

## **Export Instability and Economic Growth (The Case of OPEC)**

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### **Abstract**

Oil sector is the most effective sector in these countries. Oil is the most important product that world industries use as the cheapest energy. The price of oil depends on the world's supply and demand and many economic, political and geographical variables. This is the reason why the price of oil has fluctuations. The fluctuations in oil price lead to fluctuate in the oil revenues of the member countries of OPEC. Because the economic system of these countries directly depends on oil sector, economic growth affected by the oil sector. The research made to explain the effect of export instability on economy, by using economic growth modeling and panel data analysis with time series data from 1981 to 2006 with seven member countries of OPEC. The results show that there is a strong negative relationship between export instability and economic growth. In other words, export instability either positive or negative create many problems for these kind of countries. This means that if the revenue of oil exports in these countries increases, they fall in trouble. We can also clearly see this problem in economic growth rate. Therefore, export instability is not beneficial in OPEC countries and they should try to stabilize and manage their revenues their revenue usage properly.

**Keywords:** Instability, Export, Economic Growth, Panel Data, OPEC.

## **1- Introduction**

Oil income for OPEC member countries is as important as water for any living creature. National and international policies in these countries are inevitably affected by fluctuations in oil price. Since OPEC members' main export is oil (for example for most of them, more than 75 per cent of their foreign exchange is earned from export of oil), instability in the world oil market will affect their importance, government expenditure, investment, saving, and financing of projects necessary to promote growth of national income. In some cases, an increase in the amount of oil exported or in its price, has increased the inflation rate in member countries and has reduced the other sector product competitiveness in world markets. Thus, the production of these sectors has been reduced drastically. For example, in Iran, increase in value of petroleum export reduced the production index of the industrial sector (Dutch disease).

Increased oil revenues may have different consequences. It may result in a stronger economy, accelerate the development plans, and help achieve a higher economic growth rate. On the contrary, it may involve the country in ambitious and unrealistic investments, which result in economic imbalances manifested by budget deficit, balance of payment deficit, and increased difference between investment and saving. In our research, OPEC countries are select. The reason for this selection is the important common characteristics i.e. the high percentage of oil revenue in their GDP. Most of them earn more than 75 per cent from oil sector. There are 13 countries in OPEC but data series of variables are used for only seven countries. As Algeria, Indonesia, Iran, Kuwait, Saudi Arabia, Nigeria and Venezuela. In panel data analysis, if in our time series data we miss one particular entry then we would lose those data for all of our case studies. Therefore, it is very important to choose good quality data for our model.

Angola and Ecuador were not in our basket because they joined OPEC in 2007 and their data are available only after 2007. We have worked on time series data analysis from 1980 to 2006. Iraq's data are not acceptable in our research because during Iraq's war with Kuwait, it was a weak country in OPEC and lost most of its economic power. Then it did not have any real economic growth during the time under consideration as part of OPEC. Some of the economists believe that Iraq had to leave OPEC in this situation. For United Arab Emirates, just around 48 per cent of its value of export comes from petroleum export and it is no big deal as a member of OPEC country. The most important thing for this country is its trade situation and the less important thing is the effect of oil export instability on economic growth. Qatar is a very small country, with less than one million population and less value for petroleum export than what is needed for the analysis. So we have not included it in our sample. Libya has a lesser value of petroleum export after Iraq (\$38miliard) and Qatar (\$37 miliard) so, we put it out of our case study too.

As a matter of fact, because of our methodology, panel data time series analysis and above mentioned limitations of availability of data, basket had to be reduced to just 7 countries. Our sources of data are World Bank, World Development Indicators (WDI),

International Monetary Fund (IMF), International Financial Statistics (IFS), Annual Statistical Bulletin of OPEC (for some years), world Investment Report (for some years), Statistical Center of Iran (CBI) and Central Bank of Iran (CBI)

## **2- Literature review**

### **2-1- Economic Growth and Export Instability**

Economic growth defined as the material increase of the total national income or the GNP of a community in a given period. This increase has shown in the form of the national income changes percentage of countries as compared to the year before.

