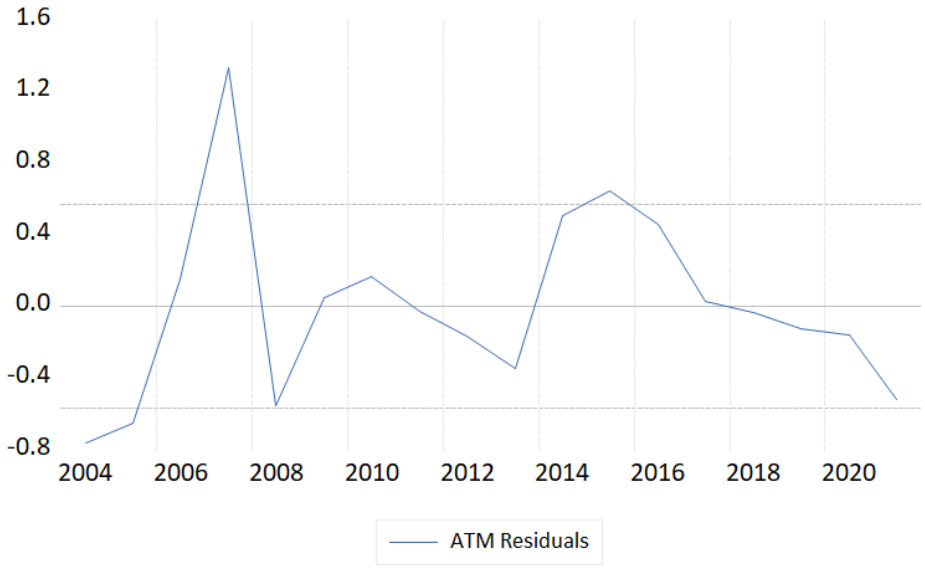
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.038	0.038	0.0309	0.860
		2	-0.007	-0.009	0.0321	0.984
		3	0.095	0.096	0.2479	0.970
		4	-0.123	-0.132	0.6364	0.959
		5	-0.130	-0.120	1.1022	0.954
		6	-0.048	-0.052	1.1723	0.978
		7	0.046	0.075	1.2412	0.990
		8	0.124	0.135	1.7956	0.987
		9	0.002	-0.028	1.7957	0.994
		10	-0.083	-0.134	2.1074	0.995
		11	-0.079	-0.111	2.4263	0.996
		12	-0.124	-0.078	3.3562	0.992

Source: Prepared by researchers, based on EViews 12 output.

The Durbin-Watson (DW) test is a statistical test used to determine if there is autoregression in the residuals of a regression model. Through the estimation results of the proposed model, we find that the value of the DW statistic reached DW = 1.60. It is confined between the minimum limit DL = 0.93 and the upper limit DU = 1.69. In this case, the decision is inconclusive (uncertainty zone).

Normal Distribution Test for Residual Series: The residual series Ut consists of 15 observations, representing the differences between the original series and the estimated series, according to the following equation: $\hat{u}_t = ATM_t - \widehat{ATM}_t$ and represented in the following figure:

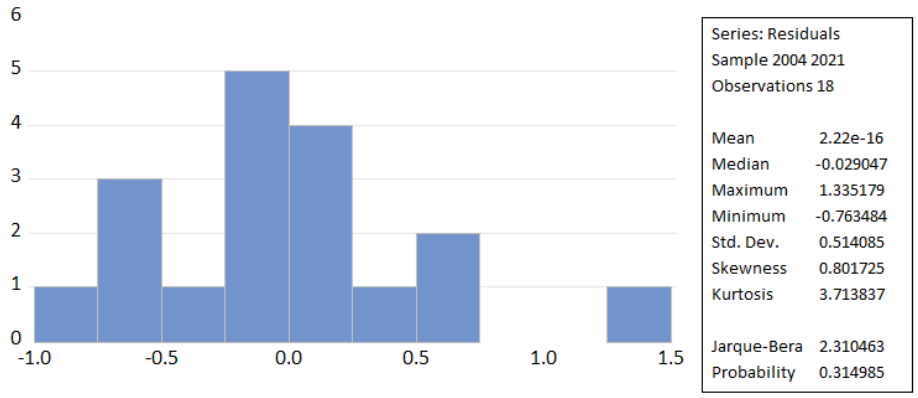
Figure (5): ATM Residuals



Source: Prepared by researchers, based on EViews 12 output.

