Journal of Economic Integration	Vol: 10 - N°: 02 / (june 2022)	pp: 553-565

Measuring the technical Efficiency in Algerian commercial banks: from a mediation approach by using Stochastic frontier analysis

قياس الكفاءة التقنية للبنوك التجارية: من منظور الوساطة

باستعمال تحليل حدود العينة العشوائية

PHD. Student.MAHDAOUI Meryem[1], Pr. BOUCHRA Abdelghani[2],

[1] University Ahmed Draia of Adrar- Adrar (Algeria), Mer.mahdaoui@univ-adrar.edu.dz
[2] University Ahmed Draia of Adrar- Adrar (Algeria), Abd.bouchra@univ-adrar.edu.dz

Received: 23/11/2021 **Accepted:** 19/04/2022 **Published:** 30/06/2022

Abstract:
The Bank is a financial intermediary between depositors and borrowers; his role is to raise funds to convert them into credits. From this perspective, loans are considered as output while deposits are included in the list of inputs.
Accordingly, this study dealt with measuring the technical efficiency of commercial banks in Algeria from the perspective of mediation, where the model for analyzing the limits of the random sample was SFA as a parametric technique tool used in the operating Algerian banks, the study was limited to the period between 1975 - 2019 as the period of advancement of the banking sector after the reforms it witnessed. .
The results showed that the average technical efficiency of the Algerian commercial banks from the perspective of mediation during the study period was estimated at 24.13%, which represents a small percentage because of the lack of optimal employment of inputs (deposits), which reflects the poor management of the movement of funds in the national economy.
Keywords: technical efficiency, stochastic frontier, deposits, mediation perspective, credits.
JEL Classification Codes : JEL,

ملخص:
يعتبر البنك وسيط مالي بين المودعين والمقترضين؛ ويتمثل دوره في جمع الأموال لتحويلها إلى ائتمانات .من هذا المنظور يتم اعتبار القروض بمثابة مخرجات بينما يتم تضمين الودائع في قائمة المدخلات، وعليه تناولت هذه الدراسة قياس الكفاءة التقنية للبنوك التجارية في الجزائر من منظور الوساطة، حيث تم الاعتماد على نموذج تحليل حدود العينة العشوائية كأداة إحصائية مستخدمة في البنوك الجزائرية العاملة، واقتصرت الدراسة على الفترة ما بين 1975 – 2019 باعتبارها فترة النهوض بالقطاع البنكي بعد الإصلاحات التي شهدها.
حيث أظهرت النتائج أن متوسط نسبة الكفاءة التقنية للبنوك التجارية الجزائرية من منظور الوساطة خلال مدة الدراسة قدر بـ 24.13٪ والتي تمثل نسبة ضئيلة نتيجة لعدم التوظيف الأمثل للمدخلات (ودائع) ذلك ما يعكس سوء تسيير حركة الأموال في الاقتصاد الوطني.
كلمات مفتاحية: الكفاءة التقنية، الودائع، القروض، نموذج تحليل حدود العينة العشوائية، منظور الوساطة.
تصنيفات JEL : JEL

Corresponding author: MAHDAOUI Meryem, **e-mail:** Mer.mahdaoui@univ-adrar.edu.dz

INTRODUCTION: Measuring the technical Efficiency in Algerian commercial banks: from a mediation approach by using Stochastic frontier analysis

During the last two decades of the twentieth century, the world economy witnessed many transformations within the framework of the so-called economic globalization, which was built on the basis of economic and financial liberalization through lifting customs restrictions and liberating the movement of goods, services and capital. New and advanced financial tools have been developed, financial transactions have increased, and their implementation has become easy and fast. These changes were reflected in the banking arena, and considering that banks are the backbone of the economy as they represent the main channel for the flow of capital and their role in supporting the economy, the banks have been greatly affected by these changes, as their most important manifestations were the trend towards liberating banking activity from restrictions, in addition to the recurrence of Financial crises and their severity the trend towards expansion through banking merger and the formation of major banking entities has also increased, and the role of banks has shifted from financial intermediation to totalitarianism. In light of these developments, banks have become in a position to keep pace with these developments and take advantage of the advantages such as innovative new financial products and information technology, with a focus on performance efficiency, as the ability of the bank to allocate its resources with high efficiency is one of the basic requirements and as a condition for its success in maintaining its survival, continuity and ability to The competition. Assessing the efficiency of banks and working to monitor their activity is necessary for the banks to survive in light of risks and changes, as well as the occurrence of many financial crises that were mainly caused by banks. The development of tools for measuring technical efficiency in banks also shows the importance of positive performance in the banking industry, and this is evident through the development or improvement of many indicators and techniques to measure this efficiency.

