

Survey of Effects of Financial Development and Quality of Institutions on Iran's Economic Growth by ARDL Model

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Abstract

This study examined the quality of institutions and financial development, and the interaction of financial development and institutions on economic growth in the short run and long run by using of Auto Regressive Distributed Lag (ARDL) model during the period of 1981-2013. Thus, this study adopts the framework introduced by Mankiw, Romer and Weil (1992) that expanded with the addition of institution variables. The results of estimation equations shows that financial development in the long run has meaningfully positive effect on real GDP per capita. But when combined with the quality of the institution will be a negative influence. This means that when the financial development causes to economic growth which the context of appropriate institutional quality is formed.

Keywords: Quality of Institutions, Financial Development, Iran's Economic Growth, ARDL Model

JEL Classifications: O16, O43, G21, G28, C35

1. Introduction

Economic growth is considered the main symbol for the performance of governments, so economists are trying to assist policy makers to improve such type of growth via more precisely understanding the dynamics and factors effective for change of this index. Today, it is accepted by most economists that neither physical and human capital accumulation nor technological changes by themselves could not explain the differences of economic growth. The main key to growth in the recent literature has been the two concepts of quality of institutions and financial development.

Institutions that play a role in the society as the rules of game lead to the formation of mutual relations among the members of a society and economic behavior of producing factors. When laws are frequently changed or not respected, when corruption becomes widespread in the society, or when ownership rights are not properly defined and implemented, the market cannot perform well, which consequently leads to uncertainty and lack of optimal allocation of resources in the society and economy. A number of recent articles have provided empirical evidence that could confirm the importance of institutional quality for economic performance (Kumssa & Mbeche, 2004; Acemoglu, Johnson & Robinson, 2003; Bulte et al., 2005; Glaeser et al., 2004).

Also, financial intermediaries play an important role in the development process via performing their role in the allocation of resources to the most efficient use. More access to financial instruments reduces financial information and costs. Deeper and more efficient financial markets help economic factors in terms of business, hedging, risk reduction, and investment increase and, thus, increase economic growth (Goodhart, 2004).

Difference in causality relationship between financing and economic growth that has been revealed in time series studies indicates that there is an important difference in the way financing affects economic

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growth in different countries, which is caused by institutional differences. This idea was expanded in Demetraides and Andranova's (2004) study, in which difference in the pattern of causality was found to reflect the difference in the quality of financial regulations and rule of law. For example, increased funding of the private sector, as an indicator of financial development, may have no incremental effect on economic growth, because, due to the corruption of banking system or political intervention, funding may be directed towards useless activities with less productivity.

Therefore, the hypotheses of the present research are formed following this question: How are the effects of institutional quality and financial development as well as the influence of financial development on the economic growth in the context of institutional quality? In this article, we sought to answer the above question. So, the paper is organized as follows: in the next section, theoretical literature is discussed. In the third section, some foreign and domestic empirical studies that have been conducted in this regard are reviewed. Theoretical expression of the model, description of the data, and explanation of ARDL pattern are described in the fourth section. Model estimation and analysis of the obtained results form the discussions in the fifth section and, finally, summary and conclusion of the research are presented.

2. Related Literature

To theoretically explain the subject, some discussions are presented in this section in which the role of financial system and institutional quality in economic growth and development is highlighted.

• Financial Development and Economic Growth

The impact of financial development on economic growth has been one of the main topics of study and focus of some economists in the last decade. Some of them believe that financial development, via increasing level of savings and investments, can provide the proper condition for economic growth, while others believe that transfer of the effect of financial development on economic growth is highlighted through its effects on resource allocation and capital efficiency. With the development of endogenous growth theory, in the past decade, great attention has been paid to the relationship between financial markets and economic growth. The main difference between exogenous and endogenous growth models should be sought in the position and changes of technology. According to endogenous growth theory, financial markets affect economic growth through influencing rates of capital accumulation and technological innovation. Endogenous growth theory emphasizes the impact of financial markets on economic growth (Eatsfeld, 1994; Bensivenga et al., 1995; Raza et al. 2012). As far as empirical aspects are concerned, there is a significantly positive relationship between development of financial markets and economy, as shown by King and Levine (1993) and Levine and Zeroce (1998). However, based on exogenous growth theory as one of the traditional growth patterns, financial markets and their development only affect capital accumulation and also technological and technical advances are considered in these exogenous models. In a group of endogenous growth models, technology factor that has a great share in economic growth rate along with the development of financial markets is entered into the process of economic growth.

