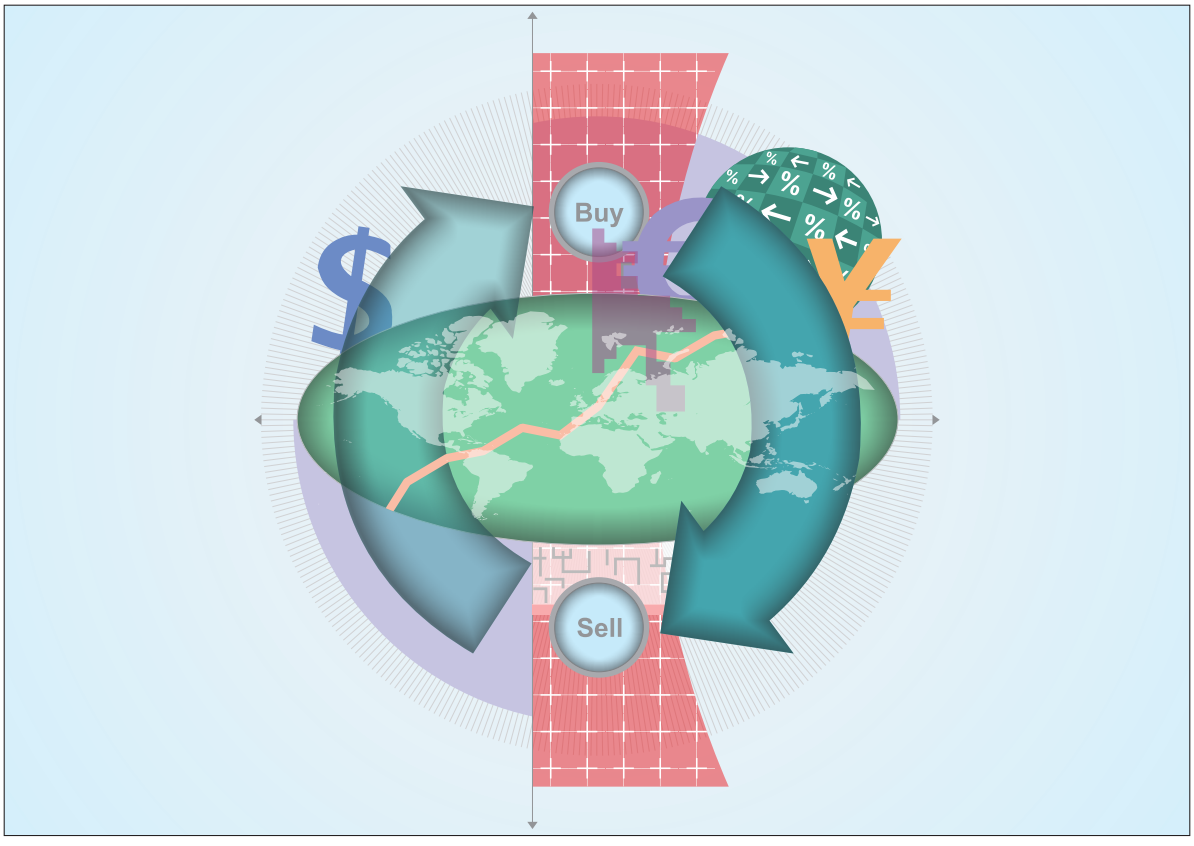

The International Journal of Applied Economics & Finance

ISSN 1991-0886

science alert

ANSInet
an open access publisher
http://ansinet.com

The International Journal of Applied Economics and Finance 8 (2): 29-42, 2014
ISSN 1991-0886 / DOI: 10.3923/ijaef.2014.29.42

A CGEM Analysis of the Impact of the Financial Crisis on the Algerian Economy

[1]Touitou Mohammed, [2]Abul Quasem Al-Amin and [3]Gazi Mahabubul Alam
[1]High National School of Applied Economics and Statistics, 11 Rue Doudou Mokhtar, Ben Aknoun, Algiers, Algeria
[2]International Business School, Universiti Teknologi Malaysia, Kuala Lumpur, Jln Semarak, Malaysia
[3]Academic Performance Enhancement Unit, University of Malaya, Kuala Lumpur, 50603, Malaysia

Corresponding Author: Touitou Mohammed, High National School of Applied Economics and Statistics, 11 Rue Doudou Mokhtar, Ben Aknoun, Algiers, Algeria

