A decade of the Algerian economy: is it really lost?

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Abstract

Algeria has initiated an extensive program of public investment during the last decade. But it seems that the results of economic activity (GDP, diversification of the economy) have not been commensurate with the efforts. Through estimating a SVAR model we have shown that the impact of the shocks of the fiscal policy (budget revenues and expenditures) have a small effect on the variables of the study. However, the results of the study showed a positive effect on economic growth, but in the short term. It is important to override this expansionary fiscal policy based on investment in infrastructure for a structural policy based on industry and diversification of the economy.

Keywords: Algeria, fiscal policy, SVAR, public finance.

JEL: E6, E62, H30

هل حقيقة ضيّع الاقتصاد الجزائري عقداً من الزمن؟

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الملخص

أطلقت الجزائر برنامجاً طموحاً للاستثمارات العمومية في العقد الماضي شمل 3 برامج عمومية للتجهيز والرابع قيد الانجاز. غير أن المجهود المبذول لم يكن له تأثير كبير على الاقتصاد خاصة فيما يتعلق بنسبة نمو الاقتصاد وتنويعه. وباستعمال طريقة المتجهات ذات الانحدار الذاتي الهيكلية (SVAR) استطعنا تبيان أن صدمات السياسة الميزانية (النفقات والإيرادات العمومية) لها تأثير ضئيل على متغيرات الدراسة. وعلى الرغم من ذلك، أظهرت نتائج الدراسة بعض الآثار الحميدة لهذه الصدمات على النمّو الاقتصادي لكن على المدى القصير. ولذا من المفيد تجاوز هذه السياسة المرتكزة على الاستثمار في المنشآت العمومية إلى سياسة هيكلية تعتمد أساساً على سياسة صناعية لتنويع الاقتصاد.

الكلمات المفتاحية: الجزائر، السياسة الميزانية، طريقة SVAR، المالية العامة.

A decade of the Algerian economy: is it really lost?

By Khaled MENNA et Samer MEHIBEL

1.Introduction

Taking advantage from a favourable international environment , Algeria has launched since 2000 an extensive program of public investment. The effort was concentrated on the economic and social aspects. The period in which our study is recorded was marked by

three major events that have had an impact on the conduct of economic policy in Algeria.

- The first period (2000-2008). This period was characterized by a massive investment in basic infrastructure. These investments were spread across three public investment programs. The first of an amount of U.S. $ 7 billion which lasted three years (2001-2004), the second mobilized more than U.S. $ 150 billion (2005-2009) and the third program (2010-2014) of an amount of 280 billion U.S. $. Those investments funded exclusively by the public treasury raises the issue of sustainability of public finances in Algeria insofar as almost 60 % of the budget resources come from oil revenues .

- Second period (2008-2011). Period of redefinition of economic policy in terms of the world financial and economic crisis. Public authorities have responded differently to the consequences of the world financial crisis which becomes economic. Decisions were taken to tighten the conditions of exercise for foreign direct investment, especially with the application of the rule of national participation (49/51). Other sectors, such as foreign trade or banking, have been affected by decisions that can be described as a return to " economic nationalism lattant "

- Third period (2011-2013). New measures for young people and an increase in social transfers. The last period, even it did not reveal all its details, it can be described as a massive return to the welfare state but in another form. It is direct aids to young people to start their own business, aids for housing, subsidized prices of mass consumption and the subsidy to vulnerable populations. Social transfers budgeted is about U.S. $ 28.3 billion, but implicit subsidies are almost high, with U.S. $ 26.6 billion a little bit over 30 % of GDP.

Thus, for the second time in ten years (the first was recorded in 2009) , hydrocarbon exports fell by 13.9 % in the first quarter of 2013 compared to the same quarter of 2012, falling from U.S. $ 20.378 to U.S. $ 17.536 billion. Compared to the first quarter of 2009, it could

be described as a shock of the balance of payments in 2013 (Bank of Algeria , 2014)[1]. In contrast, imports of goods and services continued their upward trend to reach about 8.6 % in the first quarter of 2013 compared to the same quarter of the previous year. Fiscal policy was especially expansionary in 2011. Government spending has increased by nearly 25 % compared to 2010, which represented 40.6 % of GDP. The budget deficit has risen to the level of 2.3% of GDP in 2011. (National Office of Statistics (ONS), 2014)[2].

Through the three periods mentioned above, we will try to study the conduct of economic policy and especially fiscal policy. We will attempt to study the impact of fiscal policy on the Algerian economy using a SVAR model. The study will focus on some of the most significant economic indicators for the Algerian economy.

Indeed, fiscal policy and its impacts on the economy, has been for a long time neglected from the theoretical debate compared to the monetary policy. But the recent financial crisis has demonstrated the importance of the use of fiscal policy as a mean of stabilizing the economy. The analysis will therefore be based on a series of annual data on the Algerian economy covering the period (1970-2011) and will rely on the use of SVAR model, impulse response functions and the analysis of the variance to measure the impact of a shock on the instruments of fiscal policy (government spending and revenues) on each of: economic growth (GDP), private consumption, public expenditure, revenues, exchange rate and inflation .

Our work will be organized as follows: after an introduction, the first part will be devoted to an overview of the historical evolution of the Algerian economy and a literature review on economies in transition. The second part will be dedicated to three stages of the period of study. In the third part the results of the empirical study will be presented . We end with a conclusion that traces the various stages of our study.

2. Main characteristics of fiscal policy in Algeria (2000-2010)

During the last decade fiscal policy was characterized by the launch of public investment programs but other measures relating to the global crisis of 2008 were adopted.

2.1. Public investment programs

On the eve of launching programs of public investment, the state budget in recent years was characterized by extremely fragile situation due to the weakness of the ordinary taxation. Budget revenues in this situation, are of the order of 10,5% of GDP and cover barely personnel costs of administration and its branches; extreme volatility of resources from hydrocarbons; the high level of fixed expenses corresponding to: salaries and related expenses (10% of GDP) , public debt (6 to7 % of GDP), pensions of mujahideen (veterans) and some social spending (5% of GDP), a total of around 21-22 % of GDP. This requires total cessation of public investment in case of significant decreases in oil revenues (**Figure 1**). The judgment of cessation of public investment was always the adjustment variable made by public authorities to deal with any deterioration of the situation in the international oil market. This, has consequences on the level of development and management of urgent demands of the population.

Since 2001, the date of launch of the first public investment program, Algeria has intensified its investment efforts to catch the accumulated delay recorded especially during the decade of the 90s marked by a serious multidimensional crisis. Investment programs undertaken since 2000 may be presented as follows:

2.1.1. The economic recovery program (2001-2004)

At a cost of U.S. $ 7 billion initiated to relaunch the economic growth remained weak for a decade. This growth has registered only 2.1% on average during 1990-2000. This rate is very low to absorb the

high unemployment rate especially among youth. This is the result of several factors including the ineffectiveness of the production system, the disappearance of a large part of public companies as a result of the structural adjustment program (1994-1998) and the hostility of the environment of the company.

To overcome all insufficiency, the program aimed to revive the Algerian economy through the pulse of local demand, support creative activities of wealth and creating jobs. The three priorities of the program were the fight against poverty, creating employment positions to absorb the maximum amount of the unemployed and the implementation of a policy of regional equilibrium to valorize the territory. This plan whose scope is the effects did not make a serious assessment was the forerunner of other plans which characterized the Algerian economic scene. The other two programs were more consistent. They especially enjoy the windfall driven mainly by exports oil.

2.1.2. Complementary program to support growth (2005-2009)

The second program, which covered the period 2005-2009, called complementary program to support growth (PCSC) and "South" and "Highlands" programs for an amount of 200 billion U.S. $, devoted mainly to the territorial equilibrium. It focused on the improvement of living conditions; development of basic infrastructure; supporting economic development; modernization of the public service and the development of new communication technologies.

The first two axes alone absorb respectively 45.4% and 40.5% of the overall budget. Indeed, the emphasis is on the need to quickly accumulated deficits in a number of areas.

