

THE EFFECT OF SHORT-TERM AND LONG-TERM EFFECTS AFFECTING IRANIAN ECONOMIC GROWTH WITH AN EMPHASIS ON THE ROLE OF EXPORTS, GOVERNMENT DEBTS, LIQUIDITY, AND TAX INCOMES

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Abstract: In this paper the effects of exports, size of liquidity, and tax incomes on the economic growth of Iran for the period of 1973-2012 have been discussed. In this regard, by using an autoregressive distributed lags model (ARDL), the long-term and short-term relationships between economic growth and mentioned variables are considered. Results suggest that in the short run, exports and tax revenues have a positive and significant effect on economic growth. According to the results, exports and fluidity have positive effect in the long run, but are statistically insignificant and tax revenues have a positive and significant impact in the long run. Also, in the long run, government debts have negative and significant impact on Iranian economic growth.

JEL Classification: O, H₈₁, H₂

Keywords: Exports, liquidity, tax revenues, economic growth, autoregressive distributed lags model (ARDL).

1. INTRODUCTION

To facilitate the society's welfare, achieving economic growth is necessary. Many factors affect the economic growth of every country. In Iran, too, factors such as exports, government debts, liquidity, tax revenues and many other factors influence economic growth.

Liquidity has had many fluctuations over the recent years. Liquidity changes and fluctuations create uncertainty conditions for the business environment of private sector in the future and these conditions have negative effect on decisions of bureaus and decreased investment resulting in reduced economic growth (Haghighat and Gholipur Tappeh, 2014, 64). One of the main economic problems of Iran's public sector is financing governmental expenses and especially the very low share of taxes. As open income distribution policies, taxes can play an important part in improving

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income distribution in the society, thus affecting economic growth (Abuzari & Zivari Masud, 2014, 64). From early on economists believed in the relationship between business and economic growth, so that economists considered business as the motor of growth and development. Also, a number of economists emphasize the role of trade especially trade and mention it as the motor of domestic growth (Azarbaijani & Shahmuhammadi, 2008, 43). Governments are providers of general goods and the more these goods are provided, the more socially and politically popular and reputable the governments become with people. To provide these goods and products, the government needs to make expenditures, and if they receive taxes from people to meet these expenses, it will result in people's dissatisfaction. In countries like Iran, which have small tax bases and weak tax collection system, the government faces shortage in meeting these expenses. Therefore, they have to borrow from the Central Bank to meet these expenditures. This financial loan from the Central Bank by the government results in increased money volume and increased level of prices and eventually, decreased economic growth (Hemmati, 2013).

This article, has discussed the short-term and long-term effects of exports, tax revenues, government debts, and liquidity on the economic growth of Iranian economy. For this purpose, the article is divided into the following sections: After introduction, literature review and theoretical basics in part two, study model and methodology in part three, and model assessment and result interpretation in part four, and conclusion and results in the final part have been discussed.

2. THEORETICAL BASICS

Economic growth is one of the most important economic goals of societies. In line with this goal, constant increase of production power and goods production volume and services in the society is intended. As a result of economic growth, customer needs are met and life standards improved. For this reason, economic policymakers, considering this goal, can on the one hand meet the needs of society members and on the other hand, improve competition ability of the society in the international arena. Therefore, economic growth can mean increase in the gross domestic product over a specific time period. Kuzents has defined economic growth as the ongoing increase of per capita income or output per worker, which are often accompanied with increase in population and broad structural changes, thus investigating structural changes in the form of industrialization, urbanization, individuals' income status, product distribution among consumers, and cooperation and partnership of countries with each other (Mousavi Jahromi, 2009). There are various economic factors that influence economic growth. Increase in governmental incomes, often provided through oil and tax revenues and increase in exports lead to increased economic growth in the country. Also, there are other factors affecting economic growth, as addressed below.

2.1. Exports

In terminology, exports refer to relationship with foreign markets and foreigners' request for domestic goods. From early on, economists have been believing in the relationship between trade and economic growth. That said, classic economists considered trade as the motor of trade and economic growth. Also, a number of economists emphasize the role of trade, especially exports, mentioning it as the motor of domestic economy growth (Azarbaijani, Shah Muhammadi, 2008, 43). The issue of role of exports in economic growth of developing countries has undergone significant evolution, moving from replacing imports to expanding exports and increasing the openness level of economy. Iran has an oil-based economy, with its exports being dominantly from oil production, using this income for buying most needs in the form of consumer, intermediary, capital goods and workforce services from outside the country. Every country will have better status economically when it has trade relationship with the world, rather than when it acts in a closed economy. Open economy will have a lower final ratio of capital to product, that is, investment productivity in economy will yet be probably more than supportive economy. To improve resource allocation exports must be encouraged and supported and this strategy will undoubtedly increase investment efficiency and finally lead to economic growth (Komijani and Haji, 2012, 10).