ABSTRACT

Over the past decade, the global economy has gone through a severe recession triggered by a financial catastrophe and the slowdown of global commercial and industrial activity. This slowdown has weighed heavily on global economic growth. Algeria, which is not fully integrated into the international economy, feels the impact of the economic slowdown but on a level much more timid than that experienced by Europe. Algeria has all the potential human and material resources to be a pivotal country in development the Euro-Mediterranean and Arab-Africa. This requires development based on a coherent economic policy. This study conducts a Computable General Equilibrium Model (CGEM) analysis of the impact of the financial crisis on the Algerian economy with particular focus on hydrocarbon revenue. The analysis seeks to simulate the effects of decline in oil prices by 50%. The results of the model used in this study show that the state budget and investment heavily suffer for the effects of the financial crisis. The study concludes that the structural weaknesses of the Algerian economy remain extroverted and strongly oriented towards the exploitation of unprocessed raw materials.

Key words: Financial crisis, Algerian economy, social accounting matrix, CGEM

INTRODUCTION

The current Global Financial Crisis (GFC) is unlike the international economic crises of 2001-2002 or 1990-1991 (Martin and Machicado, 2011). According to United Nations Economic Commission for Latin America and the Caribbean (CEPAL), the world is experiencing the worst crisis since the thirties, as it is affecting the real sectors of most economies around the world. Although it can be compared to the great depression, it has certain peculiarities that make it different and a subject that has to be analysed with stringency. The GFC is a financial-banking crisis that emerged in a period of unprecedented sustained growth of the world economy. According to Cecchetti *et al.* (2009) while banking crises may be quite common, financial crises also tend to be quite diverse: initial conditions are different, industrial and institutional structures are different, levels of development are different, degrees of openness are different, policy frameworks are different external conditions are different (Reinhart and Rogoff, 2009).

It is a poly-sectorial crisis. The industries have returned at half-mast, exports of goods and services are in decline. The result is that the global financial crisis has seen the largest and sharpest

drop in global economic activity of the modern era. In 2009, most major developed economies find themselves in a drop recession. The fallout for global trade, both for volumes and the pattern of trade has been dramatic. The OECD predicts world trade volumes could shrink by 13% in 2009 from 2008 levels (Mckibbin and Stoekel, 2009). Due to globalization, the crisis has spared no one. It affects both rich and poor countries. Algeria recorded a growth of 2.4% in 2008, appearing capable of bearing the impact of the global financial crisis. The payment of debt in advance and the establishment of a reserve fund the price boom in hydrocarbons all contributed to Algeria's ability to absorb the short-term effects of the crisis (Khellif, 2009).

However, Algeria which collects nearly 98% of its export revenue from the sale of hydrocarbons is not immune to the eternal effects of the crisis .Algeria is affected by the crisis through various factors related to hydrocarbon exports. The decline in exports resulting from a slowdown in global energy demand and the depreciation of the dollar threatens the value of exports and has created grave uncertainties in the international market price of oil. Such factors directly threaten the Algerian economy and its ability to absorb the financial crisis in the long term.

An analysis of the structure of the economy, the impact of the international crisis on industrialized countries (the largest consumer of oil) and its impact on Algerian exports of hydrocarbons, along with the evolution of the balance of payments, can identify the transmission channels of the impact of the financial crisis on the Algerian economy. The sharp drop in oil prices combined with a global economic recession significantly reduces export earnings and threatens the country's fiscal standing.

In Algeria, hydrocarbon account for over 50 of the GDP and 98% of Algerian exports. Soaring oil prices between 2006 and 2008 has allowed Algeria to garner input on major currencies (Khellif, 2009). This windfall has helped to reduce the external debt and launch a comprehensive economic development program valued at more than 150 billion US Dollars. With the economic downturn, like the prices of other commodities, oil prices have suffered the effects of the downturn through a sharp fall in price in international markets.

Computable general equilibrium models have some limitations in their ability to analyse a financial crisis, however, they have been used to generate insights into the impacts of previous economic crises (Anderson and Strutt, 1999; Mckibbin *et al*., 2001; Siriwardama and Iddamalogan, 2003). Some efforts to model the current crisis have also been made, including through the use of comparative statics of the well-known Global Trade Analysis Project (GTAP) model (Jongwamich *et al*., 2009; Strutt and Walmsley, 2009). This study performs a CGEM analysis the impact of the financial crisis on the Algerian economy with particular focus on hydrocarbon revenue. The analysis is to simulate the effects of lower oil prices by 50%. Unlike the first, it allows us, despite the static nature of the model used for the analysis of the impact of falling oil prices on the sectors and economic variables.