This increase, as a general concept, is simply a quantitative phenomenon. Professor G. Myrdal has confirmed this definition. He views economic growth as an increase in GNP. In addition to this definition, Michel Todaro suggests a stable process because of which the capacity of economic production increases over time and leads to an increase in national income. However, on Simon Kuznets opinion, economic growth is a more precise concept. According to Kuznets, economic growth defined as a long-run increase in production capacity to supply people with even more economic goods. Another definition with a slight difference is that economic growth can define as a qualitative and uninterrupted increase in production or a state's annual revenue through an increase in work power, consumption, capital and trading volume.

Therefore, an examination of the most economic growth definitions supports a common concept. This common definition is as follows: a quantitative increase in production over a large period of time. According to the above definition, economic growth implies a consistent and un periodic increase in production capacity. Because of the increase in production capacity always accompanied by the production costs increase and that is actually payed to production factors or production factors' income, income distribution affected by economic growth.

The term "growth" is usually use in relation with real output. However, there is a variety of growth concepts, even in relation with output. For example, are we interested in gross or net output? Is it simply real output which interests us or is it output per head of population? On the other hand, should we look at output per head of the work force? Do we mean by growth the absolute or proportional (percentage) increase in the variables, which interest us?

There is no single correct answer to these questions which is relevant, depends, as always, upon the question we are asking. For example, if our concern is with economic welfare, net output per head is probably the appropriate variable, but if we are interested in productivity we may prefer gross output per man hour year. (Rowan 1968)

### **2-2- Definition of Export Instability:**

Value of exports like other economic variables does not have a fixed trend over time. This volatility has some costly effect on the economic system of any country. This fluctuation is called instability. As we cannot find just one clear definition for instability, we

introduce here some comparative research on that. The first economist to define instability was Coppock. He believes that, sometimes fluctuations of variables are not unutilized or unwanted changes, but the aim of economic activities is to find the best usage of variable volatility.

So he had a comparative research between useful fluctuation and some another kind of fluctuation that make problems for economic system (Coppock, 1962; 29).

Coppock (1977;4) discusses that instability is not only residual; but also more than normal. Therefore, he believes that it is different in meaning from wasteful or excessive or normal. Most of economists think about one fixed trend and residual as a definition of instability. In this way, we have just found a normal trend of variable and instability that is a kind of volatility from this trend.

Massell(1964) creates a difference in comparative way, difference between long run effect that makes a trend for us and short run effect that shows the residuals.

Certainly meaning of adjusted trend with normal trend in both theory of Massell and Coppock is the same and could answered volatility of economic wants, technology and supply of resource.

From the researches in the instability index we can find that in most of them, any residual is instability. In addition, some of economists like Coppock tried to make a clearer definition of instability. It is important because with this knowledge, we can think about both- positive and negative effects of instability.

Hirshman(1959; 355-356),has another idea about instability and he just states that excessive volatility is trend volatility. He believes that each volatility has not made a problem in equation of long-term supply and demand and all over the world; he believed that excessive volatility is the worst thing for economic systems.

Massell (1970; 618-630) states there is difference between income stability and income certainty. He said in his article that it is possible that income has fluctuations over time but there is a certainty about income.

Katrak (1973; 558) believes in rational expectation. The power of forecast in the face of economic accident helps us to make a stability policy in crisis. But Love (1979; 60-69) explains that even if a country can forecast any crisis, it cannot do much against it.

Certainly, the reasons for instability are unadjusted exchange rate and structure of monetary and fiscal policies in the developing country.

Parnes and Knudson state the theory of certainty degree of achieving export revenues. They extracted from Fridman persistence's income theory to analyze instability and made a definition of that. They believe that the volatility of export income has three parts, such as persistence volatility, transient volatility and forecast volatility. In their opinion, all of these volatilities are not a part of instability. Against Massell's theory of instability, these two believe that forecasted and planned volatilities are uncountable in the changing trend.

They also believe that an unforecasted and transient parts have an uncertain meaning in transient income and the meaning is equal to instability .In fact, income uncertainty is

income instability. The effect is on saving, investment and also income growth with risk adverse behavior.

