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Impact Of Financial Crisis On Macroeconomic Variables In The MENA Region: The Case Of Oil Shocks

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Abstract: The impact of oil price shocks on the economy has occupied the attention of researchers for almost four decades. Majority of studies support the existence of a negative association while some recent evidences seem to have popularised the view that outcomes are the artefacts of misspecified functional forms. This study though similar in spirit to this popular opinion is however distinct in a number of ways. This paper explores alternative measures of oil price shocks that have been developed and used in the literature with a view to ascertaining the extent to which conclusions about the oil price-growth association depends on the definition of shocks adopted. More importantly this, to the best of our knowledge, is a pioneer attempt at introducing effects into the linkage between oil price shocks and output growth in MENA. The relatively recent regime dependent multivariate, together with the characteristic impulse response functions and forecast error variance decomposition, is adopted in this study.

Key words: Financial crisis, oil shochs, MENA, VAR

INTRODUCTION

Since the early 70s, much attention has been paid to correlations between the fluctuation of oil prices and economic activity. Empirical studies show that these shocks in oil prices have always been followed immediately by global economic crises and periods of inflation have prompted numerous studies. Following the study of the transmission mechanism of shocks to oil prices in the economy, many researchers have argued that, in general, there is a connection between the fluctuation of oil prices and macroeconomic performance.

This theoretical link between macroeconomics and the evolution of oil prices has been widely applied and tested using various econometric methods on essentially the economy of the United States and other OECD countries. However, analysis of the impact of the volatility of oil prices on macroeconomic variables is complicated by other major events and changing economic environments, the period during which price changes occur. This raises an important question, but difficult, that does not lend itself to sweeping generalizations, namely "how to apply cause-effect relationship between the fluctuation of oil prices and key indicators / macroeconomic aggregates? This question was more relevant at the outset (during the 70s and early 80s), but is being gradually resolved, as the techniques and methodologies are refined and become more complex, facing the increasing complexity of phenomena and economic environments. Although a surge in energy prices and disruptions related to the supply of petroleum products in the U.S. economy have preceded most recessions since World War II, this does not mean that the oil shocks are the source of macroeconomic distortions. Hamilton (83) advanced the following three hypotheses to explain the relationship between oil shocks and the production of: i) the historical coincidence ii) the endogenous nature of crude oil prices, and iii) the causal effect of an exogenous increase in the price of crude oil. The econometric results show that there is significant evidence that the correlation was the fact neither a coincidence nor a series of influences that trigger the oil shocks and economic crises. The causal interpretation leads to the conclusion that the characteristics of pre-1973 economic crises were different in the absence of such energy shocks and disturbances (Hamilton, 1983).

The main objective of this study is to examine the impact of fluctuating oil prices on key macroeconomic variables in the MENA region to identify policy implications. The results of the study could help decision makers respond to shocks in oil prices.

This paper is organized as follows: Section 2 presents the main impacts of the financial crisis on key macroeconomic variables, Section 3 is subject to a review of the literature, Section 4 presents the methodology adopted as the model VAR impulse functions and variance decomposition, and Section 5 presents the main estimation results and their interpretations

The Repercussions Of The Financial Crisis In Various Countries Of The MENA:

The global financial crisis has caused the worst global recession since the Second World War and had a direct negative impact on the Middle East and North Africa (MENA) because of lower oil prices. The region also suffers the side effects of the crisis on trade, remittances and foreign direct investment (FDI).

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The impact of the crisis on the oil exporting countries of the Gulf Cooperation Council (GCC) countries, developing countries exporting oil and oil-importing countries were significantly different (Figure 1). The oil exporting countries of the GCC have been the hardest hit because the crisis has directly affected in two ways: a) by a negative shock to the terms of trade due to falling oil prices and b) by a shock destabilized financial resources of national banks and led to the bursting of a housing bubble.

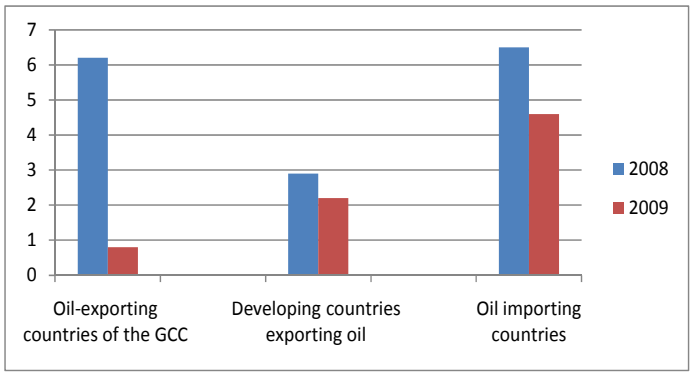

Fig. 1: Growth rate of real GDP

Due to the limited integration of its banking sector to international financial markets, the oil exporting countries of the GCC have felt the impact of the crisis through the falling price of oil. Growth has ebbed only slightly from 2.9% in 2008 to 2.2% in 2009.The countries of the MENA oil importers have mostly suffered side effects of the crisis on trade, remittances and FDI. Growth was sustained before the crisis, has slowed from 7% in 2008 to a moderate 4.8% in 2009.

The main non-oil export sectors such as services, fared relatively well, while lower oil prices and other products has limited the deterioration of their external balance.

The halving of oil prices between 2008 and 2009, and decreased production decided by the oil exporting countries of the GCC have greatly reduced their production (Figure 1) and caused a negative shock to current account and balance budget (Figure 2 and Figure 3). Although in most countries, current accounts have remained in surplus, external positions of developing countries exporting oil deteriorated sharply, reflecting the collapse of oil prices and production (Figure 2). Fiscal balances are also degraded (Figure 3), the result of lower oil revenues and increased government spending in response to the crisis.

