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Global Financial Crisis and Inflation: Evidence from OPEC

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Abstract: This study has attempted to examine the effect of 2007 financial crisis on inflation in OPEC based on a panel data regression model during 2000-2010. Financial crisis affects economic variables such as economic growth, oil price and stock price index (i.e. financial markets), which in turn change inflation. In other words crisis caused an increase in oil price which in turn had a positive and important influence on the inflation of the OPEC. For Example, the study finds as a result of one percent increase in oil price, inflation increase by 0.08 percentage points in these countries. Also our findings indicate that economic growth and stock price index have negative but statistically insignificant impact on inflation in OPEC. In other words, one can concludes that there has been no exchange between production and inflation in these countries implying a weak structure of the manufacturing sector (real sector of the economy) in these countries.

Key words: Inflation · Financial Crisis · OPEC · Panel Data

INTRODUCTION

The crisis phenomenon is not a novel and new phenomenon in the world, sometime a single economical structure encountered with it or a set of economical structures. With regards to this matter that nowadays the economy excessively are interdependent and intertwined together, economical evolution in one country have influence on other countries' economical issues and this manipulating rate depends highly on economical dependency rate to each other. Thus if an evolution occurs in a country which has the greater share in the global economic, the impact of this evolution will be greater on other countries' economy [1]. The current financial crisis in U.S.A also can be considered as one of these evolutions that due to the high dependency of global economy to U.S.A economy, quickly spread to global markets and other countries. Energy market also was under this impact. The impact of crisis on oil price can be divided into two categories: 1) after crisis occurrence and before its globalization: Following the crisis occurrence and reduction in dollar value, the oil price in global market increased. 2) After crisis globalization: following the crisis expansion in Europe and rising in Euro value against dollar, oil price reduced. On the other hand the crisis caused reduction in demands and thus originated the reduction in production and consequently unemployment rate increased. Reduction in demand and consuming services caused reduction in investment as a result the more reduction in total demands happens so the demand for energy declines and this matter made oil price lessen.

With regarding to this matter that most countries which are as a OPEC member are developing and their economy is excessively dependent on oil revenues, thus reduction in oil price makes oil revenues decline and consequently some major economical problems will occur in these countries. Nevertheless the dependency rate of countries in OPEC member is not identical, so the impact of oil crisis on the economical condition of these countries is not identical as well. Some of these countries are more sensitive to oil price reduction than others.

OPEC for dealing with crisis employs two strategies: 1) acceptance of oil price reduction consequently production maintenance 2) reducing in production consequently rising in oil price. Evidences show that OPEC after crisis and consequently oil price reduction, placed the second strategy on its agenda, this action from OPEC, caused a relative improvement in oil price from the middling of year 2008 [2].

In view of undetermined impact of crisis on countries' inflation in OPEC member, namely from one hand, financial crisis increased inflation rate (as one of the dire effects of crisis) and from the other hand, it can origin the reduction in inflation rate (we can state reduction in liquidity along with the oil price reduction, oil revenues reduction and at

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last reduction in the government consumption expenditure as the major reason for this inflation rate reducing in countries in OPEC member), hence, we quantitatively investigated the impact of crisis on inflation of countries in OPEC member in this respect with comprehensive Understanding of crisis effects, a way for the appropriate decisions will be provided.

Intended for this consequence investigation, this study is provided in 5 sections: after presenting the introduction, in section 2 research literature and a reviewing on the empirical studies will be provided, in section 3 empirical trend during the reviewing period in countries in OPEC member is presented, section 4 is dedicated to model evaluation and eventually the final section allotted for conclusion remark.

