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Research Article

Impact of Entrepreneurship on Economic Growth in selected Developed and Developing Countries: Exploring the Role of Institutions

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Abstract:

This study explores a new stream of research shedding light on the influence of entrepreneurship on economic growth by exploring the role of formal (government effectiveness & political stability) and informal (control of corruption & freedom to trade internationally) institutions. Two Step System Generalized Method of Moments (SGMM) was used to analyze the unbalanced panel dataset of thirty-six developed and developing countries for the time period 2002-2017. The empirical results of the study revealed a conclusive effect of entrepreneurship on economic growth of the sample countries. Furthermore, informal institutions have a greater impact on entrepreneurship than formal institutions. Institutional variables like government effectiveness, control of corruption, freedom to trade internationally and political stability have robust, conclusive and significant effects on economic growth in all the countries. The study results confirmed that formal and informal institutions can further strengthen the relationship between entrepreneurship and economic growth. From the study results we concluded that development of entrepreneurial activities along with strong institutions are mandatory for faster economic growth and should be the primary focus of development policy.

Keywords: Economic growth; Entrepreneurship; Institutions; panel data analysis; Two Step System Generalized Method of Moments

1. Introduction

From a long time, progress in economic growth remained the focal point of economic policies, therefore a significant body of economic literature have discussed it. Different economic and non-economic variables like national saving, property rights, presence of seaports, education, climatic conditions etc. affect the progress of economic growth (Sala-i-Martin, 1997). In similar lines entrepreneurship may also influence economic growth positively, therefore for modern day economics, it has become more essential than ever. Entrepreneurs may propose significant inventions through the production processes and by introducing new goods in the market (Acs & Audretsch, 2003). By increasing competition, entrepreneurs may escalate

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productivity (Geroski & Statistics, 1989). They may elaborate our knowledge of what is feasible technically and what customers go for, by introducing varieties of extant goods and services. This consequential learning process rushes the discovery of the leading design for product-market combinations. Knowledge spillovers play a dynamic role in this process (Audretsch & Feldman, 1996; Audretsch & Keilbach, 2004). As Entrepreneurship deals with the process of creating or starting new businesses. (Onuoha, 2007) defined entrepreneurship as "the practice of starting new organizations or revitalizing mature organizations, particularly new businesses generally in response to identified opportunities." Entrepreneurs are business owners or persons, who create valuable businesses for the sake of earing business profits and also bear business losses. (Eroglu & Piçak, 2011) defined entrepreneur "a person who habitually creates and innovates to build something of recognized value around perceived opportunities" their income is firmly associated with their working effect, they may be willing to work more accurately for longer hours.

Institutions3 play a central role in the development of new businesses which in return contribute to economic growth. (Scott, 1995; Williamson, 2000), claimed that formal (laws, regulations and constitutions) and informal (norms, culture, ritual, and social practices) institutions contribute to economic growth and development by providing conducive environment to start up new businesses, by increasing competitions among entrepreneurs and by reducing transaction costs. According to (North, 1990) "efficient economic institutions reduce transaction costs by decreasing information costs and risks, e.g. by decreasing uncertainty about the quality of products in the market, reducing the risks of confiscation and increasing contract enforcement". Economic institutions significantly contribute to two potential drivers of entrepreneurship and economic growth i.e. physical and human capital accumulation (Fuentelsaz, González, & Maicas, 2019; Hall & Jones, 1999).

In Literature many studies are carried out to demonstrate the impact of entrepreneurship on economic growth. However, very less attention has been paid to study the impact of entrepreneurship on economic growth in the presence of formal and informal institutions. Studies (Acs & Virgill, 2010; Aparicio, Urbano, & Audretsch, 2016; Coulibaly, Erbao, & Mekongcho, 2018) have analyzed the institutional impact on entrepreneurship and the impact of entrepreneurship on growth separately. Whereas some other studies (Kasseeah, 2016) discerned entrepreneurial activities as an accelerator to economic growth ignoring the role of institutions. (Bosma, Sanders, & Stam, 2018) predicted the economic growth through entrepreneurial activities for 25 European countries only. Therefore, the questions that this research examine are: Is economic growth affected by entrepreneurship and do the institutional factors affect entrepreneurship, economic growth nexus? The present study analyzes the relationship among entrepreneurship, institutions and economic growth which is usually ignored in the cross-country analysis. In this study we have tried to expand the literature by increasing no. of countries and by including more variables and time periods. This study also bridges the methodological gap by introducing two step System Generalized Method of Movements (SGMM) to analyze economic growth and Entrepreneurship nexus in the presence of formal and informal institutions. By applying this estimation technique on the data set of thirty-six selected developing and developed countries4 for the period 2002-2017, this study analyzes the institutional aspect which favors entrepreneurship to achieve higher rates of economic growth. We used different proxies to measure entrepreneurship i.e. Opportunity Entrepreneurship, Total Early Stage Entrepreneurial Activity, Employers Total (% of total employment. Proxies like Control of Corruption, Government Effectiveness, Political Stability and Freedom to Trade internationally are used to represent formal and informal institutions. The rest of the study is arranged into four parts. Part one comprises literature review which describes various studies related to entrepreneurship, institutions, and growth. Part two explains theoretical framework and