MATERIALS AND METHODS

Hydrocarbons in the Algerian economy: The Algerian economy is based predominantly on the exploitation of hydrocarbons. It is the main source of income (98% of Algeria's total exports). During the last decade, hydrocarbon revenues have funded various stimulus programs and significantly reduce the country's external debt. Gross Domestic Product (GDP) remains strongly influenced by the behaviour of the hydrocarbon sector with a percentage of 52% and the rest for the other sectors as shown in the Fig. 1.

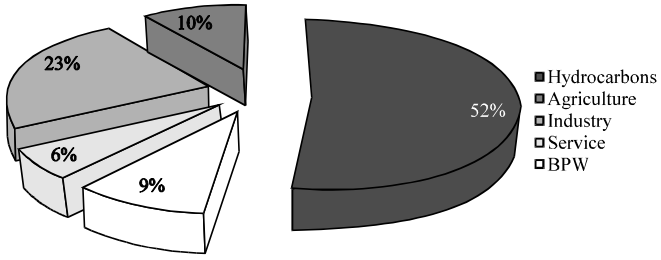

Fig. 1: Contribution of the hydrocarbons to GDP in 2007. Algerian national office of statistics, Algerian ministry of finance

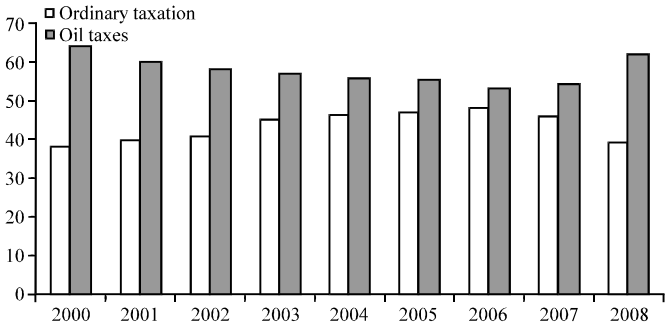

Fig. 2: Contribution of oil taxes to the state budget. Algerian ministry of finance

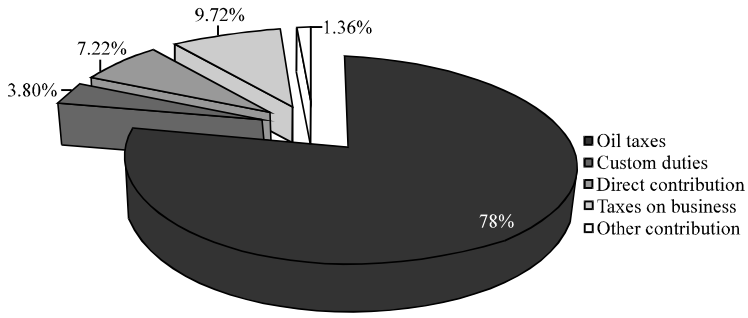

Fig. 3: Contribution of hydrocarbons to the total revenue of the state in 2007. Algerian ministry of finance

Hydrocarbons revenues contribute significantly to the state budget through oil taxes. During the last decade when oil prices showed significant increases (97 dollars on average in 2008), the contribution of oil taxes to the state budget is around 60% (Fig. 2).

A careful examination of the contribution of oil taxes during 2007 and taking into account the hydrocarbons revenues paid to the revenue regulation fund, noted that the oil taxes is the main resource of the state revenue compared to other fiscal resources (Fig. 3). This shows the fragility of public finances facing a sharp drop in crude oil prices. Thus, the transmission of the global financial crisis through the price of crude oil will highlight, again, the structural vulnerability of the Algerian economy in the sense that the decline in crude oil prices recalls the strong relationship between the state budget and economic growth through public investment.

Technique: The model proposed in our study, concerned a small open economy. It draws on the work of Dervis *et al.* (1982) and De Melo and Tarr (1992). It is a static CGE model similar to the

model of EXTER-1 by Decaluwe *et al.* (2001). The model is essentially walrasian in the sense that it determines only relative prices and other variables in real sphere of the economy.

The main agents used in the present model are firms, households, government and the international market. The model is presented as a sensible set of simultaneous equations describing the behaviour of economic agents. It is calibrated on the basis of the SAM for years 2009. Goods are produced using primary factors and intermediate products. The primary factors are labour and capital. The capital is sector-specific while labour is mobile between sectors. Production is constant returns to scale and firms operate in a perfectly competitive market. In the export sector, there is no difference between production for the domestic and international market.

The other assumptions used to describe the different parts of the model, namely the production block, generation of income and expenditure of economic agents, called block-savings income, as well as block of trade and the prices. This concludes of the description of the model closure rules and equilibrium conditions.

