

TRADE AND FINANCIAL LIBERALIZATION AND THEIR EFFECT ON ECONOMIC GROWTH OF IRAN

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Abstract—In this paper, self explanatory dynamic approach with distribution lags, and for short run relation between variables, vector error correction model is used.

The finding of this paper shows that, in short run, there is a direct significant relation between economic growths in one period with that of previous one. In addition there is a direct significant relation between economic growth and increase in Gross Domestic Investment in construction and machinery sectors. A comparison between long and short run effect of Gross Domestic Investment on economic growth of Iran shows that in the short run, an increase in formation of Gross Domestic Investment accelerates economic growth more than the long run. In the short run, there is a direct significant relation between FDI in one period with FDI of the pervious period. In other word, in the short run, increase in the FDI shall accelerate the economic growth of next period. Finally, imposed war on Iran has shown its negative effect on economic growth in both long as well as short run.

I. INTRODUCTION

Keywords- *Economics Growth; Foreign Direct Investment; International Trade; Iran.*

Prosperity and continued growth of the economy of a country requires understanding and application of fundamental economic policies in the country one of these policies is the rapid development of the financial and investment markets of the country and foreign direct investment can play a key role in this regard. In addition one of the leading issues which have taken the interest of the economist is the relation between globalization and world trade and the size of the government. One of the problems preventing the countries from joining WTO is shortage of financial markets and capital. Iran is also suffering from same phenomena .Iran, can through experiencing a high and sustained economic growth raise her per capita income and improve her place, from degree of development among other countries. To achieve this goal we should know factors affecting economic growth and the way these factors influence on the economic growth of the country.

In this paper it is tried to have a glance at theoretical literature concerning effect of macro variables of economics such as fixed gross domestic investment, foreign direct investment, size of the government, level of foreign trade and discussing various ideas about this topic, a suitable

pattern of econometric will be designed. Then by collection and processing of required time series data for each one of explanatory and dependant variable and ensuring about their stationary models will be estimated .after estimation of the model and with regard to estimated co efficient, effects of aforesaid variables on economic growth will be analyzed. At last conclusion regarding effects of variables of the model on economic growth in a short and long time will be discussed.

II. THEORETICAL BACKGROUND

A. Definition of Foreign Direct Investment.

Generally .any kind of investment in foreign country by private companies and real persons (excluding government help) is called foreign investment. According to a definition foreign investment contains long run relations which reflect profit and continued observation of private property of a country, which is in the economy of another country. This kind of investment includes trade between trading partners and all the trades thereafter, between these peoples and other affiliated organizations. In addition this investment includes capitals transferred from one middle investment company to foreign direct investors through accepting capital from foreign direct investors by these companies and includes three topics:

1-foreign shares: purchase of shares from a production unit from a foreign country.

2-reinvested profit: distributed or undistributed shares of investors in a foreign company (which is reinvested)

3-inter-company loans: long or short run loans between investing companies and companies related o them and vice versa.

Some of the outcomes of foreign direct investment are the increase in potentiality of production of goods in foreign country, change in excess balance of payment, change in exchange rate, change in corporate taxes, transformation of technology and managerial skills, prosperity of advantages, ease of globalization, change in the size Of government and finally economic growth of the country .

B. FDI and Strategy of Export promotion.

Basically those countries which have adopted import substitution strategy do not enjoy comparative advantage in their capital intensive sectors. And since foreign investment is mostly used in capital intensive sectors, therefore foreign

investment does not have necessary. Effect on economic growth. Beside, foreign investment is a way for entrance of the foreign firms investing in the country of accepting capital and this fact is contradictive with the strategy of import substitution. but regarding strategy of export promotion, the case is different. under this strategy, keeping in mind cheap labor and raw materials in such countries, foreign investors will have more reason to invest. Moreover when the strategy of export promotion prevails, the market of domestic product will not be confined to domestic market and will go beyond it and in international market it may enjoy large scale economy.

Foreign investment and the method to absorb it is undoubtedly one of the main tools of export promotion. In the other word, execution of export promotion strategy, in practice multi national companies to cooperate in foreign direct investing regarding transition of technical know-how and managerial skills and marketing. Absorption of foreign capital for most of the discipline of export promotion is a success. They count foreign investment not as chain of dependent but as the chain of production and economies. Generally there are four ways for creation of necessary and suitable condition for foreign investment and import promotion strategy. he believes that the strategy of export promotion brings equality between the average rate of effective exchange with that of investment which are ; support against non commercial trade, possibility of free exit of capital, custom exemption for import of capital goods intermediate goods and raw materials needed for exporting factories and other financial incentive, Therefore in general, strategy of import substitution is not suitable for absorption and leading foreign investment. Whereas strategy of export promotion has got the suitable condition to absorb foreign capital.

The idea of trade strategy on growth which is due to FDI was given by Baghwati for the first time in 1978 the problem asked in this regard is the type and effects of policies and import substitution and export promotion on economic growth emerged from FDI.. In his theory which is called Baghwati theory, he explains that the productivity which is emerged from application of FDI is different in the countries using export promotion import. Therefore this strategy is neutral from trade point of view. therefore this policy is biased towards the policies supporting import substitution.