empirical model of the study. Part three consists of results and discussion of study. Part four concludes the research findings, provides policy recommendations, and suggests the area for future research.

2. Literature review

Literature addressing institutional factors which enable entrepreneurship to achieve higher levels of economic sustainability is growing rapidly. The subsequent sections present theoretical and empirical literature of entrepreneurship, instructions, and growth nexus. The literature on Institutions and entrepreneurship is presented in section 2.1 followed by entrepreneurship and growth in the economy in section 2.2, institutions and economic growth in section 2.3, entrepreneurship, institutions and economic growth in section 2.4, and conclusions in section 2.5.

2.1. Institutions and Entrepreneurship

(Fuentelsaz et al., 2019) conducted research to study the Entrepreneurial Opportunity via the interaction among formal and informal institutions using unbalanced panel data of eighty-four countries over the time period of 2002 to 2015. They employed 2 Limit Tobit Method for empirical investigation". The findings of the research revealed that the countries with more assimilation have strong relation among formal institutions and opportunity entrepreneurship.

(Fuentelsaz et al., 2019) examined 70 countries for the years 2005-2015 to investigate that in what way the quality and quantity of the entrepreneurship of the developed and developing countries are getting influenced by the aspects of formal and informal institutions. Their findings revealed that the entrepreneurship's quality and quantity are affected by the institutional dimensions and has a significant role over the entrepreneurship's quality, with keeping into mind that not every institution act the same.

In similar lines (Yay, Yay, & Aksoy) conducted a study where the influence of institutions over entrepreneurship was examined by utilizing panel data for the time interval 2004 - 2012 for fifty-four countries. The results showed that there was a conclusive influence of" formal institutions over entrepreneurship. (Weitzman) examined the results of 3 informal institutions, mode of expression, work orientation and social power on early-stage globalization entrepreneurial enterprises using a data set of 39 countries over a time period 2001-2008 by multilevel modeling technique of 20,656 individual level response acquired from Global Entrepreneurship Monitor survey. The outcome showed that high self-expression, high efficient adaptation, and Poor social attractiveness of entrepreneurship in communities boosts the scope of early-stage entrepreneurial enterprise globalization. (Yay et al.) examined the connection among entrepreneurship and efficiency of the government for 36 countries. The outcomes revealed that the recognized efficiency of government at national level was substantially negatively linked to entrepreneurship.

2.2. Entrepreneurship and Economic growth

(Wong, Ho, & Autio) examined in what way the institutional framework on country level moderates the connection among awareness of new business opportunities, fear of failure and entrepreneurial self-efficacy by employing a dataset of forty-five countries for a time span 2002-2012. The findings showed that opportunity entrepreneurship was encouraged by awareness of new business opportunities and entrepreneurial self-efficacy whereas it was deterred by fear of failure. Similarly, (Yay et al.) analyzed the development of regional businesses policies and structures of the governance within the United Kingdom. They found that the local enterprises variations appear because of dimensional and places mode of the underlying determinants, market's characteristics, kind of novelty systems, places cultures and norms, communities, and institutions that they established.

(Wong et al.) investigated the interaction among innovation and economic development, considering entrepreneurial behavior, using data of 10 developed countries over a time period 2001-2009. Many hypotheses were tested considering 3 equations, and the techniques of both generalized least square (GLS)

and panel least square techniques were employed. The results revealed that innovation have an important role in the cycle" of development of the economy and the entrepreneurs are medium for developing new ideas to boost the operation of businesses and to achieve higher profits. (Wong et al.) used a panel of United States metropolitan areas over a time-period of 1993 to 2002. They found that an increase in the provision of venture capital" significantly affects the establishment of new enterprises, employment and contribute to economic growth. In similar lines, (Gnyawali & Fogel) conferred an evolution to the growth model built by (Valliere & Peterson), (North) through the replication of variations economic" impacts "of opportunity entrepreneurship and necessity entrepreneurship in developing and developed countries. Results revealed that there are considerable variances in factors that support the economic advancement among developing and developed countries.