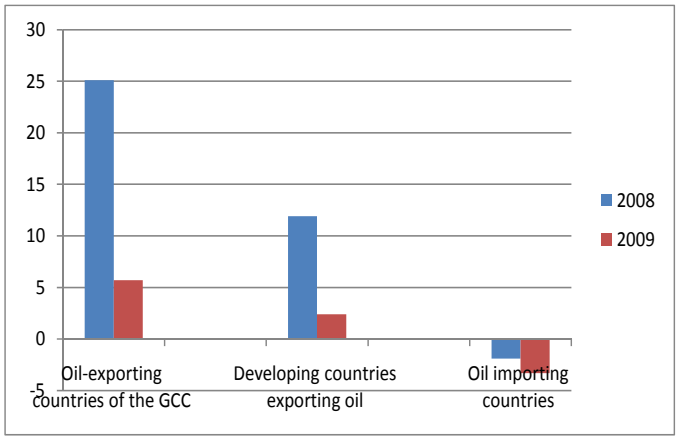

Fig. 2: Current Account

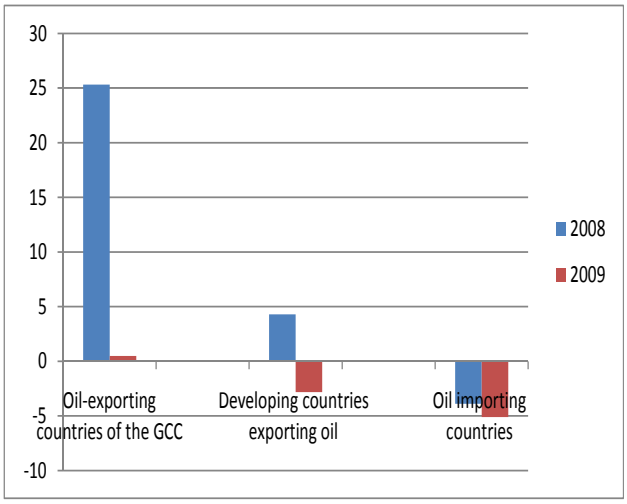

Fig. 3: Deteriorating fiscal balances due to the crisis

Saudi Arabia has made use of fiscal stimulus to improve the economic outlook in the short term, but also to support reforms and long-term growth. Since the beginning of the financial crisis, the government of Saudi Arabia has spent half of the funds for its investment program of $ 400 billion over five years. Developing country oil exporters have been less affected than the oil importers of the GCC because they have felt the effects of the crisis only through the oil (Figure 1).Growth not based on hydrocarbons has enjoyed a good harvest, which resulted in a sharp increase in agricultural production and expansion of services and construction sector through increased publics pending. In these countries, they are typically aimed at economic stabilization, but in the current crisis, Iran and Algeria for example, have resorted to monetary easing and fiscal stimulus to boost economic activity.

The growth of oil importing countries of the MENA region has slowed from 6.8% in 2008 to 4.8% in 2009, mainly because of side effects of the crisis on trade and remittances, and in some cases because of its negative impact on FDI. Income from exports of goods and services dropped by about 13% in 2009, while remittances have been more resilient and decreased by 8.4%.

The financial sectors of these countries were relatively unaffected by the turbulence in international financial markets because banks in oil-importing countries were not put to use so as excessive as that of the GCC countries. In 2009, the average loan-deposit for this group was slightly less than 80% against 100% for the GCC countries. In addition, these countries were much less dependent on foreign borrowing as the GCC countries. Therefore, the slowdown in credit growth during the crisis was much more moderate than in the GCC countries. As the crisis gathered momentum, these countries had to introduce various measures of financial support. And they have put in place to support liquidity. In oil-importing countries, the policy response has essentially committed to mitigate the impact of the crisis on the real economy. They have adopted fiscal stimulus packages focused on job-creating investments in infrastructure.

Export earnings and remittances received by the oil importing countries having ties with the GCC markets have declined much less than those of countries with ties to the markets of the European Union (EU) because the activity in the EU declined by nearly 4% in real terms, while production in the Gulf has increased by almost 1% in 2009. Remittances have contracted slightly as export earnings for oil importers with ties to the GCC 10, while FDI has remained relatively resilient.

The production growth in oil importing countries that have close links with the EU markets has slowed in 2009 compared to 2008, as manufacturing activity shrank due to a slowdown in European demand goods and services. Export earnings fell 15%, while remittances were slightly less folded. However, growth has remained subdued due to the strong expansion of agriculture and better service performance.

1. A Literature Survey

This section is devoted to an extensive, albeit far from exhaustive, review of both the theoretical and empirical literature on the relationship between oil prices and the macroeconomy.

Theoretically, the real balance channel posits that oil price increases lead to higher inflation, with a given money supply, which lowers the amount of real balances. The lower real balances then produce recessions via the familiar monetary channel- increased interest rates leading to depressed investment spending, reduced aggregate demand and a concomitant fall in output (see Hall and Taylor 1991). Under the income transfer explanation, oil price increases lead to a transfer of income from net oil-importing economies to oil-exporting countries. This result in a reduction in consumption expenditure in the oil-importing countries since the

purchasing power of consumers has been eroded by the oil price increase. This income redistribution leads to lower aggregate demand. Some researchers have opined that endogenous monetary policy responses are crucial. Hence, real output declines which usually characterize oil price increases are viewed as the result of counter inflationary responses of monetary policy (Bohi 1991). The argument is essentially that the oil price increases do not entirely account for the observed recessions but it is the reaction of monetary policy that either triggers or reinforces the output declines. Finally, the sectoral shifts hypothesis posits that changes in oil prices perform better in explaining observed variations in output growth (Loungani, 1986). Within this backdrop, oil price shocks lead to a temporary upsurge in aggregate unemployment since workers in adversely impacted sectors may opt for suffering frictional unemployment pending improvement in conditions in their sector rather than outright movement into positively affected sectors of the economy (Hamilton, 1988).