Priority areas covered by the program were mainly housing (1 million units), health (production of 17 hospitals and 55 clinics), water supply (production 1280 DWS projects and sanitation 1150 drilling).

And the connection to the gas distribution (965000 households) and electricity (397700 households).

2.1.3. The third public capital program 2010-2014

The public investment program from 2010 to 2014 represents a projection of expenditures of 21,214 billion Algerian Dinar AD (or the equivalent of U.S. $ 286 billion). It includes a "current program" at the end of 2009 of 9.680 billion AD (equivalent of U.S. $ 130 billion) and a program called " New" of 11.534 billion AD (or U.S. $ 155 billion). The distribution of this program is into two parts: one for the programs already launched and the other for new programs, nevertheless some questions about this distribution need to be asked.

In fact any public development program takes over from a previous program under the name "current program". According to government figures from 2005 to 2009 program including itself 1216 billion AD of "current program" at the end of 2004. Indeed, a running program is still necessary to avoid "white years" in meeting the expectations of the population (schools, housing, gas supply and electricity...).

2.2. The new guidelines of the Algerian economic policy

The many reforms since 1990 appear to have been powerless to improve the performance of the Algerian economy, at least allow the emergence of a true diversified economy. In 2009, Algeria's GDP was dominated by the oil sector (49.5%). The non-hydrocarbon industry occupied only 4.8% while the Algerian industry occupied 15% of GDP in the 1980s. Also, the Algerian government has considered that these reforms have not exercised the positive impact expected regarding the diversification of the economy. The last decade (2000-2010) witnessed the strengthening of the role of the state in the economy in three stages marked by the application of three public equipment programs but also through the adoption of additional finance laws in 2009 and 2010.

The changes through annual and additional finance laws seem to question the principles of the market economy (interference in the management of public enterprises, stopping the privatization process, change of conditions for foreign investors, etc...). Behind the goals of boosting the growth assigned to complementary finance laws[3], other measures can be described as "protectionist" just mark the Algerian economic landscape. These measures have mainly affected the rules of the establishment of foreign direct investment, the rules governing banking activities and then the rules related to foreign trade. However, protectionism has often been a hidden facet of the development strategy of Algeria marked by one major concern: protecting the interests of the Algerian economy. In this perspective, additional finance laws seem to follow another plan to the one adopted in the context of the world crisis. These measures were taken to address the deteriorating balance of payments and the exponential expansion of imports.

2.2.1. Investment

The level of economic growth, excluding oil remains in recent years based on the demand generated by public infrastructure programs of a strong physical and financial consistency. The traction of economic growth through the offer remains conditioned by the dynamics of the sphere of production of goods, whose contribution to the GDP remains today below the expectations.

In the purpose of dynamizing the production sphere, the current policy, conduct in terms of taxation aims at lowering the tax pressure on enterprises and the simplification of tax procedures. The rate of IBS[4] was reduced for activities producing goods for construction companies and tourist institutions. To encourage the use of leasing by companies that have cash flow problems, a VAT exemption was introduced on acquisition operations performed by banks and financial institutions under this credit, exemption from registration fee mutations goods or professional buildings and excluding the

calculation base of IBS capital gains generated by leasing operations and alignment of the tax depreciation on the financial depreciation.

The funding of any foreign or domestic investment from internal resources. This is made possible by strengthening the capital of state banks, the reinforcement of bank liquidity, stability of debtors interest rates, the creation of a national investment fund, created by public banks before end of the first half of 2009, subsidiaries of capital investment and leasing.

These decisions seem to follow a different pattern than the one adopted in the context of the global crisis, but also to answer a major concern: preserving the interests of the Algerian economy. This first wave of protectionist measures was dictated after the sale of factories belonging to the Egyptian group Orascom such as the cement factory to the French group Lafarge[5]. In addition to wanting to master the repatriation of profits of foreign companies based in Algeria. After a decade of opening, the Algerian authorities have discovered that outflows (as repatriation of profits far exceed inflows in terms of FDI). The balance of payments for the year shows the level of net direct investment in 2009 (U.S. $ 2.54 billion) flow is significant after the significant increase recorded in 2008. FDI entry (net) reached U.S. $ 2.33 billion in 2008 against U.S. $ 1,37 billion for 2007. For 2009, foreign direct investment flows are largely under capital inflows related to increased capital requirements for banks and foreign financial institutions operating in Algeria, strengthening the country's financial stability in the context of international financial crisis and global economic crisis, Bank of Algeria, (2010).

2.2.2. The banking sector

The changes introduced in the banking sector obeying to two major objectives: strengthening the control on banks by the central bank and the introduction of new rules for the establishment of foreign banks. These rules are consistent with the rules already promulgated by the additional financial law for 2009 on foreign direct investment.

The privatization of the first public bank should have been concluded in 2008, but the world crisis pushed the deadline to a date not yet determined. After some hesitation, the authorities found in the consequences of the global financial crisis the best argument for postponing the deadline for the privatization of public banks.

The global financial crisis of 2008 did not affected immediately Algeria for several reasons. The non liberalization of the capital account, which excludes the freedom of capital movements by national economic operators. These movements can be made only with the agreement of the Council of Money and Credit. Prepayment of external debt, prior to the onset of the crisis, which allowed Algeria not to suffer losses due to changes in interest rates and exchange rates. Domestic financing of the economy and its reinforcement by strengthening the capital of banks to increase their engagement capabilities. The capital of state banks has doubled between 2007 and 2009.

The changes introduced in the legislation that governs the banking sector have been introduced in order to strengthen the authorities' control over the activities of banks, especially foreign once. The cancellation of the privatization of public banks, yet programmed, provides another sign that the authorities want to take a step back from the reforms of 20 years ago.

A. The revision of the banking law

The revision of the Law on Money and Credit[6], aims to strengthen the role of the central bank, especially in its oversight, and secure payment methods. This revision, the third in such since 1990, aims for essentially five fields of banking activities in Algeria.

Firstly, these changes are intended to update the missions of the Bank of Algeria in relation to progress under the modernization of the financial system, by charging it ensuring the efficiency of payment systems and issuing the rules governing them, and by mandating it to ensure the safety of means of payment other than fiat currency.

Secondly, strengthen the safety and soundness of the banking system, a close monitoring of banks including private, to ensure the safeguarding of the interests of their customers, and maintaining monetary and financial stability of the country.

Thirdly, the fight against fraud and malfeasance in transactions by banks and financial institutions through the addition of corruption offenses to the grounds for prohibition of the exercise of the banking function.

Otherwise, to enhance transparency in banking activities, government will hold a special share in the capital of banks and financial institutions with private capital, through which it will be shown in their governing bodies without the right to vote. This provision, new in Algeria, exists in many developed countries. It is in the spirit of control that this action was introduced.

Fourthly, confirm the application to banks and financial institutions of the national legislation in terms of foreign investment, and strengthen the protection of state interests by providing that any future opening of bank or financial institution by a foreign investor will be conditioned by holding a 51% stake by national shareholders. In case of transfer of a bank or a financial institution whose capital is abroad, the State has a right of refusal.

Fifthly and finally, to support the development of credit and safeguard the interests of customers of banks and financial institutions mandating the Bank of Algeria to fix the remuneration of bank services to customers

The changes in banking legislation seems to obey the objectives put order into the profession, more transparency in business and protection against malpractices that can be harmful to the banking sector and affect the interests of the country.

B. The privatization of banks

Algeria is committed to privatize the popular credit of Algeria (CPA)[7] in 2007/2008 and to open the capital of the BDL[8] and the CAAR[9] and later that of Badr[10]. But the scale of the global financial crisis in 2008 forced the Algerian authorities to postpone the decision.