Baghwati believes that in comparison to strategy of import substitution, strategy of export substitution has more ability for absorption of FDI. moreover in the export promotion strategy FDI is used more productive in attaining economic growth. And the extreme dependant of strategy of import substitution to tariffs and quotas as the main tools of this strategy shall lead to vast disturbances in product and factor market and uses the production pattern which is completely different from that of availability of factors in the economy. Therefore not only less FDI shall be absorbed but also there will be less economic growth by absorption of FDI.

Under the policy of import substitution. extreme support of government from domestic industries do not allow to the foreign investors to compete with these industries. therefore FDI shall be more absorbed in domestic industries which

have no talent and potential for application of this capitals and since FDI has no return, as a result the share of foreign investment in economic growth shall decline.

In the other extreme in the export promotion strategy emphasis is on neutrality of policy between import and export section. therefore this strategy can lead to free market, free mobility of factors and allocation of resources on the bases of comparative advantage. as a result not only more FDI shall flow to the country but also through absorption of FDI there will be more economic growth. it is because the available competition shall lead to investment in human capital and promotion of research and development activities and on the bases of endogenous model of growth it leads to more economic growth.

III. EXPLANATION OF FOREIGN INVESTMENT MODEL

In this part of the paper in order to determine the effect of foreign investment on economic growth of different countries and in relation to existing discussion about foreign investment, it is tried to introduce a model which is the basic model in this research. the structural form of the model for a country I can be as follow; (Davoodi and Shahmoradi 1383p97).

$$C_{it} = \alpha_{i1} + \alpha_{i2} GNP_{it} + \alpha_{i3} C_{it-1} + \varepsilon_{it}^C \quad (1)$$

$$I_{it} = \beta_{i1} + \beta_{i2} GNP_{it} + \beta_{i3} GNP_{it-1} + \beta_{i4} r_{it} + \varepsilon_{it}^I \quad (2)$$

$$FDI_{it} = \theta_{i1} + \theta_{i2} GNP_{it-1} + \theta_{i3} Z_{it} + \varepsilon_{it}^F \quad (3)$$

$$M_{it}^C = \lambda_{i1} + \lambda_{i2} I_{it-1} + \lambda_{i3} FDI_{it-1} + \lambda_{i4} ExchRev_{it} + \varepsilon_{it}^{M^C}$$

$$M_{it}^R = \mu_{i1} + \mu_{i2} I_{it-1} + \mu_{i3} FDI_{it-1} + \mu_{i4} ExchRev_{it} + \varepsilon_{it}^{M^R} \quad (4)$$

$$M_{it}^O = \gamma_{i1} + \gamma_{i2} GNP_{it} + \gamma_{i3} C_{it-1} + \varepsilon_{it}^{M^O} \quad (5)$$

$$GNP_{it} = C_{it} + I_{it} + G_{it} + FDI_{it} + X_{it} - M_{it} \quad (7)$$

$$M_{it} = M_{it}^O + M_{it}^C + M_{it}^R \quad (8)$$

The definitions of above items are as follows C_{it} consumption, I_{it} domestic investment, GNP_{it} (gross domestic product), r_{it} rate of interest, FDI_{it} (foreign domestic investment), G_{it} government expenditure, Z_{it} is the vector of spatial variables, M_{it}^C import of capital goods, M_{it}^R import of raw materials, M_{it}^O import of consumer goods, M_{it} stands for total import, $ExchRev_{it}$ for total exchange revenues. the (1)relation is based on Keynes and freedman theories the (2) relation has emerged from acceleration principle equation (4).(5).(6)are the effecting factors on import of capital goods, raw materials, and consumer goods. the (7)and (8) relation also shows the union

of above systems. In order to estimate the method ,since simultaneous biasness in above macro method is seen clearly through substitution of (1)and (2) relationship in (7) and with the help of (8) equation ,the exchanged form similar to the remaining five relation will be as :

$$H_{it} = A_i H_{it-1} + B_i X_{it} \quad (9)$$

In (9) relation column vector dimension of X_t, H_t , is 5 and n which shows the vector of exogenous and endogenous variables. A_i, B_i Is the matrix of the coefficient of exogenous variables and indicate the quantities with vector lag of endogenous variable. For obtaining the exchange form relation the GNP_{it} equation, is extracted as follow: if we substituted the relation no (1) and (3) in (7) relation .and rearrange the resulting relation we shall get

$$\begin{aligned} GNP_{it} = & \pi_{i0} + \pi_{i1} GNP_{it-1} + \pi_{i2} r_{it} + \pi_{i3} C_{it-1} \\ & + \pi_{i4} G_{it} + \pi_{i5} X_{it} + \pi_{i6} I_{it} + \pi_{i7} ExchRev_{it} \quad (10) \\ & + \pi_{i8} FDI_{it} + \pi_{i9} FDI_{it-1} + u_{it}^{GNP} \end{aligned}$$

IV. REVIEW OF THE PREVIOUS RESEARCH

Weinhold and Rauch(1997)by doing a research on 39 less developed countries studied the relation between the commercial and financial freedom and economic growth . the result shows that relation between commercial and financial freedom and economic growth is positive and meaningful, Lensink and Morrissey (1999) in their research on the effects of FDI on economic growth of host countries found a direct and meaningful relation between FDI and economic growth of these countries. Yadollah dadgar and Ali akbar naji maidani (2004)in an article about effect of trade globalization on economic growth in Iran during a period of 22 years from 1338-1379the effect of globalization of trade on per capita production was positive in Iran. In this paper the ratio trade to output was assumed as the index of trade openness.

