The Effect Of Integration Of The Households Savings Into The Banking System On GDP By Late 2022

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Abstract:

Our empiricalstudy aims to measure the effect of the integration of the households savings into the banking system on the economic growth, this savings that represent an important portion of the parallel market, estimated in mid-2018 from 7.72% to 10.29 of the GDP, and the government put this integration as one of its major objectives, facilitating a platform which is the Islamic finance usingit as a tool to attract the households savings.

But because of the weak dynamic of our inefficient economy translated by a high I.C.O.R rate, even with the rise of the lending capacity to 35.67%, the integration will have a weak effect with 1.7% economic growth.

Keywords: The parallel market, The household's savings, The Islamic finance, I.C.O.R rate, Inefficient economy.

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1. Introduction:

Since Algeria plunged on it worst economic crisis the widespread of the corona pandemic, the government issue a plan to boost our economy.

One of the most important is to boost the Islamic finance, by open windows at the conventional banks level, and use it as a tool to attract the savings of the parallel market, which represent according to the budget and finance committee of the national assembly 43,46% of the GDP in early 2020.

The households that have from 1.500 to 2.000 billion DA are the most attracted to the Islamic finance, will invest its savings, in case of the availability of the sharia non-interest based finance.

But the weak dynamic of our economy makes the integration of this savings will result with a weak economic growth, and for that we need to measure the contribution of this integration to answer our problematic, which is: **what will be the effect of integrating households savings into the banking system on GDP?**

To answer this question we will start from this hypothesis: The integration of the households savings will improve our economy efficiency.

Method:

The approach used in our paper is deductive one, testing a macro-hypothesis, using a macro-sample (the households savings, the entire Algerian banking system), to gain a macro-conclusion about the effect of the integration on the GDP.

Our data are summarized historically (by financial years) and by sectors (especially in the structure of the deposit between the private and the public sector).

In our data analysis, we used the granger causality test (to test the effect of both the GDP and the credit to the economy on each other), and the correlation to measure the development of our variables in 2022, and the ADF test (for the stationarity testing of the time series), and for that we used E-Views 10 program.

2. The situation of the parallel market :

In Algeria there is an ambiguity on how to define the parallel market, and what kind of operations we could include it in the parallel market, according to the national economic and social council (CNES in French), they define the non-official market and not the parallel as “it is the market or the economy where the produced and exchanged products and services and businesses avoid partially or totally the laws and rules of the fiscal (primarily) and the socio-economic systems, where they are not imposed to the official accounting and statistics registrations, not all these businesses are illegal (like drugs dealing or contraband), but you should have a license of agreement from the empowered authority to realize the activity” (Attar, 2010).

But the best method to identified the parallel market is to focus on the job (or the worker), where it is not declared to the authority and by that he’s not paying thecontributions to the national fund of social insurance (CNAS in French) or the national fund for the self-

employed social insurance (CASNOS in French), because not all businesses that register it operations register all it employees, so the work that employee is doing is considered a parallel activity, and according to Pierre fisher the parallel market are operations eitherillegal, fraudulent, or not declared in the accounting (or accountancy). (Benmoussa & Beragh, 2013, p. 197).

2.1. The factors of the emergence of the parallel market: There are several factors push businesses to deal in the parallel market, and we could divide those factors to 4 factors:

2.1.1. The economic factors: Those factors emerges because of the bad management of the government to the economy, like the rise of the fiscal burden on business, pushing them to commit tax frauds, or switch to the parallel market, to avoid it all, or the scarcity of goods (especially the commodities and essential goods), that represent an opportunity to the agents to rise the saving of those goods to satisfy the demand on it with higher prices (like the currency exchange in the parallel market in Algeria).

One of the essential economic factors that lead to the rise of the parallel market, is the rise of small business (because of the nature of it activities, they deal with cash, and that help the tax evasions, and the non-declaration of the revenues, and all that represent a parallel activity.

The financial and economic crisis contributes to the rise of the parallel market, because of the layoffs of employees, those latter are pushed to find jobs in the parallel market. (Bouraada & Rekik, 2017, p. 80).

2.1.2. The administrative factors: The bureaucracy of the administration proved to be one of the major reasons to spread the parallel activities, and the complication of procedures to realize an economic activity will push the individuals to choose the parallel market to its simplicity, and the most obstacles that alienate people from the official market are the extraction of documents, the agreement and the license of the activity, the trade and commercial register, and procedure to gain the financing (bank credit) and the guarantee needed.