The earlier attempts in the empirical literature were on investigating the economy's aggregate response to an unanticipated and permanent shock to oil prices (Eastwood 1992). Hamilton's (1983) seminal article shifted the macroeconomic analysis of shocks to oil prices to the supply side employing the concept of Granger causality in testing the direction of effects of such shocks within a business cycle framework. Conventional wisdom posits symmetry in the response of the macroeconomy to both increases and decreases in oil prices. The failure of the oil price collapse of 1986 to result in economic boom for most countries served as a basis for growing scepticism on the attribution of recessions or their deepening in the past to positive shocks to oil prices. The efforts to address this issue have led to the investigation of the different mechanisms via which oil price shocks affect the macroeconomy. Mork *et al*., (1994) using data spanning 1967:3-1992:4 for seven OECD countries found that all the countries except Norway experienced negative association between oil price increases and GDP growth. The bivariate regression estimated included GDP and current and lagged oil prices while the multivariate model included other variables such as the inflation rate, short-term interest rate, the unemployment rate and the growth rate of industrial production. Jimenez-Rodrigruez and Sanchez(2005) in an empirical investigation of the effects of oil price shocks on real economic activity using a multivariate VAR for a sample of seven OECD countries revealed that oil price increases have a larger impact on the growth of GDP when compared to declines in oil prices. These oil price increases affect economic activity in an oil importing country negatively (and significantly) while the effect for oil exporters was found to be ambiguous. Cavallo and Wu (2006) used a VAR model of three variables namely output, inflation and oil prices to estimate the effects of oil-price shocks on output and prices for the U.S. economy. The study found that following an oil-price shock, output declined and prices increased. Lardic and Mignon (2006) investigate the existence of a long run relationship between oil prices and GDP in 12 European countries using quarterly data from 1970:1 to 2003:4. To account for possible asymmetry in the linkage between oil price shocks and economic activity, they employ both the standard cointegration and a variant- asymmetric cointegration. From the results, only asymmetric cointegration exists between oil prices and GDP in most of the countries considered. This suggests that rising oil prices appear to retard economic growth by more than declining prices stimulate it.

Although emphasis with respect to research has being on net oil importing industrial economies a few recent studies have focused on the effects of oil price changes on the macroeconomy in developing countries. Raguindin and Reyes (2005) examined the effects of oil price shocks on the Philippine economy. Their impulse response functions for a linear specification of oil prices revealed that oil price shocks lead to prolonged declines in real GDP. In the non-linear VAR however oil price decreases play a greater role in fluctuations of model variables than oil price increases. They used data covering the period 1981-2003. Chang and Wong (2003) using quarterly data from 1978:1-2000:3, within a vector error correction model (VECM), on oil prices, GDP, consumer price index and unemployment rate find a marginal impact of oil price shocks on the Singapore economy. Both impulse response and variance decomposition analysis provide reasonable basis for their conclusion that the adverse effect of oil prices on GDP, inflation and unemployment rates in Singapore was minimal. They however conclude that this impact, though small, should not be interpreted as negligible. Specifically for Nigeria, Ayadi *et al*., (2000) examined the effects of oil production shocks on a net oil exporting country, Nigeria. Using a standard VAR which includes oil production, output, the real exchange rate and inflation over the 1975-1992 period, the impact responses show that a positive oil production shock was followed by rise in output, reduction in inflation and a depreciation of the domestic currency. With the same methodology and set of variables (except that oil price replaces its level of production), Ayadi (2005) finds negligible responses of output, inflation and the real exchange rate following an oil price shock. Olomola and Adejumo (2006) examined the effects of oil price shocks on output, inflation, real exchange rate and money supply in Nigeria within a VAR framework. They found no substantial role for oil price shocks in explaining movements in output and inflation. Only the long run money supply and the real exchange rate are significantly affected following a shock to oil prices. In a similar vein, there is a burgeoning literature on the nonlinear impacts of oil price shocks on economic activity. However, due to the differences in the degree of economic development, energy dependence, and the efficiency of energy use in each country, the level of economic tolerance and speed of economic response to a positive oil price change and its shock are expected to be different. Huang *et al*. (2005) employed the multivariate threshold autoregressive model (MVTAR) of Tsay

(1998) to find the threshold value of an oil price change and its shock in each country. They arrived at a number of interesting conclusions. First, the most appropriate threshold value appears to vary according to an economy's degree of dependence on imported oil and its attitude towards adopting energy-saving technology. Second, an oil price shock has a limited impact on the economy if the change is below the critical threshold levels for a given economy. Third, if the change is above the threshold levels, it appears that the change in the oil price explains the macroeconomic variables better than the shock caused by the oil price. Finally, an oil price change above the threshold level explains the variation in GDP growth better than the real interest rate.

More countries specific studies and superior statistical techniques are needed to test the relationship between oil price changes and macroeconomic performance.

Farzanegan and Markwardt (2009) studied the effects oil price shocks on the Iranian economy and found a strong positive relation between positive oil price changes and industrial output growth and observe the Dutch disease syndrome through significant real effective exchange rate appreciation. Conversely, the study by Chang and Wong (2003) on the Singaporean economy show that the impacts of oil price shocks only had an insignificant adverse effect on Singapore's gross domestic output, inflation and unemployment rate.

Berumet and Ceylan (2005) studied the effects of symmetric oil price shocks on output for a group of Middle East and North African countries. Using impulse response and variance decomposition analysis, they find that the effects of world oil price shocks on GDP of Algeria, Iraq, Jordan, Kuwait, Oman, Qatar, Syria, Tunisia, and UAE are positive and statistically significant. However, for Bahrain, Egypt, Lebanon, Morocco and Yemen, they found the existence of positive but not significant impacts. In another work, Jbir and Zounari-Ghorbel (2009) studied the impacts of the recent oil price shocks on the Tunisian economy focusing on the role of subsidy policy and found from their linear and non-linear specification of the oil price macroeconomic model that there is no direct impact of oil price shocks on economic activity in Tunisia.

Akpan (2009) study the asymmetric effects of oil price shocks on the Nigerian economy. The findings from her study show a strong positive relationship between positive oil price changes and real government expenditure. Also, the impact of oil price shocks on industrial output growth was found to be marginal with observed significant appreciation of the real exchange rate. Aliyu (2009) used a non-linear approach to investigate the oil price macroeconomic relation in Nigeria and find evidence of both linear and non-linear impacts of oil price shocks on real GDP. The results of the asymmetric oil price increases in the non-linear models are found to have positive impacts on real GDP growth of a larger magnitude than for other specifications; a result that is an aberration from the previous empirical works earlier reviewed.