Why privatize part of the banking sector? We must admit that all the reforms undertaken by the government since the law of August 19,1986 , through the Law on Money and Credit of April 10,1990 , and finally the order of August 26, 2003 that amend it on substantive items, were powerless to improve the performance of the banking sector, much less allow the emergence of a true monetary market able to overcome the almost total absence of a financial market, whether of shares or bonds. But it is not enough to privatize large state banks. It will still monitor the implementation of privatization and not to repeat the mistake about public economic enterprises (PEE) which privatized where the state was disinterested then, as soon as the transfer of property was made. Finally, it is essential not only to work for the independence of the Bank of Algeria but also to provide the institution of the emission means (human and material) so that it can exercise an effective supervisory on primary banks. The independence of the central bank takes a too important politico-economic dimension to afford to enroll in a law that was just broken (Ilmane, (2007)). It seems that we do not have sufficient economic and institutional capacity and most importantly, there is not a minimum political and intellectual consensus to sit the independence of the central bank.

The absence of a central of risks, 20 years after the promulgation of the money and credit law, unfortunately reveals the extreme slowness of institutional reforms in the banking sector. Given this, the privatization of public banks is now a necessity, as the current functioning of our banks and different crediting modes to companies do not conform to the spirit of the market economy.

2.2.3 . Foreign trade

The measures taken in the sense of a more rigorous state control over foreign trade sector consists of the prohibition of all debit and customs clearance for import transactions of goods, which the operator is not holder of the new tax ID; The establishment of a list of importers showing, among others, importers who have committed offenses against customs or tax legislation; the prohibition on the importation of any product threatening consumers' health or public safety, strengthening organizations responsible for standards in order to develop a goal of protecting the national economy. At the end, creating a portal on foreign trade, domiciled Agency exports

3. Dirigism and economic recovery

In this section, we focus on one essential point: it should not be confused state logic and socialization of economic activities. Several factors illustrate that the 2000s are those of a return of the Algerian state intervention in the economy rather than a return to socialism planner of the 1970s.

A first element is about the share of expenditure in GDP which has never stopped growing. From 2000 to 2009, this proportion increased from 0.29% in 2000 to 0.42% in 2009. If we remove the effect of oil, the share of budgetary expenditure in GDP pass to 0.61% in 2009. (**Figure 2**)

A second feature, a characteristic of this return to the intervention of the State is about the constitution of a public reserve fund financed by the taxation of hydrocarbons. Indeed, it is a noticeable difference compared to the period of the seventies and eighties, the Algerian government has chosen to use the fiscal lever bearing in mind the need to preserve the balance of public finances in the medium term. In other words, the policy of boosting growth could be established under the condition of sustainability of public expenditures. It was at the same time to reconstruct the official foreign exchange reserves and dispose of sufficient import of goods and services capacities. It is in this context that a regulatory fund (RRF) was created in 2000, on the

eve of the launch of the first program to support the economic recovery that started in 2001. Authorities have always in mind the bad memories of the 1986 oil shock. This shock has resulted in the complete degradation of macroeconomic balances and urged Algeria to reschedule its debt under the auspices of the IMF and implement an austerity program that has taken the form a structural adjustment program. Hydrocarbon Revenues Regulation Fund (RRF), for its origin to cover the budgetary burden of repayment of foreign debt, now hosts a public savings that accompanies the financing of the investment program of the State (the law authorizing financing part of the deficit projected by the treasury). It seems that these packages are part of a logic of support of economic activity rather than a philosophy where the State supports directly the economic activity, as was the case during the Algerian development strategy adopted in the 1970s. Many arguments abound in this direction.

Firstly, it is important to note that Algeria has known an improvement in the rate of non-hydrocarbon growth (see Figure 3), which indirectly shows a withdrawal of the State insofar as hydrocarbons, through the national public company "Sonatrach", represent not only the State but also and especially Algeria has always been the lungs of the Algerian financial system. In other words, stimulus programs are also a sign that if the State does support the non-hydrocarbon growth, it is not the State that produces. Since 2006, non-oil GDP (HH) is growing faster than overall GDP. Since 2002, growth in real GDP (HH) accelerated sharply to an annual average rate of about 5.5%. Regarding the supply side, growth was particularly strong in agriculture, construction and public works and non-governmental services. On the demand side, growth of GDP (HH) was mainly driven by domestic consumption, exports of products other than oil represents less than 2% of GDP (HH) (IMF, 2007)[11]. (**Figure 3**)

The contraction of the international oil market, as an immediate consequence of the global international crisis has had an impact on budget revenues and, consequently, the budget revenue / GDP. The share of budgetary revenues in GDP rose from 20% to 49% from 2000

to 2009. This increase was due to the growth in volume of GDP over the period 2000-2009. But if we refer to the non-oil GDP (HH) the share of budgetary revenues decreased significantly. In 2000, this share is 80% of GDP, which explains the very high proportion of hydrocarbons in the formation of Algerian GDP, while in 2009, it was only 29%. (**Figure 4**)

Furthermore, we emphasize that we should not confuse between a recovery of an economic activity in a context of financial crisis and a return to economic planning (dirigism). Indeed, the global financial crisis has led many countries to adopt economic stimulus policies, especially in the benevolence of the International Monetary Fund, Spilimbergo et al., (2008)[12]. Plans and methods differ, but we have seen a return of the State in the world that had often advocated a withdrawal of the State. Has Algeria reacted differently? If additional finance laws for 2009 and 2010 contain a protectionist bias (see previous section), they are rather part of the general spirit of fiscal responses adopted by many developed countries or neighboring countries of Algeria. It is thus possible to interpret the Algerian reaction as a counter-cyclical reaction; also observed in many neighboring countries of Algeria, Abdih et al., (2012)[13]. In fact that Algeria has reacted countercyclical financial crisis, with budget balance, positive in 2008 (+1293,2 billion AD), became negative in 2009 (-924.3 billion of AD).

4. Theoretical framework and empirical results

4.1. What about the effects of fiscal policy

Despite the large literature on the impact of monetary policy on economic activity, the importance of fiscal policy for economic stabilization has received less attention. But Since the outbreak of the financial crisis the effectiveness of fiscal policy as a tool for stabilizing the economy in response to a negative shock has also received strong attention from governments and policy institutions.

In the Keynesian model with price elasticity, the expansionary fiscal policy has an effect on the general price level which leads to a decrease in money supply. This leads to higher interest rates and crowding the positive effects on GDP. The opposite is true if a restrictive fiscal policy is applied. Decreasing budget deficits also leads the decline in inflation and interest rates. Controversies, recurrent in the public debate about the effects of fiscal policy on GDP, inflation, interest rates, exchange rates, etc.., Have always struggled with the identification methods of fiscal impulses. Potentially harmful or beneficial effects of fiscal policy cannot be measured until after the fiscal policy has been corrected for endogenous elements in its evolution, Jerome Creel et al, (2007)[14].

Fiscal policy has a direct as well as an indirect effect on output. The direct effect reflects that higher government consumption and investment add directly to aggregate demand. The indirect effect works via the response of private consumption and investment as well as net trade and depends on the characteristics of the economy. Roberto Perotti (2001)[15] presented evidence on the effects of fiscal policy on GDP and its components, the price level, and the short interest rate, for five countries for which he was able to assemble sufficiently detailed quarterly data on the budget of the general government: the US, West Germany, the UK, Canada, and Australia. Using an approach originally developed in, Olivier Blanchard and Roberto Perotti, (2002)[16]. He found that: 1) The effects of fiscal policy on GDP and its components have become substantially weaker in the last 20 years; 2) The estimated effects of fiscal policy on GDP tend to be small: in the pre-1980 sample, positive government spending multipliers larger than 1 tend to be the exception; in the post-1980 period, significantly negative multipliers of government spending are the norm; the tax multipliers are even smaller; 3) To understand the effects of fiscal policy on prices, the price elasticity of the government budget items is crucial, an issue that has not been widely appreciated; 4) Once plausible values of the price elasticity of

government spending are imposed, the negative effects of government spending on prices that have been frequently estimated become positive, although usually small and not always significant; 5) Government spending shocks have significant effects on the real short interest rate, but of uncertain signs: after 4 quarters, positive in three countries, negative in two. 6) Net tax shocks have very small effects on prices, typically negative or zero in the second part of the sample; 7) The US is an outlier in many dimensions; responses to fiscal shocks estimated on US data are often not representative of the average OECD country included in this sample.

