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The Effects of Financial Development and Institutional Quality on Economic Growth with the Dynamic Panel Data Generalized Moment Method Method: Evidence from the Organization for Economical Cooperation and Development Countries

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ABSTRACT

Institutional quality and financial development (FD) have been considered as two main key of economic growth in recent literature. Regarding institutional quality, it is an essential and necessary condition to enhance FD, so in this context suitable policies are demanded. Our main aim is to survey the effects of FD and institutional quality on economic growth for the case of Economic Development and Cooperation Organization Countries in 2002-2014, using Generalized moment method of Dynamic Panel Data. Here also we have used the mean of opinion and response, political stability and lack of violence, administrative efficiency, quality of provisions and legality and corruption control as six institutional indicators as well as the ratio of available credits for private sector in banks to gross product as FD indicator. The results show that FD and institutional quality have a positive and significant effect on economic growth in selected countries. Furthermore, from interactive effect, we found that FD may cause economic growth in developed countries due to their opportune institutional structure.

Keywords: Institutional Quality, Financial Development, Economic Growth

JEL Classifications: E44, F4

1. INTRODUCTION

Today, it has been widely accepted that capital, i.e., both physical and human capitals, accumulation and technological changes cannot explain economic growth merely. Institutional quality and financial development (FD) are mentioned as more explanatory indicators and the main key for different rates.

A healthy and dynamic economy is just possible when both institutional and financial sectors grow and move commensurately. Also difference in essence and performance of juridical and political institutions could be mentioned is another factor to explain variety in development as depend on consistence degree, they would impact on production factor's accumulation and marginal efficiency and on national product consequently. In other words, these intuitions can act as economic development promoter by forming motivational structure and provide appropriate bed for

productive activities on the one hand, and as deterrent factor via deviation from production and increase transactional costs and risk of investment on the other hand. Moreover, many economists believe that FD would overtly affect macroeconomic performance in both developed and developing countries as in former group large proportion of explanatory efforts go to this sector as a main cause in case of crisis and for the later group they have been recognized as a major obstacle of slow growth records since large proportion of financial institutions are government-owned, inefficient banking system, resource shortages and dual-structure of financial sector, i.e., formal and informal (dominant one in majority of cases) sectors.

In this paper we seek for possible causes for economic growth especially by institutional quality and FD in members of Organization for Economical Cooperation and Development (OECD) club. In so doing, first we introduce institutional quality

and FD indicators and then peruse their effects on economic growth. Finally this paper is structured as follow: Theoretical framework for institutional quality, FD and economic growth are presented in section two, literature review in section three, model specification and methodology in sections four and five before conclusion and suggestions which are provided in section six.

2. THEORETICAL FRAMEWORK

2.1. FD and Economic Growth

It is believed that the one key for economic growth is development of financial system which includes a complex of factors, methods and intuitions that form financial markets and effective financial mediators as well as providing deep and broad access to capital and financial services (Durusu et al., 2016). Also it's effect on economic growth continue to be controversial as some economists believe that FD could provide appropriate background for economic growth by rise in saving and in investment consequently, however some other economists focus on its impact on growth imposed by optimum allocation of resources and capital efficiency (Hassan et al., 2011). Nevertheless, from Schumpeter (1932), Gurley and Show (1960), McKinnon (1973) and Shaw (1973) we see that banks' activities stimulate saving then with efficient allocation of resources can bring technological innovations. Therefore, some policies (especially those help financial liberalization) are unlikely to enhance FD and economic growth. These findings have remained as violation of relationship between these two variables.