According to the doing business index (2020), Algeria is ranked 82 in the ease of doing business, 152 in ease of starting a business, 181 in getting credit, 158 in the category of paying tax, and 179 in protecting minority investor, 121 and 102 in dealing with construction permits, and getting electricity, all these indicators ranking proves that Algeria's market is a fertile climate of the parallel market. The situation worsened when the bureaucracy will lead to the emerge of corruption in the empowered authorities, by pushing the individuals to bribe the employees of those services, and these latter will accepted especially where there insufficient wage level make them vulnerable to those acts.

2.1.3. The political factors: The instability of the political scene in the country will give more space for the parallel market, because it will cause an economic liberalization and unsupervised opening by the state.

2.1.4. The social factors: There's a strong correlation between the demographic growth and the rise of the parallel market, because it cause the rise of the unemployment rate that will push the individuals to find jobs in the parallel market, and the rise of poverty rate in

the society, making people vulnerable to the parallel market. (Bouraada & Rekik, 2017, pp. 81-82).

There is another major factor that push individuals to the parallel market, but it not common to all societies, and that is the ideological and religious factors, especially in societies with a Muslim majority, where individuals refuse to work or treat in a specific activities for ideological or religious reasons, like the work or treat with the conventional (interest based) banks.

2.2. The size of the Algerian parallel market: According to the ex-minister of finance "Mohamed Loukal" (the governor of the central bank at the time), that in mid-2018 the monetary mass parallel market represent 30% of the official monetary mass M2, with 4.780 billion DA, and this mass belong to two categories, the first one is the savings of the households and the other economic agents that treat in the parallel market, and those have from 1.500 to 2.000 billion DA, and according to the high national charaic authority of the Islamic financial institutions are the most influenced by the last major factor that contribute to the parallel market, which is the absence of a legitimate financial alternative (the non-interest based operations).

And the second one, the monetary mass outside the banking system by economic agents that treat in the official market, and the size of these mass is between 2.500 to 3.000 billion DA, that will make the total size of the monetary base outside the banking system from 4.000 to 5.000 billion DA. But lately the head of the financial and budget committee in the parliament (the national popular assembly) in late April 2020, indicated that the total size of the parallel market is approaching 9.000 billion DA (representing 52,81% of the total monetary mass, and 927,83% of the banking liquidity and 43,46% of the national GDP).

2.3. The government measures to contain the parallel market: Since 2012 the Algerian government planned a program with 14 billion DA to contain the parallel market (4 billion DA for the ministry of the interior, 10 billion DA to the trade ministry) the objective of the program is to build a national distribution network containing 30 wholesale market, 800 retail market, 1000 local market, and since the trade operations without billing, cost the national treasury around 155 billion DA from 2010 to 2012, the government try to impose the billing and the use of the checks for payment for every operation it value surpass the 500.000 DA, but at the end the government abandoned this measure. (Bouraada & Rekik, 2017, p. 91).

The development of the e-payment platform since 2005 was one of the key tools to contain the parallel market, by developing three platforms of e-payment (the mass payment system, the SPM in French, the Algeria interbanking tele-compensation ATCI in French, and Algeria real time settlement ARTS), but since the application of these three system, it effect was obsolete moving the e-money rate to the entire monetary mass from 24% in 2004 to 26,8% in 2014 (Chaib, 2017, p. 219).

The minister of finance issue a banking incentives in which every individual put a deposits that surpass a 10 million DA, they only impose on it an arbitrary tax of 7%, and the launch

of the bond loan in which it collect only 568 billion DA (11,36% of the total monetary masse outside the banking sector).

The currency exchange offices: in march the 6th 2016, the central bank issue the 16-01 regulation that give permission to currency exchange offices in Algeria to pursue the activity of currency exchange in Algeria, what been seen as huge step to contain the parallel exchange market activities, and procedures to open an exchange office, and terms and modalities of the activity, are yet to be determined. Promotion of the Islamic financing: what left for the authorities, is the use of the last major factor that contribute to the parallel market, and tern it as a tool to contain the parallel market and integrate it savings into the banking system.

According to the chief executive of a salam-bank, most agents that prefer to guard their savings outside the banking system in the Muslim majority societies, owing to the absence of a sharia non-interest based banking, and according to the dean of the Islamic finance "Ahmad a Najar ", 91% of the household in Muslim majority countries refuse to treat with the conventional banks.

Even that in Algeria there is participative (or Islamic) finance alternative, but according to it responsible from the both banks (a salam and el-baraka bank), the treatment during 30 years for al-baraka), and 12 years (a salam-bank) in a banking system that don't respect the particularity of the Islamic finance, which submitted to the terms and dispositions of sharia law, will lead the administrations of those bank banks to commit violation and deviate from the right application of the Islamic finance, and that give a negative and a bad notoriety to those banks, in which in the eye of the households they just want to use the Islamic finance as a label to attract their savings, but in fact their activities are similar to the conventional banks operations.