2.2. Liquidity

Amount of money in flow is called liquidity. It includes the two basic monetary components of monetary base and money multiplier. Monetary base is the amount of cash and coin in flow plus banks deposit in the Central Bank, but this factor per se does not determine the amount of money in flow, and money multiplier caused by the activities of commercial banks and people's economic interactions are considered as liquidity component. The amount of liquidity in economy must be proportionate with the amount of production of goods and services. Otherwise, no doubt, it will lead to inflation with record in production. High fluctuation in liquidity does not favor economic growth. When liquidity is growing sharply, inflation will go up and non-productive and brokering activities will increase and the investor will not go for agricultural and industrial productions, and finally, national production will decrease, resulting in reduced economic growth.

2.3. Tax Revenues

Taxes are one of the strongest economic tools and the main source of income for providing related costs. Also, taxes as open distribution policies can play a significant role in improving income distribution in the society, and implementing these policies can have different effects on economic growth. To improve the welfare condition of the society, access to higher economic levels, it is necessary to implement poverty-

eliminating policies focused on income and wealth distribution. One of the factors for poverty-alleviation is financial and just income distribution policies that has direction relationship with economic growth (Abu Nouri & Zivari Masoud, 2014, 65).

2.4. Literature Review

Abu Nouri and Zivari Masoud (2014) studied the effect of tax revenues on economic growth and income distribution in Iran and OECD selected countries for the period of 1990-2011. Using panel data and OLS and GMM methods, they concluded that tax revenues have direct positive relationship with economic growth.

In an article titled "Effect of Money Growth Uncertainty on Iranian Economy Growth for the Period of 1990:3-2010:6, Haghghat and Gholipour Tappeh (2014) found using GARCH and ARDL models, that increase in money growth uncertainty in the long run and the short run leads to reduced economic growth. They observe that in the long term, the negative effect of money growth uncertainty on economic growth is more than in the short term.

Molaii and Golkhandan (2013) using vector error correction model (VECM), considered the relationship between budget deficit and economic growth of Iran over the period of 1980-2011. The results of their study suggest that the ratio of budget deficit to gross domestic product in the long term is significant and negative and in the short term, significant and positive. They also found that foreign debts have negative and significant effect on economic growth in the long term and government sector investment has positive and significant effect on economic growth.

Delavari and Basir (2012) considered the effect of economic instability and budget deficit on economic growth for the time period of 1973-2006, using cointegration model and vector error correction model (VECM). Results of the study suggest that the ratio of actual government budget deficit to gross domestic product to gross domestic product has negative and significant effect on economic growth in the short and long term.

Eghbali, Halafi and Gaskari (2003) in an article titled "Oil Exports and Economic Growth", considered the relationship between oil exports and economic growth. Results of their study shows there is positive and significant relationship between oil exports and economic growth in Iran.

Eberhardt and Presbitero (2015) in an article titled "Public Debt and Growth: Non-Linear and Non-Homogeneity" considered the relationship between growth and public debt in a big panel of countries. They found that there is a significant negative relationship between public debt and long term growth in all countries, but this trend does not exist inside countries.

Spilioti and Vamvoukas (2015) using Greek data over the last 40 years starting from 1970, considered the effect of government debt on government debt, using

empirical studies from the Greek market. The results of their study suggest that debt has a positive and significant effect on gross domestic product. Also, important independent variables such as government debts, per capita gross domestic product, population, and saving are among significant factors determining growth rate of gross domestic product.

Dritsaki (2013) using vector error correction model (VECM) and the 1960-2011 annual data, considered the relationship between economic growth, export and government debts in Greece. The results of his study shows that one-way Granger causation relationship exists from exports to economic growth and from economic growth to government debts, and in the short-term no causality exists between exports and government debts. In the long-term, results show that there is one-way relationship between economic growth and government debts.

