The extent of legal reserve policy effectiveness for the influence of monetary mass: The case of Algeria from 2001 to 2018

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Abstract:

The study aims to identify how effective the legal reserve policy is in influencing the money supply in Algeria, using the Vector auto-regression technique (VAR) to estimate the impact of the legal reserve on the money supply during the period from 2001 to 2018. The study found that the size of the legal reserve is an important interpreter of the variations in the money supply circulating in the short, the medium and, even in the long term. Which confirms the effectiveness of its money supply control policy inside the Algerian economy, as it is one of the methods approved by the Central Bank and available under the ineffectiveness of the financial market to carry out the operations of the open market as the most important alternatives for influencing the amount of money.

Keywords: *Monetary mass, Monetary policy, Legal reserve, Vector auto-regression.*

JEL Classification: E31; E58; E52.

مدى فعالية سياسة الاحتياطي القانوني للتأثير على الكتلة النقدية
حالة الجزائر للفترة 2001–2018

ملخص :

تهدف الدراسة للتعرف على مدى فعالية سياسة الاحتياطي القانوني في التأثير على الكتلة النقدية في الجزائر، باستخدام تقنية متجهات الانحدار الذاتي VAR لتقدير أثر حجم الاحتياطي القانوني في الكتلة النقدية خلال الفترة 2001-2018. وقد توصلت الدراسة إلى أن حجم الاحتياطي القانوني مفسر هام لتغيرات الكتلة النقدية المتداولة سواء على المدى القصير ، المتوسط وحتى الطويل، ما يؤكد فعالية سياسته للتحكم في الكتلة النقدية داخل الاقتصاد الجزائري، كونها أحد الأساليب المعتمدة من قبل البنك المركزي والمتاحة في ظل عدم فعالية السوق المالي للقيام بعمليات السوق المفتوحة كأبرز البدائل الكمية للتأثير على كمية النقود.

الكلمات المفتاحية : الكتلة النقدية، السياسة النقدية، الاحتياطي القانوني، الانحدار الذاتي.

تصنيف JEL : E31، E58 ، E52.

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1. Introduction :

Money plays an important role in the economies of countries, as it not only measures the values of goods and services, but also acts as a mediator in the exchanges, but also affects the direct impact on macroeconomic variables. The study of the money supply is therefore important and necessary for its financial implications for the economy, so in various countries, the monetary authorities attach great importance to the money supply and the regulation of its issuance, under the overall economic objectives. The monetary authority tracks the money supply and the factors that affect it, either by increasing or decreasing its size in the national economy.

Monetary policy instruments are among the most efficient and effective instruments for achieving economic stability and dealing with economic deficiencies and problems, such as inflation and recession problems that the economy may experience. The legal reserve is one of the monetary policy instruments used to control and influence the money supply and the cash credit volume, as it is imposed by the central bank like a ratio of deposits that are deposited at the banks not only to protect them from liquidity dangers; but also to control an important aspect of liquidity by influencing banks' ability to create money and granting credit; and thus to control the money supply within the economy.

-The study problematic: the study problematic is centered on the following main question:

To what extent is the policy of legal reserve effective to influence the monetary mass in Algeria during the period from 2001 to 2018?

– **Study hypothesis:** From the previous problem the study is based on testing the following main hypothesis:

The policy of legal reserve has an effective and important impact on the monetary mass in Algeria during the period from 2001to 2018.

Study methods: In an attempt to answer the problem raised, it was relied on both descriptive and analytical methods to explain the policy of legal reserve and analyze its impact on the monetary mass. The study also relied on the standard statistical method for the conduct of the standard study and the identification of the best model for the interpretation and designation of the relationship of the explained variables, namely, the size of the legal reserve with the dependant variable, represented by the monetary mass in Algeria.

Instruments used in Analysis: The study used the auto-regression vector model, which requires many stages to be followed, based on data from the Bank of Algeria quarterly statistical reports published on its website and EViews8 software outputs, therefore the application study included the following stages:

- Determination of the time series stability degree for the variables in question;
- Determination of the model delay degree and the causality study;
- Assessing the model and ensuring its stability;
- Model dynamic analysis: By analyzing response functions and the variance division.