Also, legal and political environments play a determining role in the quality of services offered by financial institutions. For example, in some developing countries, banks are reluctant to increase loans, because inefficient judicial system or corrupted political and administrative institutions prohibit the repayment of loans. Quality of legal institutions, rights of ownership, quality of bureaucracy, and accountability of government have an impact on the functioning of the financial system.

• Institutional Quality and Economic Growth

During the last half-century, growth models have undergone numerous revolutions. In 1950s, Solow proposed a model in which, after analyzing the behavior of production based on variables such as physical capital and labor, considered technology as the engine of economic growth. They, he was encountered with criticisms that convergence of per capita income growth as one of the results of his model did not happen in

the countries with similar conditions. He also believed that technological growth is the factor of economic growth, as assumed in the exogenous model and did not have any political recommendation. In the late 1980s, a group of scientists such as Romer (1986) and Lucas (1988) included the discussion of ideas, knowledge, and human capital in growth issues and presented models known as endogenous growth models. By the entry of human capital into the model, its explanatory power was reinforced and the cause of difference in per capita income of countries was more justified, but there were still some problems. For example, in Romer's (1990) growth model, it is stated that if a state allocates more resources to innovation, it will become more prosperous, but the reason is not explained. Therefore, attention is gradually shifted towards institutions (Acemoglu et al., 2005). During the years that classic scholars were focusing on completing their growth models, more scientists were trying to provide an explanation for the causes of economic growth. In the meantime, new institutional economy was the paradigm efforts that won ahead of the rest. North and Thomas (1973) rejected the view that factors such as innovation, economic scale, education, and capital accumulation are growth factors and introduced institutions instead (Acemoglu et al., 2005).

Before continuing the discussion, the difference between growth and development should be essentially considered. The institutional approach to growth has in fact a major difference from other approaches. Gerald Meyer defined development as growth that is resulted from technological, institutional, and value changes (Motevaseli, 2005). Therefore, emphasis on institutional changes for achieving economic growth practically leads to the emergence of development in countries.

• **Financial Development, Economic Quality, and Economic Growth**

Quality of institutions is an important variable in explaining economic growth. In recent decades, many studies have revealed that adopting efficient policies supports financial development and, thus, facilitates economic growth. Eschenbach et al. (2004) who studied a sample of 100 variables from 130 countries found that the main factors of economic growth were related to financial indicators, macroeconomic performances, and institutional quality. In other words, they confirmed the importance of institutional and financial frameworks on economic growth. Chinn and Ito (2006), Mishkin (2009), as well as Blackburn and Forgues-Puccio (2010) have argued that, when institutional quality is good, financial liberalization is beneficial for economic growth and vice versa. Financial development is an important factor in stimulating institutional reforms in developing countries, which promotes financial development. Quality of institutions, which is the basis of financial development, is described by theories that determine different forms of institutions as follows:

1. Legal entities that define the nature of legal systems, terms of guarantee and execution, particularly rights of ownership.
2. Economic institutions that represent a set of rules to manage production process, allocation and distribution of goods and services, and rules that govern functioning of the market.
3. Political institutions that specify laws of the political and electoral system.
4. Social institutions that represent general rules of social security, education, and health.