Mahdavi(2004)in his research based on historical and theoretical analysis of effect of foreign investment on economic growth has emphasized on two types of investment which are FDI and foreign portfolio investment FPI. the most important result derived in this paper indicates that the effect of entrance of capital on economic growth is improving during the time under studied and other variables of such as FDI has been the most effective variable among different types of investment. This variable has had the clearest horizon and sustainability for using economic planning which is growth oriented. The experimental finding of this paper shows that flexibility of production structures and power of investment absorption in host countries and also intensity of needs of these countries to financial resources are among the most effective factors on the level of efficiency of FDI on economic growth of host countries.

Behzad salmani(2004)in his paper with the help of weightless tabular data and the information from oil export in countries during 1960-1999 showed that there is a strong

and significant relation between the various criteria of trade policies and economic growth of these countries. he ascertain that trade openness' of oil exporting countries on economic growth has positive effect and trade barrier has delayed their growth, The result shows that physical capital, human capital, change in terms of trade, FDI, export of factory production and growth of export has positive effect and government expenditure and inflation has negative effect on economic growth of oil exporting countries. Moreover conditional co integration about economic growth of these countries has been observed.

Reza najarzadeh and mehran maleki (2005),in a paper has studied the effect of FDI on economic growth countries including Indonesia Malaysia ,Venezuela Saudi Arabia and Iran and it has been positive beside ,effect of FDI on growth is under the effect of human capital .sayed safdar hossaind morteza molaiee (2006) with the help of time series data for 1978-12002 has estimated three econometric approaches, In the first approach the variables of FDI, domestic investment, ,human capital, and foreign trade and in the second approach the joint effect of FDI and domestic investment ,human capital ,and foreign trade and in the third approach effect of inflation taxes and government expenditures index of economic structure was analyzed .the result of these approaches indicate the positive effect of FDI on economic growth of the country .and the human capital also strengthen this effect. It also shows that increase of rate of inflation, taxes and government expenditure on economic growth is negative. Hamid Abrishami,Mohsen Mehrara and Aliraza Tamadon nejad (2009)in their research named ,study of relation between foreign trade and economic growth in under developing countries by using augmented momentum has studied the effects of macro policies of liberalization from international trade point of view on economic growth of under developed countries. For doing this research he has selected 24 countries during 1991-2002 which are based on augmented momentum and dynamic panel .Finding shows a positive and negligible effect of the rate of growth of trade on economic growth .In addition trade barriers such as rate of tariff reduces the economic growth at a minimal rate. Alireza Karbasiand Mehdi piri (2008)in a paper entitled " study of relation between trade liberalization and economic growth in Iran (a co integrated analysis)by utilizing endogenous model of growth and also time series data during 1971-2004 has studied the relation between trade liberalization and economic growth of Iran with the help of ARDL model .the obtained result shows a long run relation and co integration between the variables of Gross Domestic Product and other variables of the model and the effect of the variable of index of trade liberalizations a new variable along with other variables on Gross Domestic Product was positive and significant. As a result it can be said, improvement of the index of trade liberalization can create economic growth of the counties .Jafari Samimi, Farhang and Rostam zadeh and Mohamadzadeh (2009) have reviewed the effect of trade liberalization and financial expansion on economic growth of Iran . The time span selected by them was1973 to 2007 and the econometric technique used in this paper is auto regression with distributive lag .the result of this model

estimation shows that there is long run relation between the variables of the model and the effect of trade liberalization and financial expansion on Gross Domestic Product is significant and positive. grencher causality test also shows that there is causality from variables to Gross Domestic Product, karim Azarbajjani and zohreh Shirani fakhr(2009)have studied the effect of trade and market expansion on economic development of Iran and her 30 main commercial partners during 1995-2005The model which is used in this paper is a growth regression and on the bases of relation between economic growth of the countries regulates the variables explaining trade and market expansion. This variables are estimated by OLS, They have used three criteria of nominal freedom, real freedom and real geographical freedom as criteria for trade liberalization and after estimation of the model they found that when trade liberalization with dollars values of import and export as a ratio of GDP on the bases of purchasing power parity in terms of dollars is calculated then trade and market size will have a determining role in increase of economic growth in the year under study. And if it is reversed trade and market size will have no powerful impact on growth and real freedom is a better criterion for trade and real geographical freedom also explains that trade in Countries with smaller domestic market will have more impact on growth.

