Factors Affecting Investment in the Iranian Oil and Gas Sector

Sanaz Jahan Bozorgi, Farzaneh Taheri

Islamic Azad University of Marvdasht, Marvdasht, Iran

The aim of this study was to investigate factors affecting investment in the oil and gas sector. Therefore, the required data and statistics from the national accounts, economic websites, and the Islamic Republic of Iran Central Bank were collected by using case analysis Econometrics model ARDL. In order to investigate the relationship between investment in the oil and gas sector and variables affecting it, in the first test, the assumption of the classical study of the problem in your case and the correlation between linear time failed to see the variance. A study on the existence or absence of malpractice in the desired pattern by using the results of that test was done, the R-Ramzi showed the lack of test by error in the template. The results of this study showed that in the long run the price of oil and the amount of export of the oil and gas sector are positive and statistically significant (5% level) on investment in the oil and gas sector. Also, the added value and the exchange rate variables were positive and negative relationship with investment in the oil and gas sector, as well as oil income has a positive impact on the investment amount which is the estimated coefficient, though this is not a politically significant variable.

Keywords: investment, oil, gas, Iran, ARDL

Introduction

Small and medium enterprises (SMEs) contribute to economic development by virtue of their employers' numbers and increasing share in Gross National Product (GNP) (Mehrjerdi, Talebi, & Akbari, 2014; Talebi, Mehrjerdi, & Akbari, 2016). Agriculture plays an essential role in gulf security and employment, production and food security and the country had a major share of GDP allocated to will (Akbari & Mehrjerdi, 2011; Kohansal & Akbari, 2013), but the country's oil industry, one of the leading industries and at the same time with the importance and the advantages in the country that has a significant share in the exports, the national government and the production of incomes and its monopoly which are more accurate in the government can be said more activities of this section which is done by the government. The petroleum sector includes three sections: the extraction of crude oil, gas extraction, and production of petroleum products. This sector is very capital-intensive, due to the high dependence on the politicaland international crisis and highly vulnerable to the effect of any changes it makes, influencing on other sectors.

Foreign direct investment (FDI), one of the most important economic variables that could be major economic countries fulfills the goals. In the meantime, some factors can affect the absorption of foreign investment. Awareness of how to affect these variables can affect decisions and macroeconomic variables such as production and employment. Optimal policies of investment in the oil and gas sector in order to supply the

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Sanaz Jahan Bozorgi, M.Sc. of Agricultural Economics, Islamic Azad University of Marvdasht, Marvdasht, Iran.

Farzaneh Taheri, assistant professor of Agricultural Economics, Islamic Azad University of Marvdasht, Marvdasht, Iran.

Correspondence concerning this article should be addressed to Farzaneh Taheri, Faculty of Agricultural Economics, Islamic Azad University of Marvdasht, Marvdasht, Fars, Iran.

country's national interest, one of the key objectives of macro in the country in recent years is considered (Arimon, Gonzalez-Paramo, & Rolldan, 1997; Bairam & Bert, 1993).

Certainly, any kind of policy is on the run due to some problems and the obstacles, we will reach the optimal macro-objectives in trouble, on the same basis, the aim of this study was to identify and explore factors affecting foreign investment in Iran's oil and gas sector. As one of the most important elements of production in the economy of capitalism, capital is composed of movement that comes and gets on earning money, as well as investing in which a capital goods for the production of other goods and services (Emran, Imam, & Forhad, 2003; Balts, 1999; Loony, 1999).

In different patterns of economic growth, one of the main factors of growth, is foreign investment and capital accumulation because of it. However, the impact of this factor and the strengths and weaknesses in accelerating the economic growth of a country depend on several factors, which, if the set of these factors does not operate correctly; the effect of investment on economic growth also will be ambiguous. In Iran, the performance of some of these factors is as follows (Siddiki, 2000; West & Pan, 1994):

A) Not withstanding that the investment rate especially in Iran is often high, but due to its extreme dependence on the massive oil resources and revenues from the sale of crude oil, caused by currency fluctuations on the system. The negative momentum of the two oil products direction limit: one of the limitations of the imported goods (materials, semi-finished goods needed by manufacturing process) because of currency restrictions and limitations of the financial resources of the order necessary for investment.

B) Political instability is another characteristic of Iran's economy and influences the increasing investment risk. Iran has always been under global and regional threats and wars (the Iran-Iraq war, Afghanistan war, Iraq war and Kuwait...) and has been suffering in the regional.