2. Theoretical study

2.1. The concept of monetary mass and its components: The monetary mass is the overall payment methods of a country in a given time, and varies according to the monetary policies applied in modern economies to monitor the evolution of the monetary balance in their economy, and to know the factors leading to the monetary release. The monetary mass is defined as amount of money available in a given period, which is determined by the

monetary authorities, or the amount of money represented through of payment of all kinds. (Ben Ali, 2008, p. 49) It can therefore be said that the monetary mass is the amount of money circulating in a society over a specified period, and the money circulating here means all the forms of money held by individuals and institutions, which are different in forms by the extent of economic and social development and the development of banking practices in societies.

To determine the supply of money and to enable countries to exercise monetary policy to the fullest extent, they need to determine the amount of money circulating in the economic environment according to indicators called monetary aggregates, and to determine the components of the monetary mass inhomogeneous aggregates, we rely on the liquidity principle.

a. Cash availabilities Pool (M1): It includes Central banknotes, money circulation assistance, current or on-demand deposits (printed money), it is distributed according to the institutions it deals with which are: (Miftah, 2005, p. 15)

- On-demand deposits at banks and lending institutions;
- Safe -deposit (at post offices);
- Account of individuals and institutions at the Central Bank;
- Other deposits in the check accounts at savings funds.

b. Monetary mass pool (M2): This pool combines the desire of economic units to make profits and benefits, with the acquisition of cash liquidity that is why this pool includes:

- Cash availabilities (M1);
- The quasi-money: The sum of bank and treasury deposits that cannot be incorporated into direct and immediate trading through all forms of dealing such as check or money transfer; they are represented in the following deposits: Deposits on -demand in the ledger and term deposits.

c. Total domestic liquidity pool (M3): It includes, together with the M2 cash pool, savings outside commercial banks, and State-issued negotiable Treasury bonds between non-financial members; therefore, it is one of the largest monetary complexes in term of expansion.

2.2.Monetary policy concept: Monetary policy is one of the most important tools used by economic management and seeks to achieve economic stability. (Castells, 2017, p. 25) Monetary policy is considered the cornerstone of macroeconomic policy (Binder, Lieberknecht, Quintana, & Wieland, 2017, p. 4); it is one of the main components of it. It has a great impact on the state of the national economy at the macro level, not to mention fiscal policy (Khalaf, 2018, p. 11) Monetary policy is defined as works through different transmission channels to affect an economy, including the credit channel, the interest rate channel, the asset-pricing channel, and the exchange rate channel. These channels generally behave differently in different economies depending on the structure and efficacy of an economic system. (Abdul Rachid, Kabir, & Abdul Rehman, 2020, p. 3) These measures are aimed not only at influencing the money supply but also involving the government sector's policy and its clear repercussions for the money supply. (Onyiriuba, 2017, p. 424) As well as to manage and control the money supply, the monetary policy uses two types of instruments, both quantitative (indirect) and qualitative (direct).

a. Qualitative monetary policy instruments (direct): Instruments used by the central bank to influence the quality of credit and to guide it for specific economic purposes. For example, if the Government wishes to encourage a particular economic sector, it can induce

the banks to reduce the cost of financing projects or any related activity in that sector. These quality instruments are usually used in developing countries more than in developed countries because of the lack of an effective market mechanism in those countries, and some of its economic sectors have been completely deficient. (Hadad & Hedloul, 2005, p. 190), However, it is not expected that specific monetary-policy instruments will have quick and effective effects in addressing the high inflation caused by expanded bank credit granting if used as single or alternative instruments to quantitative monetary-policy instruments.

b. Quantitative instruments of monetary policy (indirect): The Quantitative instruments or quantitative controls work on influencing the monetary mass and the amount of credit that banks provide, regardless of their uses, without paying attention to the quality of credit provided to economic units. Among the most important of these we find:

- **Rediscount rate policy:** it is the interest rate obtained by the central bank for rediscounts of the securities that banks provide for larger reserves that help them increase the amount of credit granted by them (El-Wazni & El-Refaai, 2005, p. 307). The central bank is rediscount banks' securities and trade, which they have already discounted to provide them with the required liquidity against an interest rate called the "rediscount rate" that commercial banks pay to the central bank for rediscounting their securities. (Yass & Djamil, 2016, p. 61).
- **Open Market Policy:** what was meant here by theopen market is the sale and purchase of bonds in the financial market, and these operations performed by the central bank depend on its objective of increasing the quantity and circulation of money in the market. The central bank, through its monetary policy, can influence the state of the economy through open market operations, according to which it directly get into the monetary and financial markets as a seller of treasury bonds or a buyer of securities, depending on the state and need of the economy: It makes purchases in recession and deflation and sells in the event of inflation. (Greenbaum, Thakor, & Boot, 2020, p. 233)
- **Legal Reserve Policy:** In a banking system that imposes reserve requirements, an alternative way for the central bank to achieve the same objective would be to adjust the stated percentage indicating how much reserves banks are required to hold with their outstanding deposits. (Friedman, 2001, p. 9978). The large variation in how central banks implement reserve requirements around the world suggests that a consensus has yet to emerge on what constitutes an optimal reserve requirement strategy, (Carrera, 2013, p. 11). The legal reserve ratio is defined as a proportion of deposits held by commercial banks in the form of cash balances at the Central Bank, which means that part of commercial banks' deposits remains frozen by the central bank and banks can only draw from it as much as their customers' deposits have dropped. This leads the banks not to be able to lend or invest all their deposits, but only the size of their deposits minus the amount of the legal reserve ratio, so the central bank uses this ratio to influence the cash liquidity of commercial banks and their ability to grant loans. (El-Jenabi & Yassaa, 2009, p. 267)

Central-bank laws differ when they imposing this ratio because some central banks impose this ratio on all types of deposits without distinction and at one rate; other banks set different rates according to each type of deposit. Some central banks distinguish between deposits when they impose this ratio, imposing a higher ratio on current deposits than time deposits: The reason for this distinction is that current deposits are subject to withdrawal at any time, and in this case, the term of the deposit is inversely proportional to the ratio of the legal reserve for the same reason. Some central banks distinguish between commercial banks and investment banks while imposing this ratio.

2.3. Effectiveness of the legal reserve policy for controlling the monetary mass: The legal reserve policy is effective as a weapon in the hands of the central bank, especially when there are circumstances that render other quantitative monetary policy instruments ineffective. However, the policy of legal reserve cannot be effective if the country's monetary market is narrow and undeveloped, and therefore it can be said that this policy cannot be an effective substitute for open policy; but rather the combination of monetary-policy instruments is needed to achieve effective control over the monetary mass and the size of bank credit in particular. (El-Douri & El-Samerai, 2006, p. 4)

The ratio of legal reserves may not be an effective instrument for influencing the size of credit and therefore the monetary mass for the following reasons:

–The reduction of this rate in times of economic recession may not increase the demand of economic units on credit because of pessimistic expectations about profits; banks are also not encouraged to expand credit grants because of the high degree of risk to their loans;

– The central bank does not change this ratio repeatedly and on short periods, as this causes disruption in the operation of banks and creates uncertainty;

-The fact that commercial banks maintain large reserves weakens the impact of this instrument on the size of credit so that banks can cope with both the increase in the ratio of legal reserves and the demand for loans;

–This instrument treats all banks alike regardless of their size and degree of liquidity risk exposure, and it is not imposed on non-bank financial institutions such as insurance companies, investment companies and specialized banks;

– Raising the legal reserve ratio may negatively affect bond prices, as banks may sell bonds to fulfil them at that ratio, this can lead their price to fall; to avoid this, it is suggested that this policy be accompanied by the purchase of bonds on the open market.

It should be noted that the advantage of using the legal reserve ratio is that it is used in countries with weak financial markets, featured by its quick generation of the required effect on the money supply due to the central bank's complete control over this ratio, unlike other instruments that depend on the behavior of commercial banks. This instrument is also characterized by banks being generally included; it is a clear indicator of monetary policy's tendency toward supplying money.

2.4. A preview of the monetary situation in Algeria: Starting in mid-2014, the government resorted to the option of unconventional finance and excessive money printing policy, due to the sharp drop in oil prices. According to the Bank of Algeria's 2018 annual report, major monetary developments have been characterized by a growth of 8.4% of the monetary mass (M2), contrary to its poor growth rates during the previous two years of 2018 (0.1% and 0.8%, respectively). During the first nine months of 2018, the monetary mass rose from 14,975 billion Algerian dinars at the end of December 2017, to 16256 billion Algerian dinars at the end of September 2018.