Methodology:

Variables And Model Specification:

This article uses data from the 2010 version of the World Bank Indicators. They span the period from 1987 to 2008. This choice is dictated by the availability of data on various macroeconomic variables at the country level and by the desire to have a panel with no missing data. It is the same number of countries included in the article.

Indeed, only 5 countries in MENA have in this database. These are Algeria, Egypt, Iran, Saudi Souad and Libya.

The model variables are the price of oil (PP), investment (INV), public spending (DEP), inflation (INF) and Gross Domestic Product (GDP). The sources of data used is taken from data from the World Bank for the period 1980-2007. We also log transformed variables to flatten the differences between the series used:

$$(PIB)_{i,t} = \beta_0 + \beta_1 (PP)_{i,t} + \beta_3 (INV)_{i,t} + \beta_4 (INF)_{i,t} + \beta_4 (DEP)_{i,t} + \varepsilon_{i,t} \quad (1)$$

Heterogenous Data Test:

When one considers a sample of data of panel, the first thing which it is advisable to check is the homogeneous or heterogeneous specification initiating process of data. On the econometric level, that amounts testing the equality of the coefficients of the model studied in individual dimension.

$$y_{it} = \alpha_i + \beta'_i x_{it} + \varepsilon_{it} \quad (2)$$

H_0: $\alpha i = \alpha$ et $\beta_i = \beta$

From the economic point of view, the tests of specification amount determining if one has the right to suppose that the studied ideal model is perfectly identical for all the countries, or on the contrary if there are specific specificities to each country.

Let us take the case of our study, the initial model to estimate is:

$$(PIB)_{i,t} = \beta_0 + \beta_1 (PP)_{i,t} + \beta_3 (INV)_{i,t} + \beta_4 (INF)_{i,t} + \beta_4 (DEP)_{i,t} + \varepsilon_{i,t} \quad (3)$$

The random term ε_{it} it is supposed to be i.i.d. : of null average and variance equalizes with σ^2(i = 1…,5 and t = 1987..... 2008).

Initially, the phase of test of specification, reconsiders the economic plan, to determine if it has the right to suppose that this function is completely identical for all the countries (model pooled).In this case, propensities of each variable on the radiant intensity are identical for all the countries ($\beta_i = \beta$) and the mean level of the radiant intensity is him also identical for all the countries. The model is written then in the form:

$$(PIB)_{i,t} = \beta_0 + \beta_1 (PP)_{i,t} + \beta_3 (INV)_{i,t} + \beta_4 (INF)_{i,t} + \beta_4 (DEP)_{i,t} + \varepsilon_{i,t} \quad (4)$$

If the assumption of total homogeneity is accepted, it is advisable then to test if propensities of the various variables are identical. If it is not the case, there is not a priori any common structure between the countries. One must thus estimate the functions country by country.

If on the other hand, it proves well that there is an identical relation between the radiant intensity and the other variables for all the countries, the source of heterogeneity of the model can then come from the constants α I. However, nothing guarantees that the studied countries have the same economic and financial characteristics. The geographical position, distance compared to the large commercial axes which could have led to structural differences between the countries, energy situation, etc. It is thus advisable to test the assumption of a constant commune to all the countries. If this assumption is rejected, we then obtain a model with individual effects, and who is written in the form:

$$PIB_{it} = \alpha_i + \beta' X_{it} + \varepsilon_{it} \quad (5)$$

In this case, the price of oil, determined by E ($\alpha_i + \varepsilon_{it}$) = α_i ; vary according to countries', even if the other variables are identical. The phase of test of specification amounts determining if the generating process of data can be regarded as homogeneous, i.e. single for all the individuals, or if on the contrary it appears completely heterogeneous, in which case the use of the techniques of panel cannot be justified. It is appropriate, therefore to identify the source of heterogeneity for specifying the model well.

Specification Test:

In a first stage, one tests the assumption of a perfectly homogeneous structure (identical constants and coeffcients):

$H^1_0 : \beta i = \beta \; et \;\; \alpha i = \alpha$

We then use statistics of Fischer to test these (K+1)(N-1)linear restrictions.

If we suppose that the residues "ε_{it} are independently distributed in dimensions i and t according to a normal law of null hope and variance σ^2 "; These statistics follow a distribution of Fischer with (K+1)(N-1) and NT-N(K+1) degrees of freedom. The conclusions of this test are as follows. If one accepts the null assumption H_0^1

Each β_i corresponds K parameters, for panel N individuals, total NK parameters. But β_i=β, there is Nk-k restrictions. For $\alpha_i = \alpha$, there is N constants, it amounts imposing N-1 restrictions. Thus the total (Nk-k)+(N-1)=(N-1)(K+1).

Of homogeneity, one obtains a completely homogeneous model pooled then. But, if us kids the null assumption, one passes to one second stage which consists in determining if heterogeneity comes from the coefficients β_i

By definition, the statistics of Fischer F associated with the test with total homogeneity H_0^1 are written in the following form:

$$F = \frac{\left(SCR_{1,c} - SCR_1\right) \Big/ \left[(N-1)(K+1)\right]}{SCR_1 \Big/ \left[NT - N(K+1)\right]} \quad (6)$$

And follows Fischer with (N-1)(K+1) and NT-N(K+1)degrees of freedom.

Where SCR_i Indicates the sum of the squares of the residues of the following model:

$$y_{it} = \alpha_i + \beta'_i x_{it} + \varepsilon_{it} \quad (1')$$

And $SCR_{1,c}$ the sum of the squares of the residues of the constrained model:

$y_{it} = \alpha + \beta' x_{it} + \varepsilon_{it}$ (2')

For the non constrained model (model (1')), the estimator αi and β_i of the estimators obtained equation by equation for each country. That is to say $SCR_{1,i}$ the sum of the squares of the residues non constrained model (1').