V. DESIGNING MODEL AND INTRODUCTION OF VARIABLES.

There are many relations which can be used as growth functions in economics. the main property of the function which can be called growth function are that they are increasing equally .Growth functions may have upper asymptotic or not, it should be noted that growth functions in economics are for short period of time .therefore, if we assume that upward side lacks asymptotic it seems logical. In order to study the relation between variables which has been presented in this research, the macro new classical production function in the form of Cob-Douglas has been used. This model can be written in general form as below:

$$GDPR_t = F(DDIGDPR_t, FDIGDPR_t, GGDPR_t, AXMRGDPR_t) \quad (11)$$

In this model GDPR represent real gross national product and DDI ,,,,,,represent formation of fixed domestic gross capital and GDRP represents size of the Government .FDI ,stands for direct external investment and AXM level of international trade .t shows the years under review,

$$\frac{dGDPR_t}{dt} = \frac{\partial F}{\partial DDIGDPR_t} \cdot \frac{dDDIGDPR_t}{dt} + \frac{\partial F}{\partial FDIGDPR_t} \cdot \frac{dFDIGDPR_t}{dt} + \frac{\partial F}{\partial GGDPR_t} \cdot \frac{dGGDPR_t}{dt} + \frac{\partial F}{\partial AXMRGDPR_t} \cdot \frac{dAXMRGDPR_t}{dt} \quad (12)$$

Dividing both sides of equation 2 on GDPRL we shall get proportionate growth rate

$$\frac{dGDPR_t / dt}{GDPR_t} = \frac{\partial F}{\partial DDIGDPR_t} \cdot \frac{1}{GDPR_t} \cdot \frac{dDDIGDPR_t}{dt} + \frac{\partial F}{\partial FDIGDPR_t} \cdot \frac{1}{GDPR_t} \cdot \frac{dFDIGDPR_t}{dt} + \frac{\partial F}{\partial GGDPR_t} \cdot \frac{1}{GDPR_t} \cdot \frac{dGGDPR_t}{dt} + \frac{\partial F}{\partial AXMRGDPR_t} \cdot \frac{1}{GDPR_t} \cdot \frac{dAXMRGDPR_t}{dt} \quad (13)$$

Multiplying right side of equation 3 in 4 we get 4 If relation $\frac{DDIGDPR}{GDPR}, \frac{FDIGDPR}{GDPR}, \frac{GGDPR}{GDPR}, \frac{AXMRGDPR}{GDPR}$

$$\frac{dGDPR_t / dt}{GDPR_t} = \frac{\partial F}{\partial DDIGDPR_t} \cdot \frac{DDIGDPR_t}{GDPR_t} \cdot \frac{dDDIGDPR_t}{dt} \cdot \frac{1}{DDIGDPR_t} + \frac{\partial F}{\partial FDIGDPR_t} \cdot \frac{FDIGDPR_t}{GDPR_t} \cdot \frac{dFDIGDPR_t}{dt} \cdot \frac{1}{FDIGDPR_t} + \frac{\partial F}{\partial GGDPR_t} \cdot \frac{GGDPR_t}{GDPR_t} \cdot \frac{dGGDPR_t}{dt} \cdot \frac{1}{GGDPR_t} + \frac{\partial F}{\partial AXMRGDPR_t} \cdot \frac{AXMRGDPR_t}{GDPR_t} \cdot \frac{dAXMRGDPR_t}{dt} \cdot \frac{1}{AXMRGDPR_t} \quad (14)$$

Be replacing in equation 4 we shall have

$$\begin{aligned} GDPR^\circ &= [(dGDPR_t / dt) / GDPR] \\ DDIGDPR^\circ &= [(dDDIGDPR_t / dt) / DDIGDPR] \\ GGDPR^\circ &= [(dGGDPR_t / dt) / GGDPR] \\ FDIGDPR^\circ &= [(dFDIGDPR_t / dt) / FDIGDPR] \\ AXMRGDPR^\circ &= [(dAXMRGDPR_t / dt) / AXMRGDPR] \end{aligned} \quad (15)$$

$$GDPR^\circ = \frac{\partial F}{\partial DDIGDPR_t} \cdot \frac{DDIGDPR_t}{GDPR_t} \cdot DDIGDPR^\circ + \frac{\partial F}{\partial FDIGDPR_t} \cdot \frac{FDIGDPR_t}{GDPR_t} \cdot FDIGDPR^\circ + \frac{\partial F}{\partial GGDPR_t} \cdot \frac{GGDPR_t}{GDPR_t} \cdot GGDPR^\circ + \frac{\partial F}{\partial AXMRGDPR_t} \cdot \frac{AXMRGDPR_t}{GDPR_t} \cdot AXMRGDPR^\circ$$

If the amount of $\eta_i, \eta_j, \eta_g, \eta_a$ be called elasticity's of growth of gross national products to formation of fixed gross domestic investment elasticity's of economic growth to the level of increase in direct investment (liberalization) and elasticity's of economics growth to the level of government size and elasticity's of economic growth to the level of volume of world trade (globalization) and substitutes in 5th equation 6th shall be obtained

$$GDPR^\circ = \eta_i \cdot DDIGDPR^\circ + \eta_j \cdot FDIGDPR^\circ + \eta_g \cdot GGDPR^\circ + \eta_a \cdot AXMRGDPR^\circ \quad (16)$$