The rise in the M2 monetary mass in 2017 was due mainly to the increase in bank deposits (+ 20.5%), in particular alongside with the payment by the public treasury of part of its debt to the National Company for fuels, following the entry of non-conventional financing under implementation. (Loukal, 2018, pp. 4-13)

a.Banking liquidity: Following the shortfall in 2015 and 2016, bank liquidity was relatively stable after the launch of the open market operations by the central bank, which resulted in more liquidity injections since March 2017, to grow rapidly as early as November 2017, after non-conventional financing came into effect. The latter attain 1380.6

billion dinars at the end of 2017, up 68% compared to its level back to the end of 2016 (Algeria, 1st half of 2018, pp. 9-10)

b. The ratio of legal reserves evolution in Algeria: The ratio of legal reserves in Algeria has been dynamic and unstable, reaching 12% under instruction No. 02-2013 issued on 23/04/2013 amended and completed the instruction No. 02-2004 issued on 13/05/2004 relating to the compulsory reserves system, and then fall to 8% in 2016. Then up to 4% under instruction 04-2017 issued on 31/07/2017, before rising from the beginning of 2018 to 8% and then 10% from 15/06/2018. (Sulaiman, 2019, p. 63)

3.Applied study:

The relationship of one of the quantitative monetary policy methods, the legal reserve, and monetary mass in Algeria, will be assessed during this part of the study, following the methodological steps and using the appropriate statistical and mathematical instruments and methods appropriate for the study model.

3.1.Mathematical formula of auto-regression models: P-grade auto-regression models are written as follows:

$$\mathbf{Y_t = \delta + \phi_1 Y_{t-1} + \phi_2 Y_{t-2} + \cdots + \phi_p Y_{t-p} + \varepsilon_t ……..(1)}$$

Since:

Y_t : The value of the variable in the current period.

ε_t : Random error limit in the current period.

$Y_{t-1}, Y_{t-2}, \dots, Y_{t-p}$: The variable values in previous periods.

δ: Represent the value of the constant.

The auto-regression model is usually written by the delay factor L:

$$\mathbf{Y_t = \delta + \phi_1 L Y_{t-1} + \phi_2 L^2 Y_{t-2} + \cdots + \phi_p L^p Y_{t-p} + \varepsilon_t}\text{……..}\mathbf{(2)}$$

After simplifying the correlation, we get:

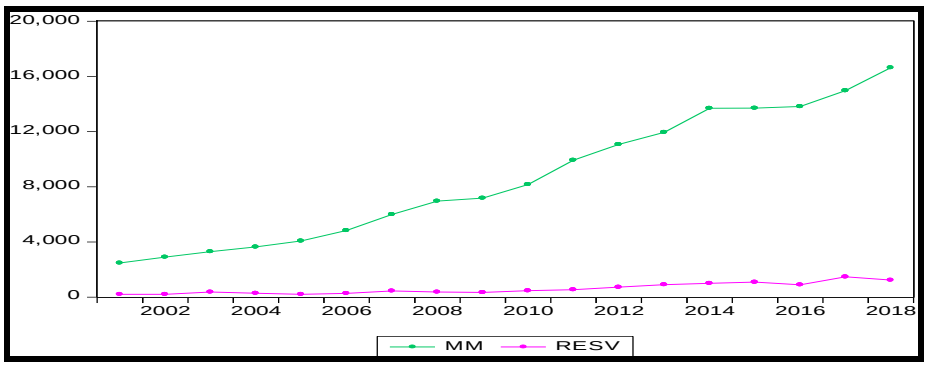
$$\phi(L)Y_t = \delta + \varepsilon_t$$

Since: $\phi(L) = (1 - \phi_1 L - \phi_2 L^2 - \cdots - \phi_p L^p)$

3.2. Study variables identification: The study variables are:

- The legal reserve in local currency, which we are symbol "RESV" (1 billion Algerian dinars); it reflects a proportion of the total deposits of commercial banks active in the Algerian banking system held by the Bank of Algeria;
- The monetary mass, symbolized by "mm" (one billion Algerian dinars), is represented in cash circulating inside the economy plus the quasi-money.