The model (2') constrained

$y_{it} = \alpha + \beta' x_{it} + \varepsilon_{it}$ (2')

One thus has a sample of TN observations to identify the common parameters α and β of this relation. We apply then Ordinary Least Squares on the piled up data (model pooled).

Results of estimate of model (1') non constrained show that $SCR_1 = 4{,}626$ and the square sum of the residues of model (2') $SCR_{1,c} = 20{,}539$. One accepts the null assumption H_1^1 bus $F((K+1)(N-1),NT-N(K+1))=(20,85) \approx 1{,}70<14{,}72$. Therefore, we pass to the test of homogeneity coefficients β_i

Homogenous Test of β_i coefficients:

Statistics of Fischer F2 associated the test of total homogeneity in the model (1'):

H_0^2: $\beta_i = \beta, \quad \forall i \in [1,N]$

is written in the following form and follows Fischer with (N-1)K and NT-N(K+1)degrees of freedom

$$F_2 = \frac{(SCR_{1,c'} - SCR_1) \big/ [(N-1)K]}{SCR_1 \big/ NT - N(K+1)}$$

Where SCR_1 indicates the sum of the squares of the residues of the model (1') and $SCR_{1,c}$ the sum of the squares of the residues of the constrained model (model for individual purposes):

$$y_{i,t} = \alpha_i + \beta' x_{i,t} + \varepsilon_{i,t}$$

There is $F_2 = 2{,}09$ and $F\alpha(20,85) \approx 1{,}7$, one accepts the assumption H_1^2

Homogenous Test of α_i coefficients:

Let us consider finally the last test of homogeneity of the constants α_i noted:

H_0^3: $\alpha_i = \alpha \quad \forall i \in [1,N]$

With

$$F_3 = \frac{SCR_{1,c} - SCR_{1,c'} \big/ (N-1)}{SCR_{1,c'} \big/ [N(T-1) - K]}$$

Where $SCR_{1,c'}$ it indicates the sum of the squares of the residues of the model (1') pennies the assumption $\beta_i = \beta$ (model for individual purposes) and $SCR_{1,c}$ the sum of the squares of the residues of the constrained model (model of pooled):

$y_{it} = \alpha + \beta' x_{it} + \varepsilon_{it}$

it thus $F_3 = 50{,}17$ et $F_\alpha(14,101) \approx 2{,}4$ pour $\alpha = 0.95$. On accepts H_1^3.

Finally, the final specification of our model is:

$$y_{it} = \alpha_i + \beta_i x_{it} + \varepsilon_{it}$$

The existence of various countries: Algeria, Saudi Arabia, Egypt, Libya, Iran can expose the specific country and write the disposition of each country saying the level of heterogeneity. Thus, the heterogeneity test shows that the link between the price of oil PP, DEP expenditure, GDP, investment, INV, INF inflation differs across countries.

Table 1: Mean values for each variable and each country

	LPP	LPIB	LINV	LINF	LDEP
Algeria	3.31	7.752	3.249	2.208	4.121
Saudi Arabia	3.141	9.141	2.959	0.369	4.453
Egypt	3.143	6.889	3.09	2.410	4.673
Libya	3.275	8.894	2.80	1.617	4.403
Iran	3.194	7.676	3.42	3.009	4.166

Note: values in red are the highest values for each variable. Blue values are the values smaller for each variable.

In 2007, the Middle East and North Africa MENA has grown by 5.7% on average. This boom was in the context of an external environment that was marked by three major developments: the continued rise in oil prices, the turbulence in international financial markets following the sharp drop in market valuations of securities backed by mortgages, and the increase in the price of non-oil commodities, particularly food products. These developments have affected the various economies of the MENA region and do so in various ways. However, on average, the area was tidy, showing solid growth and external balances and fiscal comfort. Oil prices remain unnoticed, leading to high levels of investment nationally and internationally. The food prices should also remain high. Given that most countries in the region subsidize food and energy, it will take to tax burdens for most of them. However, we do not expect that such pressures stifle economic growth, which continue to be focused around high levels of investment.

From Table1, Algeria has launched major economic plans that have allowed the establishment of a strong industrial base. This allowed him to take advantage of the oil revenue, much of which was reinvested in the economic development plans. In the 1980s, the Algerian economy has experienced significant obstacles. Indeed, the oil crisis of 1986 dealt a severe blow to an economy almost annuitant. This is the period of anti-shortage plans and stabilization. In the early 1990s, Algeria is connected to the Bretton Woods institutions to complete a first pattern of structural adjustment. Algeria is undertaking structural reforms representing the transition to a market economy whose profits belong to the current and future changes in the global economy in a condition of free trade and globalization. As we can see that Iran, Egypt and Algeria are the biggest beneficiaries of investment in the MENA region, representing more than Libya and Saudi Arabia. Similarly, we conclude that Iran is characterized by a high value of inflation. The latter has increased worldwide and the MENA region has not been counted by these developments. The two major causes of this are the increased costs of energy and food prices. The dramatic rise in food prices (mainly cereals, fats and oils) is directly linked to higher fertilizer costs (energy), the massive increase in the use of cereals and fats for biofuels and reduction of land used for food and food products. It may be that higher inflation linked to these resources last few years. This is something that arouses anxiety and that results directly relevant to decision makers in the MENA region, especially for food-importing countries.

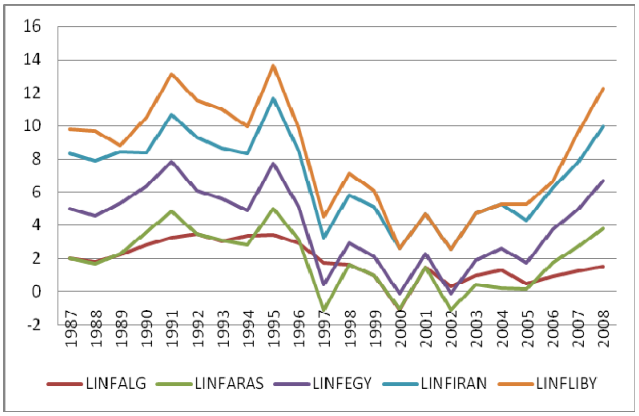

Fig. 4: Signs of inflationary pressures for the different countries

The VAR Approach:

In our work we will apply the VAR approach to the PP oil prices, the inflation rate INF, investment rates, growth rates and public spending for three different economies, annual data.