C) Institutional rules and regulations and complex disorders in Iran are a significant share of the bad investment performance due to the complex processes of administrative, often private investors leave the country or work in Non-productive sections, it creates a slight and weak competition and less innovation and classification in the economic system.

Study on oil and the factors affecting the amount of investment in this sector is a very important issue and as far as the amount of investment in the oil and gas sector impacts of major developments in the creation of economic stability as recession and inflation.

Methodology

In order to examine the long-term relationship and get this relationship for investment in Iran's oil and gas sector, its pattern of ARDL offered by Pesaran and Shin (1995), has been used. This method is the ability to estimate short- and long-term components to synchronize. This template estimates the compatibility of the long term analysis that are asymptotic normality and regressions can be I(0) and I(1), no longer need I(1) and these variables are suitable for small samples too. So far, different methods to test the validity of variables have been introduced, but these tests are lacking this feature to distinguish between the variables which is a package of grade a, I(1) has been, but that series is almost sticky I(1) can be distinguish. While no method (ARDL) does not have unit roots and for variables that are sticky or are having a valid unit root. Therefore, the use of different test methods will lead us to different results, but the problem with the aforementioned methods (ARDL) will largely be fixed (Pesaran, Shin, & Smith, 1999).

Pesaran and Shin (1995), approach (ARDL) is divided into two stages:

In the first stage of the existence of the convergence of F-test for being a significant break with the variables, and then the table of Pesaran and Shin (1996), we use. It's a critical comparison with two indices which has value because it is the unit root test which must be creative because according to the terms of Avatra (2004), if the template variables I(2) are in this case, the F statistics relating to test (Pesaran & Shin,1996) is not valid because this test is done under the assumption that the variables are I(0). Therefore, the unit root test in the case of (ARDL) (Pesaran & Shin, 1996) should also be taken to ensure that none of the template variables are I(2). If this statistic is greater than the critical value of high convergence which will be accepted, and if this value is smaller than the critical statistics there is convergence of the bottom (Kohansal & Akbari, 2013).

The second step involves estimating the equation and determining the coefficients estimated using methods (ARDL).

In order to estimate the relationship between short-term balances of error correction (ECM), which is a short-term imbalance to balance values, long-term relationship, we use.

Generally, if the pattern of ARDL is considered as follows:

$$\varphi(l,p)y_t = \sum_{i=1}^{k} \beta_i(l,q_i)x_{it} + \delta'w_t + u_t \tag{1}$$

So that:

$$\varphi(l,p) = 1 - \phi_1 L - \phi_2 L^2 - \ldots - \phi_p L^P$$

$$\beta_i(l,q_i) = \beta_{i0} + \beta_{i1}L + \beta_{i2}L^2 + \ldots + \beta_{iqi}L^{qi}$$

$$i = 1, 2, \ldots, k$$

L Operation is interrupted so that $Ly_t = y_{t-1}$ and w_t A vector $s \times 1$. The categorical variables such as the intercept, seasonal dummy variables, process variables and exogenous variables are constant interruptions.

Long-term coefficients are calculated as follows:

$$\hat{\theta}_i = \frac{\hat{\beta}_i(1,\hat{q}_i)}{\hat{\phi}(1,\hat{p})} = \frac{\hat{\beta}_{i0} + \hat{\beta}_{i1} + \ldots + \hat{\beta}_{i\hat{q}i}}{1 - \hat{\phi}_1 - \hat{\phi}_2 - \ldots - \hat{\phi}_{\hat{p}}} \tag{2}$$

$$i = 1, 2, \ldots, k$$

where $\hat{p}$ and $\hat{q}_i$ for $i = 1, 2, \ldots, k$ selected values (estimated) p and q_i, according to one of the criteria which is mentioned.

To get the error correction model coefficients, (ECM), the autoregressive distributed lag model, ARDL, the pattern (1) according to a standstill, and the first difference variables, $x_{1t}, x_{2t}, \ldots, x_{kt}$ and y_t rewrote.

$$y_t = \Delta y_t + y_{t-1}$$

$$y_{t-s} = y_{t-1} - \sum_{j=1}^{t-1} \Delta y_{t-j} \quad S = 1,2,\ldots, p \ w_t = \Delta w_t + w_{t-1} \ x_{1t} = \Delta x_{1t} + x_{1,t-1}$$

$$S = 1,2,\ldots, q_i \ x_{i,t-s} = x_{i,t-1} - \sum_{j=1}^{t-1} \Delta x_{i,t-j}$$