The time series for Study change RESV and MM were obtained based on the Bank of Algeria's three statistical bulletins from 2001 to 2018. The development of these series can be noticed in descriptive terms as follows:



Source: Eviews8 Outputs

Figure (1): Study variables

3.3. Time series stability study: To check the stability of time series data for the variables in question, the unit root test was performed using the Phillips-Perron test, which is the most appropriate for the small sample size. Nihilism hypothesizes that the variable's time series contains the unit's root, i.e. it is unstable, and the alternative hypothesis is that the unit's root is not present in the variable's time series, i.e., it is stable. The following table shows the results obtained:

Table (1): The Phillips-Perron test of Time series stability

Variables	value of the calculated PP in the level	value of the calculated PP at the first differential	value of the calculated PP at the second differential	Critical value To a moral level 5%	integral grade
Mm	1.939691	-2.586709	-7.629059	-3.081002	I(2)
Resv	-0.122083	-6.863734		-3.065585	I(1)

Source: Eviews8 Outputs

Through the results from Table (1) reached in the table above, we notice that the absolute value of the calculated PP is greater than the absolute value of the tabulated PP, and therefore we accept the hypothesis of nihilism for the two study variables, where we find it stable at the first differential, integral grade (1)I for the RESV variable, stable at the second and integral differential of degree (2)I for variable mm.

3.4.The causality test: Before the estimation of the auto-regression vector, causality will be tested by applying the "Granger" test to determine the causal direction between time series, as well as testing the causal relationship between the monetary mass and the legal reserve.

Table (2): Results of Causality Granger Test

Null Hypothesis	F-Statistic	Prob.
Resv does not Granger Cause **mm**	0.04708	0.8313
mm does not Granger Cause **Resv**	12.2831	0.0035

Source: Eviews8 Outputs

Through Table (2) we conclude that:

• Legal reserves do not create the amount of money in circulation. Because the probability value corresponding to Fischer's statistical is greater than 5%.

• The amount of money in circulation creates legal reserve because the probability value corresponding to Fischer's statistical is less than 5%.

Thus, a one-way causal relationship is evident from the monetary mass to the legal reserve.

3.5. VAR model Rating: After the causal test, an auto-regression vector will be estimated, since the VAR function is written as follows:

VAR=F(DDMM, DRESRV, C)

Assuming all variables are internal, i.e. change within the model and all values can be predicted internally. However, before estimating this model, the Nd must determine the VAR model defined for this series, which is the most difficult stage in building time series models.

Table (3): Degree of deceleration of VAR model Rating

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-205.511	NA	2.57e+10	29.644	29.735	29.636
1	-201.384	6.4846	2.56e+10	29.626	29.900	29.601
2	-192.400	11.551*	1.32e+10*	28.914*	29.370*	28.872*

* indicates lag order selected by the criterion

Source: Eviews8 Outputs

Although there are few views (short time series in question), we note from the table above that the appropriate slow down for this model is (Nd=2).

After determining the degree of deceleration (Nd=2), we now estimate the Vector auto-regression **(**VAR**)**, based on the estimation results using the Eviews8 software shown in Appendix n°.1, the estimated relationships for monetary mass can be summarized as follows:

MM= 211.607 – 0.747504 DDMM (-2) – 0.550499 DDMM (-1) – 3.144015 DRESV (-2) + 0.62565 DRESV (-1)

[1.19729] [-3.17851] [-2.54737] [-2.47742] [0.65931]

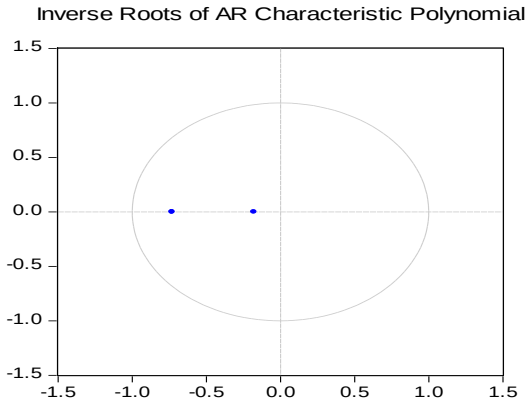
$R^2 = 0.6951$ F= 5.129548

We notice from the equation estimated above that:

- For the Coefficient of determination, estimated at 0.6951, i.e. 69.51% of the change in the monetary mass is explained by the variables that are slow by two periods of time.
- Through statistical testing of model coefficients, it can be said that according to Student's statistical test, the coefficients of study variables are different from zero, i.e., they have a statistical significance at a 5% indication level.
- The overall significance test of the model shows that F calculated is greater than F tabulated ($F = 4.41$), i.e. at least one variable is not equal to zero; therefore the model is good and statistically acceptable.

The previous model shows a significant negative and strong impact for a late two-period legal reserve in changing the amount of money in circulation (monetary mass), as RESV change in one unit leads MM to fall by 3.144015.

3.6. Model stability study: So we can trust the outcome of the auto-regression and its explanatory ability of the relationships that combine its variables, the model's stability must be tested, as the model's instability makes the results obtained incorrect; the following figure shows the result of the test for the model's stability:



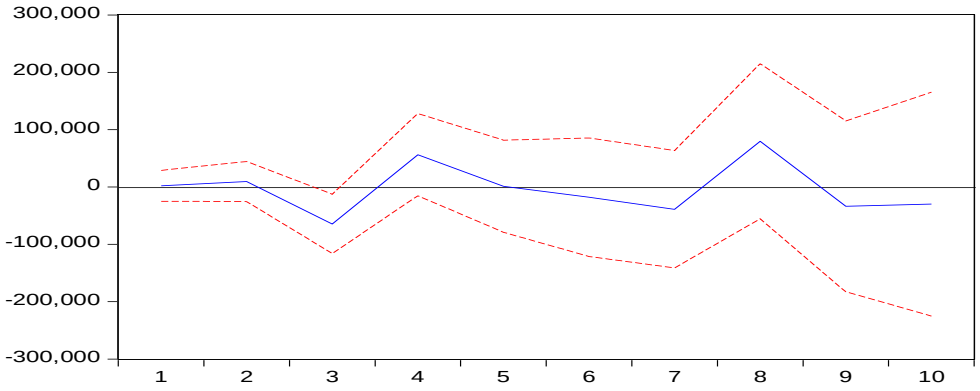
Source: Eviews8 Outputs

Figure (2): Result of the test for the model's stability

Figure no. 2 shows that the single roots reciprocal for the polynomial within a single circle mean that the VAR model is stable.

3-7- Model dynamic analysis: Perhaps the most important thing that distinguishes VAR models is their ability to study the dynamic behavior of the relationship between variables, through variance division and response pulses functions.

a.Analyzing the response pulses functions: The results of the response pulses function test are as shown in the following figure:



Source: Eviews8 Outputs

Figure (3): Response of DD MM to DRESV

Through figure n°.3 above, we note that a positive structural shock in the 1% estimated legal reserve ratio leads to a fairly weak response in the amount of money circulating at 9.4% after a while i.e. in the second year of the shock. This response quickly becomes a strong negative response in the third year, becoming positive again in the fourth year and then short falling until it takes a negative value of 39% in the seventh year of the shock. Although response takes positive value in the eighth year, the impact is negative from the ninth year of the impact.

b. Variance Division: Variance analysis shows the relationship between variables and their impact on each other, by determining the amount of variance in the forecast for each variable due to the forecast error of the same variable, as well as the amount that resulted on the forecast error in the other variables, and the following table shows the results of the variance division.

Table(4): Variance analysis

Period	S.E.	DDMM	DRESV
1	504.8303	100.0000	0.000000
2	583.7743	96.76694	3.233058
3	895.6701	48.23204	51.76796
4	1080.256	38.21321	61.78679
5	1131.095	43.64243	56.35757
6	1274.261	54.08134	45.91866
7	1333.202	49.44347	50.55653
8	1607.847	41.68081	58.31919
9	1643.174	39.98331	60.01669
10	1781.965	46.62273	53.37727

Source: Eviews8 Outputs

Table n°.4 above represents the contribution of study variables to the explanation of the change in monetary mass, where we note that most of the circumstantial fluctuations in the monetary mass (MM) are primarily caused by self-shocks of the same variable during the first year of the shock; because these shocks allow the explanation of all changes in the monetary mass. But this ratio falls to 97% in the second period. It soon fell to 48% in the third period, reaching its lowest level in the fourth year, 38%, to remain fluctuating within the limits of 39% and 54% in the medium and long term.