The country studies show different effect of fiscal policy on different variables. But the evidence is scarce due to the limited availability of quarterly public finance data. Perotti (2004)[17] finds that fiscal policy leads to no response of private investment and a relatively large and positive effect on private consumption in a set of five countries (Australia, Canada, Germany, the U.S. and the U.K.). For Spain, De Castro and De Cos Hernández, (2006)[18] show that a positive spending shock lead to higher inflation and lower output in the medium and long-term, but can be expansionary in the short-term. For France, Biau and Girard, (2005)[19] find a positive effect on both private consumption and private investment. In addition, Burriel et al. (2010)[20], using a quarterly standard SVAR, report that expenditure shocks are more persistent in the US than in the euro area, while the negative response from net tax increases is shorter lived in the euro area.

4.2. SVAR modelling and empirical results:

The structural VAR methodology consists of moving from residues issued from the canonical VAR to structural shocks that can be economically interpreted. The necessary orthogonalization of canonical residues which consists on obtaining impulses at each instant are uncorrelated, can be obtained in conventional manner by performing a Cholesky decomposition (trigonalisation process) of the variance canonical innovations. But this orthogonalization mode does

not allow an economic interpretation of impulses independently obtained. Mathew.D Shapiro,. and Mark.W Watson, (1988)[21], Olivier Blanchard and Quah (1989)[22] first who proposed to identify structural shocks that are economically interpretable: In addition to the usual constraints of orthogonalization, it is about solving a system of constraints translating the economic behavior. This last method promoting the economic interpretation was adopted in Blanchard and Perotti (2002)[23] and Perotti (2002)[24] in this paper.

A. Structural VAR modeling

Here the vector autoregression representation VAR (q) of the model under its reduced form:

$$A(L)\Delta Y_t = e_t \tag{1}$$

where q is the number of lags, Y_t is the observable variables vector (n×1), with n, the number of variables of the model and e_t is a white noise.

To obtain the response functions to shocks as well as the variance decomposition of the forecast error. It is necessary to write this process under a structural infinite moving average form. To do so, an intermediate step consists on "reversing" the canonical VAR model according to Wold theorem to obtain a canonical VAR under a moving average form:

$$\Delta Y_t = C(L)e_t \tag{2}$$

where $C(0) = I_n$ and e_t is the vector on canonical innovations.

Hence the structural moving average form of VAR:

$$\Delta Y_t = \Theta(L)\varepsilon_t \tag{3}$$

with

$$e_t = P\varepsilon_t \tag{4}$$

where P is a passage matrix invertible (n×n) to be estimated in order to identify the structural shocks. Short-term constraints are

translated by the nullity of certain coefficients of the matrix P. The matrix Θ_j represents response functions to shocks ε_t of ΔY_t elements. We suppose that the different structural shocks are not correlated between them and have a unit variance:

$$\mathrm{E}(\varepsilon_t, \varepsilon_t^T) = I_n \tag{5}$$

Ω is the variance covariance matrix of canonical innovations e_t, we have:

$$\mathrm{E}(e_t, e_t^T) = P\mathrm{E}(\varepsilon_t, \varepsilon_t^T)P^T = PP^T = \Omega \tag{6}$$

The lack of response in the long term of a certain number of variables ΔY_t to shocks ε is translated by the nullity of the corresponding dynamic long term multiplier.

B. Data

We have used annual fiscal variables. Quarterly data is so difficult to obtain. Even we obtain for some quarterly fiscal variables the other variables seem unfound. According to Perotti one reason why fiscal policy VARs have been less popular than their monetary policy counterparts is that fiscal policy data at high enough frequency are more difficult to collect; in most countries they simply do not exist.

The series that we dispose cover the period from 1970 to 2011a total of 42 observations. The order of the variables is selected to facilitate the implementation of short and long term constraints. These are the variables traditionally used in the literature on structural VAR when the objective is to take into account the real dimension of the economy

Here, we have changed interest rate by inflation for two reasons: interest rate is stable for a long period, and the financial market is very small and weak. In this application the series will be noted as follow:

- LDP: Logarithm of public expenditures.
- LRB: Logarithm of government revenue.
- LPIB: Logarithm of GDP.
- LCONP: Logarithm of private consumption.

- LTC: Logarithm of exchange rate.
- INF: Inflation.

As it is known when using time series, we will begin to test the stationarity of the time series variables covered by the analysis, using: the augmented Dickey Fuller test (ADF) and phillips - perron (PP) test.

The first observation of the series shows that the series are not stationary, also the unit root test confirmed this observation (See the figure.1. in the Appendix). At first differentiation, we notice that the series are stationary, we find the confirmation of this conclusion through the unit root test (See the tables below) (**Tables1, 2 and 3**).

The Johansen cointegration test above shows two different results. First, the trace test indicates that there are two cointegrating relationships for the null hypothesis of the abscence of cointegration was rejected (109.14> 95.75) at 5% threshold, while the Max-Eigen test indicates that there is no cointegrating relationships (the null hypothesis of the abscence of cointegration cannot be rejected (36.35 <40.07)) which is considered as contradictory results and since both tests are of significant value we decided to choose one test and as we are interested in the analysis of impulse response functions that the VECM models do not allow, we decided to choose the Max-Eigen test which means that there is no cointegrating relationships which allows us to use VAR model and then pass to the SVAR modelling and after that we will be able to proceed to the structural impulse response function analysis.

First we have to determine the number of lags "p" that minimizes AIC or SC criteria. The values for different values of "p" are shown in the table below (We present just the first 3 lags because there is no interest to show more lags because of the results obtained):

According to the table above we conclude that P=1 is lag chosen because it minimises AIC and SC criteria.

After estimating the VAR(1) model we can say according to the figure and the table below that the model satisfies the stability conditions. (**Figure 5**) and (**Table5**).

Now we can estimate the matrix A, B and P

Matrix A

1	0	0	0	0	0
−024025315	1	0	0	0	0
−0.42985544	−0,42354487	1	0	0	0
−0,45443468	−0,24159949	0,18702496	1	0	0
−0,09592832	0,1987167	−0,48907669	0,01632729	1	0
1,71601249	5,37235714	−16,9265518	−8,83920755	9,74095823	1

Matrix B

0,18369755	0	0	0	0	0
0	0,09159119	0	0	0	0
0	0	0,0712 3209	0	0	0
0	0	0	0,12699551	0	0
0	0	0	0	0,0560813	0
0	0	0	0	0	4,81133737

Matrix P

0,18369755	0,00000000	0,00000000	0,00000000	0,00000000	0,00000000
0,04413391	0,09159119	0,00000000	0,00000000	0,00000000	0,00000000
0,09765608	0,03879298	0,0712 3209	0,00000000	0,00000000	0,00000000
0,07587714	0,01487313	−0,01332218	0,12699551	0,00000000	0,00000000
0,05538491	0,0055165	0,03505547	−0,00207349	0,0560813	0,00000000
1,23184202	0,29066389	0,74648233	1,14273746	−0,54628560	4,81133737

After estimating the VAR model we can now pass to the estimation the SVAR model and more importantly to the studies of the impact of shocks.

B. Impact of shocks on fiscal revenues (DLRB)

First, the short-term effects on GDP are ambiguous. Fiscal policy has Keynesian effects: In Algeria DLPIB variable is assigned a positive way (0.097656%) in the first period and decreases in the second period (0.036256%) then it reaches its Max in the 3rd period (0.057645%) and then it decreases to regain its balance after about 17 times. This Keynesian conclusion does not deviate from that advanced

to the U.S. by Blanchard and Perotti, (2002)[25] or Biau and Girard, (2005)[26] for the French economy. Algeria's economic growth remained always timid despite the fiscal effort made by the state.