Concerning the block of production, labour and capital are substitutable in determining the value according to a Cobb-Douglas relationship to technical unitary elasticity of substitution between labour and capital which are constant returns to scale, if there is zero elasticity of substitution between the intermediate input and the set of inputs or value added.

Household income is composed of wage payments, the share of capital that accrues to households and net transfers from the state and the rest of the world while corporate income consist of product sales and net transfers paying wages, taxes linked to production intermediate consumption purchased from the remuneration of capital accruing to households. The state revenue includes direct and indirect tax revenues, receipts consist of tax on Value Added Tax (VAT), Customs Duties (CD) and other taxes on products and activities.

Concerning the final domestic demand, households determine demand for each good through the composite utility function of Cobb-Douglas. The choice of this specification is motivated by the fact that this function is characterized by elasticity's of substitution and income unit. Using this function chose to consider the budget share of household consumption allocated to each asset is constant, that is to say that the structure of the household budget does not change in the medium term. Total consumption of the state is distributed among the different composite products according to a fixed proportion.

In the modeling of imports, this study has adopted Armington (1969) hypothesis that product differentiation by country of origin and domestic and imported goods are imperfect substitutes in demand condition. By cons, this study also uses export processing, using a function Constant Elasticity of Transformation (CET) is introduced by Powell and Gruen (1968). The export supply is no longer determined by a residual surplus of production over consumption it is derived optimally by the producer. This specification avoids overestimating the export supply response to trade policy changes or exogenous shocks and thus solve the problem of specialization on the export side.

Different prices used in the model are the price of value added to the composite prices, domestic prices, the production prices the rate of return on capital, import prices and export prices. Finally, in equilibrium conditions this study chose a classic loop where macroeconomic equilibrium is always guaranteed by adjusting the total investment level of savings. Since only relative prices are factors in the decisions of economic agents, the nominal exchange rate is chosen as the cash of the model.

In the economy that have just described, the structure of supply and demand would be in equilibrium if it simultaneously performs the macroeconomic balance by equalizing exports

investments and savings, the balance on all goods markets and services, as well as the balance of the balance of payments. The balance of the rest of the world is derived, hypothetically, the balance of the balance of payments. In fact, the world does not produce a transformation Boundary and Linear Supply System (BLSS), behaviour deduced from an optimization rule would derive explicit functions, export demand and import supply optimally (Devarajan *et al.*, 2000; Robinson *et al.*, 1999). It is also assumed to be able to offer an unlimited amount of import and absorb an unlimited amount of export prices.

The modelling of trade requires explicitly introduce the exchange rate (Robinson *et al.*, 1999). However, the determinants of the exchange rate are ignored because of the actual model. This exchange rate may a conversion factor of international prices in domestic currency. In the present model, the adoption of a fixed nominal exchange rate, chosen as cash, with exogenous capital flows is that the balances of payments depend on the trade balance. The present modelling technique considers several blocks which are duly presented in the following section.

Production block: Equation 1-2 for general production in this present study as follows:

$$XS_j = \frac{VA_j}{v_j} \tag{1}$$

$$Ci_j = i0_j XS_j \tag{2}$$

where, VA_j is a value-added and Ci_j represents the sum of intermediate consumption of the branch j.

In addition, v_j, io_j are two fixed parameters technologists, that given the production function of the first level and intermediate consumption necessary to product one unit of the product composite product where it cannot bring the product composite by the intermediate products. The value-added factors (capital and labor) analyzed with each other according to the Eq. 3, "Cobb Douglas":

$$VA_j = A_j^{v} LD_j^{\alpha} KD_j^{1-\alpha} \tag{3}$$

Where:

A = Scale coefficient
LD = Work Request
KD = Capital request
α = Value-added flexibility with regard to the use of labor
1-α = Value-added flexibility with regard to the use of capital intermediate consumption for branch (j) from the entrance intermediate (i) is given in Eq. 4:

$$DI_{i,j} = aij_{i,j} CI_j \tag{4}$$

where, aij represents the size of the entrance intermediate (i) of the order unit request intermediate (j) request unit labor from sector (i) that which maximizes the gross profit is given by relationship Eq. 5:

$$LDj = \frac{\alpha_j PV_j VA_j}{w}^{\frac{1}{2}} \quad (5)$$

Where:
Pv_j = Value-added rate

Income-spending block: Household income YM consists from wages paid from the capital belonging to the household and net transfers that come from the state and the rest of the world and which symbolized, respectively TRAGM, TRARM:

$$YM = \sum_j w \times LD_j + \varphi \sum_j r_j \times KD_j + TRAGM + TRARM \quad (6)$$