Equation 6 can also be obtained through the COB – DOUGLAS logarithm form in the shape of

$$GDPR_t = DDIGDPR_t^\alpha \cdot FDIGDPR_t^\beta \cdot GGDPR_t^\theta \cdot AXMRGDPR_t^\sigma \quad (17)$$

$$\text{Log}(GDPR_t) = \alpha \cdot \text{Log}(DDIGDPR_t) + \beta \cdot \text{Log}(FDIGDPR_t) + \theta \cdot \text{Log}(GGDPR_t) + \sigma \cdot \text{Log}(AXMRGDPR_t) \quad (18)$$

The amount of $\eta_i, \eta_j, \eta_g, \eta_a$ in equation 6 is equal to $\alpha, \beta, \theta, \sigma$ in equation (8) With the help of this model the

relation between size of economic growth and other parameter such as growth of level of Foreign Gross Domestic capital formation, growth of direct foreign investment or liberalization and level of growth of size and level of world trade can be explained.

This model also explains that logarithm variations of these models may be related. In addition if we keep in mind the dynamics of short run in behavior of these models, keeping other things constant, the past variation in above variables can contain valuable information about forecasting the future changes of growth of the country. Therefore with reference to above discussion, in order to study the relation between these variables and economic growth in Iran, the following regression model is estimated.

$$LGDPRM = \beta_0 + \beta_1 \cdot LDDIGDPR + \beta_2 \cdot LFDIGDPRM + \beta_3 \cdot LGGDPRM + \beta_4 \cdot LAXMRGDPR + \beta_5 \cdot DUW59 \quad (19)$$

Definition of present variables in relation to (9) are LGDPRM logarithm of gross real domestic product at constant prices of 1997.

LDDIGDPRM logarithm ratio of capital formation and gross domestic fixed capital in machinery sector and building on real gross domestic product at constant prices of 1997 in market prices (billion rials)

LEDIGDPRM logarithm of ratio of foreign direct investment on real gross domestic product at constant prices of 1997 and market prices (billion rials)

$LGGDPRM = \text{Log}\left(\frac{G}{GDPRM}\right)$: Logarithm of ratio of total current payment and developmental payment of government at constant prices of 1997 over real gross domestic product at constant prices at market prices (billion rials)

GDPRM: real gross domestic product at constant prices of 1997 and market prices (billion rials).

LAXMRGDPRM :logarithm of absolute value to difference of net export and net import of goods and services at constant prices of 1997 over real gross domestic product at constant prices of 1997 in market prices (billion rials)

DUW50 dummy variables of imposed war during 1980-88 is zero and for the rest of the years is one in numerical terms.

VI. ESTIMATION AND DISCUSSION OF THE MODEL

The data used in this research are from various statistical years of Central Bank Iran and statistical Center of Iran and the office of vice president of the IRI. Calculation of data is also on the bases of library and other documentation available in the time series used for estimation of model includes data from 1959 to 2007.

It is worth mentioning that most of economic time series variables are unidirectional, this due to common trend which exist in most of them. As a result in most of time series variables statistical features such as mean mode and variance are a function of time, which means the variable are valid. Estimation of regression with the help of non- valid variables are called false regression and as the result of such model shall be misleading. One of the ways to avoid false regression is the use of co integration. Various co integration

has been used to avoid false regression. One of these approaches is the Engle Granger approach. Since co integration approach like Engle Greg her has got many limitation, in studies with better samples, as it does not take into consideration the short term dynamic reaction between the variables therefore it is not valid. Because the estimated result between them is not without bias and as a result testing of assumption with the use of common statistical test such as t shall not be valid. Pesaran and Shin proved that if co integration vector resulted from use of least square approach on a self explanatory approach with distributive time lag, in which it lags are well- defined, be achieved.

Although least square will have a normal distribution in small samples they will have less bias and higher efficiency. For this reason those approaches which have short run dynamic and lead to estimation of more accurate ratio are more attentive. In this research also, since, for evaluation of the approach and test of co incidence, ideas related to experimental observation from data of time series and co integration technique particularly dynamic auto regressive, distributed and error correction method are used.

In general a dynamic approach is the one in which lags of variables enter as relation no 20

$$Y_t = a \cdot X_t + b \cdot X_{t-1} + c \cdot Y_{t-1} + u_t \quad (20)$$

For reduction of distortion related to estimation of ratio of model in smaller cases, it is better to use model with lags for variables such as relation (21).

$$\phi(L, P) \cdot Y_t = \sum_{i=1}^k \beta_i \cdot (L, q_i) \cdot X_{it} + c' \cdot w_t + u_t \quad (21)$$

The above model is called auto regressive distributed lag (ARDL) and we will have

$$\phi(L, P) = 1 - \phi_1 \cdot L - \phi_2 \cdot L^2 - \dots - \phi_p \cdot L^p \quad (22)$$

$$\beta_i(L, q_i) = \beta_{i0} + \beta_{i1} \cdot L + \dots + \beta_{iq} \cdot L^q \quad i = 1, 2, \dots, k \quad (23)$$

In the above sentences L is the lag is the vector from fixed variables such as Intercept, dummy variables Time trend and exogenous variables with constant lags Y is the dependent variable and X_i is the independent variable.

