The Effect of Oil and Non-Oil Exports on Economic Growth in Iran

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ABSTRACT

The present study aims to investigate the relationship of oil, non-oil exports, capital formation and economic growth in Iran. Empirical results show that there is positive significant relationship between these variables and economic growth. Thus, findings of this study recommend that government should create an enabling environment that would facilitate non-oil exports and augment capital formation.

Introduction

There are many contributors to economic growth. A large number of studies claim that export expansion is one of the key determinants of economic growth. It has been argued that export trade is an engine of growth, being that it enhances employment generation through the development of export oriented industries, increase foreign exchange earnings and improves balance of payment position of a given economy. For instance, studies such as: Balassa (1985), Ram (1987) and Greenaway and Nam (1988) have identified an affirmative link between exports and economic growth for different countries. In other words, they have provided empirical validation of the view that growth performance is more satisfactory under export promotion. But it is important that exports are not be limited to primary products only; it should to be extended to final exportable products which are high in value added with high backward linkages in order to create dynamism in the economy. Single commodity exporting countries or those with a narrow export base must frequently face the challenge of unpredictable changes in world demand. They need diversification in their exports to compete in the international market and increase volume of exports. On the other hand, the competitiveness in global market leads to production of innovative product and making able the local producers in meeting competition in global market.

Iranian economy such as other single product economy in order to experience sustainable economic growth, it tries to reduce its heavy dependence on oil revenues and release of mono-product economy. Because, due to high dependence on oil revenues, fluctuations in oil prices on world markets causing different problems such as imbalances in the various sectors of the nation's economy.

According to foreign trade statistics of the country, the trend of non oil exports in the period under study, generally, have been growing trend; but while data show that oil and non-oil exports were valued 118.2 and 34.6 billion dollars respectively in 2011; imports was valued 61.8 billion dollars in the same year. It means that the economy's dependence on oil revenues is still high and economy is far from optimal economic growth. Hence, present study attempts to investigate the effect of exports on economic growth in Iran during 1968-2011, and specifically, following objectives are set for this study:

-To understand the importance of exports in the process of economic growth

-To examine empirically the effect of oil exports, non-oil exports and capital formation on economic growth in Iran

In order to achieve mentioned aims we can make the following hypotheses:

-Effect of oil-exports on economic growth will be positive.

-Effect of non-oil exports on economic growth will be positive.

-Effect of capital formation on economic growth will be positive.

After introduction, the rest of the paper is organized as follows: Section 2 contains literature review. Section 3 deals with the data and methodological issues. Section 4 presents empirical findings, while, Section 5 concludes the paper.

Literature Review

Many empirical studies have been undertaken to investigate the relation between exports and economic growth and found positive impact of exports on economic growth of developing economies (e.g., Feder, 1982; Balassa, 1985). These studies clearly indicate that there exists a positive and strong relation between exports and economic growth. Exports are a key factor in promoting economic growth. Generally, a rise in the level of exports leads to increase in economic growth. Feder (1982) and Vohra (2001) indicate that when a country has achieved some level of economic development only then the exports have a positive and significant impact on economic growth. In recent wave of country case studies, most empirical evidence seems support for export-led growth hypothesis. Bahmani-Oskooee and Alse (1993), using Error Correction Modeling (ECM) approach, examined the relationship between export growth and economic growth for nine developing countries and found strong support for the export-led growth hypothesis for all of the countries. Merza (2007) investigated the relationship of two components of exports (oil exports and non-oil exports) with economic growth for the Kuwaiti economy. The results of this study show that bidirectional causality between oil exports and economic growth, and a unidirectional causality from non-oil