Where:
Q = Excess exploitation, which dates back to the families
W = Wage rate
r = Rate of return of capital

Household income available for consumption (YDM) is a net income from tax income (IRM) paid to the state as described in Eq. 7:

$$YDM = YM\text{-}IRM \quad (7)$$

$$IRM = ty_m \times YM \quad (8)$$

Household saving (SM) gives by the relationship given in Eq. 9:

$$SM = S_m \times YDM \quad (9)$$

Where:
SM = Marginal propensity to save

Corporate revenues is composed of sales products and net transfers from the state and this after paying wages, taxes related to production, intermediate consumption purchased return on capital of the household as shown in Eq. 10:

$$YE = (1-\varphi)\sum_j r \times KD_j + TRAGE \quad (10)$$

Other expenses of institutions composed of direct taxes on revenues (IDE) paid according to the ratio shown in Eq. 11:

$$IDE = tye \times YE \quad (11)$$

Surplus income over expenditure, consisting of the total savings, which are equal to Eq. 12:

$$SE = YE\text{-}IDE\text{-}TRAERM \quad (12)$$

where, TRAERM represents a net transfer of institutions for the rest of the world.

State revenue represents direct and indirect tax revenue, this latter consists of the Value-Added Tax (VAT) taxes and fees on import (TDI) and other taxes on products and activities. TVA Applied to the part no imports from domestic production and imports denominated in local prices:

$$TVA_j = tv_j(P_jXS_j - PE_jEX_j) + tv_j(1 + tm_j)PWM_jER.M_j \quad (13)$$

Where:

tv = Value-added ratio and the tax revenue given from taxes on factors of production (production-related taxes) by relationship given in Eq. 14:

$$ILP_j = tp_jP_jXS_j \quad (14)$$

Where:

tp = Average tax rate on the factors of production

The relationship of tariffs on product is given in Eq. 15:

$$DT_j = tm_jPWM_jER.M_j \quad (15)$$

Where:

PWM = World price of imports
Pwe = World price of export
Tr = Exchange rate
Tm = Fee rate tariffs

The general income of state is given in Eq. 16:

$$SG = YG\text{-}CG\text{-}TRAGM\text{-}TRAGRM \quad (16)$$

Where:

YG = Amount of the expenses of public administrations
CG = Transfers related with institutions and household and for rest of the world

And the commercial margins represented at rates of production sold locally to import as Eq. 17:

$$MC_j = tmc_j(PD_jD_j + PM_jM_j) \quad (17)$$

Domestic block: Maximize the utility function under budget constraints (Eq. 18):

$$\sum_i PQ_iCM_j^{\beta i} = YDM \quad (18)$$

Where:

PQ = Price of the commodity complex (composite product) i and the demand for each product based on price, income the budget proportions

The investment demand for various products is given by Eq. 19:

$$CM_i = \beta_i \times \frac{YDM}{PQ_i} \tag{19}$$

The investment for different products can be found by Eq. 20:

$$INV_i = \frac{\mu_i IT}{PQ_i} \tag{20}$$

Where:

INV = Size of the investment demand for the product I

IT = Total investment of the country (by value)

μ = Share (by value) of the product i in total investment (gross) of the country as follows:

$$\sum \mu = 1$$

$$(0 \le \mu \ge 1)$$

This means that there is for a level of investment unitary elasticity of substitution between different products that been.

Total consumption CG divided between different structured products according to fixed rates, as shown in Eq. 21:

Where:

$$\sum_t g_i = 1$$

$$CG_i = g_i \frac{CG}{PQ_i} \tag{21}$$

And, intermediate demand for entrance (DTI) i is the sum of all requests for this portal from branches j as shown in Eq. 22:

$$DIT_i = \sum_i aij_{ij} CI_j \tag{22}$$

Export block: Assuming a small country means that the demand curves for the rest of the world infinitely flexible, the offer from the exploitation of the country is relatively small, so that the terms of trade are external. Suppose that the product of the product (j) can affect the total production (XS) to varying degrees on export sales (EX) and domestic sales (D) This shift between (EX) and (D) are the same flexible shift commercial fixed and limited (r2) as in Eq. 23:

$$XS_j = \beta_j^e \left[\lambda_j^e EX_j^{-k_j^e} + \left(1-\lambda_j^e\right) D_j^{-k_j^e} \right]^{\frac{-1}{k_j^e}} \tag{23}$$

$$(-\alpha < K^e < -1)$$

$$K_j^e = \frac{1-\tau_j^e}{\tau_j^e}$$

$$(-\alpha < p^e < 0)$$

Where:

β = A fixed parameter at the level of commercial transfer function

λ = Size distribution parameter related to the volume of imports by the following boundaries:

$$0 < \lambda < 1$$

Through the Eq. 23 maximizing gross profit for the product (j) requires:

$$D_j = \left[\left(\frac{1-\lambda_j^e}{\lambda_j^e} \right) \left(\frac{PE_j}{PI_j} \right) \right]^{\tau_j^e} EX_j \tag{24}$$

This allows the equation linking the ideal relationship, from the point of view of producers, between the size of the supply in the domestic market and supply in the foreign market (Eq. 25):

$$D_j = \left[\left(\frac{1-\lambda_j^e}{\lambda_j^e} \right) \left(\frac{PE_j}{PI_j} \right) \right]^{\tau_j^e} EX_j \tag{25}$$

Import block:

$$Q_j = A_j^m \left[\delta_j^m M_j^{-p_j} + \left(1-\delta_j^m\right) D_j^{-p_j} \right]^{\frac{1}{p_j}} \tag{26}$$

Distribution parameters for alternatives sources shown in Eq. 26 represent, respectively, composite products (j) and dismal fixed function replacement commercial terms:

$$0<jm<1$$

$$-1<p_j<\alpha$$

The elasticity of substitution between domestic and imported goods defined as follows:

$$\delta_j = \frac{1}{1+p_j}$$

Where:
PD = Domestic price
PM = Local currency price of the imported products

This feature allows calculating the degree of substitution (replacement) and hence the degree of differentiation between domestic and imported goods before.

In fact, depending on the level of flexibility import substitution can be perfect substitutes for domestic goods when j = 0.

The reduction of the total cost of the product compound (j) requires the relationship as shown in Eq. 27:

$$\frac{M_j}{D_j} = \left[\left(\frac{1-\delta_j^m}{\delta_j^m}\right)\left(\frac{PD_j}{PM_j}\right)\right]^{\delta_j} \tag{27}$$

This allows reducing the demand equation for the import of the product (j) (Eq. 28).

$$M_j\left[\left(\frac{1-\delta_j^m}{\delta_j^m}\right)\left(\frac{PD_j}{PM_j}\right)\right]^{\delta_j} D_j \tag{28}$$

Price block: The price of value added (PV_j) set of this composite price and the cost price (P_j) is shown in Eq. 29:

$$PV_j = \frac{P_j XS_j - \sum_i PQ_i DI_{ij}}{VA_j} \tag{29}$$

And is determined return on capital as shown in (Eq. 30):

$$PV_j.VA_j = r_j KD_j + wLD_j$$

or

$$r_j = \frac{PV_j.VA_j - wLD_j}{KD_j} \tag{30}$$

Import price equal to the international price+internal customs duties (Eq. 31):

$$PM_j = ER \times PWM_j(1+tm_j)(1+tv_j) \tag{31}$$

Price of exports is linked to the international price by the relationship in Eq. 32:

$$PE_j = ER \times PWE_j \tag{32}$$

It is assumed that the exports are not supported and not contain a fee for export activities. The price of the local product sold in the international market at the market price (PD) is equal to the difference between the overall width of the product (Q) at composite price (PQ) and the value of exports of this product (M) by it price (PM) by unit sold locally (Eq. 33):

$$PD_j = \frac{PQ_jQ_j - PM_jM_j}{D_j} \tag{33}$$

The price which the producer gets on it soles in the domestic market (PI) as according to Eq. 34:

$$PI_j = \frac{PD_j}{(1+tv_j)} \tag{34}$$

The price received by the producer is a weighted average between the value of domestic production and exports as shown in Eq. 35:

$$P_j = \frac{PI_jD_j + PE_jEX_j}{XS_j} \tag{35}$$

And finally defined the price index of domestic crude output (P_{index}) for price factors, presented in Eq. 36:

$$P_{index} = \sum_j Pv_jw_j \tag{36}$$

where, W represents the share of value added of the sector (j) on by priced factors in the particular case:

$$\sum_j w_j = 1$$

Equilibrium conditions: Balance requirement in the market for goods and services is achieved equally between demand and supply of goods as shown in Eq. 37:

$$Q_j = CM_i + CG_i + INV_i + DIT_i \tag{37}$$

Balance the labor market by the relationship given in (Eq. 38):

$$LS = \sum_j LD_j \tag{38}$$

Balance investment savings is given in Eq. 39:

$$IT = SM + ES + SG + SR \tag{39}$$

The balance of the rest of the world is described in Eq. 40:

$$SR = ER \times \sum_j PWM_j \times M_j - ER \times \sum_j PWE_j \times EX_j + [TRAERM + TRAGRM - TRARM] \tag{40}$$