Theobald and Lawson (1976) explained that definition of instability is related to depression effect of instability. In other words, they believe that the positive residual is not important and we have to count on just negative one, because decreases of income do not increase it but create a problem.

### **3- Research Variables & Models**

#### **3-1- Export Instability Index Used in This paper**

We have used the following instability index for our research:

$$\text{Inst} = \left( rX_t - \bar{X} \right)^2$$

$rX_t$  = value of export growth rate

$\bar{X}_t$  = an average of export value during the time series of research

#### **3-2- Historical perspective**

In principle, all of the macroeconomic variables like economic growth need a stable atmosphere and many studies have shown that unstable atmosphere cause damages to the economics system.

We try to review some studies which explain the effects and the relationship between export instability and economic growth. Most of the studies have found negative relationship between export instability and economic growth but some studies have found that export instability can be the reason of higher economic growth. It is possible that accelerated volatility and export shocks increase motivation for investment in short run but it can change to uncertainty and decrease in investment in the long run. Experience of oil price increases is a clear example of short run success and long run disappointment for the oil exporting countries.

Certainly some of the oil exporting countries like Saudi Arabia and Norway try to lessen the effect of export instability by creating an exchange saving account. They forecast a long run oil price and if the price goes up, they put extra revenue in the saving account and if the price goes down, they use from that account for their expenditure. Therefore, they can control directly the effect of oil export instability. Authors show some of the historical perspective as below:

Serial No	Author	Title of the work	Time period	Method applied	Finding
1	Reynolds (1963)	Domestic Consequences of Export Instability	1950 -1966	Time series' Econometric	Negative
2	Massell (1970)	Export Instability and Economic Structure	1955-1966	Cross-section	Negative
3	Hanson(1980)	Export Instability in Historical Perspective	1850-1899	Panel Data	Negative
4	Ozler and Harrigan(1988)	Export Instability and Growth	1963-1982	Autoregressive	Negative
5	Mullor-- Sebastian(1990)	Export Instability and Policy Implications for Developing Countries as Residual Suppliers	1966-1980	Panel Data	Some period is positive Some period is negative
6	Gyimah-Brempong (1991):	Export Instability and Economic Growth in Sub -Saharan Africa	1979-1986	Panel Data	Negative
7	Kose and Riezman (1999)	Trade Shocks and Economics and Finance	1970-1990	General Equilibrium model	Negative
8	Sinha (1999)	Export Instability , Investment and Economic Growth in Asian Countries	1948-1997	Panel Data	Some countries are positive Some countries are negative
9	Akpokodje (2000)	The Effect of Export Earnings Fluctuations on Capital Formation in Nigeria	1973-1995	Time series' Econometric	In the long-run is positive In the short-run is negative
10	Bonjean at al (2001)	The Economic Consequences of Export Instability Developing Countries	1958-1999	A Survey and review of literature	In the long-run is positive In the short-run is negative
11	Kwasi Fosu (2001)	Economic Fluctuations and Growth in Sub-Saharan Africa	1968–1986	Panel Data	Negative but weak
12	Abraha (2004)	Export Instability and Economic Growth in Ethiopia	1966-2002	Time series' Econometric	Negative
13	Sinha (2007)	Effects of Volatility of Exports in the Philippines and Thailand	1960-2005	Time series' Econometric	Negative
14	Hesse (2008)	Export Diversification and Economic Growth	1961-2000	Panel Data	Positive

### 3-3- Fixed Effects Model

Fixed effects models are not without their drawbacks. The fixed effects models may frequently have too many cross-sectional units of observations requiring too many dummy variables for their specification. Too many dummy variables may sap the model of sufficient

number of degrees of freedom for adequately powerful statistical tests. Moreover, a model with many such variables may be plagued with multicollinearity, which increases the standard errors and thereby drains the model of statistical power to test parameters. If these models contain variables that do not vary within the groups, parameter estimation may be precluded. Although the model residuals are assumed to be normally distributed and homogeneous, there could easily be country-specific (group wise) heteroskedasticity or autocorrelation over time that would further plague estimation. The one big advantage of the fixed effects model is that the error terms may be correlated with the individual effects. If group effects are uncorrelated with the group means of the regressors, it would probably be better to employ a more parsimonious parameterization of the panel model