Literatures Review: The current financial crisis in U.S.A that was known as the black box or a financial tsunami of the century, was one of the greatest crisis occurrence in this country's economy after crisis of decade 1930.almost all the analyses indicate that the current financial crisis which is set in August 2007, has rooted in subprime mortgages or second rate loans in U.S.A housing market. After the incident of 11 September in year 2001 (invading into the world trade buildings), due to the sudden shock stricken to the financial markets (in psychic aspects and Uncertainty about the future), the possibility of economical downturn and lack of foreign investment in U.S.A economy, for compensating this problem, the government and the central bank Federal Reserve of this country took into action, the Federal Reserve reduced the Interest rate from 6 percent to 1 percent that consequently this policy led to raising in demand for loan (especially housing loan). Contributing of housing loan extremely increased in the way that loans with high risk conferred to those people who had low income or it was conferred to poor people with unreliable income resources. Some of the American supply funding like banks and institutions changed a major part of these mortgage loans into stocks. Moreover cheap loans raised demands for house purchasing in U.S.A. On the other hand, due to the low speed of house conferring to people, boosting in demand caused house price increased in U.S.A. when house price goes up, the lending bank is not concerned for loan repayment by house buyers and the reason is simple, if the buyer of the house were unable to repay the loan for every reason, the buyer himself, would sell the house for higher price or the lending bank would occupy his house and it does not make any difference for the lending bank that the buyer has high credit or low credit. Boosting in house price gradually and with a little delay caused increasing in housing supply in U.S.A. Building construction overloaded so far that exceeded from the housing demands (2006) as a result a lot of buildings were empty without inhabitant. The excess of demand made a declination in house price so the house price bubble burst in U.S.A. With decreasing in house and building price and gradual increasing in interest rate, the borrowers were unable to repay loans and preferred the lending banks and institutions to occupy their houses. but this matter occurred when the house price decreased excessively and bank transactions were affected by this decline moreover due to the lack of demand the possibility of making their assets as a cash was relatively zero consequently they admitted their bankruptcy. The beginning of the year 2007 was the start of this process subsequently the validity of the stocks which were composed of housing loans encountered with a huge problem. The way for escaping from this dilemma and the risk of stocks for buyers was selling their house that naturally by questioning their validity, there is not any buyer for these assets which have unspecified risk. These groups for reducing the risk of their validity need to change their assets to liquidity, so tried to sell their interactions stocks and even their oil contracts, in this way all markets encountered with an intense reduction. Thus, although the crisis of supreme risk mortgages loans was as a regional crisis in the U.S.A, but via transforming the assets to stocks, it speeded to global markets especially energy markets [3-4].

Molouk Kenawy and Fathy Abd-el Ghany (2012) [5] considered the impact of the world financial crisis on employment in the Egyptian economic sectors during the post-crisis period. The results showed the negative effects of the world financial crisis on some economic sectors both productive and service (tourism, banks and air transport, oil and chemical industries). It focused on the most affected sectors of the crisis in light of reviewing practical cases of some sectors (sectors of spinning and textile and metal and food industries).

Ahmadzadeh Mashinchi, Yaghoubi and Amirian (2011) [6] in a joint experimental work studied the impact of the impact of the global economic crisis on non-oil operations of ports in Iran. The study showed that the first year of crisis was quiet for the ports and no significant changes occurred in loading/unloading of berthing vessels and container operations, however, in the second year, the amount of loading/unloading non-oil goods as well as the number of input were considerably reduced.

In contrary to these two variables, the number of container operations not only reduced. Although the economical crisis instantly affected on the amount of loading/unloading non-oil goods, the number of input vessels was affected by the current crisis after one year delay. In other words, since Iran's interferer demand has less influenced by the reduced global demand, the delay will be more than a year.

Arieff, Weiss and Jones (2010) and IMF [7-8] in a joint experimental work studied the impact of financial crisis on south of Africa desert countries, their studies showed that the crisis had destructive effects on economy-socially indices of these countries; such as increasing in unemployment rate, increasing in poverty, increasing in infant mortality, reduction in the level of health, reduction in direct foreign investment, reduction in foreign aid, reduction in remittances by African migrant workers to outside the country, reduction in economic growth rate (in oil exporter countries with average income the reduction in economic growth rate was in great amount),reduction in exporting due to the reduction in global demand and consequently lowness in revenues. The crisis impact on south of Africa desert was different, so that in some countries the inflation reduced and in some other countries due to the fuel high price and meal materials the inflation increased. Researchers showed that due to the heterogeneous nature in African countries, the crisis influenced more impact on some of them more than other places, for instance, those countries which imported oil and metals experienced destructive impact of this crisis rather than other places and the reason was due to the reduction in price of metal and oil. Save for those countries which importing oil, they all would benefit of this reduction in prices but they incurred a big loss for reduction in prices like cacao, cotton and coffee.