Nevertheless, these rules that specify the rights of investor in a country are necessary; but, to be adequate, they must be guaranteed. The juridical and legal frameworks of markets affect the transparency of information, possibility of objecting to obvious shortcomings, and power of concerned policy-maker in the process of investigation and punishment. McKinnon and Shaw (1973) considered these assumptions and noted that adverse provisions have a negative impact on economic growth. Based on the relationship between political institutions and financial development, Han (2010) used panel data from 90 developed and developing countries during 1960-1999 and confirmed the positive effect of institutional improvement on financial development and economic growth.

Empirical Studies

Many empirical studies have been carried out on financial development, institutional quality, and their effects on economic growth. In this study, some of the most important ones are described.

• Foreign Studies

North (1997) believed that the economic growth of America in the 19th century is due to an appropriate institutional framework. He insisted that, in a great part of the history and many economies, the number of institutions that have rewarded limiting production, making additional work, and crime has been more than those that have rewarded productive economic activities. Glaeser et al. (2005) investigated the historical trend of economic development in industrialized countries and observed that the orientation of an economy towards making reformations in the institutional structure could encourage investment, accumulation of skills, technology transfer, and optimum utilization of these investments and, thereby, lead to economic dynamism and sustainable growth. Anwar and Nguyen (2011) examined the relationship between financial development and economic growth using panel data from 61 provinces of Vietnam and endogenous growth theory. They achieved a strong positive relationship between financial development and economic growth by funding-to-GDP ratio as an indicator of financial development. Hassan, Sanchez, and Yu (2011) examined the role of financial development in economic growth using panel data and analysis of variance for the middle- and low-income countries in different regions with different degrees of development. Their results indicated a two-way relationship between financial development and economic growth in developing countries. Also, in the short term, a bilateral relationship between financial development and economic growth in most regions and another one-way relationship from economic growth to financial development in the poorest regions were established.

• Domestic Studies

Jafar Samimi and Azarmand (2005) examined the effect of institutional variables on economic growth in the countries of the world within 1980-2001. The results showed a significant relationship between long-term economic growth and performance of economic, political, and legal institutions. Mehrara and Rezai (2009) conducted a study in which they examined the effect of trade liberalization on economic growth in two institutional regimes (countries with low and high institutional quality). They then concluded that, if Iran and other developing countries intend to properly utilize the results of trade liberalization policies, they should prepare the required environment, infrastructures, and institutional arrangements for joining to World Trade Organization in order to benefit from its benefits in terms of economic growth. Akbarian and Heidari Pour (2009) investigated the effect of financial market developments on economic growth using the ARDL model. In this study, they used two different indicators of financial development, i.e. ratio of saving to GDP and ratio of domestic funding to GDP, in two separate models and concluded that, in both models, in the short term, financial indicators would negatively impact economic growth and, in the long term, this happened with some negligence. Thus, we can say that there is a positive relationship. Mahdavi Adeli et al. (2010) generalized the neoclassical growth model to study the effect of ownership rights on economic performance and found that the accumulation of physical and human capital and, consequently, level of GDP per capita in a country have a positive relationship with protection degree of ownership rights to the extent of saving rate. Jalaei et al. (2014) evaluated the effect of financial development on economic globalization process in Iran and found that increased financial development could lead to 11% increase in the private investment via expanding bank funding to the private sector and, consequently, lead to higher economic growth which itself causes 65.1% increase in exports and 73.1% growth in imports. Thereby, it could provide favorable conditions for expediting the process of globalization.

3. Empirical Analysis

• Model

To test the effects of financial development and institutions on the economic growth of Iran, the model used in this paper was adapted from the theoretical model introduced by Mankiw et al. (1992), Knight et al. (1993), and Ghura and Hadjimichael (1996). Therefore, we considered the following Cobb-Douglas function:

$$Y_t = K_t^\alpha H_t^\beta (A_t L_t)^{1-\alpha-\beta} \quad (1)$$

where Y represents real output, K is physical capital stock, H is human capital, L is simple labor, and A is incremental factor of labor that reflects level of technology and efficiency in economy. Index t also shows time.