2.3. Institutions and Economic growth

There is a bulk of "literature analyzing the relationship among economic growth and quality of the institutions. "(Williamson) showed that institutions quality had an important impact on economic growth in long run than in short run. (Sala-i-Martin) endorsed the role of regulatory institutional capacity in economic growth. (Yay et al.) found that institutional factors have a strong relationship with total factor of productivity. Their results revealed that growth in productivity is much greater in countries where institutions are well-established and well- functioning.

"For causal effect between economic performance and institutions, studies like (Muralidharan & Pathak, 2017) suggested that an institution with better performance leads to an increase in income.

2.4. "Institutions, Entrepreneurship and Growth Nexus

In literature many studies were conducted to investigate Institutions, Entrepreneurship and Growth Nexus separately. However, (Williamson) examined this nexus simultaneously for 25 European countries by using annual data for the time period of 2002-2014. Data were obtained from Global Entrepreneurship Monitor (GEM), World Development Indicators (WDI), Economic Freedom of the World (EFW) and World Governance Indicators (WGI). The study found significant positive impact of institutions on entrepreneurship which in return accelerate economic growth. In similar lines (Dreher & Gassebner) also found a significant positive correlation among institutions and economic growth via entrepreneurship. (Roodman) through their research claimed that formal institutions (constitutions, laws and regulations) and informal institutions (social practices, social norms and habits) are mandatory for successful economic development of a nation.

(Samila & Sorenson) explored different institutional factors which motivate Opportunity Entrepreneurship (OPPT) to achieve higher rates of economic growth by using data of forty-three countries and applying three stage least square method for the time period 2004-2012. They found that informal institutions have high influence on OPPT than formal institutions. They used different institutional variables like Control of corruption, confidence in one's skill and "private coverage to obtain credit. All the variables have conclusive effect on OPPT and economic growth for the sample countries.

(Valliere & Peterson) investigated the effect of political and economic institutions on formal and informal entrepreneurship using data of eighteen Asian countries for the time period of 2001-2010. They employed ordinary least square technique. The study results revealed that an increase in the quality of political and economic institutions increases the growth rates of formal entrepreneurship and decreases the growth rates of informal entrepreneurship.

Using panel data for forty-four countries of the world, (Wong et al.) explored the role of institutions by analyzing three different kinds of entrepreneurship i.e. self-employment, start a new firm and the early stage

entrepreneurial activities. The study results revealed that institutional factors affect entrepreneurship through the provision of property rights, by controlling corruption and by providing new procedures for business.

(Samila & Sorenson) analyzed the impact of corruption, weak rights of property and activities of government on entrepreneurial activities and employment generation at national level. They used data of forty-two countries taken from Global Entrepreneurship Monitor for the time period 2001 -2006 and applied multilevel estimation framework for analysis. Results of the study revealed that positive government activities and property rights have a significant positive impact on entrepreneurial activities and employment generation while corruption has a significant negative impact on employment generation and entrepreneurship.

2.5. Summary of literature

"From the literature, we concluded that institutions are the major drivers of productive entrepreneurship which in return promote economic growth. In literature many studies dealings with cross country level analysis, have explored the role of institutions on entrepreneurship and economic growth. This study is novel in the sense that it has introduced different proxies of entrepreneurship like Total Early-Stage Entrepreneurial activity (TEA), Opportunity Entrepreneurship (OPPT), and Employers, total (% of total employment) (ETP) to analyze their impact on economic growth. Secondly the study classified institutions in to formal and informal to determine the exact role of each on entrepreneurship and economic growth by using data set of thirty-six developed and developing nations of the world for the time period 2002-17 using two step System Generalized Method of Moments (SGMM).

3. Theoretical Framework

Different approaches have been used in the literature to model economic growth. One of them is growth theory by (Romer, 1986) which emphasizes that capital formation, transformation, human capital and knowledge affect economic growth in a country. With the passage of time different scholars introduce new concepts and in (Weitzman, 1996) focused on the significance of institutions and new technology in the process of growth. In this regard, the main contribution for institutions is by (North, 1990) . He has analyzed the usefulness of institutions for the economy. The society needs proper working of institutions for the progress of economy. From this ideology, advanced debate starts to realize the usefulness of institutions in the process of growth. (Rodrik, 2003) recommended that the aggregated output is not only linked with institutions, but they actually depend on endogenous factors. Inputs like knowledge, physical capital, labor and human capital".