Pose the problem:

Many countries have adopted a number of reforms in light of the challenges posed by the changes in the international banking environment, and among these countries is Algeria. Therefore, evaluating the efficiency of banks operating in Algeria is a necessary and urgent process due to the transformations and reforms that the Algerian banking sector is witnessing, based on the monetary and loan law, and the subsequent instructions In light of the above, the main problems of this research can be presented as follows:

What is the technical efficiency ratio of Algerian commercial banks from the perspective of mediation?

1. Literature review:

In recent years, there have been various studies on measuring the efficiency of banks and financial institutions because of their importance in economic balance.

Where several programs, mechanisms and methods have been used to measure this efficiency, among these methods we find SFA method (stochastic frontier analysis), from the studies that used this method, we mention:

Labidi Moez, Bannour Boutheina in there study **(Efficience des banques commerciales Tunisiennes: etude par l'approche de frontier stochastique)** were selected A sample of 20 Tunisian commercial banks, to study the level of efficiency cost achieved during the period 1990-2009 using the SFA method, in addition to identifying inefficiency variables.

The results of the efficiency scores were as follows: the BT (99,5%), the BH (98,5%) followed the AB (94,9%) and de ATB (94,5%).

Dr AOUAD Hadjar Soumia, Dr BENZAI Yassine 2018 in there study **(Mesure de l'Efficience Economique des banques commerciales Algériennes : Application de la Méthode d'Analyse des Frontières Stochastiques SFA)** tried to measure the efficiency of the Algerian commercial banks using the border cost function of SFA method during the period 2003-2015, the results showed a gradual decline in the efficiency of these banks during the study period, they waste approximately 54.25% of the potential resources that can be saved during the production process, and that public sector banks are more efficient than their counterparts in the private sector.

Limitations:

The limits of the study can be summarized in the following points:

- Time limits: The study period was chosen from 1975 to 2019 as the period that witnessed the development of the banking sector in general and commercial banks in particular after the reform
- Measurement tool: Using the limits of random sample analysis as an accurate measurement tool that is newly recognized by the banking sector
- Measuring the technical efficiency of the Algerian commercial banks from the perspective of mediation, which is the main role that the commercial bank plays between depositors and borrowers.

2. Definitions of key concepts:

2.1. The descriptive analysis of the Algerian banking sector:

In view of recent developments, the banking system, at the end of 2003, was made up of thirty (30) banks and financial institutions which, with the exception of one located in Oran all have their head office in Algiers. Banks and financial institutions break down as follows:

- six (6) public banks, including the Savings Bank;
- one (1) mutual insurance company approved for banking operations;
- fourteen (14) private banks, including one with mixed capital;
- five (5) financial institutions, two of which are public;
- two (2) leasing companies;
- one (1) development bank whose restructuring is in progress;
- One (1) private bank approved but not yet in operation. Public banks have, for historical reasons, large branch networks that are well distributed throughout the country, while the networks of private banks, in the development phase, are limited to the country's large cities. Banks, in accordance with the law, collect resources from the public, distribute loans, provide customers with means of payment and manage them. They also perform various related operations. Financial institutions carry out the same operations as banks, with the exception of collecting resources from the public and managing the means of payment which are prohibited to them by banking legislation. The entry into activity of private banks and financial institutions and their development have enabled the emergence of a competitive environment both in terms of the resource market, as well as in the credit market and that of banking services. However,

the bankruptcy of two private banks in 2003 resulted in a decline in the share of private banks in both the resource market and the credit market. (www.bank-of-algeria.dz)

Commercial banks are defined as a type of financial institution whose activity is based on accepting deposits and granting credit, in this sense, commercial banks are considered as a mediator between those who have a surplus of funds, and although traditional banks are not considered the only intermediary in this field, they are characterized by certain characteristics.