It is assumed that $\alpha + \beta < 1$, i.e. returns of all investments are decreasing. Also, we assume that function of simple labor and incremental technology of labor are expressed according to the following functions:

$$L_t = L_0 e^{nt} \quad (2)$$

$$A_t = A_0 e^{gt + p\theta} \quad (3)$$

where n represents the exogenous growth rate of labor, g reflects the exogenous development of technology, p shows vector of financial development, institutional quality, and other factors that can affect level of technology and efficiency in the economy, and ultimately θ is coefficient of variables.

In this model, exogenous variable A depends on exogenous technological progress, openness degree of economy, and level of other variables. It is obvious that A in this paper is different from A used by Mankiw et al. (1992); these adjustments are related to the empirical cases of the relationship between financial development, institutions, and economic growth. Technological improvement is reinforced through development of financial market, which increases efficient sector or investment efficiency.

In the sustainable state, real production of labor per capita grows at constant rate \mathbf{g} (exogenous component of efficiency growth rate of variable A). This result can be obtained directly from the definition of real production of effective per capita force as follows:

$$\frac{Y_t}{A_t L_t} = (k_t)^\alpha (h_t)^\beta \quad , \quad \frac{Y}{L} = A_t (k_t)^\alpha (h_t)^\beta$$

$$, \quad y^* = \left(\frac{Y_t}{L_t} \right)^* \quad (4)$$

By taking the logarithm from both sides of Eq. (4) and removing time for simplicity, the following equation in the sustainable steady state is achieved:

$$\ln \left(\frac{Y}{L} \right)^* = \ln A + \alpha \ln k^* + \beta \ln h^*$$

Using Eq. (3), the following equation can be found:

$$\ln \left(\frac{Y}{L} \right)^* = \ln A_0 + gt + \theta \ln p + \frac{\alpha}{1-\alpha-\beta} \ln s^K + \frac{\beta}{1-\alpha-\beta} \ln s^H - \frac{\alpha+\beta}{1-\alpha-\beta} \ln(n+g+\delta) \quad (5)$$

Eq. (5) represents actual production of labor per capita or labor productivity in a sustainable state, in which a vector of financial development and indicators of institutional quality exist (\mathbf{p}). Mainly due to data limitations, this study assumes that s^H and g_t do not change over time; however, s^K and n vary over time. In other words, $\ln A_0$, g_t , and s^H can be considered the constant term of A_0 in the following equation:

$$\ln\left(\frac{Y}{L}\right)^* = A_0 + \theta \ln p + \frac{\alpha}{1-\alpha-\beta} \ln s^\kappa - \frac{\alpha+\beta}{1-\alpha-\beta} \ln(n+g+\delta) \quad (6)$$

where p is institutions and financial development. By rearranging Eq. (6), an estimable model can be achieved to show the relationship between financial development, institutions, and real production per capita according to the following equation:

$$\ln RGDP = A_0 + A_1 \ln FD + A_2 \ln INS + A_3 \ln K - A_4 \ln(n+g+\delta) \quad (7)$$

where $RGDP$ is real GDP per capita, FD is financial development index, INS is institutional quality indicator, and K is accumulation of physical capital. In $(n+g+\delta)$, n is growth rate of labor, g is technological growth rate or technical progress, and δ is rate of depreciation. g and δ are constant over time and, according to Mankiw's (1992) article, are totally equivalent to 5%. A_0 is constant and A_1 , A_2 , and A_3 are the parameters that must be estimated.

Also, to estimate the interaction between financial development as well as institutions and economic growth, it is possible to expand Eq. (7) in order to include the interaction between financial development and institutional quality index according to the following equation:

$$\ln RGDP = \beta_0 + \beta_1 \ln FD + \beta_2 \ln(FD \times INS) + \beta_3 \ln K - \beta_4 \ln(n+g+\delta) \quad (8)$$

Eqs. (7) and (8) provide the empirical model that will be estimated in this paper.