### **3-4- The Random Effects Model**

William H. Greene calls the random effects model a regression with a random constant term (Greene, 2003). One way to handle the ignorance or error is to assume that the intercept is a random outcome variable. The random outcome is a function of a mean value plus a random error. But this cross-sectional specific error term  $v_i$ , which indicates the deviation from the constant of the cross-sectional unit (in this example, country) must be uncorrelated with the errors of the variables if this is to be modeled. The time series cross-sectional regression model is one with an intercept that is a random effect.

$$\begin{aligned}
 y_{it} &= \beta_{0i} + \beta_1 x_{1t} + \beta_2 x_{2t} + e_{it} \\
 \beta_{0i} &= \beta_1 + v_1 \qquad (1) \\
 \therefore y_{it} &= \beta_1 + \beta_1 x_{1t} + \beta_2 x_{2t} + e_{it} + v_1
 \end{aligned}$$

Under these circumstances, the random error  $v_i$  is heterogeneity specific to a cross-sectional unit, in this case, country. This random error  $v_i$  is constant over time. Therefore, the random error  $e_{it}$  is specific to a particular observation. For  $v_i$  to be properly specified, it must be orthogonal to the individual effects. Because of the separate cross-sectional error term, these models are sometimes called one-way random effects models. Owing to this intrapanel variation, the random effects model has the distinct advantage of allowing time-invariant variables to be included among the regressors.

### **3-5- Model and Estimate Fundamental of Theory**

Oil-export values have a very big impact on economic situation in oil-exporting countries especially in OPEC. Husain, et al. (2008), show in their study that 95 per cent of aggregate expenditure of the oil-exporting countries is managed by oil-export revenues. This percentage is around 80 per cent for some countries like Libya, Saudi Arabia and Nigeria. It seems that increasing oil price in current times has increased this percentage for all oil-

exporting countries. Therefore, these countries have certain peculiarities for research in economic science. For example, even in industrialized countries, they fund nearly 100 per cent of their expenditure from taxes but in OPEC, just 20 per cent to 30 per cent of their expenditure is covered by taxes.

This means that the governments in those countries cover their expenditure with the money from oil-revenue around three or four times more than the amount received through taxes. This point has very important impact on political and economic sectors. In spite of enormous oil revenues, these countries have a lower human development index (HDI). It has happened because the government sectors are less efficient. In these countries, the governments are custodians of economic development planning. They provide economic development planning by earning revenues from exporting oil. First, they forecast oil price and oil revenue. If their realized revenues fall short of expected oil revenue for their economic planning, they have to cut off spending or some aspects of the plans. The items of plans that they have to cut off are from reconstruction because governments cannot change the current costs, as the current costs in these countries are inflexible. Therefore, when spending on reconstruction decreases, it could pose many more problems for them.

In other words, if the price of oil increases and oil revenue amount increases, extra revenue from the forecast planning could benefit or create problems for the economy. They can use extra revenues to improve their economic strength and undertake better planning to develop their countries. On the other hand, this extra money in their budget may lead to extravagant ambitions and unrealistic plans and hereby create problems such as budget deficit, foreign trade imbalance, balance of payment deficit, etc. This extra money in their budget may also lead to gap between investment and saving in those countries.

#### **4- Modeling + Results**

This model was used by Feder (1982) for some developing countries. Khalifa Al-Yousif (1997) studied the relationship between export and economic growth between four Arab countries in Persian Gulf by using the Feder-base model. Our study can add to these studies and make a way for finding the relationship between export instability and economic growth. One of the most important problems that export instability model has is variety in export goods. Product mechanism, marketing and efficiency factors for different goods are the reasons that the result shows just an average trend and not a fixed trend. In short, it seems that the previous studies have superficial result so they are not useful in trade policy. Our study does not have this problem, in spite of some variety of crude oil; this product has more homogenous degree towards other export goods like agriculture goods and industrial goods etc. (Ahmadian, 2000; 489-510)

The production function Viz.

$$GDP = f(GXP, INV, POP, FDI, PET, OI) \quad (2)$$



Where:

GDP = Gross domestic product at fix price

GXP = Government Expenditure as the Percentage of Gross Domestic Product at fix price.