C. Consequences of a shock (1%) on the DLDP variable:

The impact of a shock on the variable DLDP (1%) on itself is estimated at (0.091591 %), then it affects other variables as follows :

-The DLRB variable is positively affected with a very low value (2.65 * 10-17 %) and reached its max (0.069739 %) in the second period after that it decreases to recover its equilibrium after approximately 18 periods.

-The DLPIB variable is affected in a positive way in the first period (0.038793 %) and peaked in the second period with (0.042178 %) and then it decreases to regain its balance after about 18 times.

-The DLTC variable is affected positively (0.014873 %) in the first period then decreases in the second period and remained stable for the rest.

-The DLCONP variable is positively affected with a very low value (0.000552 %) and reached its maximum in the 2nd period with (0.031349 %) and then decreases to regain its equilibrium after approximately 18 periods.

-The DINF variable records the greatest impact estimated at (0.290664 %) initially, but this effect becomes practically zero from the fourth period .

D. Analysis of Variance decomposition:

The study may be supplemented by an analysis of the variance decomposition of the forecast error . The objective is to calculate the contribution of each of the innovations to the variance of the error. The variance of the forecast error at horizon h depending on the error variance attributed to each of the two variables are then written . The

report is then performed between each of the variance and the total variance for its relative percentage .

The tables (see the Appendix: tables from 1 to 6) show the percentage of contribution of residues of the variables DLDP , DLCONP , DLPIB , DLTC , DLRB and DINF to the variance of the forecast error of the variables DLDP , DLCONP , DLPIB , DLTC , DLRB and DINF over a period of 10 periods (ie, d. to 10 years) .

➢ **DLRB Variable**

From the table we see that the variance of the forecast error of the variable DLDP is due to 80% to its own innovations -, 12% of innovations DLDP and 6% DLPIB innovations .

➢ **DLDP Variable**

The variance of the forecast error of the variable DLDP 41.65 % is due to its own innovations , 41.56 % of DLRB innovations and innovations of 12.24 % DLPIB .

➢ **DLPIB Variable**

The variance of the forecast error of the variable DLPIB 25.56% is due to its own innovations, 53.68% of DLRB innovations and innovations of 14.70% DLDP.

➢ **Variable DLTC**

The variance of the forecast error of the variable DLTC 65.02% is due to its own innovations, 27.20% of DLRB innovations and innovations of 4.09% DLCONP.

➢ **DLCONP Variable**

The variance of the forecast error of the variable DLCONP 21.08% is due to its own innovations, 50.31% of innovations DLRB, 16.26% of DLPIB innovations and innovations 10.56% of DLDP.

➢ **DINF Variable**

The variance of the forecast error of the variable DLCONP 83.42% is due to its own innovations to 6.71% DLRB innovations and innovations of 5.01% DLTC.

E. Economic interpretation of the statistical results:

1. GDP (DLPIB):

Statistics regarding the growth rate show the weakness of this rate especially the one recorded in the last decade which was about 4% as an average of the 90s then decreased to reach 2.1% in 2009, 3.3% in 2010, 2.5% in 2011 and 2.6% in 2012. The estimates of the world bank indicate a slight increase of 3.2% in 2013 and 3.6% in 2014 (World Bank, 2014)[27]. The weak results of the growth rate of GDP (DLPIB) despite the huge public investment programs especially in infrastructures point out the errors in the economic policy made by other countries that share the same characteristics of the Algerian economy (An economy based on the exportation of primary good).

The traditional view goes to say that revenues from the natural resources should fund public investment. However, there are always questions about the preference of this approach. The limited capacity of many countries dependent on natural resources make it difficult to achieve a proper and effective investment. The limited capacity of the government is not attributed only to the lack of its technical ability to identify basic investment projects, implement them and monitor them, but it is often a result of corruption in the public sector, which allows the lobbies to abuse the spending and the allocation of resource revenues not expected, including through high-value construction contracts vulnerable to mismanagement.

The launch of investment programs in Algeria was followed by a spread of corruption, especially in big projects such as high ways and electricity stations. The newspapers are daily full of reports about corruption at all levels and including almost all sectors. A study prepared

for thirty oil exporting countries covering the period 1992-2005 pointed out that unexpected large oil revenues cause a significant increase in corruption, Rabah Arezki and Brükner Markus, (2011)[28]. Also an index prepared by the IMF for measuring the quality of investment management shows a significant decrease in the quality of investment management in resource exporting countries, Kyobe et al.(2011).[29]

The evolution of GDP growth in Algeria shows a non sufficient growth or even weak if we compare it to the growth registered in China (doubled by 32.44 times) or the one registered in South Korea (doubled by 18.61 times). In contrast, the growth of the total population and urban population recorded a significant increase considered among the highest in the world which shows the unbalanced growth between the essential needs in health, education, nutrition, and housing.(**Figure 8**).

After fifty years of independence the structure of the inherited colonial economy changed. Agriculture is representing only between 6% to 10% of GDP for the period from 1962 to 2012. The most remarking phenomenon is the continuing decline of the size of industry in GDP which moved from 13.30% in 1965 to less than 5% in 2010. This prompted some authors to talk about the collapse of the industrial sector in Algeria (**Table 6**).

Hydrocarbon sector occupied an important place, but varying depending on the price of oil in the world markets in the long-term, where he scored an average of 35% of GDP. In spite of its relative importance, the hydrocarbon sector does not integrate totally with the other sectors. Hydrocarbon exports account for 78.4% of the total production in 2009, while this percentage was 74% in 2000. The input-output table of 2009 shows that the non-exported part (21.6% of the annual production), 84.3% was consumed by the sector itself and that was for to the needs of the oil refineries and this is what explains the weakness of the integration of this sector in the economy.

For the construction industry, public works, which received tremendous public investment during the previous decade, does not seem improved compared to the other sectors where its contribution in GDP moved from 6.8% in 1970 to 7.4% in 2000 to reach to the summit in 2010 by 10.4% and exceeded the added value of the sector, which was very important in the beginning of the manufacturing phase, those recorded in the agriculture sector in 2006 to reach 10%. On the other hand, the services sector did not witness despite the openness of the Algerian economy a great growth as its contribution to the GDP remained weak compared to the one recorded in the region (55% of GDP in Morocco and 59.7% in Tunisia).

2. Inflation (DLINF)

Algeria has known a significant increase in the rate of inflation in 2011, especially in the second semester and this increase continued in 2012 and in the beginning of the first semester 2013. In the past, after the period of the structural adjustment the inflation rate was characterized by a stability for 10 years reached the level of 5.74% as an annual average, but starting from 2011 to the first quarter of 2014 inflation rate rose significantly, especially after the rise of food prices in international markets and the rise of the prices of fresh food in local markets.

The significant rise in the rate of inflation in 2012 coincided with a decrease in money supply(in terms of M2) that grew by about 11.9% compared to 19.9% in 2011which represents the lowest rate since 7 years except in 2009 considered as the year of the large external shocks. Regarding liquid money it decreased by about 8 percentage points and despite this decrease it remains high (14.81% compared to 22.53% in 2011). (**Figure 9**)

The rate of broad money to M2 in 2012 continued to rise, related to the rise of expenses of families and this is an indicator of an increase in consumption caused by the rising incomes between 2011 and 2012 that supply was not able to face especially for fresh food what pushed to the rise in retail prices.

It should be noted that in recent years money supply and broad money recorded a big increase did not coincide with the rise of inflation rate as recorded in 2012. The decline in money supply in 2012 and 2009 coincide with a big increase in food fresh prices covered part of them. This is why we cannot attribute the big rise in inflation rate to this increase in money supply in 2012 that coincided also with the rise of the deposits by 19.46% and a slight decrease in broad money in november of the same year.

We cannot also attribute this surge to the rate of imported inflation. The IMF estimated the rate of decline in the prices of raw materials (out of hydrocarbons) by about 9.8% in 2012. The prices of goods of first necessities imported by Algeria registered a remarkable decline in the international market by about 5.6% to 16.25% as an annual average according to the type of the good. Moreover the Algerian dinar kept its stability in front of the main two currencies that are used in international transactions and that what was supposed to lead to a decrease in imported foodstuff prices.