According to (North, 1990) formal and informal institutions present the adverse circumstances related to growth. Following through, (Acemoglu, Gallego, & Robinson, 2014; Baumol, 1993; Rodrik, 2003) have analyzed that given institutions could influence economic growth in different ways instead of direct effect. On the basis of Schumpeter's suggestions, (Leibenstein, 1968) has analyzed that entrepreneurship has an significant effect on the cycle of business and growth. (Baumol, 1993) have discussed how entrepreneurship is necessary for the betterment of economic growth. At the same time, the institutions with proper working improve entrepreneurial activities which promote growth. On the basis of theory of institutions, scholars showed that institutions are forerunner of business activities (Bruton, Ahlstrom, & Li, 2010). (Gnyawali & Fogel, 1994) suggested that for the development of entrepreneurship proper circumstances are needed in which entrepreneurs can easily perform business activities. According to this, policies of government, skills related to business, factors of economy, assistance related to "financial and non-financial, etc. influence every stage of entrepreneurial process.

3.1. Model Specification

We can use production function to model the relationship among entrepreneurship and economic growth by exploring the role of different institutions. "In the linear production function, we express relevant variables viz. Growth as a function of entrepreneurship, institutions and determinants of growth. The general form of the function is given as under:

$$GROWTH_{it} = f(ENT_{it}, INST_{it}, CI_{it}) \quad (1)$$

Where Eq. (1) presents the growth as a function of the independent variables i.e entrepreneurship, role of institutions and control variables (CI) which are inflation, population growth, national savings, human capital, trade openness and gross capital formation. The linear function explains how entrepreneurship affects the growth of a country and how different institutions affect the entrepreneurial activities. Control variables are added to check the external effects, besides the direct impact of entrepreneurship and institutional variables.

To estimate the relationships among dependent and independent variables dynamic panel model is used. Empirical specification of the model is given as under:

$$LNGDP_{it} = \alpha_o + \alpha_1 ENT_{it} + \alpha_2 INST_{it} + \sum \alpha_3 X_{it} + u_i + \theta_t + \varepsilon_{it} \quad (2)$$

Here (i) represents country effect and (t) represents time period. Moreover, LNGDP (economic growth) is a dependent variable. ENT is entrepreneurship, INST denote institutions. X_{it} is the vector of control variables e.g. inflation, trade openness, gross capital formation, human capital, population growth. In addition, (μi) represents the panel level effects and (εit) represents the error term.

The empirical specification of the model with the interaction term of entrepreneurship and institutions is given in equation (3) as under:

$$LNGDP_{it} = \alpha_o + \alpha_1 ENT_{it} + \alpha_2 INST_{it} + \alpha_3 ENT * INST_{it} + \sum \alpha_4 X_{it} + u_i + \theta_t + \varepsilon_{it} \quad (3)$$

Where ENT*INST is the interaction term of entrepreneurship and institutions.

3.2. Description of Variables and Data Sources

For empirical investigation of the proposed model given in equation (3) the study employed Annual data of 36 developed and developing countries for the time period 2002-2017. Data were obtained from different sources i.e. World Development Indicators (WDI), World Governance Indicators (WGI), Global Entrepreneurship Monitor (GEM), Penn World Table (PWT) and Economic Freedom of the World (EFW). Table 1 given below provides detailed descriptions of variables, assigned symbols and data sources.

Table 1. Summary and Data Sources of Variables.

S.NO	Variables	Explanation	Symbols	Data Sources
Dependent Variables				
1	GDP	GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products.	GDP (GDP per capita)	WDI
Independent Variables				
2	Opportunity Entrepreneurship	Opportunity entrepreneurship is the percentage of adults aged 18-64 setting up a new business or owning–managing a young firm (up to 3.5 years old),	OPPT	GEM