Commercial banks are divided into several types and are classified according to specific:

- ✓ commercial banks;
- ✓ External Bank of Algeria;
- ✓ Algerian National Bank;
- ✓ Bank of Agriculture and Rural Development;
- ✓ Local Development Bank;
- ✓ Algerian popular loan;
- ✓ The National Savings and Reserve Fund ;
- ✓ Al Baraka Bank of Algeria;
- ✓ Arab Banking Corporation ;
- ✓ Algeria Natixis Bank ;
- ✓ Algeria public company ;
- ✓ Arab Bank Algeria ;
- ✓ Gulf Bank Algeria ;
- ✓ The Housing Bank for Trade and Finance;
- ✓ Salam Bank Algeria. (www.bank-of-algeria.dz)

- ➢ **The main role of the bank:**

More specifically, banks offer deposit accounts that are secure places for people to keep their money. Banks use the money in deposit accounts to make loans to other people or businesses. In return, the bank receives interest payments on those loans from borrowers.

2.2. Technical efficiency in banks:

Technical efficiency is the effectiveness with which a given set of inputs is used to produce an output.

It is based on the ratio between outputs (observed effects) and inputs (defined exclusively as a function of mobilized resources). It therefore expresses the relationship between what is achieved and the means implemented.

Technical efficiency is also defined as a process of optimizing the tools used to achieve a result. Efficiency refers to the output / input ratio. Its increase comes from the maximization of the use of resources which involves increasing production without increasing costs, or from the delivery of a given level of production or service by minimizing factor endowments. (HENNI, 2017/2018, p. 64)

2.3. Presentation of the SFA model:

Stochastic frontier analysis (SFA) was independently introduced by Aigner, Lovell, and Schmidt (1977), Battese and Corra (1977), and Meeusen and Van den Broeck (1977), as a parametric technique use for measuring production efficiency.

The original SFA model involved a production function had two components: one was to account for random effects; the other was to account for technical inefficiency. This model can be expressed in the equation:

$Yi = xi\,\beta + \varepsilon i$, $\varepsilon i = (\nu i + ui)$, i=1, 2, 3… N, where,

- ***Yi*** is the production (or the logarithm of the production) of the *i*-th organization;
- ***xi*** is a k×1 vector of (transformations of the) input quantities of the *i*-th organization;
- **β** is an vector of unknown parameters ;
- **v*i*** is random variables which are assumed to be *i*id **N (0, σv 2)**, and
- ***ui*** is non-negative random variables which are assumed to account for technical inefficiency in production and are often assumed to be *i* id |**N (0, σu2)**|.

The SFA model assumes a composite disturbance **ε*i***, which is a sum of two independent components **v*i***, ***ui***. The error component v*i* is a normally distributed random disturbance representing specification or measurement errors. Thus, **v*i*** is the counterpart of the OLS disturbance. The error component ***ui*** is a one-sided disturbance, mostly assumed to follow half-normal or truncated normal distribution. It represents any type of inefficiency. It is assumed to be distributed independently of v*i* and the regressor ***xi***. (LIM, 2007, p. 65)

This original SFA model has been used in such a vast number of empirical applications as the following: the manufacturing industry (Suh 1992); the agricultural 69 industry (Chiao 1986; Pitt and Lee 1981; Ramirez 1987; Rawlins 1984); the banking industry (Kaparakis et al. 1994; Yang 1990); the airline industry (Bauer 1986; Gallegos-Monteagudo 1992); the health and mental health area (Toren 1993; Vitaliano and Toren 1994); hospitals (Zuckerman et al. 1994); and the insurance industry (Cummins and Weiss 1993; Gardner and Grace 1993; Kumbhakar and Hjalmarsson 1995).

These extensions of the SFA model include a specification of more general distributional assumptions for the ***ui***, such as the truncated normal or two-parameter gamma distributions; the consideration of panel data and time-varying technical efficiencies; the extension of the methodology to cost functions, and also to the estimation of system of equation; etc (Forsund et al. 1980; Schmidt 1986; Bauer 1990). (LIM, 2007, p. 66)

The most fundamental advantage of the SFA model is this composite distribution structure. Using this error specification, the SFA model allows for a distinction of the effect of inefficiency from non-inefficiency related factors that may cause deviation from the frontier (Green 1993). (LIM, 2007, p. 66)

3. Measuring technical efficiency of Algerian commercial banks:

3.1. Descriptive Analysis of the Input and Output Data:

This study conducts descriptive statistical analyses, by using the intermediation approach that emphasizes the role of banks in collecting deposits from the public and transforming them into loans and other assets, and evaluates output in monetary units. It therefore considers bank inputs as being made up of customer deposits and other market resources, as well as operating costs and outputs as loans and other income-generating activities.