The various tax exempts (the value added tax, customs tax) on imported agricultural materials was supposed to contribute to the reduction of prices in the local market. It is therefore useful to study some of the other causes of inflation that have structural nature and others considered as circumstantial.

Among the first reasons cited by the Bank of Algeria in an analytical note on inflation in Algeria (Banque of Algeria, 2013)[30] and that could be the cause of this increase in the rate of inflation, is the increase in wages of public sector jobs and the economic public sector, which had an effect on expectations of other economic agents that the potential consumers have a surplus liquidity will therefore inevitably consume it, so it will be applied on the prices of fresh goods. Since the high level of these prices plays an important role in the formation of inflationary expectations. While an IMF study on the causes of inflation in Algeria, IMF (2013)[31] pointed out that a

decrease of loans to the public sector by more than 20% in 2012, contributed to increase the inflationary pressures, while loans growth to the private sector decreased by 10% in 2012. The monetary authorities raised the mandatory reserve on deposits in the banking system from 9 to 11% by expanding the absorption of liquidity estimated at 250 billion AD (23%). This study was preceded by another study, Koranchelian, (2004)[32] on the causes of inflation in Algeria between 1997 and 2003 and found that both real and monetary factors have an impact on inflation. Inflation is associated in the long term positively with money supply and the exchange rate and negatively with income. Thus, the rising incomes of the families do not have a positive impact on the high rate of Inflation. The writer suggested that the monetary authorities must continue a prudent monetary policy to cope the inflationary pressures.

On the other hand, the inflationary phenomenon is linked without any doubt on the organization of market at wholesale and retail sale level. These markets are characterized by its poor organization and its random feature especially for agricultural goods. It is not known how the prices are set, and advertisement on the goods is absent, and have less control and less application of regulations if we do not say inexistent. These factors contribute to the excessive rise of prices with the note on the presence monopoly on the market.

The refusal of dealing with written or electronic means of payment (check and electronic payment cards) contributes to ambiguity and lack of transparency, and that is the behaviours growing in the informal sector. Inflation is also related to the psychology of the economic agents and how they expect inflation which reinforces the inflationary behaviour.

Among the proposals, which was included in the analytical note of the Bank of Algeria to fight against inflation is to try to raise wages on a regular basis and linked it to productivity and inflation. The diversification of supply of goods contribute to reduce prices in the

market despite the fact that the latter did not witness a great imbalance between supply and demand. For instance, the raise of housing supply can reduce the huge demand on it and directing part of the revenues of families to saving rather than current consumption. The organization of markets (wholesale and retail) is considered more than a necessity by applying all the regulations governing these markets in a manner that allow to follow the path of price formation and the fight against Inflationary pressures. For his side, the International Monetary Fund (IMF, 2014)[33] recommended to apply a combination of monetary and fiscal policies accompanied by structural reforms. It also includes recommendations to control the current public spending and the tightening of monetary policy by raising interest rates and the authorities should deal with the sources of supply side shocks that increase inflation. The growth of total productivity factors and the accumulation of the capital is an incentive to the growth of real GDP, which was found to be a major factor to reduce the domestic inflation in Algeria.

3.The private consumption (DLCON)

The effect of the public spending and the budget deficit on the consumption can be explained that a part of this deficit directs to the direct demand on good and services from government. It leads to increase the national consumption. On the other side, a part of this deficit will be transferred to the individuals with or without payment. And also it will increase the national consumption.

All macroeconomic theories agree that the taxes and the social security contribution reduce the disposable income voted to consumption. According to the consumption point of view from the cycle life hypothesis, the consumption is based on the wealth of the consumers ie the present value of the current consumer income without taxes (tax-free). And therefore, it is necessary to take on the account the shifts into tax policy and the expectations that would modify the wealth of the consumers. On the other hand, the social

transfers must be paid to maintain the level of consumption in the case of low current income.

The empirical studies found that the fiscal policy has a small effect on private consumption (Burnside et al. ,2004)[34]. But the Giavazzi and Pagano article's (Giavazzi and Pagano ,1996)[35] remains the most important article which studied the effect of fiscal policy. The authors studied how the size of the change on the budget can affect the tools of the fiscal policy including private consumption. They found that an increase in the government spending reduces private consumption in boom and prosperity periods. The empirical finding that cyclical changes in government spending tend to be associated with positive responses of private consumption has been interpreted as a challenge for representative agent intertemporal optimizing theories, which usually imply that the negative wealth effect of higher fiscal spending reduces the households' consumption and leisure, Ludger Linnemann (2005)[36].

Among the channels of the impact of fiscal policy on consumption we find the government consumption channel. A rise in government consumption leads to a decline in private consumption. Taxes reduce disposable income for families, or transfers that can lead to a slight increase in private consumption, Kristian Jönsson, (2007)[37].

According to the results of the survey on household consumption for the National office of Statistics in 2011 (ONS, 2014b) annual private consumption per capita in 2011 in Algeria to reaches 122.274 AD (U.S. $ 1567,61) (it was 49 928 AD in 2000 (U.S. $ 640,10 U). Household consumption has recorded an increase of about 2.4 times during the same period. This shows the relative grow up on standard living of Algerians if we take into account inflation. Social transfers contributed to this result, if we know that represents 10% of the total of current expenditures.

4.Exchange rate (DLTC)

The literature on exchange rate finds two types of channels for the transmission of fiscal policy toward the real exchange rate. The first of these two channels, which stems from the re-allocation of domestic demand, which is activated by the public deficit towards domestic goods. The second channel, is the financial nature, and prefer to finance the deficit through foreign savings. Where the budget deficit coincides with pressure on interest rates and capital flows, which have become possible because of the current account deficit, and was behind the rise in the exchange rate. In the long-term, the capital outflows increases the foreign debt in reverse. Laurent Maurin, (2001)[38]. In our case, It seems that the fiscal policy shocks, did not greatly affect the exchange rate given the nature of selected (convertibility commercial) by a basket of currencies, according to supply and demand by banks on foreign currency proposed by the Bank of Algeria.

Conclusion

This paper has reviewed theory and evidence on the effects of discretionary expansions on the economy in the case of Algeria. Our results find that expansionary fiscal policy has a small effect on GDP but in the short-term. The impacts on exchange rate, private consumption are small and there is a positive effect on inflation.

A rise in public revenues (which include hydrocarbon revenues and tax revenues) has a negative impact on GDP. It seems that this rising in government revenue affect by the crowding out effect. Combined with the fact that there are lags between the identification of an economic slowdown and the implementation of a discretionary fiscal policy, using an active fiscal policy as instrument for short-run stabilization is usually beyond the capabilities of the government. The weak impact on the economic activity of fiscal impulses comes to more confirm the characteristics of fiscal multiplier in developing countries. In the theoretical and empirical literature, the large body of the literature on the fact that the response of the economic activity to

an increase in the budgetary expenditures is weak and less persistent in developing countries than in developed nations.
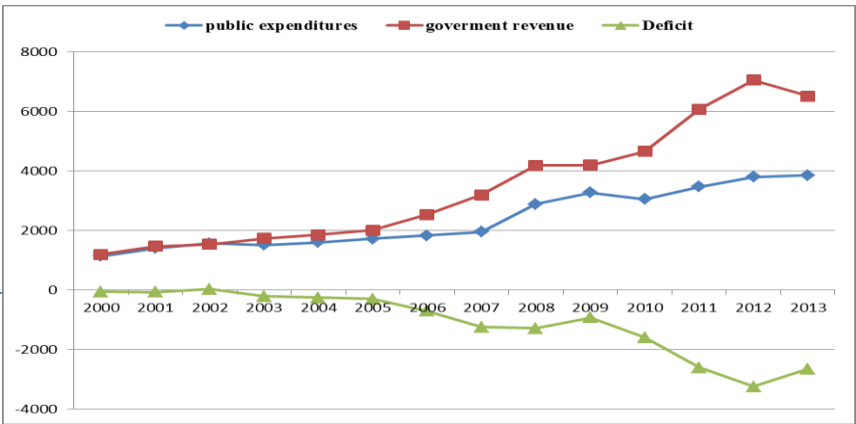
Appendices