The VAR process, is a generalization of the multivariate AR process. It was introduced by Sims (1980), as a choice for macroeconomic models Keynesian. The model provides a framework multivariate case the transmutations of a particular variable are well attached to the transformations of its own lagged values as well as changes in other parameters of the system. In the case of a VAR approach, the procedure for selecting the order p of the model is to estimate all the VAR models, for an order from 0 h (h being the maximum allowable delay). In our analysis, we focus on three groups of economies:

For Economies Rich In Resources And Manpower (Algeria and Libya):

Table 2: Determining the number of delay (p): Algeria

	VAR(1)	VAR(2)	VAR(3)
AIC	-2,265	-2,729	-2,745

The best interpretation of a VAR model comes through the variance decomposition and generalized impulse response function in order to exploit the dynamic properties of the system.

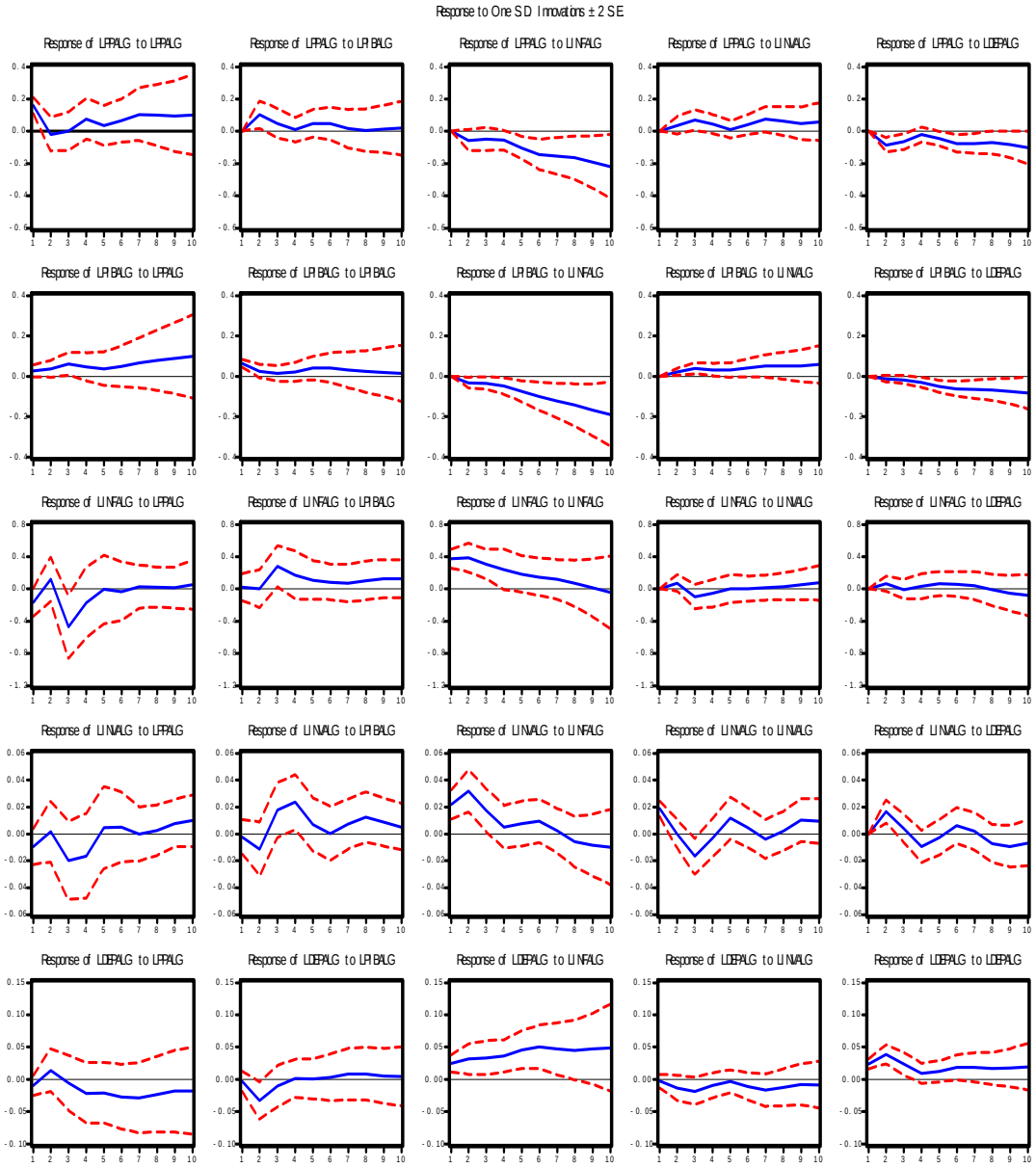

Fig. 5: Response function variables to a shock

Figure 5 shows the generalized impulse response functions of Algeria; Dotted curves represent the confidence interval. It considers that the magnitudes of the shock is equal to one standard deviation and are interested in the effects of shock in ten years.

A visualization of the different curves, it is noteworthy that the negative effects of oil price shocks are transmitted to scholarships after a while. This result indicates the inefficiency of the Algerian market in the transmission of information held in the oil market. The results of response functions show that there is a positive impact on economic growth measured by GDP in the short term and a negative impact on inflation. An oil price shock causes a temporary decrease in inflation will be eliminated after about five to six months. Indeed, the

investment response to the shock of oil prices is significant. This can be explained by the fact that Algeria has experienced a wealth of hydrocarbons. But it does appear as a factor to ensure a credible development policy. Indeed, the "recovery plan" Prime Minister's economic plans to invest $ 140 billion in five years, with projects that could mobilize the Algerian voters (35.5% participation). Similarly, with an economic flattering, a growth rate averaging 4.9%, an increase of 92% of GDP and 29% of income per capita and lower unemployment than 11%, the FLN would have raised a wave of enthusiasm. However, the opposite occurs because the party has lost seats. That is, for voters, the recent performance of the Algerian economy is not a guarantee of sustainable development, but an effect of the rising price of oil. Algeria has so enriched, but its leaders have failed to convince citizens that they would be the primary beneficiaries. "

Subsequently, in explaining the proportion of the variance of the forecast error of a variable, we use the decomposition of variance.