Soo Khoon and Lim Mah-hui (2010) [9] considered the crisis impact on Malaysia. The results indicate that a sudden shock from the financial crisis in the last season of 2008 from the financial and commercial channels transmitted to Malaysia and had destructive impact on this country's economy. These effects are including off; reduction in growth rate (GDP) from the 5.9 percent at the beginning of the year 2008 reached to 0.1 percent at the end of the year 2008, reduction in direct foreign investment from 49.9 (RM) billion in year 2007 reached to 8.1 (RM) (the reduction in foreign loans repayment in the official and private sectors was considered as a major reason for the reduction in investment), the deficiency balance of payments due to an increasing in the capital account and a reduction in currency account, devaluation of the national currency, annual reduction of export in 28 percent (the major reason of this reduction was through reduction of machinery and electrical equipment production that composed 40 percent of all Malaysia export volume, the export of agricultural production and natural resources will decrease due to the reduction in raw material prices), Increasing in import of intermediate materials, but the important point is that the crisis impact on unemployment in Malaysia in compare with other countries was insignificant and the unemployment rate was almost constant in this country so that in the depth of crisis (first season of 2009) had an increasing rate to 0.9 percent and from 3/1 percent reached to 4 percent.

ODI institution (2010) [10] examined the crisis impact on developing countries. The analysis of this study showed that the crisis impact influenced the developing countries in two ways; 1) effects on stock, goods market and depreciation of assets, 2) economy stagnation in developed countries. The crisis effects on developing countries are as following:

I) Reduction of economic growth due to the reduction in exporting (especially goods and services of exporter countries to U.S.A and Europe Union like Mexico and countries that price of their export goods -influenced on demand fluctuations- have huge intense like Zambia that its most exporting goods is copper that its expense reduced approximately to 60 percent and Tourism industry in Africa and increasing in importing goods. II) Increasing in inflation. III) Reduction in direct foreign investment due to the economy Stagnation especially these countries that are intensely dependent to foreign investment like South Africa. IV) Reduction in annual currency revenues behalf the immigrant workers due to the high percentage of unemployment rate and rejection of migrant workers in developed countries (especially for countries that the most part of their annual budgets was prepared from the migrant laborers like India and Pakistan. V) Reduction in loans, granting credits and huge amount of aids from developed countries due to the liquidity reduction in banking network of developed countries. VI) Increasing in poverty.

However the results indicate that the vulnerability rate of every country depends highly on the country's employed policy to encounter or fade out the crisis impact.

The International Monetary Fund (2009) [11] examined the crisis impact on low income countries. In this study the crisis impact on 71 low incoming countries had been examined which were from Asia parts, Latin America, middle East, Europe and countries of south of

Africa desert. the results showed that crisis commenced from those countries which have accessory to the global market like Sri Lanka, Ghana, or those countries which their inside financial markets were expanding like Kenya, Nigeria, Uganda, Malawi and Zambia. The crisis effects in these countries are included as reduction in economic growth rate, reduction in revenues and increasing in expenses, reduction in profit margins of multinational corporations, reduction in direct foreign investment (for example in Laos and Mozambique, reduction in financial aid (for example in Afghanistan, Rwanda and Burundi), increasing in poverty, reduction in employment (especially in User Industries like oil),devaluation of national money, increasing in foreign debt, reduction in transferring remittances by immigrant workers (for example in Honduras)reduction in exporting as a result reduction in revenues based on business taxes, increasing in the banking Interest rate and intensifying banking competition for marinating their deposits (for example in Mongolia and Pakistan).the results showed that the crisis impact on LICs in countries with greater degree of financial integration, elevated due to the high dependency of these countries to commercial and reduction in global demand furthermore most of these countries are among African countries.