1.Figures

Figure.1. Evolution of public expenditures as % of GDP
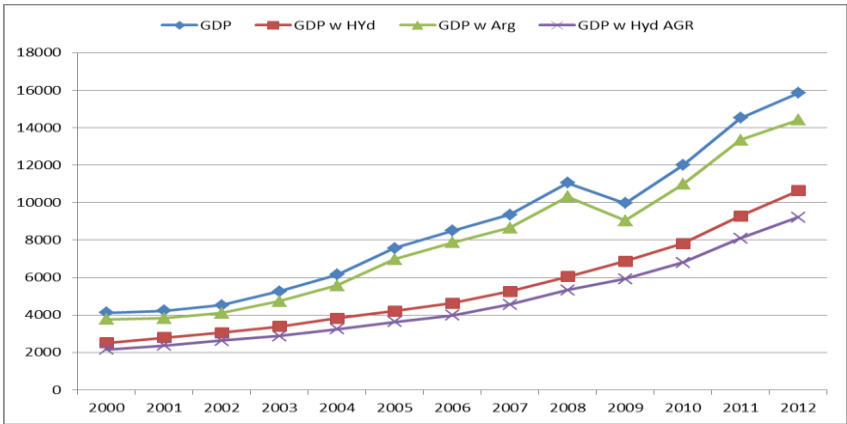
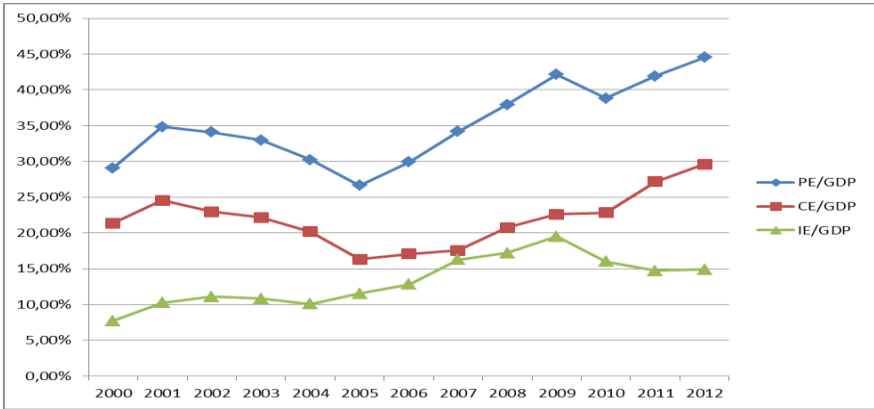PE= public expenditures, CE= current expenditures, IE = investment expenditures,

Source: ONS(2014) and Ministry of Finance (2014).

Figure.2. **Evolution of public expenditures, government revenue and deficit (2000-2013)(billion AD)**

Figure.3. Evolution GDP in current value (Mds, DA)

Figure.4. Evolution of Government revenue, hydrocarbon revenue (2000-2012).

and fiscal revenue as a part of GDP (2000-2012)
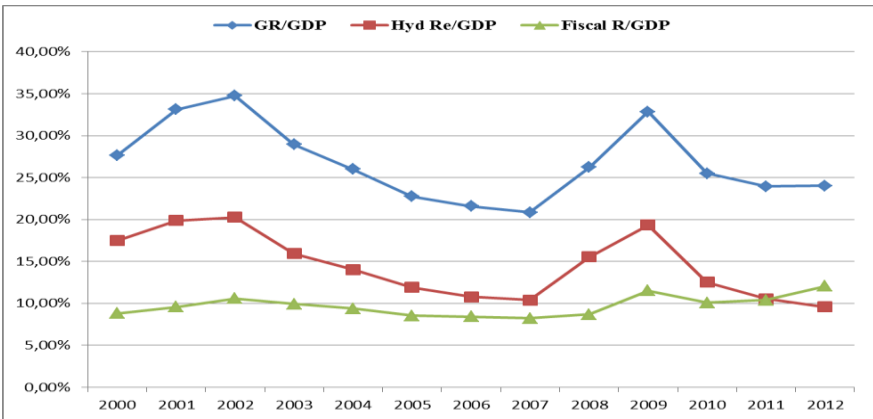
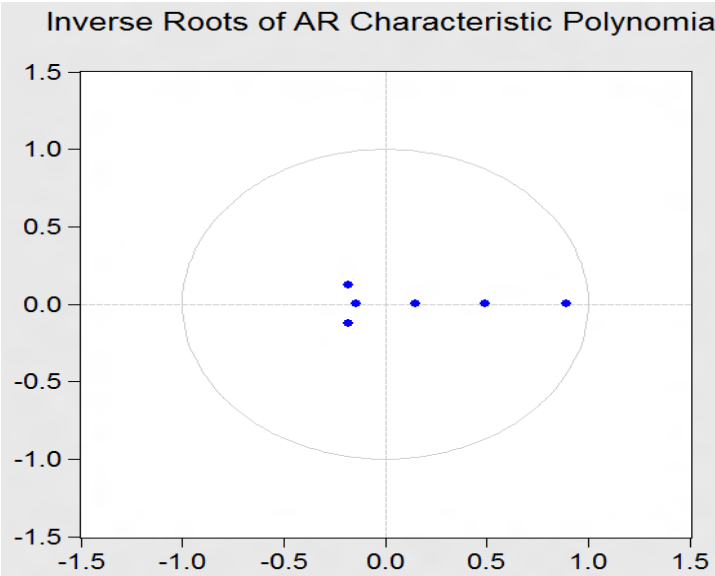**Figure.5. Global Stationarity of the model**

Figure.6. Responses of DLRB, DLDP, DLPIB, DLTC DLCONP et DINF to shock on DLRB
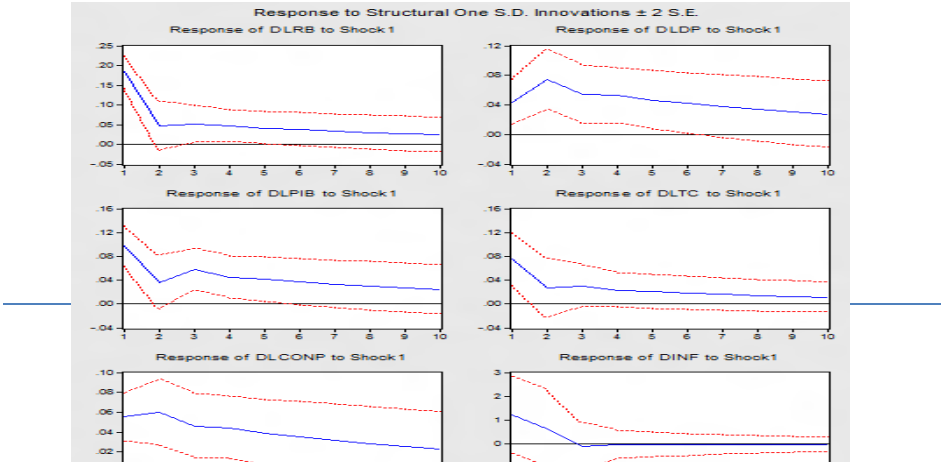
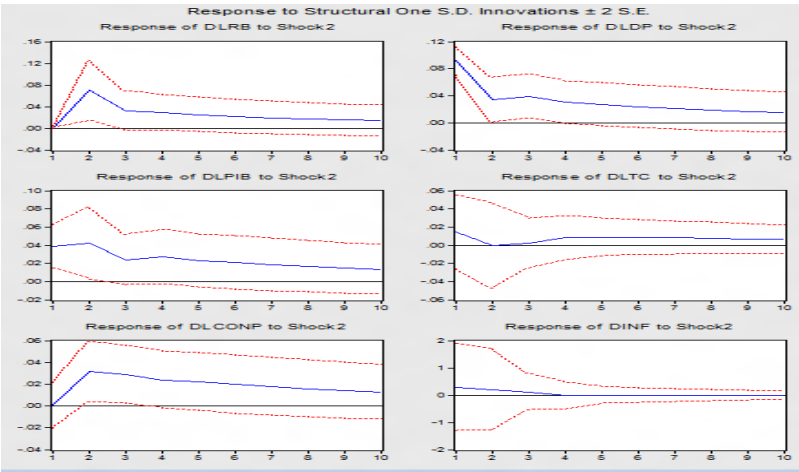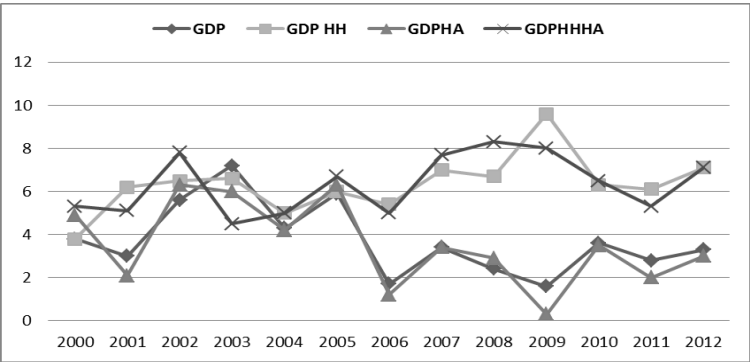**Figure.7. Responses of DLRB, DLDP, DLPIB, DLTC, DLCONP and DINF to shock on   DLDP**