In ARDL approach, the above model for all cases and all possible, arrangement, i.e. for the amount of $P = 0, 1, 2, \dots, m$ and also $q_i = 0, 1, 2, \dots, m$, in the OLS approach and number of $(m = 1)^{k+1}$ shall be estimated and maximum number of lags i.e., m will be determined by the researcher.

In the next step, out of estimated regression $(m = 1)^{k+1}$, one of the equations with use of measures of Akaike, Schwarz Bayesian, Hannan-Quinn and R-Bar Squared will be selected. In samples with level of observation below 100, it is better to use Schwartz data in order to avoid losing higher degree of freedom.

For calculation of long run ratios dynamic models should be used, Long run ratio related to X variable are obtained.

$$\theta_i = \frac{\hat{\beta}_i \cdot (1, q_i)}{1 - \hat{\phi}(1, p)} = \frac{\hat{\beta}_{i0} + \hat{\beta}_{i1} + \dots + \hat{\beta}_{iq}}{1 - \hat{\phi}_1 - \dots - \hat{\phi}_p} \quad (24)$$

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

Now, in order to see whether the long run relation obtained from this method is not false the following assumption shall be tested.

$$H_0 : \sum_{i=1}^p \phi_i - 1 \geq 0 \quad (25)$$

$$H_1 : \sum_{i=1}^p \phi_i - 1 < 0$$

cointegration on long -The null assumption reveals non because the condition for the dynamic short run relation term relation to move towards long run equilibrium is the sum of of total,that coefficients with dependant variable lags and then divide the result on total deviation

$$t = \frac{\sum_{i=1}^p \hat{\phi}_i - 1}{\sum_{i=1}^p S_{\hat{\phi}_i}} \quad (26)$$

If the absolute value of t becomes higher than the absolute value presented by Banargi, Delado and Master. The null hypothesis will be rejected and the existence of long run shall be accepted.

The most important reason for the widespread use of ECM is that it relates the short term variation of variables to their long run equilibrium. When two variables of X_t and Y_t are co integrated, There is a long run equilibrium between them. However in the short run, there may be some disequilibrium .These model are of course kinds of partial equilibrium model and by entering residual of a long run relation. The effective forces of short run and the velocity of approaching to equilibrium in the long run can be calculated. If the coefficient of error correction appears to be negative, it approaches towards long run relation. It indicates the velocity of error correction and willingness towards long run equilibrium. This ratio shows that in each term, what percentage of disequilibrium of dependant variable is attained and it approaches towards long run relation .In order to obtain ECM Based on $ARDL(\hat{p}, \hat{q}_1, \dots, \hat{q}_k)$ in equation 21, variable of $W_t, Y_t, X_{1t}, \dots, X_{kt}$ are considered on account of amount of lags and deduction of their first degree and ECM will be obtained as under

$$\Delta Y_t = -\phi(L, \hat{P})ECM_{t-1} + \sum_{i=1}^k \beta_{i0} \Delta X_{it} + c' \Delta Y_t - \sum_{j=1}^{\hat{p}-1} \phi_j^* \Delta Y_{t-j} - \sum_{i=1}^k \sum_{j=1}^{\hat{q}_i-1} \beta_{ij}^* \Delta X_{it-j} + u_t \quad (27)$$

The ECM_{t-1} is the same as equation 21 which has entered into the model with time lag.

In ARDL, in contrast to other methods of Modeling, ignoring the stationary characteristic of variables in the model, the long run estimation of the model can be attained. For obtaining long run relation and analyzing co integration uni-variable equation of Pesaran and Shins (1997)is used .This method takes place in two steps .First ,by co integration i.e. ,existence of an equilibrium relation in the long run between the variable by using a method which is mentioned in (16th)relation shall be tested and the second step while ,estimating a collection of coefficients in long run, Modeling in short run takes place ,which ensures attainment of long run relation.

A model which is used on the bases of ARDL for estimation effect of explanatory variables and the level economic growth of Iran coincides by relation (21).used is explained below

$$LGDPRM = \alpha_0 + \sum_{j=1}^p \alpha_j LGDPRM_{t-j} + \sum_{j=0}^{q_1} \beta_{1j} LDDIGDPRM_{t-j} + \sum_{j=0}^{q_2} \beta_{2j} LFDIGDPRM_{t-j} + \sum_{j=0}^{q_3} \beta_{3j} LGGDPR_{t-j} + \sum_{j=0}^{q_4} \beta_{4j} LAXMRGDPR_{t-j} + \beta_5 DUW_{59} \quad (28)$$

In this relation self explanatory variables are amount of growth of Gross Domestic Fixed Investment ,Foreign Direct Investment variable of growth which is an indicator of index of economic freedom .level of growth Government Size .and also Net Foreign Trade variables which is an index for globalization.

The dummy variable of imposed war with numerical value of one during 1980-1998 and for the remaining years value of zero will be entered in the above relation.