The monetary authorities (the central bank and it money and credit committee) try to reform the statue of those banks, first by the regulation 18-02 of 04 November 2018, where they recognize the participatory windows, and the establishing of high sharia authority in which give the license to those banks to treat with the product of the Islamic banking, but that regulation was just ink on paper with no application, and for that it didn't represent and added value to those banks.

But in 15 march 2020, the central bank issue a new regulation 20-02 and an instruction 03-20 April 2020, in which recognize the Islamic finance institutions, and the difference this time that the articles and dispositions of this regulation are immediately applicate, by establishing the high national charaic authority in 02 April charged with agreement to the financial institutions to treat with the product of Islamic finance, and that license is issued before the final agreement of the central bank, and that's mean that the central bank is submitted to the decision of the high authority.

And with the instruction 03-20 in which detailed the procedures of every product, and that is a sort of sharia control on those institutions, because this time in case of a violations of those procedures it considered a violations of the law, which before those violations didn't had a legal ramification, and it up to the administrations to respect the decision of its audit committee and internal sharia control service or not. But the most important contributions

of this new agreement, it the permission to conventional banks to open an Islamic windows at their level and 04 public conventional banks announce that they already presented their files to the high charaic authorities to gain the final agreement from the central bank to treat with 8 Islamic product recognized in the regulation (especially national bank of Algeria (BNA in French), who assure that in September 2020, will present these products in 30 windows at its agencies level).

And with the article 11, in which the central bank recognize the deposit accounts, and this will represent an opportunity to the Islamic finance, because it give the client of the conventional bank the chance to switch to the Islamic windows, and that will rise the share of the Islamic banking in the Algerian market (actually it only represent 2.04% of the financing, 2,19% of the total deposit, and 2,45% of the total assets). But what we want to measure in this study is the effect of the integration of only the household savings (from 1.500 to billion 2.000 billion DA), to several reasons, the most important of them, is that this category is the most vulnerable and attracted to lure its savings in the banking system, when there is a sharia alternative, and those agents are not investing their money in the parallel activities, however the other agents of the parallel market to make sure that we have the ability to integrate their savings we need a field survey, and to study also their mind-set and mentalities (because actually there is a sharia alternative in the Algerian market, and with all the incentives to integrate their money in the banking system (with the 7% arbitrary rate or the bond loan), there wasn't a real reaction and they only attract 568 billion DA.

Basically the agents of the parallel market have more motivation to stay in it than invest their money in the banking system (for profitability reasons, like not paying taxes, not the minimum respectable wage to their employees, and some have illegitimate businesses), and for that we will just measure the integration of the households savings because this category is free from the motivations mentioned above.

3. The effect of the integration of the households savings into the banking system: The effect of the integration 1.500 billion to 2.000 billion DA, is measured by the lending capacities that house savings could create, using the credit multiplier of late 2022 after the integration of the savings.

We focus on the period from 2020 to 2022 as a period needed to realize full integration, and the Algerian economy will need that, especially that in late 2022 the actual financial resources that the government based it management of the country on will runs out (especially the exchange reserves), and it the end term for the treasury to reimburse the central bank loans (from the non-conventional financing).

3.1. The effect of the integration of the household savings on the banking deposits by late 2022 : Using the e-views 10, we will project the total deposits at late 2022 without the integration, than with it, to measure the effect of the operation on the total deposits of the Algerian banking system.

Table (1) : The totality of the deposits of the banking system in Algeria

(Unit: Billion DA)

Financial year	Total deposits	Public deposits	Private deposits
2013	8710,4	2608,2	4001,2
2014	10001,7	3197,9	4376,3
2015	9579,7	3037,6	4667,3
2016	9319,1	2741,7	4884,2
2017	10257,7	3448,2	5121,7
2018	11709,9	3887,2	5724,4

Source: Bank of Algeria (2019), Quarterly Statistical Bulletin (N° 46), online https://www.bank-of-algeria.dz/pdf/Bulletin_46a.pdf.

By the end of 2022, our projections for the total banking deposits is submitted to the following equation:

Y= 442,50857 X + 8383,92 and by that we project that in the year 2022, the total deposits in the Algerian monetary market will be around 12.809,005 billion DA, and our projection for the private deposit is submitted to the equation: **Y= 316,26 X +3.688,94** and by that the total private deposits will be around 6.851,54 billion DA.