We thus retain two inputs in particular in this approach: sight deposits, term deposits, and two outputs in particular: short term loans, medium and long-term loans.

To understand the basic information and characteristics of the input and output data of Algerian commercial banks, the table below contains situation data banking deposits period (1975-2019):

Table1: situation data banking deposits
Source: elaborate by researchers from the site of Algerian bank central

Million DA

Years	inputs		outputs	
	sight deposits	term deposits	short term loans	medium and long-term loans
1975	15 111	1 773	28 674	3 175
1976	20 560	2 529	36 918	3 076
1977	23 849	3 402	39 773	3 938
1978	28 839	5 249	51 329	3 706
1979	29 487	7 481	59 655	5 037
1980	33 499	9 105	68 195	4 980
1981	40 078	11 232	88 204	5 613
1982	61 991	12 590	112 482	6 085
1983	76 878	13 170	132 633	8 135
1984	95 281	14 284	155 696	11 257
1985	104 622	21 630	174 531	13 951
1986	95 936	22 199	176 839	15 856
1987	103 801	33 990	180 525	17 980
1988	115 525	40 758	191 910	19 861
1989	101 893	58 134	209 304	20 279
1990	105 546	72 923	246 979	43 960
1991	133 111	90 276	325 848	29 682
1992	140 841	146 183	412 269	22 458

1993	188 933	180 522	220 207	210 320
1994	196 452	247 680	305 808	165 817
1995	210 775	280 455	565 616	111 114
1996	234 029	325 958	776 814	43 897
1997	254 833	409 948	741 203	188 789
1998	347 570	766 090	905 857	535 528
1999	368 375	884 167	1 150 143	592 065
2000	467 502	974 350	701 812	291 241
2001	554 927	1 235 006	740 087	337 612
2002	642 168	1 485 191	715 834	550 208
2003	719 591	1 723 861	791 693	586 559
2004	383 128	893 967	415 721	313 614
2005	656 92	1 532 813	810 753	611 621
2006	979 069	2 284 495	1 323 004	998 055
2007	1 116 643	2 605 500	1 640 914	1 237 882
2008	886 584	2 068 696	1 575 975	1 188 894
2009	777 691	1 814 612	1 427 027	1 076 529
2010	11 089 258	9 601 959	166 443	27 907
2011	13 004 419	10 804 693	170 642	21 790
2012	13 738 043	12 728 540	242 467	16 960
2013	13 660 660	14 319 006	331 914	14 611
2014	16 085 803	15 913 853	544 041	14 196
2015	15 804 710	17 347 096	690 454	14 516

2016	15 244 733	17 706 474	666 555	15 130
2017	16 293 116	18 518 777	629 123	14 952
2018	18 971 644	20 444 657	629 261	15 435
2019	5 192 281	5 236 694	164 352	3 700

- **Bank Inputs:**

The different forms of deposits that make finance capital are considered as an input, as advocates of the intermediation approach state.

- **Bank outputs :**

The combination of bank inputs generates the following outputs: Total credits.

In our study, we wish to estimate the translog production frontier:

As a first step we need to calculate the logarithm of the data from **table 1** to reach the following function:

$Y_{it} = x_{it} B + (V_{it} – U_{it})$ i=1,…, N, t=1,..., N

Where:

Y_{it} : is the logarithm of the production (outputs “total credits”) of the i-th firm in the t-th time period.

x_i : is the inputs quantities (deposits) of the i-th firm in the t-th time period.