INV = Total Investment at fix price

POP = Labor force

FDI = Foreign Direct Investment

PET= Oil Export value at fix price

OI = Export Instability

For the whole data of these variables, we have used these sources: Our sources for data are World Bank, World Development Indicator (WDI), International Monetary Fund (IMF), International Financial Statistics (IFS), Annual Statistical Bulletins of OPEC, World Investment Reports, Statistical Center of Iran (CBI) and Central Bank of Iran (CBI)

If the differential of equation (2) is taken in to consideration, we get the following equation:

$$\begin{aligned} dGDP = & \frac{\partial GDP}{\partial GXP} \cdot dGXP + \frac{\partial GDP}{\partial INV} \cdot dINV + \frac{\partial GDP}{\partial POP} \cdot dPOP \\ & + \frac{\partial GDP}{\partial FDI} \cdot dFDI + \frac{\partial GDP}{\partial PET} \cdot dPET + \frac{\partial GDP}{\partial OI} \cdot dOI \end{aligned} \quad (3)$$

If we divide the equation (3) by GDP and after that with division and multiplication the one variable in each fraction of equation, we get the following equation:

$$\begin{aligned} \frac{\partial GDP}{GDP} = & \left( \frac{\partial GDP}{\partial GXP} \cdot \frac{GXP}{GDP} \right) \cdot \frac{dGXP}{GXP} + \left( \frac{\partial GDP}{\partial INV} \cdot \frac{INV}{GDP} \right) \cdot \frac{dINV}{INV} + \\ & \left( \frac{\partial GDP}{\partial POP} \cdot \frac{POP}{GDP} \right) \cdot \frac{dPOP}{POP} + \left( \frac{\partial GDP}{\partial FDI} \cdot \frac{FDI}{GDP} \right) \cdot \frac{dFDI}{FDI} + \\ & \left( \frac{\partial GDP}{\partial PET} \cdot \frac{PET}{GDP} \right) \cdot \frac{dPET}{PET} + \left( \frac{\partial GDP}{\partial OI} \cdot \frac{OI}{GDP} \right) \cdot \frac{dOI}{OI} \end{aligned} \quad (4)$$

If we consider the equation (4), we come to know that the equation in parenthesis explains the definition of elasticity.

It means:

$$\mu_{GX} = \frac{\partial GDP}{\partial GXP} \cdot \frac{GXP}{GDP} \quad \text{Government expenditure elasticity ratio}$$

with product

$$\mu_{PIF} = \frac{\partial GDP}{\partial INV} \cdot \frac{INV}{GDP} \quad \text{Investment elasticity ratio with product}$$

$$\mu_{POP} = \frac{\partial GDP}{\partial POP} \cdot \frac{POP}{GDP} \quad \text{Active population elasticity ratio with product}$$

$$\mu_{\text{FDI}} = \frac{\partial \text{GDP}}{\partial \text{FDI}} \cdot \frac{\text{FDI}}{\text{GDP}} \quad \text{Foreign direct investment elasticity ratio}$$

with product

$$\mu_{\text{TT}} = \frac{\partial \text{GDP}}{\partial \text{PTT}} \cdot \frac{\text{PTT}}{\text{GDP}} \quad \text{Oil export revenue elasticity ratio with}$$

product

$$\mu_{\text{OI}} = \frac{\partial \text{GDP}}{\partial \text{OI}} \cdot \frac{\text{OI}}{\text{GDP}} \quad \text{Export instability elasticity ratio with product}$$

As we know, the first part in equation is elasticity and the next part is growth rate and also the left part of the equation is growth rate; we rewrite the equation as:

$$\text{RGDP}_{it} = \mu_{\text{GX}} \cdot \text{RGXP}_{it} + \mu_{\text{INV}} \cdot \text{RINV}_{it} + \mu_{\text{POP}} \cdot \text{RPOP}_{it} + \mu_{\text{FDI}} \cdot \text{RFDI}_{it} + \mu_{\text{PET}} \cdot \text{RPET}_{it} + \mu_{\text{OI}} \cdot \text{ROI}_{it} \quad (5)$$

In equation (6.4) as *RGDP*, *RGXP*, *RINV*, *RPOP*, *RFDI*, *RPET* and *ROI*

respectively means Gross Domestic Product growth rate ; Government Expenditure growth rate , Real investment growth rate, Worker population growth rate, Foreign Direct Investment growth rate ,Oil Export Revenue growth rate, Oil Export Instability growth rate.