Generally, there are two mainstream viewpoints in this context: The first lookout, based on Schumpeter (1911), focuses on importance of financial sector impact in FD process. Whereas in the second theory, based on Robinson (1952), financial system is relatively less important (Kenani, 2012). Patrick (1966) considered these two viewpoints as two paradigms. The first one is the supply leadership which argues that advanced financial markets would promote economic growth. This theory contains bank-base, market-based, financial service based and law and finance based theories as its sub-branches. Bank-based theory accentuates positive effects of commercial banks in FD as banks could help mobilization of resources and decrease the risk (Anwar and Cooray, 2012). Market-based theory highlights the advantages of well-performed financial markets in economic growth their high rates of performance increase profitability motivation and accelerate economic growth. In addition, well-performed markets enhance firm's management and risk variety (Levine, 2005). Financial Service Based theory, based on two bank-based and market-based by itself, stress the financial services which have provided by financial system as these services contribute the industrial development and economic growth by optimal allocation of risk and returns (Kose et al., 2010). Law and financial-based approach argues that financial system is vital factor for firms, industries and national economic (Anwar and Cooray, 2012). Reforming financial legislations may eventuate to better performance of markets and firms.

The second paradigm known as demand adherence which believes that creation of institutions and modern financial services are likely to be as a response to demand for these services from investors and savers in a real sector of economy (Patrick, 1966).

Hence, development of financial sector is a consequence of real economic growth.

Financial market development increases the investment and leads to economic growth in two ways: A. the level effect and b. the efficiency effect (Sadrosky, 2011). According to the level effect, advances in financial sector means more transparency in financial regulations such as auditing standards makes it reliable for investors and consequently flow the capital toward more productive investments (Durusu-Ciftci et al., 2016). And from the efficiency effect we have more variety in investment options so more profitable ones would be picked and finally more growth achieved in whole economy (Sadrosky, 2011). Although development of financial markets is a key factor for growth and development of each country as it is almost impossible to grow without efficient financial markets, it has suffered from lack of attention and inconsideration, e.g., sometime considered just as simple fluctuation of property prices (Ekpeno, 2015).

Generally speaking, financial system is efficient when it get its main duties such as diminish the cost of information, risk management, facilitate transactions, mobilize the savings, financing of innovation plans, decrease the risk and availability of credits for private sector, done (Vaez and Mirfenderesky, 2011). It is seen that countries with more developed financial markets have experienced higher growth rates. Also, financial institutions are important section in capital accumulation, FD and economic growth as a result. These institutions play their role via generate information and allocation of capital, firm supervision, diminish the risks, equip the savings and facilitate the transactions (Levine, 2003).

2.2. Institutional Quality and Economic Growth

At the end of 1980s, some economists such as Romer (1986) and Lucas (1988) discuss and enter idea, knowledge and human capital issues in growth models and introduced growth models known as endogenous growth models. As human capital entered into model, its explanatory power rose and justified variety in per capita income of different countries but was unable to overcome all problems. For example, according to Romer (1990) growth model argue that is more resources allocate to innovation would become more prosperous but it can't explain why, so let gradually turned into institutions (Acemoglu et al., 2005).

North (1990) argues that institutions are rules of play in a society. In other word, it is man-made restrictions which form human's interaction relations. These restrictions include informal religious barriers, custom and behaviors, traditions and behavioral instructions and formal ones such as constitution, rules and ownership rights and help to regulate political, economical and social transaction structures in a society (North, 1990).

Furthermore, institutions can create a framework for economical activities through the country by forming motivational structure and promote productive activities in the community (Siong and Muzafar, 2009). Hence, they could provide a better bed to investment, growth and economic development or conversely accrete further obstacles for activists and finally there would be

recession and depression in economy (Butkiewicz and Yanikkaya, 2006).

As an another analyze for institutions, by diminishing uncertainty, direct an economy toward more productive activities, enhance reliability and interactions may affect economic development (Yildirim and Gökalp, 2015). As an explanation for this affecting process, it is accepted that transaction costs are high, when ownership rights or administrative tools are not reliable. In that situation, private firms mainly act in a small scale and less capital-based technologies with short-term horizons. They may also participate in underground activities and rely on bribe and corruption in some cases. As expected, transfer costs will rise dramatically (Butkiewicz and Yanikkaya, 2006).