In this method ,the maximum number of lags is considered to be two and since the number of observation is less than 100 Schwarz model is used .This model has specified two lags for LGDPRM(level of economic growth)and LEDIGDPRM(level of foreign investment growth) and for the other variables zero-lag has been assigned . The result of best estimation for the above method of AEDL is explained below

$$\begin{aligned} LGDPRM &= 23.0305 - 0.86359LGDPRM(-1) - 0.93922LGDPR(-2) + 0.033200 \\ (T-Ratio) & (32.5836) \quad (-12.1509) \quad (-22.566) \quad (2.7338) \\ LDDIGDPR &= 0.88774LFDIGDPRM - 0.91235LFDIGDPRM(-1) - 0.92376 \\ & (-28.4830) \quad (-24.6681) \quad (-25.2364) \\ LFDIGDPRM(-2) &+ 0.011792LGGDPRM - 0.0011353LAXMRGDPR - 0.010179 \\ & (3.8987) \quad (-0.38022) \quad (-2.0174) \\ DUW_{59} & \end{aligned}$$

$$F(9, 30) = 6204.5 [0.000]$$

$$R^2 = 0.99946$$

$$\bar{R}^2 = 0.99930$$

In this model Rand R shows that the independent shows the behavior of dependant variables in a higher level i.e. more than 99.9% of the variation in economic growth of the coefficients foreign investment variable in normal period and with lag and Domestic Investment and the variable of growth of size of Government in the high level of 95%is significant.

As it is mentioned for examining co integration of model in ARDL approach relation no (16) can be used. Thus, if the t statistic so obtained is less than critical value presented by BENARGI-MASTER and DOLADO, null hypothesis in no (8) relation will not be rejected and lack of existence of relation in long run among the variable will be accepted.

In the obtained model t statistic is equal to

$$t = \frac{\sum_{i=1}^p \hat{\phi}_i - 1}{\sum_{i=1}^p S_{\hat{\phi}_i}} = \frac{\hat{\alpha}_1 - \hat{\alpha}_2 - 1}{S_{\hat{\alpha}_1} + S_{\hat{\alpha}_2}} = \frac{-0.86359 - 0.93922 - 1}{0.071073 + 0.041621} = -24.871$$

Since the quantity of critical value presented by BENARGI-MASTER.DELADO in 99% confidence is equal to -4.85. The null hypothesis will be rejected. Therefore, it can be concluded that a long run equilibrium relation exist between the variables.

VII. LONG AND SHORT RUN ANALYSIS OF THE MODEL OF ARDL

For considering long run relation of variables which have been discussed in this paper, The approach with self explanatory approach with wide gaps of ARDL have been used. In this approach maximum number of lags are considered to be two and since number of observation is less than 100, the Schwarz criteria is used. This method has assigned two lags to LGDPRM and LFDIGDPRM and for the remaining variables zero lags are assigned. After the determination of the number of optimum lags related to each one of the variables in the model is determined.

The model related to long run relation of explanatory variables with the dependant variables is explained below

$$LGDPRM = (8.2169) + (0.011845)LDDIGDPRM - (0.97182)LFDIGDPRM + (T - Ratio) (260.7663) (2.6962) (-168.8075)$$

$$(0.0042073)LGGDPRM - (0.4051E - 3)LAXMRGDPRM - (0.0036316)DUW_{59}$$

$$(3.7907) (-0.38003) (-1.9788)$$

Keeping in mind the obtained coefficients from long run model it is cleared that in long run there is a direct meaningful relation between increase in FIXED GROSS DOMESTIC CAPITAL in housing and machinery sector and economic growth. On the other hand, in the long run by increasing domestic investment, economic growth will also increase. Further more in the long run there is an inverse relation between economic growth and Foreign Domestic Investment, which means in the long run by ASFDI increase and financial freedom expands economic growth declines in Iran here is also a direct and meaningful relation between size of the government and increase of economic growth and finally imposed war has put its negative effect on the economic growth in the long run. The available t statistics for variables showed significant of variable at the high level of 95%.

As shown earlier, since the model in this article is a logarithmic model the coefficients variable explain the elasticity, therefore, in the long run, one percent increase in domestic investment will increase economic growth by 0.11%. Furthermore, increase of one percent in foreign investment shall reduce economic growth by 0.97% and one percent increase in government size shall increase economic growth by 0.004% in the long run.

Error Correction Method or ECM indicates the relation between growths of GOVT variable with the independent variables of the model in the short run which shows the dynamics of the model. The ECM is as follow.

$$\Delta LGDPRM = (23.0305) + (0.93922)\Delta LGDPRM(1) + (0.033200)\Delta LDDIGDPRM - (T - Ratio) (32.5836) (22.5660) (2.7338)$$

$$(0.88774)\Delta LFDIGDPRM + (0.92376)\Delta LFDIGDPRM(1) + (0.011792)\Delta LGGDPRM - (-28.4830) (25.2364) (3.8987)$$

$$(0.0011353)\Delta LAXMRGDPRM - (0.010179)\Delta DUW_{59} - (2.8028)ecm(-1)$$

$$(-0.38022) (-2.0174) (-31.3695)$$

$$R^2 = 0.98528$$

$$\bar{R}^2 = 0.98087$$

$$F(8, 31) = 251.0379 [0.000]$$

In the short run owing to the finding from ECM, it is cleared that there is a direct and significant relation between economic growths in one term with the economic growth of the previous term. On the other hand one percent increase in economic growth of the previous term will increase the economic growth of the country by 0.939 percent in the next term.