Western Asia Economic and Social community (ESCWA) (2009) [12] examined the global financial crisis impact on global oil markets and its consequences on Persian Gulf Cooperation Council countries. The results showed that the financial crisis impact on the Persian Gulf Cooperation Council countries was different and it depends highly on employed actions from these countries. the crisis impact on GCC are as following: reduction in economic growth from 7/3 percent in 2008 to 4/8 in 2009 (due to the oil price reduction and consequently reduction in oil producing) and yet again its increasing in 2010 to 6 percent, reduction in inflation rate from 17/9 percent in 2008 to 10.6 percent in 2010 (due to the aroused reduction in liquidity from reduction in oil revenues, reduction in demand, reduction in goods price especially reduction in cement, agricultural productions and steel price that together caused reduction in importing inflation and due to the high openness rate of these countries, the total inflation decreased and at last reduction occurred in house price. however the inflation rate was Two-digit in this area and higher than long-term average for this area. That the major reason is for increasing in public sector wages and oil subsidies, increasing in unemployment rate (due to this reason that most countries encountered reducing in consumption and demand, tried to make smaller their project and dismissed most part of their Work force), reduction in budget excess and incident of deficit in Saudi Arabia and Bahrain's budget (due to the reduction in oil price as a result rapid reduction in exporting and High levels of public's expenses), reduction of Current Account from 25/6 percent in 2008 to 8/1 percent in 2010 so that the greatest reduction in 2009 took place in Oman and Bahrain but this reduction took place for all the current account of countries, reduction in investment, reduction in oil exporting due to the oil price reduction, reduction in interest rate and intensified reduction of assets.

Khezry (2009) [1] studied U.S.A crisis impact on Iran. His analysis results indicate that crisis had negative and positive impact on Iran. The negative effects of crisis are as followings: reduction in economic growth (due to the reduction in China's economic growth as a result reduction in oil and Primary commodities and manufactured goods institutions demands behalf China, reduction in global demand for Non-oil exports, reduction in oil price and oil revenues),reduction in Foreign exchange earnings from export of crude oil due to reduction in oil price, economical activity stagnation and some Production units bankruptcy, Spreading of the government budget deficit, reduction in Government's tax revenues, deficit in currency account and negative balance of payments, government-oriented of economy more than before and reduction in privatization, reduction in importing the Intermediate goods and raw materials required for manufacturing companies and Economic activities, collapsing in Stock market, reduction in government's ability to foreign debt repayment, expansion in delayed demands of the banks. The positive effects of crisis on Iran are as follows: the importing goods become cheaper as a result the importing inflation decreased, loosening of economic sanctions against Iran and exploiting from the overseas Iranian capital.

In this section the inflation trend of OPEC members during the crisis period is shown in three different regions. These are a)Latin America (Fig 1), Africa (Fig 2) and Middle East (Fig 3).

In general and with regards to above diagrams it can be stated that crisis in all the countries in OPEC member caused inflation during 2007-2008 period.

According to the diagram (1), the inflation rate in both countries (Venezuela and Ecuador) increased during 2007-2008 period and during 2008-2010 period the inflation rate decreased in Ecuador but in Venezuela during 2008-2009 period the inflation rate decreased and during 2008-2010 period the inflation rate was almost constant.

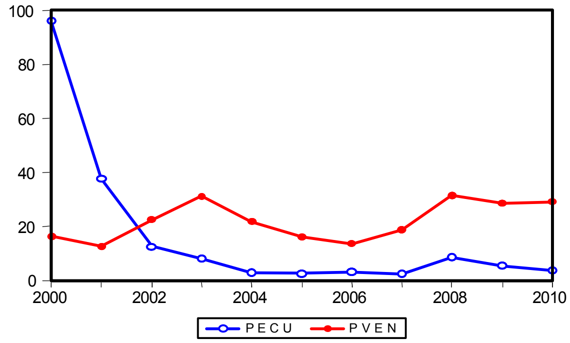

Fig. 1: Inflation trend in Latin America OPEC members (2000-2010)

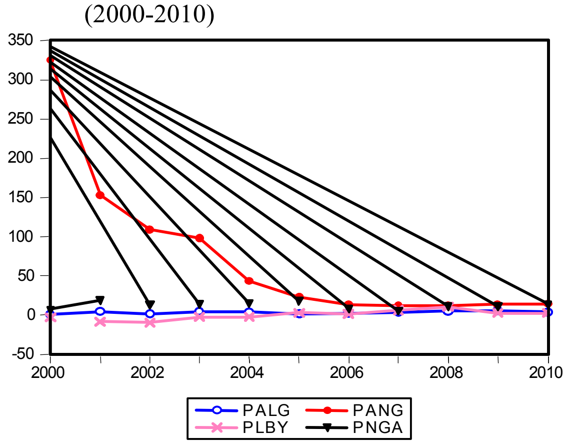

Fig. 2: Inflation rate trend in African OPEC members (2000-2010)