Therefore, efficient institutions are crucial for economic growth as they promote economical factors and affect technological, humanistic and physical investments as well as organizing the production. Although, other factors such as cultural and geographical factors may also impact, economic institutions are the most important one as they not only determine the country's whole capacity to grow but also show the way to how to allocate capitals in the future (Acemoglu et al., 2005).

Societies are successful when there are "good" economical institutions. Good economical institutions are a reason of success. There should be a guarantee for ownership rights within a society so as to all individuals be motivated to invest, innovate and participate in economic activities. It is also necessary to have equal opportunities in a society in the way that constituents could benefit fairly (Acemoglu et al., 2005). North (1990) discuss that the main obstacle for poor countries to be rich is institutional barrier within their economy structures and vice versa for the case of developed countries. From economic prospective, an important issue is that prosperity and development need physical and human capital accumulation and knowledge, continuous technological advances and create new production methods which just is accessible when there are stable, efficient and secure social, political and economical set of institutions (North, 1995).

3. LITERATURE REVIEW

Ekpeno (2016) study the effect of FD on economic growth using data from 21 south Sahara countries in 1960-2010. He found that unlike positive and statistically significant effect of institutional quality on economic growth, FD has not affected their economic growth. Also, he test for impact of interaction effect of both variables on economic growth and found that it was positive but insignificant which implies that it would not promote the relationship between these two factors.

Li and Li (2013) survey the relationship between law and economic growth to respond why official legislation and rules are not highly correlated with economic growth in China. They found that public opinion and Chinese method of governing might be effective. Nevertheless, as China economy grow, transaction costs raise if there would be over reliability on good legislation systems to make sure of sustainable economic development.

Lee et al. (2011) test the impact of market-based and bank-based financial systems on economic growth in Germany, France, United States, England, Japan and South Korea in period 1960-2002. The results show that capital market in Japan, South Korea and US have more important role in economic growth as well as banking system in Germany, France and South Korea.

Krever (2011) in studying the rule of law in developing countries, show that if the protection of private property rights is done, contracts are implemented correctly and the predictability they proceedings nots to be trusted by private sector. And because of the volatility and uncertainty in resources and environment, investment will be reduced and economic growth will fall as a result. Therefore the rule of law as a facilitator of the private sector and creating incentives for economic agents is crucial.

Hasan et al. (2009) investigate the impact of institutional development and financial depth on economic growth of Chinese provinces during 1986-2002. The results show that the development of financial markets, regulatory environment, awareness of property rights and political pluralism are associated with stronger economic growth.

Siong and Panicos (2006) study the importance of institutional issue and FD on economic growth using panel data of 72 countries in 1978-2000. The results show that as long as the financial system in the institutional framework be implemented healthy, FD and economic growth would be more effective.

4. MODEL SPECIFICATION AND DESCRIPTION OF VARIABLES

In order to test the effect of FD and institutions on economic growth, we have used the model developed by Mankiw et al. (1992), Knight et al. (1993) and Ghura and Hajimicheel (1996) which has also used in Siong and Panicos (2006) and Siong and Muzafar (2009).

$$\ln \text{RGDP}_{it} = A_0 + A_1 \ln \text{FD}_{it} + A_2 \ln \text{INS}_{it} + A_3 \ln \text{K}_{it} - A_4 (n+g+\delta)_{it} + \varepsilon_{it} \quad (1)$$

$$\ln \text{RGDP}_{it} = \beta_0 + \beta_1 \ln \text{INS}_{it} + \beta_2 \ln (\text{FD} \times \text{INS})_{it} + \beta_3 \ln \text{K}_{it} - \beta_4 (n+g+\delta)_{it} + \varepsilon_{it} \quad (2)$$

From equation 1 for survey the impact of FD and institutional quality on economic growth as well as equation 2 for test interaction effect of financial and institutional development on economic growth. Here the log of per capita gross domestic products has used to measure economic growth. Institutional quality index contains the range of confirmed criteria developed by Kaufmann et al. (2010) based on collected data from questionnaire filled by people and experts in different countries as follow:

1. Voice and accountability: This variable show participation level of people in elections, free speech as well as media and committee freedom.
2. Political stability: This measure the possibility of government's repress via illegal or violence tools.