In the case of a total integration of the household savings (from 1.500 billion to 2.000 billion DA), taking into consideration the obligatory reserve of 6% (in the central bank instruction N°06-2020 of 29 April 2020, reforming the instructions N°02-2004 of 13 may 2004, regulating the obligatory reserve systems, the obligatory reserve had been reduced to 6% from 8%, as a measure to face the ramifications of the lockdown declared by the government to contain the effect of the Covid-19 pandemic), and by that in case of a total integration of the household savings, the bank will be able to lure from 1.410 billion DA to 1.880 billion DA, and by that the totality of the deposits will rise from 11,01% to 14.67%, and the private deposits from 20.57% to 27.43%.

To calculate the effect of the rise in the deposits on the credit capacities of the banks, we need to designate the credit multiplier, who were from 2013 until 2018 in average 1.42 and that mean in case of a total integration of the household savings we will create between 2.002,2 billion to 2.669.6 in credit to the economy, and that will the total amount of the total credit from 14.79% to 19.72%.

3.2. Calculating the money multiplier in 2022:

In case of a total integration of the household savings, the money multiplier will change, because of it effect on the obligatory reserves in the part of the monetary base, and the total deposits in the part of the monetary masse. Knowing than in the Algerian banking system, the monetary base and mass are calculated on the base of these equations:

The monetary base = fiduciary money + obligatory reserves

The monetary mass (M2) = (fiduciary money + deposits on demand + treasury deposit + Algerian post deposit) + quasi-money

Quasi-money = terms deposits (by national and foreign currency)

M2

The equation of the money multiplier = ——————

The monetary base

M2

And the equation of the credit multiplier is m = ————————————

B + (r . D)

B: the fiduciary money

The obligatory reserve

r: obligatory reserve rate, or r = ————————————

The deposit on demand

D: the deposit on demand.

We must project the monetary mass by end 2022, than add the total amounts of the savings without the obligatory reserve, than project the obligatory reserve by end 2022, and add the obligatory reserve of the new savings lured into the banking system, than in the end we project the final amount of the monetary mass.

Table (2) : The components of Algerian monetary mass from 2013 to 2018
(Unit: Billion DA)

Financial year	The monetary Base	The monetary Masse
2013	4.137,8	11.941,5
2014	4.673	13.686,5
2015	5.220,5	13.704,5
2016	5.401	13.816,3
2017	6.176,7	14.974,6
2018	6.205,8	16.636,7

Source: Bank of Algeria (2019), Quarterly Statistical Bulletin (N° 46), online https://www.bank-of-algeria.dz/pdf/Bulletin_46a.pdf.

The projection of the monetary mass with follow this equation:

Y = 784.32 x + 11.381.613, and that mean that by 2022 the monetary mass will be around 19.224, 813 billion. We will add the savings without the obligatory reserves that will make the monetary mass from 20.634,813 billion DA to 21.104,813 billion DA.

The monetary base projection will follow the following equation:

Y = 429,4742 x + 3799,306 and that mean that by 2022 the monetary base will approach 8.094,048 billion DA, and we will add in case of a total integration of the household savings the obligatory reserve from the new savings integrated (assuming on the actual obligatory rate 6%), which will be between 90 to 120 billion DA, and will make the projected monetary base between 8.184,048 to 8.214,048 billion DA. According to our projections, in case of a total integration of the household savings we will have a money multiplier from 2.52 to 2.57.

To calculate the credit multiplier we must project the obligatory reserve than add the new obligatory reserves from the integrated savings than project the fiduciary money and the deposit on demand, and the fiduciary money.

The problem with this model that it assume that the monetary mass is equal deposit on demand plus the fiduciary money (ignoring the other component according to the Algerian central bank), so according to this model all the savings integrated will be as deposit on demand, and that not accurate.

To fix this problem we will project the portion of the deposit on demand according to the data of 6 past years (from 2013 until 2018), than project the total of the savings integrated as deposit on demand.

Table (3) : The structure of the deposits in the Algerian banking sector
(Unit: Billion DA)

Financial year	The deposit on demand	The terms deposits
2013	5.018,7	3.691,7
2014	5.918	4.083,8
2015	5.136,3	4.443,4
2016	4.909,8	4.409,3
2017	5.549,2	4.708,5
2018	6.477,3	5.232,6

Source: Bank of Algeria (2019), Quarterly Statistical Bulletin (N° 46), online https://www.bank-of-algeria.dz/pdf/Bulletin_46a.pdf.

The deposits on demand in the Algerian monetary system projection will follow this equation:

Y = 170,2885 x + 4.905,54 and that mean in late 2022 the deposit on demand will approach 6.608,425 billion DA, and the terms deposits will follow: **Y = 272,7 x + 3.473,73** and that mean that in late 2022 the term deposits will approach 6.200,76 billion DA, and that mean that the deposits on demand represent 51,59% of the totality of the deposits, so we will base our model that the integrated savings from the household, 51.59% of its will be integrated as deposits on demand.