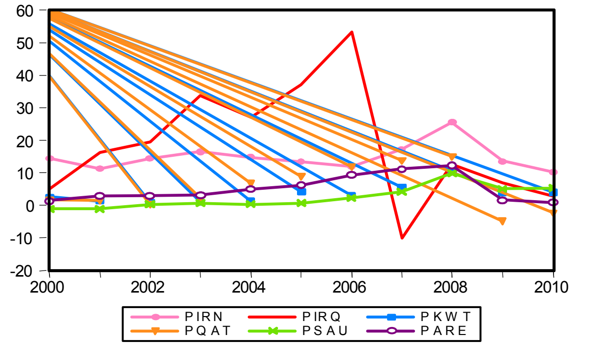

Fig. 3: Inflation trend in Middle East OPEC members (2000-2010)

Model and Methodology: The three different version of the estimated model are shown below:

$$INF_{it} = \alpha_i + \beta_1 GP_{(-1)} + \beta_2 GY + \beta_3 GOP + \varepsilon_{it} \quad (1)$$

$$INF_{it} = \alpha_i + \beta_1 GP_{(-1)} + \beta_2 GY + \beta_3 GOP + \beta_4 GM_2 + \varepsilon_{it} \quad (2)$$

$$INF_{it} = \alpha_i + \beta_1 GP_{(-1)} + \beta_2 GY + \beta_3 GOP + \beta_4 GM_2 + \beta_5 GSV_2 + \varepsilon_{it} \quad (3)$$

Where, INF is inflation rate, GP (-1) is lag of inflation rate, GY is GDP growth rate, GOP is oil price growth rate, GM2 is growth rate of liquidity and GSV is growth rate of stocks value.

Table 1: Hausman and F test results

	The amount of Ftest statistics	The value of Ftest statistics possibility	The amount of Hausman test statistics (χ^2)	The value of F test statistics possibility (χ^2)
Model (1)	2.458	0.0089	6.687	0.0826
Model (2)	1. 206	0.293	-	-
Model (3)	5.500	0.0001	10.752	0.0565

Source Authors findings

Table 2: The estimation results of three models

	Model (1)	Model (2)	Model (3)
α	4.65(4.26)	0.35(0.26)	3.60(2.59)
β_1	0.47(18.23)	0.44(13.91)	0.41(9.54)
β_2	-0.15(-1.48)	-0.11(-0.77)	-0.12(-1.21)
β_3	0.08(2.50)	0.09(2.41)	0.08(3.31)
β_4	-	0.15(3.04)	0.042(1.08)
β_5	-	-	-0.0007(-0.55)
R-Squared	0.85	0.84	0.58
Adjusted R- Squared	0.83	0.83	0.55
F	45.46	147.83	18.75
Prob F	0.000	0.000	0.000
D.W	2.2	1.99	1.24

Source: Authors findings

The Figures in Parenthesis Are T Statistics

We have estimated the above 3 models using panel data regression and pool methods With regard to this matter that Significant part of liquidity in countries in OPEC member is supplied by oil exporting, in the second pattern, Liquidity growth rate to investigate this matter that whether Liquidity effects on these countries as an independence variable or liquidity is hidden in oil revenues and impose its effect via oil price, we add it to our model. Then we added to the previous model the growth rate of stock value in pattern (3) to study the crisis impact on inflation via financial market channel (stock).

The results of F test and Hausman tests are presented in Table (1). Panel data and Pool method is used for the second model. In addition, first model is estimated by fixed effects method whereas the third model is estimated by the random effects method.

The results of all estimation models are presented in Table (2).

According to the presented results in Table (2) the Inflation lag coefficient in all 3 models are significant and positive.

CONCLUSION

This study has attempted to examine the effect of 2007 financial crisis on inflation in OPEC based on a panel data regression model during 2000-2010. Financial crisis affects economic variables such as economic growth, oil price and stock price index (i.e. financial markets), which in turn change inflation. In other words crisis caused an increase in oil price which in turn had a positive and important influence on the inflation of the OPEC. For Example, the study finds as a result of one percent increase in oil price, inflation increase by 0.08 percentage points in these countries. Also our findings indicate that economic growth and stock price index have negative but statistically insignificant impact on inflation in OPEC. In other words, one can concludes that there has been no exchange between production and inflation in these countries implying a weak structure of the manufacturing sector (real sector of the economy) in these countries.

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