The oil price may be considered the main source of rising inflation. He has contributed about 16.22% and increased to 28.60% after 10 periods. For economic growth the most important sources of its variation are the real oil price and inflation. They have contributed, respectively, after 10 periods of 18.13% and 55.59%.

For Economies In Resource-Rich And Labor Importing (Saudi Arabia and Libya):

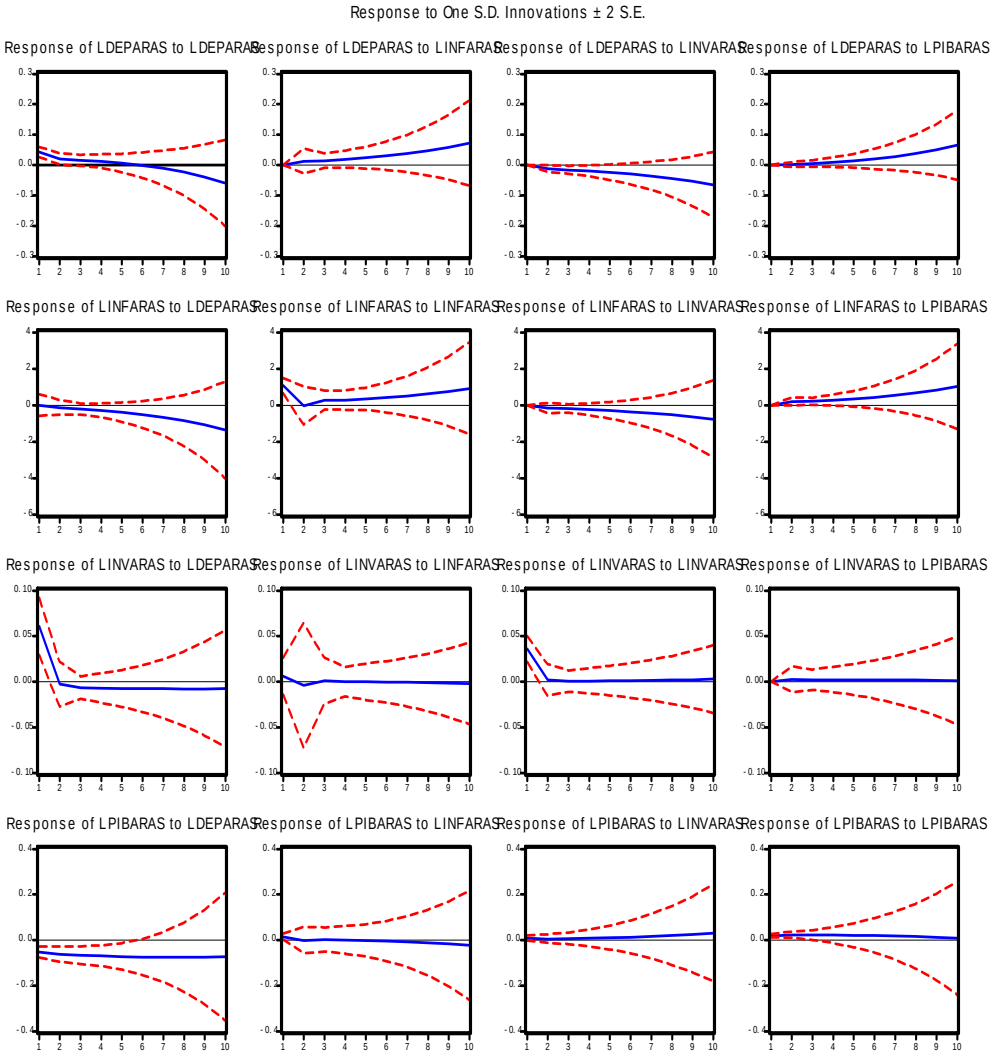

Fig. 6: Response function variables to a shock

The results of response functions show that there is a positive impact on economic growth measured by GDP in the short term and no impact on inflation: "We expect economic growth of 4% to 5% in 2011-2012, due to increased oil production and refinery production and the petrochemical sector. At current production rates, the country still has for 90 years of oil reserves. Saudi Arabia may well fill any shortfall in production from the

market; further increase its capacity up to around 15 million brail. The government plans to spend the next five years U.S. $ 375 billion in various infrastructure investments ranging from transportation (rail, airports and seaports) to the construction of buildings, through the production of water and electricity.

The high oil prices will help achieve these spending projects. The annual expenditure plan of the government amounts to about 15% to 20% of GDP or about 85% of GDP in 2010.

It appears from this study that the oil price may be considered as the main source of increased investment. He contributed about 25%, rising to 67.52% after 10 periods. For economic growth the most important sources of variation are its public spending. They participated, respectively, after 10 periods of 87.07%.