B : is as defined earlier

V_{it} : is an error team

The results obtained from this operation are as follows:

Table2: logarithm of data banking (inputs and outputs)

Source: elaborate by researchers

firm	year	output2	sight deposits	term deposits
1	1	8,063063	9,623178	7,480428
2	1	8,031385	9,931103	7,835579
3	1	8,278428	10,0795	8,132119
4	1	8,217708	10,26948	8,565793
5	1	8,524566	10,2917	8,920122
6	1	8,513185	10,41927	9,116579
7	1	8,632841	10,59858	9,326522
8	1	8,713582	11,03474	9,440658
9	1	9,003931	11,24998	9,485697
10	1	9,328745	11,46459	9,566895
11	1	9,543306	11,55811	9,981837
12	1	9,671303	11,47144	10,0078
13	1	9,797015	11,55023	10,43382
14	1	9,896513	11,65724	10,61541
15	1	9,917341	11,53168	10,97051
16	1	10,69104	11,5669	11,19716
17	1	10,2983	11,79894	11,41063
18	1	10,0194	11,85539	11,89261
19	1	12,25639	12,14915	12,10361
20	1	12,01864	12,18817	12,41989
21	1	11,61831	12,25855	12,54417
22	1	10,6896	12,3632	12,69452
23	1	12,14839	12,44836	12,92379
24	1	13,19101	12,75872	13,54905
25	1	13,29137	12,81686	13,6924
26	1	12,58191	13,05516	13,78953
27	1	12,72965	13,22659	14,02659
28	1	13,21805	13,37261	14,21105
29	1	13,28203	13,48644	14,36008
30	1	12,65592	12,85612	13,70342
31	1	13,32387	11,09273	14,24262
32	1	13,81356	13,79436	14,64166
33	1	14,02891	13,92584	14,77314
34	1	13,98853	13,69513	14,54243
35	1	13,88925	13,56408	14,41138
36	1	10,23663	16,22149	16,07748
37	1	9,989206	16,3808	16,19549
38	1	9,738613	16,43568	16,35936
39	1	9,58953	16,43003	16,4771
40	1	9,560716	16,59345	16,5827
41	1	9,583007	16,57582	16,66894
42	1	9,624435	16,53974	16,68944
43	1	9,6126	16,60625	16,7343
44	1	9,644393	16,75846	16,83323
45	1	8,216088	15,46268	15,4712

The above table represents the decimal logarithm of the study data during the selected period.

Second step we applied the previous data "from **table 2"** in the frontier program (Frontier 4.1) to measure the technical efficiency of commercial banks, and the results obtained are in the following tables:

Table3: the final mle estimates

Source: elaborate by researchers from Frontier 4.1 program

	coefficient	standard-error	t-ratio
beta 0	0.10031790E+02	0.81955013E+00	0.12240606E+02
beta 1	-0.47880704E-05	-0.18196311E-06	0.26313413E+02
beta 2	0.30639432E+00	0.63542370E-01	0.48218901E+01

- **The meaning of the variables in the above table:**

Beta 0: represent the constant variable

Beta 1: represent sight deposits

Beta 2: represent term deposits

Table4: technical efficiency estimates
Source: elaborate by researchers from Frontier 4.1 program

Firm "i"	Efficiency estimate
1	0.11249978E-01
2	0.96667257E-02
3	0.23223265E-01
4	0.17364414E-01
5	0.75465880E-01
6	0.71463555E-01
7	0.12673635E+00
8	0.13731921E+00
9	0.12484019E-01
10	0.59126640E-01
11	0.16517652E+00
12	0.30486632E+00
13	0.55656906E+00
14	0.89622786E+00
15	0.99021354E+00
16	0.46363022E-01
17	0.33781395E-01
18	0.33333280E-01
19	0.20479191E+00
20	0.18275711E+00
21	0.89593632E-01
22	0.25336641E-01
23	0.19447104E+00
24	0.53952546E+00
25	0.56608433E+00
26	0.17617210E+00
27	0.18908569E+00
28	0.40231791E+00
29	0.41483327E+00
30	0.24796613E+00
31	0.78109642E+00
32	0.53505898E+00
33	0.99892625E+00
34	0.58181576E+00
35	0.55480565E+00
36	0.80603413E-02
37	0.30188426E+00
38	0.90938803E-01
39	0.35110914E-02
40	0.38799348E-01
41	0.43169504E-01

42	0.52640958E-01
43	0.27264149E-02
44	0.57919540E-01
45	0.37236139E-02

Mean efficiency = 0.24130318E+00

The above table contain results of technical efficiency estimated during the 45 years from 1975 to 2019 in Algerian commercial banks by an intermediation approach.