Now we need also to project the obligatory reserve (than add the obligatory reserve from the new savings integrated), and the judiciary money in late 2022.

Table (4) : The component of the monetary base in the Algerian monetary market
(Unit: Billion DA)

Financial year	The fiduciary money	The obligatory reserve
2013	3.247,6	890,2
2014	3.734,6	938,4
2015	4.189.8	1.036,7
2016	4.566,9	834,2
2017	4.781,7	1.395
2018	4.986,8	1.219

Source: Bank of Algeria (2019), Quarterly Statistical Bulletin (N° 46), online https://www.bank-of-algeria.dz/pdf/Bulletin_46a.pdf.

According to the data from the 2013 until 2018 financial years, the fiduciary money projection will follow this equation: **Y = 349,1548 x + 3.028,1933** and by that the fiduciary money will approach 6.519,7413 billion DA, and the obligatory reserve will approach in the end of 2022 1.574,348 billion DA, following the equation:

Y = 80,3228 x + 771,12.

Now to finally calculate the credit multiplier, we need to add to the projected obligatory reserve the amount of obligatory reserve from the savings integrated in the banking system, which is from 90 to 120 billion DA (based on the current obligatory reserve rate), so by that the obligatory reserve is between 1.664,348 billion to 1.694,348 billion DA.

The deposit on demand we projected that in late 2022 they will approach 6.608,425 billion DA without the integration of the savings of the households, and knowing that in late 2022 the deposit on demand will represent 51.59% of the total deposit, so that mean that from the savings probably 51.59% will be integrated as deposit on demand, and that mean that 727,419 billion to 969,892 billion DA will be integrated as deposit on demand, and that mean that the total amount of the deposit on demand in late 2022 after the integration of the households savings will be from 7.335,844 billion DA to 7.578,317 billon DA.

$$\text{So by that } r = \frac{1.664{,}348 \text{ to } 1.694.348}{7.335{,}844 \text{ to } 7.578{,}317} = 0.226 \text{ or } 0.223$$

from 20.634,813 to 21.104,813

$$\text{By that, m (the multiplier of credit)} = \frac{}{6.519{,}7413 + (0.226 \text{ or } 0.223 \,.\, 7.335.844 \text{ to } 7.578.317)}$$

= 2.523 to 2.5707

We find that money multiplier is close to the credit multiplier, and that mean assuming that the household savings are from 1.500 to 2.000 billion DA (according to the ministry of finance late 2018), and on the base on the actual obligatory reserve (6%), we so that both the credit and the money multipliers are similar from 2.52 to 2.57.

3.3. The effect of the integration of the household savings on the credit sector: Now we will measure the effect of the integration of the household savings into the banking system of its credit ability, to do we need to project the total credit to the economy until 2022, that we will add the amount integrated (the savings) multiplier by the credit multiplier.

Table (5) : The Algerian banking sector credit to the economy
(Unit: Billion DA)

Financial years	Total credit	Public sector	Private sector
2013	5.156,3	2.434	2.722
2014	6.504,6	3.382,3	3.121,7
2015	7.277,2	3.688,2	3.588,3
2016	7.909,9	3.952,2	3.957,1
2017	8.880	4.311,3	4.568,3
2018	9.976,3	4.943,6	5.032,2

Source: Bank of Algeria (2019), Quarterly Statistical Bulletin (N° 46), online https://www.bank-of-algeria.dz/pdf/Bulletin_46a.pdf.

For the totality of the credit to the economy, the projection of it will follow the following equation:

Y = 910,25428 X + 4.443,493 and that mean that in late 2022, the totality of the credit to the economy will approach 13.546,03558 billion DA (excluding the integrated savings), knowing that the savings integrated are ranging from 1410 to 1880 billion DA, and the credit multiplier also from 2.52 to 2.57, that's mean that at late 2022 those savings will create from 3.553,2 billion DA to 4.831,6 billion DA. In late 2022 the totality of credit to the economy will rise from 17.099,23 to 18.377,636 billion DA, and that's mean the integration of the household savings will contribute a rise in the economy credit from 26.23% to 35.67%.

To detail the effect of the integration on the public and private sector, we need to project the private and the public sector credit in late 2022, than divide the amount of the credit created by the integrated savings according to the final share of the sectors from the credit to the economy in late 2022.

The projection of the public sector credit will follow this equation:

Y = 445,6857 x +2.225,36 and the mean in late 2022, the credit to the public sector will be close to 6.682,217 billon DA, and the private sector credit will follow the equation: **Y = 464,56 x +2205,64** and that mean in late 2022 the private sector will approach 6.851,24 billion DA, and that mean in late 2022 the private sector credit will represent 50,57% of the total credit, and the public sector will represent 49.32%, and that mean than in late 2022 the credit to the public sector will rise from 1.752,43 billion to 2.382,95 billion DA.