3. Government effectiveness: Government effectiveness index show the quality of public and social services and its independency level of political of political pressures, codification quality and government's assurance towards these policies.
4. Regulatory quality: This variable show the government's ability to codification of policies and discipline witch allow private sector extension and development.
5. Rule of law: This index shows the functionary trustful to public rules and especially to execute of contracts, ownership rights, policies, courts and also crime and violence possibility.
6. Corruption: Corruption variable means the use of power or its situation to obtain personal benefits and or the possibility of illegal payments of officials.

The range for score of countries vary from -2.5 to 2.5 in which the higher score, the better position for that country. These indices are normalized between 0 and 10 and targeted institutional index has been created after collecting those indices and taking the mean from them. The advantage of this index is that covers almost 2012 countries and territories and obtained by hundreds of variables from 35 different statistical resources which implies its high rate of accuracy. Regarding two countries' institutional macro and micro aspects is other characteristic of this indicator. In this paper we use the mean of these six indicators as institutional index.

For quantifying the FD we have used the FD index approved by the World Bank. This indicator is the ratio private credit by deposit money banks and other financial institutions to GDP (PCIGDP).

Where K is physical capital store which perpetual inventory model has used to calculate it. From this perspective, physical capital store model is an accumulation of physical capital during the past times:

$$\dot{k}_{i,t} = I_{i,t} + (1 - \delta)k_{i,t-1} \quad (3)$$

Where $I_{i,t}$ is physical capital store of the country i at the time of t , $k_{i,t}$ is gross fixed capital of the country i at the time of t , δ is physical capital depreciation rate and $k_{i,t-1}$ is physical capital store of each country at the time of $t-1$. To calculate the initial physical capital Park (1995) method is used:

$$K_{i,0} = \frac{I_{i,0}(1 - \gamma_{i,0})}{\delta_{i,0} - \gamma_{i,0}} \quad (4)$$

In above equation, $I_{i,0}$ is the mean of investment's historical growth (Oduor, 2010) and depreciation rate is 5%.

Where γ is labour growth rate, technological growth rate or technical growth and depreciation rate. And stable during the time, according to Mankiw et al. (1992) considere to be 5%.

In this study, needed data and information have been gathered through library method. Statistical data for GDP per capita, the ratio private credit by deposit money banks and other financial institutions to GDP, gross fixed capital formation and the growth rate have extracted from the World Bank Index as well as indicators of institutional quality of WGI.

Above mentioned models have been analyzed for 27 OECD members (i.e., Australia, Austria, Belgium, Denmark, Finland, France, Germany, Island, Ireland, Italy, Japan, Netherland, Spain, Sweden, Luxembourg, Switzerland, Mexico and Turkey) in 2002-2014.

5. ECONOMETRIC METHOD

2SLS method have been used in the large proportion of conducted researches in economic growth literature in which finding fit tool variable to fix the problem of endogenous institutional indices is necessary. But this appropriate variable is almost impossible to find and also this method is unable to solve correlation between explanatory variables to reduce or eliminate the collinarity (Nadiri and Mohammadi, 2011). Generalized moment method (GMM) is suggested to resolve or reduce the problem of endogenous institutional factors.

An auto regressive model with distributed lags is shown in below:

$$y_{it} = \alpha y_{i,t-1} + \beta X_{it} + \mu_i + \varepsilon_{it} \quad (5)$$

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

$$t = 2, 3, \dots, T$$

y_{it} is dependent variable, X_{it} is explanatory variables vector, μ_i individual or fixed effects of countries, ε_{it} is the error term and finally i and t represent country and time respectively. If like the model 5, the dependent variable enters the equation with amounts of lagged terms, it will cause correlation between explanatory variables (regressors) and residuals terms there as a result using ordinary least square model will give biased and inconsistent results. μ_i is incompatibility source of estimators. So an appropriate method to remove fixed and individual effects of countries would be using the first-order differentiation. Since the mean of μ_i is equal to itself, as a result differencing and incompatibility source of OLS estimators will be eliminated from equation. After taking first order differentiation, from equation 5 we will have:

$$\Delta y_{it} = \alpha \Delta y_{i,t-1} + \beta \Delta X_{it} + \Delta \varepsilon_{it} \quad (6)$$