Fricke and Ssmuth (2013) in a study, titled "Growth and Fluctuations of Tax Revenues in Latin America", due to instability of macro-economy and responding to public expenses, considered the relationship between growth and tax revenues in Latin America. Short-term and long-term trends have made assessments for 11 state economies for asymmetric reactions. They found that in the long term, tax revenues respond to strong reactions of business cycle and reach balance. They also observe that struggle can help balance tax incomes.

Ghossoub & Reed (2010) using a neoclassic growth model in which liquidity risk has negative relationship with capital formation, studied the risk of amount of liquidity, economic development, and effects of monetary policy. They suggest that in weak economies, money growth rate has a weak relationship with capital formation. Also, in advanced economies a turbine effect is observed. Their findings suggest that in an economy with high inflation, inflation is negatively related with economic activities and in an economy with low inflation, inflation is positively related with productions. Since liquidity risk varies across countries, individuals' response to output rate in low-income countries is different from that in advanced economies. Further, effects of monetary policy between developing countries is different from advanced countries.

3. AUTO-REGRESSIVE DISTRIBUTIVE LAG (ARDL) MODEL

Due to existing limitations in using Engle-Granger methods and ECM model and also, to avoid the issues with these models, such as bias in small samples and failure to perform statistical hypotheses, more appropriate methods have been proposed for analyzing long-term and short-term relationships between variables. In this regard, the ARDL approach can be mentioned (Pesaran & Pesaran, 1997). In using this approach, equality of co-integration of variables, which is required in Engle-Granger method is not necessary. Also, this method estimates long-term and short-term patterns in the model at the same time, solving the problems related

to removing variables and autocorrelation. Therefore, ARDL estimations, due to avoiding such problems as autocorrelation and endogeneity, are unbiased and efficient (Sidiki, 2000).

In general, dynamic pattern is a pattern in which delays of variables are as in equation 3.1.

$$y_t = ax_t + bx_{t-1} + cy_{t-1} + u_t \quad (1)$$

To reduce bias related to estimation of pattern coefficients in small samples, it is better to use a pattern that assumes many delays for variables, as in equation 3.1.

$$\varphi(L, P)y_t = \sum_{i=1}^k b_i(L, q_i)x_{it} + c^t w_t + u_t \quad (2)$$

In above equations, there are dependent and independent variables. The L term is the lag operator and w_t is an $S \times 1$ vector denoting pre-determined variables in the model including y -intercept, virtual variables, time trend, and other exogenous variables. P is the number of lags used for the dependent variable and q is the number of lags used for the independent variable (x_t).

The above pattern is called an autoregressive distributive lag (ARDL) model, where we have:

$$\begin{aligned} \varphi(L, P) &= 1 - \varphi_1 L - \varphi_2 L^2 \dots \varphi_p L^p \\ b_i(L, q_i) &= b_{i0} + b_{i1} L + \dots + b_{iq} L^{q_i} = 1, 2 \dots k \end{aligned} \quad (3)$$

Number of optimal lags for any of autoregressive variables can be determined with one of the criteria of Akaike (AIC), Schwarz Bayesian (SBC), Hannan-Quinn (HQC), or adjusted coefficient of determination (Pesaran and Shin, 1996).

To calculate long-term coefficients of the model, the same dynamic model is used. A valid test can be performed regarding the presence of a long-term relationship. In the ARDL method, a two-step method can be used as follows to estimate the long-term relationship. In the first step, presence of long-term relationship between variables under test is evaluated (Pesaran et al, 2001).

In order to verify that the long-term relationship from this method is not false, two methods are available:

In the first method, after estimating ARDL dynamic model, the following hypothesis is test:

$$\begin{cases} H_0 : \sum_{i=1}^k \varphi_i - 1 \geq 0 \\ H_1 : \sum_{i=1}^k \varphi_i - 1 < 0 \end{cases} \quad (4)$$

The null hypothesis represents existence of cointegration or long-term relationship. To perform the intended test, defined by Benzgi et al, one must be deducted from the sum of coefficients with variable dependent lag and divided by the total standard deviation of the mentioned coefficients, resulting in *t*-type test statistic.

$$t = \frac{\sum_{i=1}^p \widehat{\phi}_i - 1}{\sum_{i=1}^p S_{\widehat{\phi}_i}} \tag{5}$$

If the absolute value of the obtained *t*-statistic is bigger than the absolute value of critical values proposed by Benzgi, Dolade and Mister at the certainty level of 95%, the null hypothesis suggesting absence of cointegration is rejected and presence of long-term relationship is accepted.