Figure.8. The evolution of GDP rate, and outside hydrocarbon, and outside agriculture (2000-2012)(%)

GDPHH: without hydrocarbons,

GDPHA: without agriculture,

GDPHHHA: without hydrocarbons and without agriculture.

Source: ONS (2014).

Figure.9. The evolution of inflation rate in Algeria (1980-2015) (monthly data)(%)
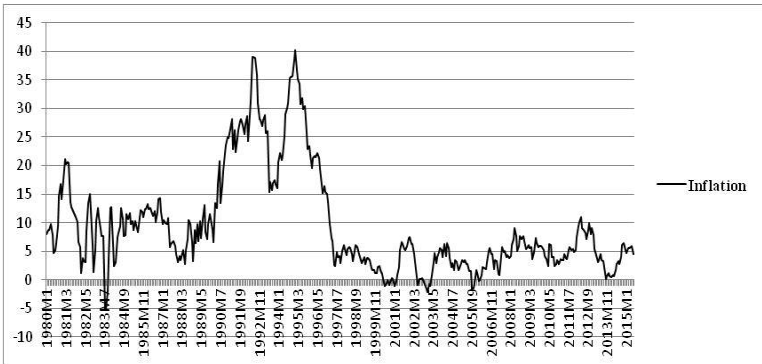
Source: ONS (2015)

2. Tables

Table.1. ADF test results

Test ADF	DLDP		DLRB		DLPIB	
	T-Student	Seuil 5%	T-Student	Seuil 5%	T-Student	Seuil 5%
1	-1.866305	-1.949319	-3.511674	-1.949319	-2.427066	-1.949319
2	-4.545360	-2.936942	-5.408693	-2.936942	-5.675511	-2.936942
3	-4.563306	-3.526609	-5.600075	-3.526609	-5.855519	-3.526609
	DLCONP		DLTC		DINF	
	T-Student	Seuil 5%	T-Student	Seuil 5%	T-Student	Seuil 5%

1	-1.798096	-1.949319	-3.611669	-1.949319	-5.893780	-1.949319
2	-4.505458	-2.936942	-4.018739	-2.936942	-5.816612	-2.936942
3	-4.891713	-3.526609	-3.958659	-3.526609	-5.803181	-3.526609

Table.2. Phillips–perron PP test results.

	DLDP		DLRB		DLPIB	
Test PP	T-Student	Seuil 5%	T-Student	Seuil 5%	T-Student	Seuil 5%
1	-1.533337	-1.949319	-3.408156	-1.949319	-2.427066	-1.949319
2	-4.553804	-2.936942	-5.371489	-2.936942	-5.675511	-2.936942
3	-4.524379	-3.526609	-5.562422	-3.526609	-5.855255	-3.526609
	DLCONP		DLTC		DINF	
	T-Student	Seuil 5%	T-Student	Seuil 5%	T-Student	Seuil 5%
1	-1.530290	-1.949319	-3.741205	-1.949319	-5.893780	-1.949319
2	-4.530960	-2.936942	-4.161592	-2.936942	-5.816612	-2.936942
3	-4.891713	-3.526609	-4.117175	-3.526609	-5.803181	-3.526609

Table.3. The results of the Johansen test

Sample (adjusted): 1972 2011
Included observations: 40 after adjustments
Trend assumption: Linear deterministic trend
Series: LDP LCONP LPIB LRB LTC INF
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.597059	109.1423	95.75366	0.0044
At most 1 *	0.521636	72.78372	69.81889	0.0284
At most 2	0.362585	43.28841	47.85613	0.1257
At most 3	0.283111	25.27502	29.79707	0.1518
At most 4	0.199403	11.96164	15.49471	0.1588
At most 5	0.073780	3.065756	3.841466	0.0800

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.597059	36.35862	40.07757	0.1237
At most 1	0.521636	29.49531	33.87687	0.1527
At most 2	0.362585	18.01338	27.58434	0.4940
At most 3	0.283111	13.31339	21.13162	0.4238
At most 4	0.199403	8.895881	14.26460	0.2949
At most 5	0.073780	3.065756	3.841466	0.0800

Table.4. The Choice of VAR order

VAR	AIC	SC
VAR(1)	-3.607	-2.103
VAR(2)	-3.444	-0.404
VAR(3)	-3.475	1.132

Table.5. Stationarity table

Root	Modulus
0.895622	0.895622
0.491201	0.491201
-0.179901 - 0.123015i	0.217939
-0.179901 + 0.123015i	0.217939
0.147163	0.147163
-0.145480	0.145480

No root lies outside the unit circle.
VAR satisfies the stability condition.

Table 6: The evolution of the structure of GDP (% of GDP) (1960-2010)

	1960	1965	1980	1990	2000	2010
Agriculture	18,58	12,88	8,51	11,36	8,88	8,4
Industry	29,37	37,73	57,65	48,17	58,61	65,2
Including Transformation Industry	15,12	13,3	10,55	11,38	7,46	5

Including Petroleom Industry	11,1	13,12	31,5	22,6	39,2	34,7
Services	52,05	49,4	33,84	40,47	32,51	35,4

Source: Bouyacoub Ahmed, « Quel développement économique depuis 50 ans ? », *Confluences Méditerranée*, 2012/ 2 N°81, p. 86.

References

[1] **Banque d'Algérie.** (2014), Tendances monétaires et financières au quatrième trimestre de 2013.

[2] Office National des Statistiques 2014a. Les comptes économiques en volume de 2000-2012. N°648.

[3] The supplementary budget law is usually published to modify or update the projections of the annual budget law to deal with the economic.

[4] Taxes on corporate profits

[5] This sale was even publicly criticized by Algerian President Bouteflika during a public speech calling it treason and a knife in the back.

[6] Ordonnance n09-01 du 22 juillet 2009 portant loi de finances complémentaire pour 2009 et l'Ordonnance n° 10-04 du 26 août 2010 modifiant et complétant l'ordonnance n° 03-11 du 26 août 2003 relative à la monnaie et au crédit.

[7] Crédit populaire d'Algérie

[8] Banque de développement local

[9] Compagnie algérienne d'assurance et réassurance

[10] Banque algérienne de développement rural

[11] **Fonds Monetaire International**, 2007. "Algérie : Questions choisies".,Rapport du FMI No. 07/61.

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