Table (6) : The distribution of the credit by maturity
(Unit: billion DA)

Financial year	The short term credits	The long terms credits
2013	1.423,4	3.732,9
2014	1.608,7	4.895,9
2015	1.710,6	5.566,6
2016	1.914,2	5.995,7
2017	2.298	6.582
2018	2.687,1	7.289,3

Source: Bank of Algeria (2019), Quarterly Statistical Bulletin (N° 46), online https://www.bank-of-algeria.dz/pdf/Bulletin_46a.pdf.

According to the model of projection of the short term credit, it will follow the equation: **Y = 245,56 x + 1.081,34** and in late 2022 the short term credit will approach 3.536,94 billion DA, without the integration of the savings of the household, and the long terms credit will follow the equation: **Y = 664,84 x + 3.350,127** and in late 2022 the long terms credit will be 9.998,527 billion DA, and that mean that the short term in late 2022 will represent 26.13% of the total credit and the long term will represent 73,86%. And that mean in late 2022 from the credit create from 928,45 billion to 1.262,49 billion DA as a short term credit, and from 2.624,4 billion DA to 3.568,2 billion DA as a long terms credit, and by that the total short

term credit in late 2022 will rise from 4.465,39 billion DA to 4.799,43 billion DA, and the long term credit will rise from 12.622, 927 billion DA to 13.566,727 billion DA, with the same rate from 26.24% to 35.68%.

3.4. The effect of the integration of the household savings into the banking system on the GDP: Before measuring the effect of the integration of the household savings into the official banking system, we should measure the effect of the economy credit on the GDP, knowing that in the period from mid-2014 until now we live in an long economic crisis caused by the fall of the oil prices, that led to the reduction in the share of the GDP of the hydrocarbons, that led the successive governments to apply a austerity policies since 2015, by reducing the government expenditures and costs, and the importations bill, and focus on promoting and encouraging internal and local productivity, but the problem that in this period the policy that had been implemented (by the hydrocarbons and the investment law, and the successive financial laws) weren't profitable nor productive, and hurt the Algerian economy, by destroying many productive sectors in favorite of a small minority of businesses, so that why we will find a rise in the credit to the economy by a 93,47% from 2013 until 2018, but only a 21,25% the GDP.

First we need to measure the relation between the credit to the economy and the national GDP, and if the national GDP is positively affected by the economy credit, or the opposite. And for that we need more detailed data to test the causality (the e-views 10 can't test the causality with few observations).

Table (7) : The development of the national GDP from 2013 to 2018
(Unit: Billion DA)

Financial quarter	The national GDP	The non-hydrocarbons GDP	The credit to the economy
S_1 2013	**16.429,45**	**9.933,45**	**4.742,7**
S_2 2013	**16.643,8**	**10.440**	**5.156,3**
S_1 2014	**16.990,5**	**10.793,5**	**5.760,6**
S_2 2014	**17.242,5**	**11.328,7**	**6.499,4**
S_1 2015	**16.799**	**11.692,2**	**7.070,6**
S_2 2015	**16.591,9**	**12.224,7**	**7.277,6**
S_1 2016	**16.946,5**	**12.673,8**	**7.743**
S_2 2016	**17.406,8**	**13.093,4**	**7.862,8**
S_1 2017	**18.205,6**	**13.427,1**	**8.470,8**
S_2 2017	**18.852,3**	**13.478,2**	**8.880**
S_1 2018	**19.421,7**	**13.913,2**	**9.424,2**
S_2 2018	**20.189,6**	**14.366,7**	**9.976,3**

Source: Bank of Algeria (2019), Quarterly Statistical Bulletin (N° 46), online https://www.bank-of-algeria.dz/pdf/Bulletin_46a.pdf.

Before using the Granger causality test, we must make sure that both data are stationery, using the augmented Dickey-Fuller (ADF) test, using the following model (that add the trend and interceptor):

$$\Delta GDP = \delta GDP_{t-1} - \sum \varphi \Delta GDP_{t-j+1} + \delta_t + c + bt + \varepsilon_t.$$

After using the e-views 10 and according to the test (look at figure N: 01) the probability is higher than 5% (0.0.8762), and that mean the national GDP data from 2013 until 2018 are not stationary.

According to the test (look at figure N: 02) the totality of credit to the economy data from 2013 until 2018, also are not stationary, because the probability is higher than 5%, (0.1979).