• Data Description

In this study, the required information and data were collected using a library method. The statistical data included annual time series over the last three decades related to 1984 to 2013, which were extracted from World Bank Development Indicators (WDI) and International Country Risk Guide (ICRG).

Institutional Quality Index (INS) that was used in this article included the criteria prepared by Kaufman et al. (2008) based on the information collected through a wide range of cross-country surveys as well as surveys of experts and specialists. These indicators include:

- 1) Voice and accountability: This variable indicates rate of citizen participation in the selection of rulers as well as freedom of expression, freedom of association, and freedom of media.
- 2) Political stability and absence of violence: With this variable, the probability by which the government will be overthrown by illegal means or violence is determined.
- 3) Government effectiveness: The indicator of government effectiveness reflects the quality of public services, quality of civil services and its independence from political pressures, quality of policy formulation and implementation, and validity of government's commitment to this policy.
- 4) Regulatory quality: This variable represents the ability of the government to develop policies and systems that allow for the development of the private sector.
- 5) Rule of law: This indicator demonstrates the trust of brokers in the rules of society, particularly implementation of contracts, property rights, policies, courts, as well as crime and violence probability.
- 6) Corruption control: Corruption variable means to use power or position to obtain personal benefits or the possibility by which officials demand illegal payments.

Each of the above indicators is rated from -2.5 to 2.5; accordingly, a higher value indicates a better institutional quality and a lower value represents a lower level of institutional quality. In this paper, the simple average of the above indices was used. In addition to the above data, data on other variables (labor growth rate, GDP per capita, and accumulation of physical capital) were extracted from the World Bank.

To quantitatively demonstrate financial development (FD), the average of two alternative criteria, i.e. liquid liabilities (LL) and domestic credit to the private sector (DCS), derived from WDI are used:

1) Liquid liabilities (LL) (% of GDP): is a criterion that shows the amount of financial system's liquid liabilities, including obligations of commercial banks, central bank, and other financial intermediaries. King and Levine (1993) believed that liquid rate is reliable as an indicator of financial development. This indicator is obtained by dividing the volume of liquidity by GDP. Its impacts on economic growth are complex. If the monetary economy indicates development of the capital market, it can have a positive effect on economic growth. But, what is more important in the financial system is the optimum allocation of funds and portfolio management. In this framework, the appropriate indicator for measuring the development of financial market is use of the definition of money market with a less degree of liquidity. Therefore, liquid liabilities can be a good indicator to measure financialization degree of the economy. This indicator is a criterion that shows obligations of the liquidity system such as obligations of commercial banks, central bank, and other financial intermediaries. King and Levine believed that liquidity to GDP ratio can be a reliable indicator of financial development.

2) Domestic credit to the private sector (DCS): Previous studies have shown that providing private credit is the most comprehensive indicator of financial intermediaries. In addition, instead of allocating credits to the public sector, credits are provided for the private sector, because unlike the private sector, when considering an investment plan, the public sector should meet different purposes and the main objective of public investment may not always be the acquisition of positive return rate. Therefore, this criterion better shows the role of financial intermediaries in directing funds to private investors as well as participation of the private sector. This criterion presents the values of loans offered by deposit-receiving banks and other financial institutions to the private sector.

• **Methodology and Model Explanation**

The model used in this research was autoregressive model with distributive lags (ARDL) to check the cointegration of the variables. Most of the recent studies have pointed out that, for checking cointegration, ARDL model is preferred to other conventional techniques such as Engle and Granger. The first reason is that the model is applicable regardless of whether the variables are I(0) or I(1). As another reason, this method has relatively more efficiency in small or limited samples than other methods. Therefore, in this study, this method was used. It is important to bear in mind that, in the case of I(2), ARDL method cannot be used. The general form of ARDL(p, q₁, q₂, ..., q_k) pattern can be expressed as follows:

$$\begin{aligned} \varphi(L, P)Y_t &= \sum_{i=1}^k \beta_i(L, q_i)X_{it} + \delta W_t + \mu_t \quad (9) \\ Q(L, P) &= 1 - \varphi_1 L - \varphi_2 L^2 - \dots - \varphi_p L^p \\ \beta(L, q_i) &= \beta_{i0} + \beta_{i1} L + \beta_{i2} L^2 + \dots + \beta_{iq_i} L^{q_i} \quad i = 1, 2, 3, \dots, k \end{aligned}$$