In the second method proposed by Pesaran and Shin the long-term relationship between variables under study is studied by calculating the F statistic for testing the significance of variables' lagged levels in error correction model (ibid). Also, Bounds Test can be used to find long-term relationship between variables.

3.1. Unit Root Test

Before estimating the model, the specifications of variables' time series are studied. Results of Augmented Dicky Fuller (ADF)'s unit root test shows that all variables are of the I(0) or I(1) type. Given that the main characteristic of the ARDL method is that not all variables need to be I(1), this method has been used for model estimation.

Table 1
Results of Augmented Dicky Fuller (ADF) unit root test

<i>Variables</i>	<i>ADF statistic</i>	<i>1%</i>	<i>5%</i>	<i>10%</i>	<i>Comments</i>
Grow; economic growth	-4.21	-4.21	-2.93	-2.60	Durable
Ldebt; logarithm of government debt to the Central Bank	-5.96	-3.61	-2.93	-2.60	Durable with first-order differentiation
Ex; export of goods and services	-3.95	-3.61	-2.93	-2.60	Durable
M; Liquidity	8.36	-3.63	-2.96	-2.62	Durable
Ltax; Logarithm of tax revenues	-4.77	-3.61	-2.94	-2.60	Durable with first-order differentiation

Source: study results

4. MODEL ESTIMATION

In this study the effect of important factors such as exports, government debt to the central bank, tax revenues, and liquidity on economic growth has been discussed

using autoregressive distributive lag (ARDL) models, over the period of 1973-2012. Data used in this study were collected from the website for the Central Bank and the World Bank based on 2004 base price. The following pattern has been considered to evaluate the effect of the mentioned factors on economic growth:

$$\text{grow}_t = \alpha_0 + \alpha_1 \text{Ldebt}_t + \alpha_2 \text{Ex}_t + \alpha_3 \text{M}_t + \alpha_4 \text{Ltax}_t + \varepsilon_t \quad (6)$$

where,

Grow: economic growth (growth of gross domestic product)

Ldebt: Logarithm of government debt to the central bank

Ex: Export of goods and services

M: Liquidity

Ltax: Logarithm of tax revenues

ε : disturbing elements.

Results of estimation are presented in Table 2.

Table 2
Results of ARDL (1, 2, 2, 3, 4) model with the grow dependent variable

<i>Prob</i>	<i>t statistic</i>	<i>Standard error</i>	<i>Coefficients</i>	<i>Variable</i>
0.4	0.83	0.14	0.12	Grow(-1)
0.92	-0.095	4.66	-0.44	Ldebt
0.07	-1.86	6.71	-12.53	Ldebt(-1)
0.02	2.47	1.81	4.47	Ex
0.03	-2.28	2.06	-4.71	M
0.06	1.96	6.45	12.67	Ltax
D.W. = 1.63				R ² = 0.80

Source: study results

In the above model, critical values of the variables of exports, liquidity, and logarithm of tax revenues are all statistically significant. Also, logarithm of government debt with a lag period is statistically significant.

Governments are providers of public goods and the more these goods are provided, the more socially and politically popular these governments become with the people. Governments need to spend money to provide these goods and services. In countries like Iran, which have a small tax base and their tax collection system is weak, the government faces deficiency in providing these costs. Therefore, it has to borrow from the central bank to meet these costs. This financial loan from the central bank by the government leads to increased liquidity and increased general level of prices, finally resulting reduced economic growth (Hemmati, 2013). Thus,

per one unit of increase in government debt to the central bank, economic growth will decrease by 0.12 unit. To put it differently, there is a negative and inverse relationship between government debt to the central bank and economic growth.

Exports are considered as the motor for economic growth. In fact, increased exports lead to domestic economic growth for every country. Considering the estimation results, exports have a direct and positive relationship with economic growth, so that per a unit of increase in goods and services, economic growth increases 0.044 unit.

Given the above estimation, there is a negative and significant relationship between liquidity and economic growth, so that one unit of increase in liquidity reduces economic growth by -0.047. Increase in liquidity leads to increased general level of prices and uncertainty in business and investment environment. In fact, as liquidity increases, motivation for investment will slake, finally leading to reduced economic growth.