RESULTS AND DISCUSSION

Through the results obtained from these simulations, the first effect of this shock is the low revenue of the hydrocarbon sector by -19.54% which occurs due to the collection of petroleum in the same proportion, exerting downward pressure on total income of the state by -17.94% which represents a loss in annual income for the base year. This is a direct impact on the hydrocarbon sector and the state budget is reflected in the rest of the sectors and economic units. The level of production recorded an increase in the production of some sectors the impact was negative on most of the other sectors records the same observations for value added and the intermediates consumptions. The results show that the volume of production has declined in some sectors, especially the construction and public works sector that increased by 14.10-%, the service and public works, petroleum sector by 11.84-% building materials sector by 5.26-% that of the link between these sectors and revenues of the hydrocarbon sector.

There was record decline in production in the water and energy by-1.56% , the trade sector by 1.01-%, the textile sector by -0.87% and note that these percentages reflects the response of these sectors to be affected by lower global oil price. This reflected positively on production in other sectors. In agriculture, production rose by 1.70% and in the agricultural food industries sector by 0.30% while in the mining sector production rose by 11.90% with 5.38% in the wood, cork and paper sector with 6.10% in other industries. The increase of production in the service sectors as a sector hotels, cafes and restaurants by 5.00% and the sector of services provided to institutions 6.26%. It should be noted that the rates of change were similar in the three variables, production, value added and the intermediate consumption. This is due to the nature of the Leontief function of production selected in this model which means that production is formed through the value added caused by the factors of production used in the production process on the one hand the intermediate consumption needed on the other hand. Any change in the volume of production is accompanied by the same change in them (i.e., the value added and the intermediate consumption). Considering that the GDP is the total value added, it has decreased by 17.22%, due to the rise in value added in some sectors. The results obtained for the overall effects of the 50% drop in oil prices indicate that the impact of lower oil prices, ultimately leads to a fall in gross production (-2.94%). A thorough analysis of sectorial outputs, suggests that this decrease in gross production is mainly due to the fall in output of building and public works sector, followed by the industry sector and hydrocarbons.

Imports recorded a decline of 14.5% and final consumption falls by more than 25%. These declines were due to falling corporate earnings (-18.66%) and households (-7.10%). The state saving suffered the brunt of the fall in oil prices by (-52.10%), resulting in a decline in investment demand more than 24%. At the sectorial level, the investment demand recorded a decline, particularly in building, public works services sector. For intermediate demand, the industrial sector

recorded the largest decline (-10.90%).The unemployment rate rose by -5.21% due to the decrease in the demand for labor in most economic sectors, the aggregate demand for labor fell -1.74% this in spite of the growing labor force increased by 2.84% in public administrations that did not change the rate of pay as the external variable in the model. In other sectors, wage rates decreased by -17.42%.

This study concludes that the economic crisis caused by the decline in global oil price, adversely affects most economic sectors including the hydrocarbons, construction industry public works in spite of the relative improvement in some sectors, such as agriculture, in addition to the deterioration of the indicators that reflect the level of living of the individual, such as income and high unemployment. Investment falls sharply in the sectors of BPW and services as they are the main growth centres. Only the hydrocarbons sector seems to react positively by increased investment. Paradoxically, it seems to be consistent with the historical economic reality of Algeria. Whenever the Algerian economy is entering a depression, the hydrocarbons sector has been developed or is relatively exempt from the effects of depression. Throughout the 90s, a critical period for the Algerian public sector, the hydrocarbons sector received significant investments that maintained its growth. This is good indication that the hydrocarbon sector plays the role of adjuster in the Algerian economy. The decline in production during shock is not inconsistent with the increase in investment. This can be explained by the reaction of OPEC in general quota reviews to keep prices at a certain level.

CONCLUSION

The model developed in this study put out clearly the importance of oil prices in the growth of the Algerian economy and in particular the non-tradable sector. The results of the model used in this research show that the state budget and investing heavily suffer the effects of the financial crisis and reinforce exactly the observed reality. Also, these results could highlight the structural weaknesses of the Algerian economy remains extroverted and strongly oriented towards the exploitation of unprocessed raw materials. Despite the vulnerability that it exposes the Algerian economy; the hydrocarbons sector is however, the adjustment mode preferred by the government both internally and externally. Hydrocarbons have consistently made the strategic lever to loosen the constraints on the country. This recurrent use hydrocarbons as the main adjustment variable implies the failure of the government to produce, through reforms, other control variables in the national economy that would reduce exposure and vulnerability to external shocks. The results of the model used in the research were to highlight the structural weaknesses remain and prospects and long-term uncertainty.