exports to economic growth. Zarra Nezhad and Zare (2005) investigated the relationship between export (total & non-oil) and economic growth for the period 1959-2003 in Iranian economy. Granger causality method with its different approaches such as VAR, Hsiao, Toda and Yamamoto are used in this paper. The results show that there exists bidirectional causality between non-oil export and economic growth in Iran. However, there is a unidirectional causality from economic growth to total exports. Pahlavani (2005) examined the major determinants of GDP growth in Iran, using annual time series data spanning from 1960 to 2003. Empirical estimate indicate that in the long-term, policies aimed at promoting various types of gross capital formation, human capital, trade openness and technological innovations will improve economic growth. Atrkar Roshan (2007) investigated the causal relationship between exports and economic growth during 1970-2001 and findings support the export-led growth hypothesis in case of Iran. Mahdavi and Fatemi (2007) investigated the impact of non- oil Exports on economic growth for the period 1959-2003 in Iran. Results show too weak impact on gross domestic product growth of non - oil exports and also low factor productivity in export sector relative to non - export sector. Taghavi et al. (2012) investigated relationship between import, export and economic growth in Iran over the period 1962-2011. Results indicate that export had direct and positive relationship with economic growth in long run. Also, import had negative effect on economic growth in long-term. In addition, the results show that shock on the export has a positive effect on economic growth. Mirjamali Mehrabadi et al. (2012) examined the effects of oil and non-oil exports on economic growth during 1973 - 2007. Results reveal that oil and non-oil exports have positive effect on the economic growth of Iran.

Methodology
Data and Estimation Technique
This study covers a set of time series annual data from 1968 to 2011 to estimate the specified model. They include the annual series data on: gross domestic product, non-oil exports, oil exports and gross fixed capital formation. The data of variables are obtained from the Time Series Database of Central Bank of Iran. The variables of gross domestic product and gross fixed capital formation were measured at constant price (1997 = 100), while oil and non-oil export value were measured at current prices.

The Ordinary Least Square (OLS) regression technique was used to estimate the specified model. The time series property (being stationary) of the data was checked with the help of the Augmented Dickey-Fuller (ADF) Unit Root Test. Also, using the Johansen method, the test has been done whether there is a co-integrating relationship between non-oil exports, oil exports, gross capital formation and GDP.

Model Specification
Non-oil exports, oil exports and gross capital formation were used as independent variables. In order to determine the impact of these variables on the economic growth with GDP, the simple regression equation is explicitly specified in functional form as follows:
$GDP = f(NOX, OX, K)$
This can be specifically expressed in explicit econometric form as:
$LGDP = \beta_0 + \beta_1 LNOX + \beta_2 LOX + \beta_3 LK + \varepsilon$
Where
LGDP = real gross domestic product in log form, LNOX= non-oil exports in log form, LOX=oil exports in log form, K= gross capital formation in log form, and ε = stochastic term.

Empirical Results
The study uses time series data ranging from 1968 to 2011, where results of Ordinary Least Square (OLS) estimates are presented in Table 1. To access a long run relationship, we begin with instability or unit root test. This test shows time series stationary or the number of times needs for a variable to be stabilized. Then, the study applies the Johansen Co-integration test which indicates the number of co-integrating relationships among the variables under consideration. Thus, Augmented Dickey Fuller (ADF) test are given in Table 2and 3, and Johansen co-integration results are shown in Table 4, respectively.

Regression analysis
Econometric equation is estimated to test the hypotheses, using the annual time series data for the period 1968-2011. The following equation shows the estimated model:
GDP =10.281 + 0.021 NOX + 0.084 OX + 0.113 K + 0.675AR (1) + 0.401 MA (1)
$R^2 = 0.988$ Adjusted R-Squared = 0.987   D.W = 2.001   F = 660.042

Table 1 reveals that R^2 is 0.98.8; this implies that about 98.8 percent of the total variations in GDP are explained by oil and non-oil exports and capital formation of the country, while the remaining 1.2 percent is caused by other variables outside the model but covered by the error term. These results support the study hypotheses. A positive significant relationship existed between oil, non-oil exports, capital formation and economic growth of the country within the period under study.