In the above equation, L is the first order time interval operator so that LY = Y_{t-1}, represents the dependent variable, X_{it} shows the vector of explanatory variables, q_i is the number of optimum lags for each of the explanatory variables, p is the optimal number of lags of the dependent variable, and W_t is the vector of definitive variables such as intercept, seasonal variations, time trend, or exogenous variables with constant lags. Eq. (9) is estimated using Microfit software. In the next step, using one of the criteria of Akaike, Schwarz' Bayesian, Hnan- Queen, or the adjusted coefficient of determination, the model's optimum lags was dealt with. Among the above criteria, Pesaran and Shin (1998) and Raza et al. (2015) suggested Schwarz' Bayesian criterion for determining the optimum lags of the model. Considering the small sample size, this criterion makes savings in the number of lags and, finally, a lower number of degrees of freedom is lost.

To determine long-term relationship, t-statistic can be compared with the critical quantities provided by Banerjee, Dolado, and Mestera (1992). The t-statistic is calculated to test the hypothesis for the existence of long-term relationship of $(H_0 : \sum_{i=1}^p \varphi_i - 1 \geq 0)$ as follows:

$$t = \sum_{i=1}^p \hat{\beta}_i - 1 / \sum_{i=1}^p S_{\hat{\beta}_i}$$

Where $S_{\hat{\beta}_i}$ the standard deviation of coefficients of the dependent variable is lags. If the value of t-statistic is greater than the critical value, the null hypothesis that there is no long term relationship is rejected and the existence of a long term relationship is confirmed.

In addition, Microfit software provides an error correction model (ECM) in accordance with the selected model. In order to extract the error correction model according to $ARDL(p, q_1, q_2, \dots, q_k)$, s variables are considered in terms of values with lags and first order difference and, then, ECM model of the following equation is obtained.

$$\Delta Y_t = -\varphi(L, P)ECM_{t-1} + \sum_{i=1}^K \beta_{i0} \Delta X_{it} + \delta \Delta W_t - \sum_{j=1}^{p-1} \varphi_j^* \Delta Y_{t-j} - \sum_{i=1}^k \sum_{j=1}^{q_i-1} \beta_{ij}^* \Delta X_{i,t-j} + U_t \quad (10)$$

The above equations are estimated using OLS method and the short term dynamics structure of the model is determined by conducting the necessary tests. In the error correction model, ECM_{t-1} indicates the speed of adjustment toward the long term balance. This coefficient shows how much of the dependent variable imbalance Y_t during the previous period is corrected in the current period.

4. Results

Before the test, the durability of the variables was examined to ensure that the type of their accumulation was not of the second order, i.e. I(2), in order to avoid the spurious results. To test the variables' durability, augmented Dicky-Fuller unit root test was used. Results of this test are presented in Table 1. The results which were obtained using Eviews7 software suggested that the two variables of accumulation of physical capital (K) and labor growth rate (N =) were durable in the form of intercept and trend, respectively. Also, other variables did not have the second or higher order of accumulation at the significance level of 5% and according to their critical levels. Thus, ARDL method can be used to estimate the pattern.

Table 1: Stationary of model's variables with ADF test

Statistic Value				Variables
First Rank Difference		In level		
with Interception and trend	without Interception and trend	with Interception and trend	without Interception and trend	
-3.69	-3.06	-2.46	-0.108	RGDP
-3.61	-2.25	-0.95	-1.05	INS
-4.32	-4.78	-4.45	0.72	K
-4.13	-2.6	-3.59	-1.55	N
-4.65	-4.62	-1.68	-0.53	FD
-3.58	-1.95	-3.58	-1.95	Statistic Critical

Source: Researcher calculations

Below, we will investigate the effects of institutional quality and financial development on economic growth. For this purpose, ARDL model was used to estimate Eqs. 7 and 8 in two distinct models. Schwarz' Bayesian criterion was used to determine the optimum lag. ARDL analysis approach was based on 3 equation interpretations of dynamic, long term, and error correction. The results of dynamic estimation (with lags) of the first model are summarized in Table 2.