If we add  $\alpha$  and  $u_t$  in that-model, the final model would be:

$$\text{RGDP}_{it} = \alpha + \mu_{\text{GX}} \cdot \text{RGXP}_{it} + \mu_{\text{INV}} \cdot \text{RINV}_{it} + \mu_{\text{POP}} \cdot \text{RPOP}_{it} + \mu_{\text{FDI}} \cdot \text{RFDI}_{it} + \mu_{\text{PET}} \cdot \text{RPET}_{it} + \mu_{\text{OI}} \cdot \text{ROI}_{it} + u_t \quad (6)$$

In this chapter, we have tried to estimate equation (6) by panel data analysis of seven members of OPEC from 1982 to 2006, but before that, we have tried to use pool unit root test for all our variables. Which we can see through the following table.

(Table 1)

Pool unit root test: Summary
Series: RGDP_ALG, RGDP_IND, RGDP_IR, RGDP_KUW, RGDP_NIG, RGDP_SA, RGDP_VEN, RGXP_ALG, RGXP_IND, RGXP_IR, RGXP_KUW, RGXP_NIG, RGXP_SA, RGXP_VEN, RINV_ALG, RINV_IND, RINV_IR, RINV_KUW, RINV_NIG, RINV_SA, RINV_VEN, RPOP_ALG, RPOP_IND, RPOP_IR, RPOP_KUW, RPOP_NIG, RPOP_SA, RPOP_VEN
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on SIC: 0 to 4
Newey-West bandwidth selection using Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.65681	0.0000	28	654
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-11.6281	0.0000	28	654
ADF - Fisher Chi-square	285.863	0.0000	28	654
PP - Fisher Chi-square	254.561	0.0000	28	686

\*\* Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

As shown in the table, the entire variables are stationary and to prove that we have used fisher test, Levin and Chan test.

We could forecast this partially because all the variables that have been used in panel data model have used the rate of growth when we use the growth rate of variables, most of the non-stationary macroeconomic variable could be changed into stationary variables. On the other hand all the data are used in the form of pool, any variable for each country being non-stationary even with the growth rate, when it is used with other stationary data, all the variables can be stationary. However, to be on safer side, we have done the above-mentioned test too and the result is shown in Table 1.

In Table 2, we estimate the model by panel data analysis. As shown in Table 2, government expenditure and oil export instability have an inverse relationship with economic growth. On the other side, investment growth rate, active population growth rate, foreign direct investment growth rate and oil export revenue growth rate have a direct relation with economic growth.

**Table 2**

Dependent Variable: RGDP?				
Method: Pooled EGLS (Cross-section SUR)				
Included observations: 25 after adjustments				
Cross-sections included: 7				
Total pool (balanced) observations: 175				
Linear estimation after one-step weighting matrix				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-30.51209	14.25796	-2.140004	0.0339
RGXP?	-0.111699	0.040367	-2.767077	0.0063
RINV?	0.330826	0.030653	10.79266	0.0000
RPOP?	0.411076	0.242290	1.696629	0.0917
RFDI?	0.000714	0.000816	0.875403	0.3827
RPET?	0.233060	0.028190	8.267370	0.0000
ROI?	-1.571234	0.579977	-2.709130	0.0075
Fixed Effects (Cross)				
_ALG--C	2.237843			
_IND--C	2.090220			
_IR--C	-4.048255			
_KUW--C	2.693850			