To determine whether the residual series follows a normal distribution or not, we conduct the Jarque-Bera test, as shown in the following figure:

Figure (6): Normality Test (Jarque-Bera)



Source: Prepared by researchers, based on EViews 12 output.

From the figure above, we note that the residuals are normally distributed (the normal distribution hypothesis is satisfied) because the Jarque-Bera statistical probability is greater than 0.05, and therefore we accept that the residuals are normally distributed in the 95% confidence interval.

Heteroskedasticity Test (ARCH Test): This test involves an autoregressive examination of the first-degree errors or residual variances. It is conducted to test the null hypothesis of "homoskedasticity", which means no heteroskedasticity in the variances. The estimation results of this test are presented in the following table:

Table (6): Heteroskedasticity Test (ARCH Test)

Heteroskedasticity Test: ARCH

F-statistic	0.022642	Prob. F(1,15)	0.8824
Obs*R-squared	0.025622	Prob. Chi-Square(1)	0.8728

Source: Prepared by researchers, based on EViews 12 output.

Based on the Fisher probability for the ARCH test, as shown in the table above, it is evident that the probability is greater than 0.05. This implies the acceptance of the null hypothesis of "no heteroskedasticity", meaning that the variability of errors is not related to time. Therefore, we can conclude that the model is relatively free from statistical and measurement issues.

4.3 Discussion:

For the total deposits of Al Baraka Bank Algeria, the positive sign in the multiple regression equation indicates a positive relationship between the total deposits of Al Baraka Bank Algeria and the number of ATMs per 100,000 adults. This means that for every unit increase in Islamic finance, financial inclusion increases by 2.44e-11 units. This result is consistent with previous studies, which show that Islamic finance can help promote financial inclusion. However, the impact of Islamic finance on financial inclusion is weak. This can be explained by the limited number of Islamic bank branches and the high cost of Islamic financial services, And the Islamic finance industry in Algeria is still in its early stages of development.

For real gross domestic product, the positive sign in the multiple linear regression equation indicates a positive relationship between economic growth and financial inclusion. This means that for every unit increase in economic growth, financial inclusion increases by 1.44e-13 units. This result is consistent with previous studies, which show that economic growth can help stimulate financial inclusion.

In the case of the inflation rate, it has a negative and statistically insignificant impact on financial inclusion. This implies that there was no significant relationship between the inflation rate and financial inclusion during the study period in Algeria.

Conclusion:

The study attempted to investigate the impact of Islamic finance on financial inclusion during the period from (2004- 2021), using the multiple linear regression model. The study found a positive and significant relationship between Islamic finance and financial inclusion in Algeria. This finding is consistent with previous studies, but the impact of Islamic finance on financial inclusion is weak. This is due to the small number of branches of Islamic banks and the high cost of Islamic financial services, and the Islamic financial industry in Algeria is still in its early stages.

In addition, economic growth has a positive and significant relationship with financial inclusion during the study period, this result is consistent with previous studies, indicating that economic growth contributes to stimulating financial inclusion.

Thus, we confirm the validity of the hypothesis, "There is a significant effect and positive relationship between Islamic finance and financial inclusion in Algeria." We can provide the following recommendations:

- Provide adequate branches of Islamic banks and Islamic windows in different parts of the country to enable customers to access and use financial services.
- Try to review the cost of Islamic financial services and make them affordable for customers, especially those with limited income.
- Promote awareness of the benefits of Islamic financial applications to attract the largest segment of customers, especially those who do not deal with conventional banks for religious reasons.

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