In parallel, the relative importance of the RSV variable in interpreting fluctuations in the monetary mass increases from 3% in the second period to 52% in the third period, remaining fluctuating within the limits (62% and 46%) in the medium and long term.

We therefore, conclude that the size of the legal reserve plays an important role in explaining changes in the current monetary mass, both in the medium and long term. This underlines the importance of the legal reserve policy and its effectiveness in controlling the monetary mass within the economy, especially in the absence of an active and effective financial market that allows the central bank to conduct open market operations as an important quantitative method of influencing the amount of money.

4. Conclusion :

The central bank manages the monetary mass and controls the expansion and reduction of the monetary supply freely and at the right speed, by the trading needs, to maintain the general price level stability and raise the rates of economic growth through many methods and instruments that differentiate quality from quantity, most notably the policy of legal reserve. This policy influences the money supply by influencing the banking system's ability to generate credit in two directions, one deflationary and one expansionary, consistent with the country's economic goals.

Through this study, we tried to find out: the impact of the legal reserve policy on the monetary mass in Algeria during the period 2001-2018, using the Vector auto-regression technique (VAR). The study concludes that;

- The size of the legal reserve is an important indicator in explaining the changes in the monetary mass circulating in Algeria, both in the medium to long term. This underscores the importance of legal reserve policy and its effectiveness in controlling the monetary mass within the economy, in the absence of an active financial market that allows the central bank to conduct open market operations as an important quantitative method of influencing the amount of money.

To ensure the effectiveness of Algeria's legal reserve policy, it can be suggested that:

- The need for the Central Bank to purchase bonds on the open market, as a process accompanying the raising of the legal reserve ratio;
- Control the reserves of commercial banks held and keep them at acceptable levels;
- The government's policy of "social and economic" is to provide the necessary support to the government and the government to provide the necessary support to the government.
- The need for banks to respect the solvency and liquidity standards set by the Bank of Algeria, which are compliant with Basel standards and to adopt quality principles in their dealings;
- The need to control per capita disposable income and direct the rise in the monetary mass to refinance economic activity;
- The need for the Bank of Algeria to take measures aimed at regulating the work of commercial banks, improving their performance and enhancing their role in financing investments;
- It is important to activate and expand the Algiers Stock Exchange and activate its role.

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5. Appendices:

Vector Autoregression Estimates		
Date: 11/02/19 Time: 21:13		
Sample (adjusted): 2005 2018		
Included observations: 14 after adjustments		
Standard errors in ( ) & t-statistics in [ ]		
	DRESV	DDMM
DRESV(-1)	-0.481727	0.625650
	(0.31562)	(0.94895)
	[-1.52629]	[0.65931]
DRESV(-2)	0.006509	-3.144015
	(0.42209)	(1.26907)
	[0.01542]	[-2.47742]
DDMM(-1)	0.033864	-0.550499
	(0.07188)	(0.21610)
	[0.47115]	[-2.54737]
DDMM(-2)	-0.125880	-0.747504
	(0.07822)	(0.23517)
	[-1.60934]	[-3.17851]

C	101.3794	211.6070
	(58.7829)	(176.738)
	[1.72464]	[1.19729]
R-squared	0.520068	0.695103
Adj. R-squared	0.306764	0.559594
Sum sq. resids	253732.1	2293683.
S.E. equation	167.9061	504.8303
F-statistic	2.438160	5.129548
Log likelihood	-88.49998	-103.9114
Akaike AIC	13.35714	15.55877
Schwarz SC	13.58537	15.78701
Mean dependent	68.47143	94.08571
S.D. dependent	201.6629	760.7092
Determinant resid covariance (dof adj.)		7.17E+09
Determinant resid covariance		2.96E+09
Log likelihood		-192.4002
Akaike information criterion		28.91432
Schwarz criterion		29.37079