We should note that taking differentiation from initial equation provides undeniable correlation between dependent variable lag and transformed error term (Bond, 2002). Therefore it is necessary to use instrumental variables in the model to solve this problem. Hence, the moments for equation 6 are defined as follow:

$$E(y_{it-s} \Delta \varepsilon_{it}) = 0 \quad s \geq 2; t = 3, 4, \dots, T \quad (7)$$

$$E(X_{it-s} \Delta \varepsilon_{it}) = 0 \quad s \geq 2; t = 3, 4, \dots, T \quad (8)$$

To estimate the parameters, the instrumental variables are used as follow:

$$Z_i = \text{diag} (y_{i1}, y_{i2}, \dots, y_{i,t-2}, X_{i1}, X_{i2}, \dots, X_{i,t-2}) \quad (9)$$

Hence the generalized moments which shown as are defined as follow:

$$\widehat{\delta} = (B'zA_Nz'B)^{-1} B'zA_Nz'Y \quad (10)$$

After estimation of coefficients, it is necessary to examine the validity of instrumental variables through Sargan test. This statistic is asymptotically has χ^2 distribution with over specified degree of freedom. The null hypothesis is correlation between instrumental variables and residuals. And if we reject the null, so used instrumental validity will be confirmed (Arelano and Bond, 1991). Using GMM of panel data has advantages such as considering the individual anisotropy and removes the bias in cross-sectional regressions so consequently we have more accurate, more efficient and less collinear estimators due to use the lag of dependent variable in the GMM. The main advantage of dynamic GMM is that all uncorrelated variables with error term (such as lagged and differentiated variables) could potentially be a instrumental variable and eventually sole the problem of endogenous institutional variables (Green, 2008).

6. EMPIRICAL RESULTS

6.1. The Saregan Test

Based on the result from Saregan test we reject the null hypothesis. So the used instrumental variables are valid. In other words, the results of saregan test show that when we estimate equations 1 and 2, there is no relationship between error term and used tools so we can confirm its validity. The results for Saregan test are shown in Table 1.

6.2. Model Estimation Results

Tables 2 and 3 show the results of estimation of 1 and 2 models respectively which both used GMM.

Table 1: Results of Saregan test

Model 1	
J-statistic	P
26.78	0.178
29.86	0.15

Table 2: The results for model 1 using GMM

Variable	Coefficient	T statistic	P
Ln RGDP(-1)	0.35	13.6	0.00
Ln FD	0.08	6.14	0.00
Ln INS	0.27	11.6	0.00
Ln K	0.31	21.7	0.00
n+g+ δ	-2.11	-7.05	0.00
t	0.007	3.78	0.00

GMM: Generalized moment method

Table 3: The results for model 2 using GMM

Variable	Coefficient	T statistic	P
Ln RGDP(-1)	0.51	39.4	0.00
Ln (FD*INS)	0.01	5.16	0.00
Ln INS	0.12	11.07	0.00
Ln K	0.05	6.1	0.00
n+g+ δ	-0.44	-4.5	0.00
t	0.01	20.1	0.00

The estimated results in both models show that GDP per capita (with an one lag) has an positive effect on the economic growth of OECD countries and it is also statistically highly significant which implies that GDP per capita in the pervious period has a positive impact on its value in the current period. The coefficient of physical capital in both models is positive and statistically significant. The result suggest that a one percent increase in gross capital, leads to 0.31% increase (from model 1) in GDP per capita.

As its positive and statistically significant coefficient implies, the institutional quality is another important and effective factor on the economic growth of OECD members. It is justifiable mainly due to their high quality in bureaucracy, voice, accountability and the rule of law which totally show that there has been improvements in judiciary, executive and civil freedoms and finall reflected in their institutional quality.