_NIG--C	-1.366492		
_SA--C	7.863307		
_VEN--C	-9.470472		
Effects Specification			
Cross-section fixed (dummy variables)			
Weighted Statistics			
R-squared	0.726905	Mean dependent var	-0.201432
Adjusted R-squared	0.706676	S.D. dependent var	1.843146
S.E. of regression	1.001244	Sum squared resid	162.4034
F-statistic	35.93332	Durbin-Watson stat	2.138383
Prob(F-statistic)	0.000000		
Unweighted Statistics			
R-squared	0.630457	Mean dependent var	-5.393840
Sum squared resid	27569.84	Durbin-Watson stat	2.142430

**We can explain this relationship theoretically as follows:**

As mentioned above already, government expenditure growth rate has a negative relationship with economic growth and the coefficient of this equation i.e. elasticity shows that 1 per cent increase in government expenditure growth rate makes 11 per cent increase in economic growth rate. It is acceptable to OPEC country members. It explains the inefficiency of the large size government and bureaucracy and their opposition to private industrial and trade sectors. These factors explain crowding out effect and harm it does to private investment. Gaskari and Eghbali (2008) have shown that the same thing mentioned above applies to Iran, as Iran is an important and effective member country in OPEC.

The other variable that we have tried to study is oil export instability. This variable has an inverse relationship with economic growth rate. The co-efficient of this variable shows a high effect on the reduced economic growth (Table 2). Each 1 per cent increase in oil export instability can reduce 1.57 per cent of economic growth rate. It also shows that studying the index is very essential. Oil revenue has a great effect on budgeting in these countries. They can forecast the oil price. Their forecasting can be optimistic, pessimistic or realistic. Whenever there is an unexpected rise in oil prices, this extra income solves their monetary and financial limitations. The political structure of these countries does not have a standard degree of political stability.

Actually, these countries do not have a real democratic set-up so governments usually try to show themselves as friends of people and resort to extravagant planning with their windfall earnings. As we know, in real terms economic explanation does not match with the political explanation in this kind of planning. Increase in aggregate demand and aggregate supply do not go together because expenditure is earned through the oil revenue. So the result is that resources are wasted and economic growth rate is low. This phenomenon in economic literature is known as Dutch disease. On the other hand, this instability can lead to a decrease in oil price. In such situation, the government cannot achieve the forecasted revenues and so the government lands with a deficit budget then the government tries to decrease government expenditure or borrow from their banking system. Because of this,

there will be more unemployment and the country will face high inflation rate. Both these effects damage the economy. As against these two variables, some other variables have positive relationship with economic growth.

Two of the variables in the model are not significant-active population growth rate and foreign direct investment growth rate. Active population growth rate has a positive relationship with economic growth but it is statistically significant.

In oil exporting countries, investment does not have to be a problem because of their high revenue earned by oil sector. So it can have improved efficiency of work force specially skilled work-force.

But in case of foreign direct investment (FDI) oil industrial sector had stable FDI. In current years, because of extra capital-risk and political instability, these countries do not have much FDI. In Kuwait and Saudi Arabia there is some FDI. Real investment has a high effect on economic growth rate and is statistically highly significant. In addition, oil export revenue has a positive and high relationship with economic growth rate and is statistically highly significant. In fact, the oil export revenue is the most important factor for their economic engine.

## **5- Summary and Conclusion**

Although there have been research studies on export instability and its effect on economic growth, few researchers have addressed the effects of instability of oil export revenue in oil producing countries which are members of OPEC. The instability of oil export value and the fall of oil price in world markets have considerable adverse effects on the economic and social conditions in oil exporting countries. In times when oil export revenue has increased, many of the oil exporting countries had an opportunity to spend more. Sometimes, this extra money in government spending resulted for higher inflation rate and reduced their growth. In many of these countries, rise of oil export revenue has not always been a blessing. Therefore, we have chosen this topic to find out whether the changes in demand for oil or its revenue, have a positive or negative effect on economic growth of oil exporting countries.

### **5-1- Findings**

As mentioned above, the main goal of this paper is to study the relationship between export instability and economic growth in OPEC countries. In panel data analysis, if in our time series data we miss one particular entry then we would lose those data for all of our case studies. Therefore, it is very important to choose good quality data for our model. We have used the data of only seven member-countries of OPEC for our analysis as we talk about before.