By replacing the top of the pattern (1) we will have to rewrite it:

$$\Delta y_t = -\phi(1,\hat{p})EC_{t-1} + \sum_{i=1}^{k}\beta_{i0}\Delta x_{it} + \delta'\Delta w_t - \sum_{j=1}^{\hat{p}-1}\phi_j^*\Delta y_{t-j} - \sum_{i=1}^{k}\sum_{j=1}^{\hat{q}_t-1}\beta_{ij}^*\Delta x_{i,t-j} + u_t \qquad (3)$$

So that the error correction EC_t is defined as follows:

$$EC_t = y_t - \sum_{i=1}^{k}\hat{\theta}_i x_{it} - \hat{\varphi}'w_t$$

So that $\phi(1,\hat{p}) = 1 - \hat{\phi}_1 - \hat{\phi}_2 - \ldots - \hat{\phi}_{\hat{p}}$ such error correction, defined it which should be noted that the importance and validity of the measurement error is corrected. Other factors such as $\hat{\phi}^*j$ and β_{ij}^* representing the remaining short-term relationships are dynamic. These coefficients are calculated according to the following formula:

$$\phi_1^* = \phi_{\hat{p}} + \phi_{\hat{p}-1} + \ldots + \phi_3 + \phi_2 \quad \phi_2^* = \phi_{\hat{p}} + \phi_{\hat{p}-1} + \ldots + \phi_3 \quad \phi_{\hat{p}-1}^* = \phi_{\hat{p}}$$

Error correction factor represents the speed of adjustment towards long-run equilibrium which is expected to be smaller than a minus.

So because of the number of static variables in the model of Autoregressive distributed lag method is used.

In the present study, the Dickey-Fuller unit root test will use stationary time series data (data that are collected over a period) (Bahmani-Oskoee & Chiwing, 2002).

So overall pattern of investment is considered to be in the following form:

Y = F(X₁, X₂, X₃, X₄, X₅)

Y: Investment in oil and gas sector

X_1: Value added

X_2: The price of oil

X_3: The oil and gas exports

X_4: Oil income

X_5: Currency

Evaluation of the variables to methods is not staged using Eviews software package. Also, regression equation was estimated with the help of Pro 4.1 Microfit and using the method of ARDL. The method of ARDL has the ability to estimate the long- and the short-term components simultaneous. This method is also able to fix the problems related to the removal and correlation variable (Siddiki, 2000). The required data and statistics from the national accounts, economic websites, and the Islamic Republic of Iran Central Bank were collected.

Results

Because of the importance of investing in the Iranian oil and gas sector, we should be aware of the impact of this variable on other economic variables, so in order to investigate the relationship between investment in the oil and gas sector and influencing variables that, in the first test, the assumption of the classical study of the problem in your case and the correlation between linear time and variance was proposed. A study on the existence or absence of malpractice in the desired pattern by using the results of that test was done and R-Ramzi showed the lack of test by error in the template. In addition, using the method of variables no investigated stage which results in Table 1 may be significant.

Table 1

Test Results of Static Variables Using 9-Step Method

Variable		*p*-value
Investment in oil and gas sector	I(1)	10%
Oil income	I(1)	1%
Oil price	I(1)	5%
Value added	I(0)	5%
Currency	I(1)	10%
Export	I(1)	10%

As may be observed, the variables in the static model are the degree of one and zero. Thus, the collective also known as ARDL analysis can be used. In order to choose the type of function in terms of linear or linear, diagnosis test results showed that the suitable model for the study of the study variables, is linear model.

The statistics based on the existence of artificial model F or the lack of a long-term relationship between the dependent variable and description of variables equal to 75.595% confidence level was significant, therefore, the existence of a long-term relationship between the investment in the oil and gas sector and the variables in the models was confirmed. Table 2 represents the outcome of long-term relationships.

Table 2

Results of Long-term Coefficients

Variable	Coefficient	*t*
Oil price	0.38	2.24
Value added	0.15	1.95
Currency	-0.086	-2.17
Export	0.18	1.95
Oil income	0.016	1.15

Table 2 shows that in the long run the price of oil and the amount of export of the oil and gas sector are positive and statistically significant (at the 5% level) on investment in the oil and gas sector. Also, the added value and the exchange rate variables were positive and negative relationship with investment in the oil and gas sector, as well as oil income has a positive impact on the investment amount which is the estimated coefficient, though this is not a politically significant variable. Table 3 represents short-term analysis of the pattern of the ECM.