The coefficient of FD index in model 1 show that the ration of private credit by deposit money banks and other financial institutions to GDP has the positive and significant effect on GDP of OECD countries as it indicates that there will be 0.08 increase in GDP if private credit by deposit money banks and other financial institutions rise by 1%. The positive coefficient also show that OECD members enjoy the necessity and benefits of favorable financial markets to meet the needs of the economy such as liberalization, privatization and balance and development. A part of these effects come from good financial markets, especially capital market, of these countries and the rest is due to favorable atmosphere on the economy, socio-economic and cultural-legal structures of these countries. therefore, we enter the interaction effect to measure the FD efficiency in the light of institutional quality on GDP per capita growth of OECD countries. The obtained coefficient for interaction effect is again positive and statistically significant. Since there is not similar results (i.e., positive and significant relationship between FD and economic growth of OECD countries) the results of most of pervious researches such as Ekpeno (2016) and Ben Naceur and Ghazouani (2007), we show that institutional quality is a necessary condition to promote FD and policymakers in countries of the organization for Economic Cooperation and Development have implemented the right policies to enhance governance.

7. CONCLUSION AND SUGGESTIONS

Many economists believe that the financial and institutional development play a key role in economic growth. So identify the factors affecting on FD efficiency in order to taking right policies to promote it is very important since it is possible to record higher rates of growth by highly promoted financial system. According to financial economists the institutional quality is one key factor in FD. The Law and Finance theory by Laporta et al. (1998) is worthwhile to refer to as distinct Britain and France law systems. This theory explain that the British legal system support private property rights and promote the private owners to interact with high level of certainty which eventually led to positive effect on development and economic growth. Conversely, there was a French law which stresses the public power and neglects the

individual rights. The powerful government has an ability and motivation to deviate the society's resource flow and thus hinder the development of the country's financial and economic progress.

So here in this paper we test for possible effects of FD and institutional quality on economic growth for the case of Economic Development and Cooperation Organization Countries in 2002-2014, using GMM method of dynamic panel data. In so doing we specified two different models: The separate effect of FD and institutional quality on economic growth surveyed in the model number one as well as the simultaneous and interacted effects of two above variables on economic growth in model number two. We used the mean of opinion and response, political stability and lack of violence, administrative efficiency, quality of provisions and legality and corruption control as six institutional indicators as well as the ratio of available credits for private sector in banks to gross product as FD indicator.

The results show that FD has a positive and statistically significant effect on economic growth of OECD countries which is consistent with the results from Rudra et al. (2014) Kenani (2012), James (2008) and Suleiman and Aamer (2007). Also the research estimations show that like FD, institutional quality has a positive and significant effect on the economic growth of selected countries which match the Ekpeno (2016) theory. After reviewing the importance of institutional quality on economic growth we can conclude that it has a considerable effect as democracy and the quality of monitoring (efficient state) in control of corruption, bribery etc., has become a prerequisite for sustainable economic development. i.e., The economic performance in both developed and developing financial policies in the implementation phase depend on nature and quality of political and institutional structure of countries. The results of the effects of FD and institution quality show that interaction variable has a positive and statistically significant effect on economic growth for the case of OECD members which is consistent with finding of Hassan et al. (2011) and Siong et al (2006).

Regarding the research findings, it is necessary for any country that wants make serious changes in its economic growth to execute its institutional reforms. Thus, it is essential to facilitate economic activities and obtain higher rates of economic growth, consider both economy and politics in form of the simultaneous view, and pay policy by default of these two factors reinforce each other and contribute to economic development. Finally in case of institutional reform, the move must be toward democracy and making political institutions from monitoring ones must get considered as well as serious try to adopt appropriate policies according to country's realities. The same is true for taking efficient legal system which is flexible and adaptable with short time conflicts and lawsuits have a favorable impact to get necessary loans available for firms and increase investments. So take appropriate legal regulations required by banks, financial institutions and capital market is suggested to promote private ownership, enforcement of financial contacts and increasing investment security are offered.

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