Table 1: Simple Regression Model

Dependent Variable: LGDP
Method: Least Squares
Sample: 1968 - 2011
Included observations: 44

Variable	Coefficient	Std.Error	t-Statistic	Prob.
C	10.28124	0.482037	21.32875	0.0000
LNOX	0.021688	0.010441	2.077256	0.0446
LOX	0.084324	0.016345	5.159087	0.0000
LK	0.113888	0.048121	2.366699	0.0231
AR(1)	0.675147	0.104485	6.461635	0.0000
MA(1)	0.401934	0.164842	2.438295	0.0195
R-squared	0.988617	Mean dependent var		12.43050
Adjusted R-squared	0.987119	S.D. dependent var		0.424804
S.E. of regression	0.048213	Akaike info criterion		-3.100243
Sum squared resid	0.088332	Schwarz criterion		-2.856944
Log likelihood	74.20534	Hannan-Quinn criter.		-3.010016
F-statistic	660.0423	Durbin-Watson stat		2.001506
Prob(F-statistic)	0.000000			
Inverted AR Roots	.68			
Inverted AR Roots	-.040			

Source: Author's computation from E- views version 7

Table1 further shows that the effect of explanatory variable, non-oil exports is found positively significant at the 0.05 level of significance. The coefficient size of non-oil export is 0.02. So, in this case one percent change in non-oil export will change economic growth by 0.02 percent. It means that due to promotion of exports, economic growth of the country would increase. Results also indicate that oil export is obtained positively significant at the 0.01 level of significance. The coefficient size of oil exports is 0.08 and show that one percent change in oil exports will change economic growth by 0.08 percent. The present study also found gross capital formation positively significant at the 0.05 level of significance and the coefficient size of capital formation is 0.11. It shows that the

effect of capital formation on economic growth is important. F _statistics is the true explanatory of the goodness of model. It is significant as its P_ value is 0.000. Meanwhile, the Durbin Watson (DW) statistic suggests that there is no evidence of autocorrelation. The positive relationship between oil, non-oil exports and economic growth, found in our study is consistent with the findings of other studies by Mirjamali Mehrabadi et al. (2012) Mahdavi and Fatemi (2007). Similarly, the positive impact of gross capital formation on economic growth has also been found by Komijani and Memarnejad (2004) and Pahlavani (2005). Hence, results of the previous studies support results of the present study.

Unit Root Test

Stationary time series tend to return its mean value and fluctuate around it within a more-or-less constant range. On the other hand, a non-stationary variable becomes stationary after it is differenced where; first order differencing is enough in general. Stationary of a variable depends on whether it has a unit root or not. Table 2 represents the results of Augmented Dickey-Fuller (ADF) test for the level series. More specifically, the null hypothesis that the series are non-stationary is not rejected at the levels of variables. Therefore, it is concluded that the GDP, NOX, OX and K are non-stationary series.

Table 2. ADF Unit Root Test: level series

Variable	5% critical value		Level ADF statistic	
	Without Trend	With Trend	Without Trend	With Trend
LGDP	-2.933158	-3.529758	-0.883882	-2.522671
LNOX	-2.933158	-3.520787	0.496567	-1.750616
LOX	-2.933158	-3.520787	-0.255884	-1.634280
LK	-2.933158	-3.520787	-1.505836	-1.630800

Note: ADF shows that there is unit root in the series.

However, when the first differences of the variables are considered, the null hypothesis is rejected in favor of alternative hypothesis which state that series are stationary. Table 3 shows that first difference series are stationary. In other words, at first difference, all the variables: real gross domestic product, non-oil exports, oil exports, and gross capital formation were stationary.

Table 3. ADF Unit Root Test: First difference series

Variable	5% critical value		First Difference ADF test statistic	
	Without Trend	With Trend	Without Trend	With Trend
LGDP	-2.933158	-3.529758	-3.878241	-3.788744
LNOX	-2.933158	-3.520787	-6.724794	-6.907055
LOX	-2.933158	-3.520787	-6.107131	-6.035666
LK	-2.933158	-3.520787	-4.311360	-4.255207

Note: ADF shows the series are stationary.

Co-integration Test

Table 4 below reports the number of co-integrating relationships among the variables under consideration.