Table 2: Determination of Optimal Lags (first model of Effects of Financial Development and Quality of Institutions on Economic Growth)

Autoregressive Distributed Lag Estimates			
ARDL (1,0,0,1,0) selected based on Schwarz Bayesian Criterion			
Dependent variable is RGDP			
29 observations used for estimation from 1364 to 1392			
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
RGDP(-1)	.71456	.051776	13.8 [.000]
FD	.064213	.078980	.81303 [.427]
INS	.19199	.065501	2.9311 [.009]
K	.18776	.15669	1.1983 [.247]
K(-1)	-.60421	.15643	-3.8624 [.001]
N	-.23461	1.2056	-.19460 [.848]
N(-1)	-1.4450	.84919	-1.7017 [.107]
C	3.3835	1.5938	2.1228 [.049]
F-Stat.	F(7,17)	R-Squared	.9795
	116.4865 [.000]		
Schwarz Bayesian Criterion	14.6060	Durbin's h-statistic	.40507 [.685]

Source: Researcher calculations

The estimation results suggested that improvement of institutional quality and financial development had a significantly positive effect on real GDP per capita so that each percent of improvement in the institutions and financial development could respectively lead to 12% and 0.06% increase in the real GDP per capita. After estimating the dynamic equation, to determine the long term relationship, t-statistic value was calculated as -5.51 using the above formula, which was more than the critical value provided by Banerjee, Dolado, and Mestera (-4.35% at 95%). So, the null hypothesis was rejected and the existence of long run relationship in this model was confirmed. After ensuring the existence of long term relationship, it is possible to interpret this relationship with respect to Table (3). These results that were slightly unexpected demonstrated the effect of financial development and quality of institutions on the long term economic growth.

Table (3): Results of Estimations of Long run Economic Growth (first model)

Regressor	Coefficient	S.E.	T-Ratio[Prob]
FD	-.89943	1.2233	-.73524 [.472]
INS	-2.6893	1.6536	-1.6263 [.122]
K	5.8332	4.1284	1.4129 [.176]
N	23.5269	18.6967	1.2583 [.225]
C	-47.3924	44.8797	-1.0560 [.306]

Source: Researcher calculations

Later, error correction model (ECM) was used to investigate how the short term imbalance in the growth of real GDP per capita is performed towards the long term balance. ECM coefficient shows that, in each period, what percentage of the short term imbalance is adjusted in order to achieve long term balance. The results of ECM estimation are presented in Table 4. Value of the coefficient was 0.071, i.e. in each period, almost 7% of imbalances in GDP growth was adjusted and got closer to its long-term trend.

Table (4): ECM's Results of Iran's Economic Growth (first model)

Regressor	Coefficient	S.E.	T-Ratio[Prob]
dFD	.064213	.078980	.81303[.426]
dINS	.19199	.065501	2.9311[.009]
dK	.18776	.15669	1.1983[.246]
dN	-.23461	1.2056	-.19460[.848]
ecm(-1)	.071392	.051776	1.3789[.184]
R-Squared	.75510	F-Stat. F(5,19) 10.4833[.000]	
DW-statistic	2.1565	Schwarz Bayesian Criterion 14.6060	
$ecm = RGDP + .11172*FD + 1.6999*INS - 4.6245*K - 10.8394*N + 24.2394*C$			
Error Correction Representation for the Selected ARDL Model ARDL(1,0,0,1,0) selected based on Schwarz Bayesian Criterion Dependent variable is dRGDP 29 observations used for estimation from 1364 to 1392			

Source: Researcher calculations

The results obtained from the dynamic estimation (with lag) of the second pattern are summarized in Table 5. In fact, in this pattern, the interaction of institutional quality as well as economic development and economic growth can be observed.