According to the grangers tests (look at figure N: 03 and 04), hypothesis is proved because the probability is under 5%, and that's mean there is a causality between the Credit to the economy and the GDP, meaning that the rise of the credits will affect positively the GDP in the short term, pushing it to realize a growth, by we also realize than the fact that the second hypothesis is not approved, because that probability is higher than 5% (0.326), and that's mean that the GDP will not affect the banking systems credits at the short run.

The prediction of the GDP in late 2022 after the integration of the household savings:

There are two methods to estimate the effect of the rise of the credit to the economy on the national GDP, the first one, is the traditional linear regression, in wish after proving with the grangers test that in short term the credit to the economy will affect the national GDP, now we will project the national GDP with the effect the credit to the economy in late 2022 after the integration of the household savings. So we know after the integration of the households' savings, the totality of the credit will rise in late 2022 from 17.099,23 billion DA to 18.377,636 billion DA, and that mean in late 2022 according the regression model the GDP will be between 23.921,86 billon DA to 24.747,93 billion DA. If we estimate the national GDP affected by the banking credits without the integration of the household savings we will find that the national GDP will approach 21.620,556 billion DA, and that mean the integration of the households savings contribute from 10.64% to 14.46% growth to the national economy.

The second method to estimate the national GDP growth caused by the rise the banking credit, is using the I.C.O.R indicator (the Incremental capital-output ratio), that measure the effect of the investments on the national economy (or the GDP).

$$I.C.O.R = \frac{\Delta K}{\Delta Y} = \frac{\frac{I}{Y}}{\frac{\Delta K}{\Delta Y}} = \frac{\frac{I}{Y}}{\Delta Y}$$

/ I : total investment / Y: GDP

ΔY: The economic growth / ΔK: the share of the investment to the entire GDP.

We will use the GDP (excluded hydrocarbons), because we are measure the effect of the integration of savings on the real investment system, that will finance the sectors that guarantee the profitability not the sectors that guarantee the rent (like the hydrocarbons sectors).

The average Algerian I.C.O.R now is 13.1, and that mean with a 1 million DA unit of investments, we will add to the national GDP around 75.988 DA, and that mean by this logic if we add from 3.553,2 to 4.831,6 billion DA as the new credit to the economy from the integrated household financing, we will add from 271,23 billion to 368.6 billion DA.

The non-hydrocarbons GDP will rise in late 2022 to 17.659,743 billion DA, and that mean the integration of the households savings will contribute to the non-hydrocarbons GDP from 1,52% to 2,07%.

Knowing that without the integration of the household savings the total GDP in late 2022 will rise to 21.620,556 billion, so that mean using the I.C.O.R model, the integration of the household savings will contribute to the national GDP with 1.25% to 1.7%. Or if we know that the average Algerian I.C.O.R now is 13.1, and that mean if we invest 10% of the GDP we will create a growth in the national GDP with around 0.75%, and that mean by this logic if we add from 3.553,2 to 4.831,6 billion DA as the new credit to the economy from the integrated household financing (that represent from 16,44% to 22,34% of the national GDP in late 2022 without the integrated households savings), we will add from 1.25 % to 1.69% as growth to the national GDP.

We observe a huge contrast in the result between the two models, in which we think it is based on the fact that the I.C.O.R indicator takes into consideration the productivity of the national economy, so that mean not only luring money into the economy will push the national GDP into the growth, but also the I.C.O.R measure the efficiency of the capital invested into the economy, and as long the I.C.O.R is high that represent a huge inefficiency in the investments caused by the lack of productivity of the national economy.

4. Conclusion:

The problem with our economy, is its weak dynamic translated by a high I.C.O.R rate, proving it inefficiency absorbing all the households savings and produce a small economic growth.

The integration of 1500 billion to 2000 billion DA will absolutely rise the credit multiplier to 2,57 producing an add lending capacity from 3.553,2 to 4.831,6 billion DA in late 2022, contributing to a rise from 26,23% to 35,67% to the lending capacities.

This rise will be effected by a low efficiency of our economy, making the economic growth rate to the GDP from 1,25% to 1,7% (using the ICOR ratio of Algeria, and that equals 13,16, meaning if you invest 1 million DA unit it contribute to the GDP with 75.988 unit, making our economy among the least productive economies in the world).

The other problem is the hypothesis put forward by the authorities that runs the monetary and financial policy in Algeria (the central bank, and ministry of finance) that assume that in case of the availability of a non-interest sharia based finance, the households will directly invest in the banking system, there is no empirical studies that support such hypothesis, and with the current situation with the pandemic crisis the householders prefer to save their money because of the instability of the market, and not invested in the banking sector, especially with the liquidity crisis (banks and the post office), true that the integration of the households savings will reduce the effect of the liquidity crisis in the banking system (970

billion DA in May 2020), but the behavior of them during the crisis say otherwise, especially with the rise of layoffs and unemployment rate in the society, and the difficulties that most companies (especially in the private sector) find in the management of their costs, the households tend to save their economies, for their liabilities.