Table 3

The Results in the Short-term Coefficients

Variable	Coefficient	*t*
Oil price	0.24	2.12
Value added	0.11	1.91
Currency	-0.027	-2.04
Export	0.13	1.87
Oil income	0.010	0.89
ECM (-1)	-0.70	-4.12
R^2	0.78	
DW	2.8	

The results of Table 3 show that the price of oil and the amount of variables to export oil and gas sector had a significant and positive impact on investment in the oil and gas sector. The added value of variables, coefficients of oil and gas sector, and exchange rate also which had a significant value on investment in the oil and gas sector, were not in the short term, but it should be added that the value of the variable of the positive effect of the oil and gas sector and exchange rate were also negative effects on investment in oil and gas sector. The error correction coefficient such as ECM (-1) is equal to 70.0 and as expected, the 99% confidence level in the negative and statistically significant. This coefficient reflects that in every year, there is 70% of the lack of balance in a period in the course of later modification. In other words, after nearly one year and four months the effect of policies in the field of investment in the oil and gas sector will be seen. For the study of the parameters estimatein the ARDL model test, the result presented 2 (CUSUMQ) and the sum of the squares of stacking and it used by Brown and partners (1975), totally including the accumulation of squares of range of disturbing the banks have been determined and the estimated coefficients on the structural stability of the desired course with a significant level of 5%. In other words of the estimated model coefficients stability hypothesis about the sensitivity analysis confirmed investment. The results of the estimation of drawing investment toward more effective operating in the long term and short term are in Table 4.

Table 4

Results Obtained From the Elasticity of Investment With Respect to Factors Affecting It

Variable	Long-term	Long-short
Oil price	0.86	0.58
Value added	0.55	0.47
Currency	-0.61	-0.14
Export	0.65	0.49
Oil income	0.51	0.38

As in Table 4 may be more variable, see the price of oil in the oil and gas sector in the short term and long term, respectively, 86.0% and 58.0%. That concept, which assumes the other conditions being constant, if the price of oil increased one percent, investment in this sector in the long term and short term (86.0% and 58.0% respectively) will increase. Recall also that the increase of one percent of the amount in the case of export of the oil and gas sector, investment in the oil and gas in the short- and long-term (65.0% and 49.0%) increase respectively. In the circumstances of the other factors constant, and the value added to the 1% rate increase is expected, then, that the increase in the oil and gas investment rate is 55% in the long term and 47% in the short term realization. With the increase of one percent of this in between in the exchange rate, investment in the oil and gas sector in the long term and short term (61.0% and 14.0%) will be showed. It may be stated that such investment in the oil and gas sector in the long term and in the short term the highest reaction against the oil price and the exchange rate has shown, therefore, more efficient management systems in the oil and gas sector may be used for investment in this sector. Also, as the data of Table 4 show, the lowest sensitivity of investment in the oil and gas sector is relative to the oil income.

Discussion and Conclusion

The mentioned topics can be inferred that the price of oil had a positive and significant relationship with the amount of investment, and with the price increase, the amount of investment has also increased and for a unit change in the price of oil, assuming other conditions being constant, 86% of investment in long-term and

58% in short-term will change. Value added is also a positive relationship with the amount of investment in circumstances that have a unit change in the variable 55.0 to the amount of investment in the long term and short term 47.0. We also remind that the amount of investment in the oil and gas sector with the exchange rate relationship between photos, meaning that with the increasing rates of exchange of the amount of investment will be eased and with constant regardless of other conditions, long-term investments in the amount of 61.0 and 14.0 in the short term will be reduced. Between the export of oil and gas and the amount of investment, there is a significant correlation and per a unit increase in exports as well as investment to the size of the 65.0, 49.0 in the short term and in the long term will be changed. Between the oil revenues and the amount of investment is also a positive relationship, there is significant if a unit increases revenues, investment will increase 51% in long-term and 38% in short-term. So it can be stated that the investment in the oil and gas sector has the most reaction against the oil price and the exchange rate in the short-term and long-term interval show itself, also in the oil revenues between the lowest impact on the amount of investment in the oil and gas sector.

Offers

1. With regard to the results achieved single-tiered currency, revenue and expenditure of the oil sector transparency and proper management in order to increase the oil contracts, oil prices and security of supply will offer foreign investors.

2. Upgrade and efficient building management system in oil and gas sector in order to attract investors.

3. Effective interaction with advanced countries in terms of technology in the oil industry in order to encourage foreign investment.

4. Easy regulation to improve the rules governing investment.

5. The formation of a joint investment fund with the presence of Iranians outside the country.

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