Table (5): Determination of optimal lags (interaction of financial Development and Institutional Quality -second model)

Regressor	Coefficient	S.E.	T-Ratio[Prob]
RGDPC(-1)	.1081	.052100	21.2690[.000]
FD	-.17379	.11097	-1.5661[.133]
K	-.094072	.12482	-.75366[.460]
K(-1)	-.53763	.12997	-4.1366[.001]
N	-1.9434	.37017	-5.2500[.000]
FDXINS	.20144	.068866	2.9251[.008]
C	4.4384	1.2903	3.4398[.003]
R-Squared	.96870	F-Stat. F(6,20) 103.1621[.000]	
DW-statistic	2.1308	Schwarz Bayesian Criterion 13.4040	

Source: Researcher calculations

The estimation results showed that the improvement of financial development had a significantly negative effect on real GDP per capita. But, when it was combined with institutional quality, the obtained coefficient (FDxINS) had a significantly positive effect on real GDP per capita.

After estimating the dynamic equation, to identify the long term relationship, t-statistic value was calculated as -17.12 using the above formula, which was more than the critical value provided by Banerjee, Dolado, and Mestera (4.35 at $p > 95$). So, the null hypothesis was rejected and the existence of long term relationship was confirmed in this pattern.

Table (6): Results of Estimation of Longrun Economic Growth (second model)

Regressor	Coefficient	S.E.	T-Ratio[Prob]
FD	1.6074	1.2048	1.3342[.197]
K	5.8427	2.8245	2.0686[.052]
N	17.9745	8.9644	2.0051[.059]
FDXINS	-1.8632	.81264	-2.2927[.033]
C	-41.0507	25.71	-1.5964[.126]

Source: Researcher calculations

After ensuring the existence of the long term relationship, this relation can be interpreted considering Table (6). These results showed the effect of quality of institutions and financial development indicators on economic growth in the long term. In fact, financial development index had a positive effect on real GDP per capita, but in the long term, when combined with the institutional quality, this effect was negative.

Below, error correction model (ECM) was used to investigate how the process of balancing the short term imbalance in the growth of real GDP per capita was performed. The results of ECM estimation are presented in Table 7. Value of this coefficient was %11; i.e. in every period, almost 11% of imbalances in GDP growth was adjusted and got closer to its long term trend.

Table (7): ECM's Results of Iran's Economic Growth (second model)

Regressor	Coefficient	S.E.	T-Ratio[Prob]
dFD	-.17379	.11097	-1.5661[.132]
dK	-.094072	.12482	-.75366[.459]
dN	-1.9434	.37017	-5.2500[.000]
dFDXINS	.20144	.068866	2.9251[.008]
ecm(-1)	.10812	.052100	2.0752[.050]
R-Squared	.73307	F-Stat. F(5,21) 10.9852[.000]	
DW-statistic	2.1308		

Source: Researcher calculations

5. Summary and Conclusion

Considering that most of the recent empirical studies on economic growth in the world acknowledge the effect of financial development and institutional quality, in this study, we empirically investigated this issue in Iran and found interesting results. The results were as follows: in the first pattern in which the effects of institutions quality and financial development on economic growth were separately tested, this effect was positive in the short term, but in the long term, negatively affected economic growth. In the second pattern, in which the effects of financial development and interaction of institutional quality on economic growth were examined, in the short term, financial development had a negative effect, but the achieved interaction of financial development and institutional quality was positive. However, in the long term, financial

development had a positive effect on economic growth; but, when combined with institutional quality, this effect became negative, which indicated the insufficient institutional grounds for economic growth through financial development. In Iran, these problems included improper financial provisions on selectively granting loans and credits to individuals as well as lack of timely repayment of loans.

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