This study concludes that the economic crisis caused by the decline in the world price of oil, adversely affect the most economic sectors sensitive a sector of fuel and construction and public works sector. Despite the relative improvement in some sectors such as agriculture, for example, in addition to the deterioration of the indicators that reflect the level of living of the individual such as income and high unemployment. There are many factors that affect the results of the percentages that have been found in the change in the value of variables this is due to the imperfections which is characterized by the model reflected changes in the price petroleum on development policies and economic reforms in Algeria since independence this is what requires the application of development policy effective exploitation appropriate revenue petroleum encourage production in non-oil sectors by diverting proceeds fuels to productive assets alternative could constitute income always of the country. The Algerian economy is extroverted and strongly oriented towards the exploitation of unprocessed raw materials.

REFERENCES

Anderson, K. and A. Strutt, 1999. Impact of East Asia's growth interruption and policy responses: The case of Indonesia. Asian Econ. J., 13: 205-218.

Armington, P.S., 1969. A theory of demand for products distinguished by place of production. IMF-Staff Pap., 16: 159-178.

Cecchetti, S.G., M. Kohler and C. Upper, 2009. Financial crises and economic activity. NBER Working Paper No. 15379, National Bureau of Economic Research, September 2009.

De Melo, J. and D. Tarr, 1992. A General Equilibrium Model of US Foreign Trade Policy. MIT Press, Cambridge, MA., USA., ISBN-13: 9780262041225, Pages: 289.

Decaluwe, B., A. Martens and S. Savard, 2001. The Economic Development Policy and Computable General Equilibrium Models. Montreal University Press, Montreal, Canada.

Dervis, K., J. de Melo and S. Robinson, 1982. General Equilibrium Models for Development Policy. Cambridge University Press, New York, USA.

Devarajan, S., G.D. Lewis and S. Robinson, 2000. Getting the model right: The general equilibrium modeling approach to adjustment policy. IFPRI Research Paper, International Food Policy Research Institute (IFPRI), USA.

Jongwamich, J., W.E. James, P.J. Minor and A. Grennbum, 2009. Trade structure and the transmission of economic distress in the high-income OECD countries to developing Asia. ADB Economics Working Paper Series No. 161, Asian Development Bank.

Khellif, A., 2009. Collective work under the direction of Khellif Amour: Market dynamic recovery of hydrocarbons. Centre de Recherche en Economie Appliquee pour le Developpement (CREAD), Algiers, Algeria.

Martin, C. and C.G. Machicado, 2011. Effects of the global financial and economic crisis on the bolivian economy: A CGE approach. Working Papers, CEDLAS, Universidad Nacional de La Plata, June, 2011.

Mckibbin, W.J., Z. Wang and W. Cogle, 2001. The Asian financial crisis and global adjustments: Implications for US agriculture. Jan. Econ. Rev., 52: 471-490.

Mckibbin, W.J. and A. Stoekel, 2009. The potential impact of the global financial crisis on world trade. Policy Research Working Pepper No. 5134, November 2009.

Powell, A.A. and F. Gruen, 1968. The constant elasticity of transformation production frontier and linear supply system. Int. Econ. Rev., 9: 315-328.

Reinhart, C.M. and S.K. Rogoff, 2009. This time is different: A panoramic view of eight centuries of financial crises. Economic Report, National Bureau of Economic Research, Cambridge, MA., USA.

Robinson, S., A. Yunez-Naude, R. Hinojosa-Ojeda, J.D. Lewis and S. Devarjan, 1999. From stylized to applied models: Building multisector CGE models for policy analysis. North Am. J. Econ. Finance, 10: 5-38.

Siriwardama, M. and A. Iddamalogan, 2003. Effects of the Asian economic crisis on Singapore and its policy responses: A general equilibrium analysis. UNEAC Papers No. 6, UNE Asia Centre.

Strutt, A. and T. Walmsley, 2009. Trade and sectoral impacts of the global financial crisis: A dynamic CGE analysis. Proceedings of the ARTNet Asia-Pacific Trade Economists Conference: Trade-Led Growth in Times of Crisis, November 2-3, 2009, Bangkok, Thailand.