3.2. Results Discussions:

Through the previous tables, we reached the following results:

The average technical efficiency ratio of the Algerian commercial banks from the perspective of mediation represented in the synthesis of input elements (deposits) to achieve the maximum volume of outputs (loans) was estimated at 24.13% including a percentage of contribution of sight deposits estimated at 26.31% and another percentage of contribution of term deposits estimated at 4.82% , where the technical efficiency ratio of these banks ranged from the same perspective over a period of 45 years from 1975 to 2019 between 0.27% and 99.89%.

The following table contains a translation of the results obtained:

Table4: interpretation of technical efficiency estimates

Source: elaborate by researchers

Variables and parameters		t-ration of technical efficiency
sight deposits	**beta 1**	26.31%
term deposits	**beta 2**	4.82%
Mean efficiency		24.13%
TE Maximum		99.89%
TE Minimum		0.27%

The reasons for the low percentage of technical efficiency of commercial banks are due to:

- The poor combination of input elements to achieve a certain volume of output;
- Mismanagement of the movement of funds as a result of the lack of independence in the decision to grant loans with banks;
- The use of the banking economic field as a tool to embody political decisions and thus the lack of objectivity of the decision.

Conclusion:

In this article, we apply the stochastic frontier method (SFA), to estimate the technical efficiency of Algerian commercial banks during the period (1975-2019) from a mediation approach.

The method makes it possible to estimate a border function taking into account simultaneously the random error and an inefficiency component for the banks evaluated. Although traditional econometric estimation methods such as regression take into account random error, but, they estimate an average function and not a border function.

The empirical results of the parametric analysis show that the level of technical efficiency in Algerian commercial banks from a mediated approach is to 24.13%

Based on the findings, our study recommended that bank officials must study the reasons that prevent the maximum use of the inputs represented in deposits by knowing the weaknesses and reaching full technical efficiency levels, thus increasing the volume of outputs.

Bibliography List:

- **University theses:**

1. Amrawi, Z. (2013). Measuring the relative efficiency of banks using DEA (Unpublished MSc. Dissertation). université alger 3, Algeria.
2. Altajini, E. & Fawzi, Sh. (2015). Evaluation of the Financial Performance of Commercial Banks "Case Study of the Algerian National Bank and the Algerian People's Loan 2005-2011. Economic and administrative research Journal, Mohamed khider Biskra University.
3. Mearaj, H. & Shayad, F. (2011). Measuring the efficiency of Islamic and conventional banks in Algeria, First International Forum of the Institute of Economic and Commercial Sciences and Management Sciences, University Center in Ghardaia, Algeria
4. HENNI, A. (2017/2018). Les déterminants de l'efficience des banques des trois pays du Maghreb.
5. HENNI, A. (2017/2018). Les déterminants de l'efficience des banques des trois pays du Maghreb.
6. LIM, D. J. (2007). A comparative study of performance measurement in korean.

- **Articles in a scientific journal:**

1. Alsiad, A. (2017). Measuring the efficiency of Islamic banks in the Arab countries using data envelope model, Jordan Journal of Economic Sciences (JJES).
2. Alrashidi, A. (2015). Data Envelopment Analysis for Measuring the Efficiency of Head Trauma Care in England and Wales. (Unpublished MSc. Dissertation). Salford Business School, United Kingdom.
3. Almumani, M. (2013). The Relative Efficiency of Saudi Banks: Data Envelopment Analysis Models. International Journal of Academic Research in Accounting

4. Shahwan, T. & Hassan, Y. (2017). Efficiency analysis of UAE banks using data envelopment analysis. Journal of Economic and Administrative Sciences
5. Khato, F. & Quraishi, M. (2013). Measuring Efficiency of Algerian Banks - Use of Data Envelopment Analysis. El- Bahith Review, Kasdi Merbah University of Ouargla – Algeria
6. Hussain, A. (2016). The role of efficiency in banking performance: An applied research in a sample of Iraqi private banks. Economic and administrative sciences Journal
7. Helles, S. & Alhbeel, N. (2014). Measuring banking efficiency by using stochastic cost frontier model Applied Study on Local Banks in Palestine. IUG Journal of Economics and Business Studie.
8. Bou Abdelli, A. & Aman, A. (2016). Measurement of operational efficiency degree and its role in the liquidity risk management in commercial banks by using the envelope data analysis "DEA" The case of study: Algeria Gulf Bank AGB for the period 2010-2015. roa iktissadia review Journal- Hamma Lakhdar University.

- **Websites:**

1. www.bank-of-algeria.dz. (s.d.).