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Appendices:

Figure (1): The ADF test on the national GDP from 2013-2018

Null Hypothesis: GDP has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.084708	0.8762
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP)
Method: Least Squares
Date: 07/12/20 Time: 03:04
Sample (adjusted): 2014S1 2018S2
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	-0.245328	0.226170	-1.084708	0.3197
D(GDP(-1))	0.614094	0.380768	1.612776	0.1579
C	3730.167	3596.527	1.037158	0.3396
@TREND("2013S1")	113.2886	62.98634	1.798622	0.1222

R-squared	0.611277	Mean dependent var	354.5800
Adjusted R-squared	0.416916	S.D. dependent var	404.6705
S.E. of regression	309.0062	Akaike info criterion	14.59377
Sum squared resid	572909.1	Schwarz criterion	14.71481
Log likelihood	-68.96887	Hannan-Quinn criter.	14.46100
F-statistic	3.145054	Durbin-Watson stat	1.875937
Prob(F-statistic)	0.108003		

Source: Done by the researchers on EViews 10

Figure (2): The ADF test on the credit to the economy data from 2013-2018

Null Hypothesis: D(CRE) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.927791	0.1979
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CRE,2)
Method: Least Squares
Date: 07/12/20 Time: 02:54
Sample (adjusted): 2014S1 2018S2
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CRE(-1))	-1.107170	0.378159	-2.927791	0.0221
C	610.6648	264.1056	2.312199	0.0540
@TREND("2013S1")	-12.07588	23.68947	-0.509757	0.6259

R-squared	0.550521	Mean dependent var	13.85000
Adjusted R-squared	0.422099	S.D. dependent var	278.0144
S.E. of regression	211.3460	Akaike info criterion	13.78820
Sum squared resid	312669.9	Schwarz criterion	13.87897
Log likelihood	-65.94098	Hannan-Quinn criter.	13.68861
F-statistic	4.286799	Durbin-Watson stat	1.859874
Prob(F-statistic)	0.060881		

Null Hypothesis: CRE has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=0)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.523479	0.3299
Test critical values:	1% level	-8.235570	
	5% level	-5.338346	
	10% level	-4.187634	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 5

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(CRE)
Method: Least Squares
Date: 07/12/20 Time: 00:38
Sample (adjusted): 2014 2018
Included observations: 5 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CRE(-1)	-1.278152	0.506504	-2.523479	0.1277
C	6794.586	2282.815	2.976406	0.0968
@TREND("2013")	1100.860	452.4024	2.433365	0.1354

R-squared	0.768198	Mean dependent var	964.0000
Adjusted R-squared	0.536396	S.D. dependent var	279.1150
S.E. of regression	190.0451	Akaike info criterion	13.61611
Sum squared resid	72234.32	Schwarz criterion	13.38177
Log likelihood	-31.04027	Hannan-Quinn criter.	12.98717
F-statistic	3.314025	Durbin-Watson stat	1.920759
Prob(F-statistic)	0.231802		

Source: Done by the researchers on EViews 10

Figure (3): The Granger causality test for the national GDP and the economy financing

Pairwise Granger Causality Tests
Date: 07/12/20 Time: 02:33
Sample: 2013S1 2018S2
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
DCRE does not Granger Cause DGDP	9	8.84558	0.0340
DGDP does not Granger Cause DCRE		1.50122	0.3263

Estimation Command:
==========
LS GDP CRE C

Estimation Equation:
==========
GDP = C(1)*CRE + C(2)

Substituted Coefficients:
==========
GDP = 0.647689513949*CRE + 12846.9312271

Dependent Variable: GDP
Method: Least Squares
Date: 07/12/20 Time: 20:55
Sample: 2013S1 2018S2
Included observations: 12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CRE	0.647690	0.118189	5.480140	0.0003
C	12846.93	895.0343	14.35356	0.0000

R-squared	0.750199	Mean dependent var	17643.30
Adjusted R-squared	0.725219	S.D. dependent var	1237.416
S.E. of regression	648.6475	Akaike info criterion	15.93867
Sum squared resid	4207436.	Schwarz criterion	16.01949
Log likelihood	-93.63201	Hannan-Quinn criter.	15.90875
F-statistic	30.03193	Durbin-Watson stat	0.358577
Prob(F-statistic)	0.000269		

Source: Done by the researchers on EViews 10