The results show that we have a strong negative relationship between export instability and economic growth, which is significant. In other words, export instability either positive or negative creates many problems for this type of countries. This means that if the revenue of oil export in these countries increases, these countries fall in trouble. Then we can see this

problem clearly in economic growth rate. Therefore, export instability in OPEC member-countries is not beneficial to them so they have to try to stabilize their revenues and manage its revenue usage properly.

In this model by unit root test, we tested the variables of model and the results show that all of the variables are stationary. We could use it for forecasting in the past. Each variable is estimated with data for seven countries. So automatically, the entire variable could be stationary even if data for one or two countries are missing. Second reason is that we have used growth rate of the variables and the growth rate could change most of the macroeconomic variables from non-stationary to stationary.

Four variables have a positive relationship with economic growth and two of the six variables which we introduced as dependent variables, have a negative relationship with the economic growth. Investment growth rate, active population growth rate, foreign direct investment growth rate and oil export revenue growth rate, have a positive relation with the economic growth. In this way, foreign direct investment growth rate is quite insignificant. In these countries, FDI is not high enough. So its effect is not important in our model. However, other variables with positive relation have a strong and significant relation with economic growth.

On the other hand, Government expenditure growth rate and export instability variables have a negative relation with economic growth. Government expenditure's growth rate explains bureaucracy in their country. As the government has a strong relationship with oil sector in these countries, it can increase their size easily. That is the reason why the economic resources make their size larger, make more investment to develop their countries and increase government expenditure. However, the most important variable in our paper is export revenue instability related to petroleum products. It has a destructive effect on economic growth. In these countries, the variable having most negative effect is oil export revenue. The fluctuation in oil sector revenues places the economy and the country in an uncertainty situation.

They have to plan for three alternatives, optimistic pessimistic and realistic. For each of them, they should have a special plan. With increasing oil revenue, they do not have any limitation on their investment. Therefore, the interest rate decreases and the government enters into highly ambitious planning and in principle, political explanation is preferred to economic explanation.

Hence, the government injects this revenue and raises the base of money and it could be the reason for the increase of aggregate money and increased aggregate demand and inflation rate. However, for their governing structure in those countries and non-efficiency in economic system, aggregate supply does not change. So it just leads to a short run and temporary briskness and high inflation rate. It is not just an economic problem. It creates political and sociological problems too for the country. This we can explain as "Dutch diseases". On the other hand, if their oil export revenue reduces, they confront financial resource deficit. As in the current years, they did not get foreign investment. Therefore, for

filling this gap, the governments receive loans from the banking system which leads to increase in inflation rate in these countries. To summarize if the oil export revenues increase or decrease, we can find theoretical reasons which explain the negative effect that they have on economic growth.

### **5-2- Recommendations and Policy Implications**

Our research shows that oil export instability has a negative effect on economic growth. This finding has following policy implications:

- 1) In most of the OPEC countries, more than 70 per cent of economic activity belongs to their governments. The governments have a big size and are so powerful economically that they should reduce their role in economic activity so that private sector can be promoted.
- 2) These countries do not have to secure their budget from selling oil. With instability in their export value, they have failed in their planning and because of the big size of the government in the economy; these countries may fall in trouble. It's better that they find another source of income like taxes for the government expenditure.
- 3) If the oil export instability increases their income, they do not have to spend this extra money in their current budgeting and if they save that, they can use it during crisis.
- 4) Major part of export value in these countries earned is from exporting oil. They have to work on industrializing crude oil products and if they make some value addition to this industry, perhaps they will overcome the economic crisis easily. For example, they cannot cover consumption of petrol for the cars in their own country and they have to buy it from another country. If they try to make it inside, the negative effect of oil export instability can become weak.
- 5) In this research, the important thing was the effect of export instability on economic growth from aggregate supply side. However, if we check the aggregate demand side in an equilibrium situation, we can use other variables too. For example by an active finance policy, we can cut off the negative effect of decrease in oil income on economic growth. In addition, when the export revenue increases, we can manage the relation between financial policy and individual investment.

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