Another effect factor affecting every country's economic growth is its tax revenue. One of the factors for poverty-elimination is financial policies and just income distribution that has direct relationship with economic growth. According to estimation results, per one unit of increase in tax revenues, economic growth will decrease by 0.12 units. This signifies a positive and direct relationship between tax revenues and economic growth.

To estimate long-term relationship between variables, Bounds Test has been used, with the results thereof summarized in the following table.

Table 3
ARDL Bounds testing

<i>Significance</i>	<i>Bound 0</i>	<i>Bound 1</i>	<i>F statistic</i>
10%	1.9	3.01	11.92
5%	2.26	3.48	
2.5%	2.62	3.9	
1%	3.07	4.44	

Source: study results

Bearing in mind the F statistic and intervals in different levels, it could be suggested that F statistic is not present in any of these intervals. Therefore, the null hypothesis that suggests lack of long-term relationship between the variables is rejected. In other words, the above table shows there is long-term relationship between variables.

Error correction model estimation method can be used to adjust errors in the long term. The following table shows estimation results of the error correction model.

Table 4
Estimation results of the error correction model (ECM)

<i>Variables</i>	<i>Coefficient</i>	<i>T-test statistic</i>	<i>P-value</i>
Exports differentiation	0.000045	2.47	0.02
Differentiation of the logarithm of government debt	-0.44	-0.095	0.92
Differentiation of government debt logarithm (1)	-9.88	-2.19	0.04
Differentiation of tax revenues logarithm	12.67	1.96	0.06
Differentiation of tax revenues (-1)	16.45	1.78	0.09
Differentiation of tax revenues logarithm (-2)	19.14	1.92	0.07
Differentiation of tax revenues logarithm (-3)	-31.66	-4.87	0.0001
Differentiation of liquidity	-0.000047	-2.28	0.03
Differentiation of liquidity (-1)	0.000109	2.63	0.01
Differentiation of liquidity (-2)	-0.000055	-1.57	0.13
ECM Error correction element (-1)	-0.87	-5.89	0.000

Source: study results

In error correction model, the ECM(-1) coefficient is important. This coefficient must be negative in order to show error correction, and if a shock is inflicted on the model, it shows whether the model returns to its long-term balance or not. The closer this coefficient is to one, the faster significant adjustment and error correction are. Therefore, estimation results of this coefficient is -0.87 and significant, suggesting that after nearly one and a half years, the model restores to its long-term balance.

Table 5
Results of goodness of fit tests

<i>Test</i>	<i>Null hypothesis</i>	<i>Test type</i>	<i>Statistic value</i>	<i>P-value</i>
Normality of disturbing terms	Distribution of error terms produced by regression estimation is normal	Jarque-bera	0.021	0.98
Homogeneity variance	Homogeneity of variance	ARCH	F=0.0091	0.92
Lack of autocorrelation	There is no autocorrelation between error terms	LM test	F=0.56	0.58

Source: study results

5. CONCLUSION AND SUGGESTIONS

High economic growth is considered an important political goal for countries as it is a solution for many of economic issues such as poverty, inappropriate distribution of income, etc. and results in increased welfare of the society. For this reason, it is very important to study the factors that affect economic growth in any country.

In this study, the long-term and short-term effect of exports, government debt, liquidity, and tax revenues on Iranian economy growth over the 1973-2012 period was analyzed using autoregressive distributive lags (ARDL) model. Results showed that all variables have significant effect on economic growth, so that exports and tax revenues logarithm have a positive and significant effect, and logarithm of government debt to the central bank with a lag and liquidity has negative and significant effect on economic growth.

Therefore, given the results of the study, the following recommendations can be suggested for Iranian economy growth:

- Creating a suitable and efficient tax system in a way that framework of rules are considered for everyone, and there is no discrimination between people of the society, and by proper implementation of tax system, more tax revenue is collected by the government, helping achieve the main goal which is economic growth.
- Economic policymakers must consider growth stability of liquidity and monetary policy regarding liquidity and monetary policy.
- Given the positive effect of exports on economic growth, new approaches of non-oil exports must be considered and exports encouragement policies with the aim of not relying on a single-product economy implemented.
- To achieve economic growth, the government must limit its debts, including loans from the central bank. Also, the government must act by increasing tax revenues to meet budget deficiency and achieve economic growth.

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