Poor Economies Rich In Resources And Manpower (Egypt and Iran):

The chart below shows that the shock in the inflation rate rises to 0.2% after a year and a half before stabilizing relatively close to this value. Regarding the function of the impulse responses, shock fear cause an increase in the inflation rate of 3%. This is higher than the inflation rate changes in developed countries during the shocks that have occurred in recent years. In fact, the increase caused by these shocks shows that Egypt has supported the shock when the first effects of the global financial crisis thanks to its banking sector and because of its weak integration with global financial markets, "the agency Moody's upgraded the rating in September 2009 the country's sovereign debt, the category grew from negative to stable category. Egypt has increased by ten rows, it ranks 106th out of 183 in Doing Business 2010 World Bank. It also rose ten places in the 2009/10 Global Competitiveness Report World Economic Forum, ranking 70th out of 133 countries»

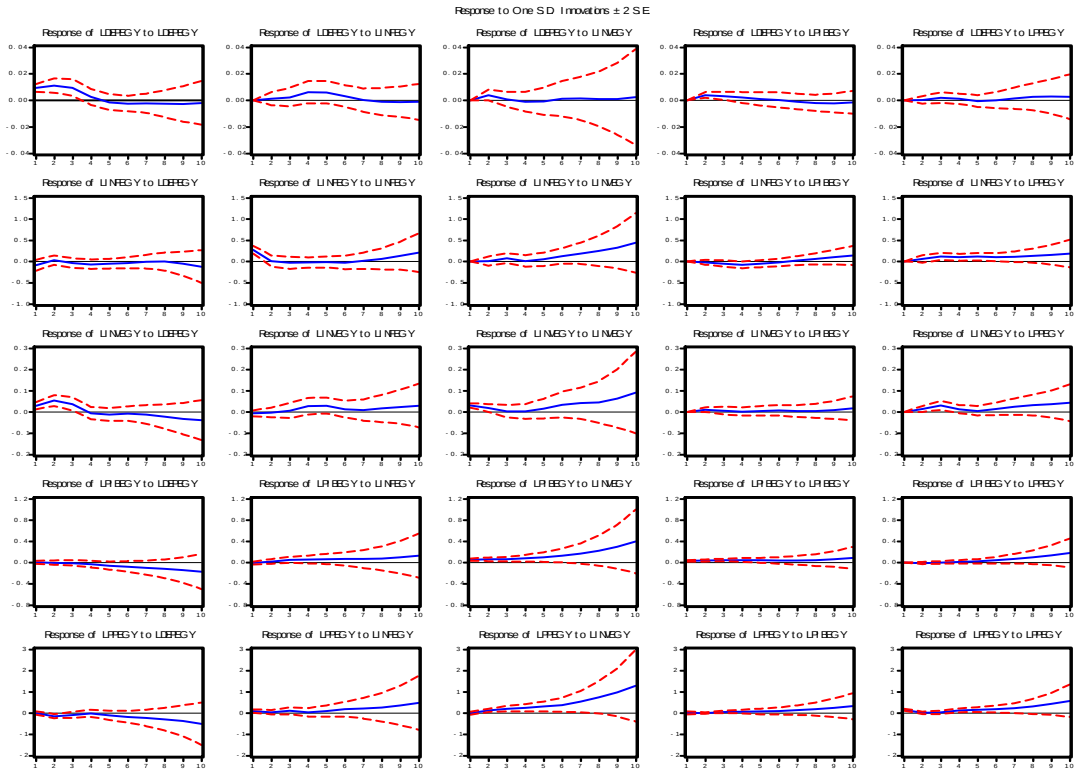

Fig. 7: Response function variables to a shock

Finally, Egypt is the largest country in the Arab world. Economically, it comes second after Saudi Arabia. He is one of the few countries in the world have not been punished by the credit crisis. Even in the absence of strong global growth, the country is able to grow by 5 to 6% per year thanks to robust domestic engines of growth. The results of the response functions are discovering that there is a positive impact on economic growth measured by GDP and for each economic variable.

The variance decomposition indicates that the variance of the forecast error of real GDP is due to 4.3 '% to its own innovations and 11.48% for those in oil prices. Also the error variance of INV is due to 49.32% to its own innovations and 17.2% in those oil prices. The variance decomposition shows that oil accounts for both the investment to GDP. Indeed, the relatively limited impact of oil price increases may be due to the policies of compensation and subsidy to consumers.

Conclusion:

In this paper we are interested to study the impact of shocks to oil prices on key macroeconomic variables in some countries in the MENA region. The paper reviewed the existing literature on the subject, and used different techniques particularly econometric methodology VAR and variance decomposition which has been adopted for this study.

In our analysis, we focus on three groups of economies: 1) For the resource-rich economies and labor (Algeria), 2) Case of resource-rich economies and importing labor (Saudi Arabia and Libya) and 3) poor economies rich in resources and manpower (Egypt and Iran).

For the case of Algeria, the results of response functions show that there is a positive impact on economic growth measured by GDP in the short term and a negative impact on inflation. An oil price shock causes a temporary decrease in inflation will be eliminated after about five to six months. Indeed, the investment response to the shock of oil prices is significant. This can be explained by the fact that Algeria has experienced a wealth of hydrocarbons.

For the second case (Saudi Arabia and Libya), the results show that there is a positive impact on economic growth measured by GDP in the short term and no impact on inflation. It expects economic growth of 4% to 5% in 2011-2012, due to increased oil production and refinery production and the petrochemical sector. Saudi Arabia may well fill any shortfall in production from the market; further increase its capacity up to around 15 million barrels per day. Regarding the function of the impulse responses, shock fear causes an increase in the inflation rate of 3%. This is higher than the inflation rate changes in developed countries during the shocks that have occurred in recent years.

Finally, the last case (Egypt and Iran), the results of response functions show that there is a positive impact on economic growth measured by GDP and for each economic variable.

About the implications of economic policies, we can say that high oil prices have a significant drain on the budget in both revenue and expenditure. In terms of revenue, the tax base will be eroded if the profitability of oil-consuming companies is affected and if unemployment increases. Spending could increase each time the government subsidizes petroleum products or programs that rely heavily on petroleum products. In this regard, an important question concerns the merits of a full impact of rising oil prices. The state is under severe pressure to get him to intervene to mitigate the impact of rising oil prices. If oil prices do not return to its average level, price controls will result in ever increasing losses to be borne ultimately by taxpayers or future.

Subsidies of public services could also aggravate the consolidated fiscal deficit of the state. In many countries, electricity generation is based on oil and electricity is sold below its cost of production. In this case, the State is called upon to bear additional costs due to higher oil bill. Lack of resources (eg if the currencies are insufficient), it may be forced to resort to rolling blackouts, which could have very negative consequences. Moreover, the State itself should pay higher energy bills under its own activities and those of public enterprises.

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