In addition in the short run there is a direct significant relation between economic growth and increase in Gross Domestic Fixed Capital Formation. On the other hand in the short run an increase of one percent in domestic investment shall increase economic growth by 0.033%. If we compare the long run effects of variables of Gross Domestic Capital Formation on economic growth of the country with the effects of the short run, we can infer that in the short run increase in Gross Fixed Capital Formation shall increase the economic growth of the country as compare to the long run. There is an inverse meaningful relation between economic growth in one term with Foreign Direct Investment in the same period whereas there is a direct meaningful relation between FDI in the pervious period and economic growth of the same period. On the other hand in the short run during current period, increase in FDI has reduced the economic growth, but causes an increase in economic growth in the next period.

As it can be seen from the above equation, in the period under study, one percent increase in FDI shall reduce the economic growth by 0.88% in the same period. While, it shall increase economic growth by 0.92% for the next period. A comparison between long run and short run variables of FDI on economic growth presents this fact that increase in FDI in the long run shall increase economic growth more than short run. In addition, there is a direct meaningful relation between GOVT size and economic growth. On the other hand in the short run an increase of one percent in the level of growth of GOVT size, shall increase the economic growth by 0.11 percent. In the long run effect of increase in GOVT size and increase in economic growth is less than the short run.

It is to be remembered that in the short run negative influence of globalization on economic growth of Iran is neither meaningful nor confident. Coefficient -1 for ECM is equal to -2.8028 and considering the t statistic it is meaningful with a considerable degree of confidence. Therefore there is a short run relation among the variables of the model. Coefficient ECM shows that in each year 2.80 of disequilibrium in growth of GOVT size approaches

toward equilibrium of the long run .Therefore the Adjusted Coefficient shows a smooth movement of co integration towards long run equilibrium. It can be seen fro above equation that the available t statistic for variable is an indication of meaningfulness of variable in a 95 percent level.

$$ecm1 = LGDPRM0.011845LDDIGDPRM+0.97182LFDI \\ GDPRM- 0.0042073 LGGDPRM+ 0.4051E-3 \\ LAXMRGDPRM-8.2169C-0.0036316DUW59$$

VIII. CONCLUSION

There is a direct meaningful relation between formation of fixed gross domestic investment in housing and machinery sector and economic growth in the long run .On the other hand as domestic investment increases, economic growth will also increase .In addition in the long run, there is a inverse significant relation between economic growth and FDI which means in the long run as FDI and globalization increases economic growth shall reduce. There is also a direct and significant relation between growth of GOVT size and increase in economic growth, therefore in the long run one percent increase in domestic investment will increase economic growth by 0.11 percent .Furthermore, in the long run one percent increase in Foreign Investment shall reduce economic growth by 0.97 percent .In addition in the long run one percent increase in GOVT size shall increase economic growthby0.004 percent.

It is to be mentioned that the effect of globalization on economic growth of Iran is neither meaningful nor confident. In the short run the obtained result shows that there is a direct and significant relation between economic growths in one term with economic growth of the previous year. On the other hand in the short run one percent increase in economic growth of the previous term will increase the economic growth of the next term by 0.939 percent.

In addition in the short period .there is a direct meaningful relation between economic growth and increase in formation of Domestic Gross Fixed Capital. Moreover in short period one percent increase in Domestic Investment will increase economic growth of the country by 0.33 percent. A comparison between the effect of variable of Gross Domestic Capital Formation on the long run relation and short run shows that in the short period increase in formation of Gross Domestic Investment grows more than that of the long run.

In the short period .there is an inverse meaningful relation between economic growths in one term with FDI of the same period. while, there is a direct meaningful relation between economic growth of one period with FDI of the pervious period .On the other hand in a short run during current period increase in FDI will reduce the economic growth but in the next term it increases economic growth .As it can be seen from aforesaid equations, in the period under study one percent increase in FDI shall reduce economic growth by 0.88 percent .while it shall increase economic growth in the next term by 0.92 percent.

A comparison of long run and short run effects of variable of FDI on economic growth shows that increase in FDI in

the long run shall reduce economic growth more than short run.

Furthermore, in the short period there is a direct meaningful relation between growth of GOVT size and economic growth. In the short run one percent increase in the level of GOVT size, economic growth shall increase by 0.011percent.In the long run effect of increase in GOVT size on economic growth is smaller than short run. Coefficient ECM shows that in 2.80 of disequilibrium GOVT size will approach long run. Therefore adjusted Coefficient will show a smooth speed of co integration towards the long run equilibrium and at last imposed war has put its negative effect both on long and short run on economic growth of Iran.

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