Table 4: Johansen Co-Integration Test Result

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	5% Critical Value	Prob.**
None*	0.480688	51.91923	47.85613	0.0198
At most 1	0.344933	25.05399	29.79707	0.1595
At most 2	0.150495	7.710275	15.49471	0.4969
At most 3	0.024645	1.023106	3.841466	0.3118

Trace test indicates 1 co-integrating eqn(s) at the 0.05 level.
* denotes rejection of the hypothesis at the 0.05 level.
** MacKinnon-Haug-Michelis (1999) p-values.

Results of tests suggest the existence of at least one co-integrating relationships among the variables in the series at 5% level of significance. This implies that we fail to reject the null hypothesis of no co-integration between research variables; therefore, there is a long run relationship between these variables in Iranian economy for the period of 1968-2011.

Conclusions

The objective of present study is to investigate empirically the effect of oil exports, non-oil exports, gross capital formation on economic growth during 1968 – 2011in Iran, particularly to understand the importance of exports in boosting of economic growth. Results found support the study hypothesis. The effect of oil, non-oil and gross capital formation during the study are statistically significant. The positive effect of non-oil exports on economic growth indicate that non-oil export promotion is important for stimulating economic growth in Iranian economy. While, the positive effect of oil exports on economic growth can be related to effect of oil exports on investment and saving. Because, exports increases saving of foreign exchange.

References

Alavinasab, S. M. (2013), *"Studying the effects of macroeconomic variables on non-oil exports in Iran"*, *Elixir International Journal* (61) 16955-16958.

Atrkar Roshan, S. (2007), "Export Linkage to Economic Growth: Evidence from Iran", *International Journal of Development Issues,* Vol. 6, 38 - 49

Bahmani-Oskooee, M. and Alse, J. (1993), "Export Growth and Economic Growth: An Application of Cointegration and Error-Correction Modeling", *Journal of Developing Areas*, 27(4), 535–542.

Balassa, B. (1985), "Exports, Policy Choices, and Economic Growth in developing Countries After the 1973 oil Shock", *Journal of Development Economics,* Vol. 18, pp. 23-35.

Feder, G. (1982), "On Export and Economic Growth", *Journal of Development Economics*, 12: 59-.73.

Komijani, A. and Memarnejad, A. (2004), "Importance of Quality Manpower in Economic Growth of Iran", *Journal of Trade Researches,* No. 31.

Mahdavi, A and Fatemi, M. (2007), "An Investigation on the Impact of Non- Oil Exports on Economic Growth– Case of Iran", *Iranian Economic Review,* Vol.12, No.19.

Merza, E. (2007), "Oil exports, non-oil exports and economic growth: time series analysis for Kuwait (1970-2004)", *Kansas State University.*

Mirjamali Mehrabadi, M. S. Nabiuny, E. and Etemad Moghadam, H. (2012), "Survey of Oil and Non-oil Export Effects on Economic Growth in Iran", *Greener Journal of Economics and Accountancy,* Vol. 1 (1), pp. 008-018, January.

Ram, R. (1987), "Exports and Economic Growth in Developing Countries: Evidence from Time series and Cross- Sectional Data", *Economic Development and Cultural Change,* Vol. 36(1).

Pahlavani, M. (2005), "Source of Economic Growth in Iran : A Cointegration Analysis in the Presence of Structural Breads", *Applied Econometrics and International Development. AEID.*Vol. 5-4.

Taghavi, M. Goudarzi, M. Masoudi, E. and Parhizi Gashti, H. (2012), "Study on the Impact of Export and Import on Economic Growth in Iran*", Journal of Basic and Applied Scientific Research*, 2(12)12787-12794.

Vohra, R. (2001), "Exports and Economic Growth: Further Time series Evidence from Less developed Countries", *International Advances in Economic Research,* Vol. 7.

Zarra Nezhad, M. and Zare, R. (2005), "Analyzing the causal relationship between export and economic growth in Iran", *Quarterly Journal of Economic Review,* 2 (3).