		including self-employment who are motivated to pursue perceived business opportunities.		
3	Total Early-Stage Entrepreneurial activity	Total early-stage entrepreneurial activity is the key regional measure employed by global entrepreneurship monitor involved in setting up of business and those owning and running new business less than 3.5 years old.	TEA	GEM
4	Employers, total (% of total employment)	Employers are those workers who, working on their own account or with one or a few partners, hold the type of jobs defined as a "self-employment jobs" i.e. jobs where the remuneration is directly dependent upon the profits derived from the goods and services produced and, in this capacity, have engaged, on a continuous basis, one or more persons to work for them as employee.	ETP	WDI
Institutional Variables				
5	Government Effectiveness	Quality of public services, the quality of the civil service and the degree of its independence from Political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies	GEF	WGI
6	Control of corruption	Extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as capture of the state by elites and private interests.	COC	WGI
7	Political Stability	Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism.	PS	WGI
8	Freedom to trade internationally	Freedom to trade internationally is a complex indicator of absence of tariff and non-tariff barriers that affects exports and imports of goods and services. Trade barriers affect the entrepreneurial activities which	FTI	EFW

		definitely influence the growth of a country.		
Control Variables				
9	Inflation	Inflation is measured as a percentage change in Consumer Price Index (CPI). It captures the outcome of macroeconomic policies.	INF	WDI
10	Gross capital formation	Investment consists of outlays on additions to the fixed assets of the economy plus and the net changes in the level of inventories.	GCF	WDI
11	Population	Population growth has a negative relationship with the growth of the economy. As population increases in an inappropriate manner it will effects the growth of the country.	POP	WDI
12	National Savings	Gross domestic savings are measured as gross domestic product less final consumption expenditure.	NS	WDI
13	Trade openness	Trade openness is generally shown to be positively linked with economic growth. Trade has been one of the most important determinants of economic growth.	TRA	WDI
14	Human Capital	The knowledge, skills and experience hold by an individual or whole population, in terms of their value or cost to an organization or country.	HC	PWT

3.3. Estimation Method

We estimated our model by applying two step System Generalized Method of Moments (SGMM). Generalized Method of Moments (GMM) is an instrumental variable technique, which is used to deal with internal problems. GMM method gives reasonable and logical results even in the presence of heterogeneity and endogeneity. A good instrumental variable (z) always satisfies these two properties:

a) No interrelationship with error term

Covariance $(X, \mu) = 0$

b) Strong interrelationship with explanatory variable

Covariance $(Z, X) \neq 0$

The model has widely been used in the econometric analysis of cross sectional and time series data (Anderson & Hsiao, 1981) . Estimation of two equations in system GMM decreases imprecision and potential bias linked with a simple first difference GMM estimator (Arellano & Bover, 1995; Blundell & Bond, 1998). Two specification tests i.e. Hansen and Sargan tests are used in SGMM (Arellano & Bover, 1995; Blundell & Bond, 1998). To measure the impact of entrepreneurship on economic growth by exploring the

role of institutions, Generalized Method of Moments (GMM) technique is considered as an efficient analytical method, since it allows combining different cross sections and time periods, and provides more reliable and robust inference. However, the following form of GMM system estimator:

$$\hat{\theta}_{GMM} = \begin{pmatrix} \hat{a}_{GMM} \\ \hat{\beta}_{GMM} \end{pmatrix} = \left[\left(y^*_{-1}; x^* \right) z^* V_N^{-1} z^* \begin{pmatrix} y^*_{-1} \\ x^* \end{pmatrix} \right]^{-1} \left[\left(y^*_{-1}; x^* \right) z^* V_N^{-1} z \, y^* \right] \tag{1}$$

The above equation (1) is a system containing of a regression covering information on levels and differences in terms of conditions of moments:

$$E\left[X_{i,t=s} \left(V_{it} - V_{i,t=1} \right) \right] = 0, \mathrm{S} \geq 2; \ \mathrm{t} = 3 \ldots \ldots \mathrm{T} \tag{2}$$

Which will be applied to the first part of the system. The regressions in differences, which are written below, are applied to the second part i.e., the regression in levels:

$$E\left[X_{i,t=s} - X_{i,t-s-1} \left(V_{it} - V_{i,t=1} \right) \right] = 0 \ \mathrm{S} = 1; \ \mathrm{T} = 3, \ldots \ldots \ldots, \mathrm{T} \tag{3}$$

The lags of the variables in levels are used as instruments in the regression in differences. Only the most recent differences are used as instruments in the regression in levels. The model generates consistent and efficient estimates of the coefficients. In this case,

$$Y_i^* = aY_{i-1}^* + \beta \mathrm{X}_i^* + V_i^* \tag{4}$$

And the error component V_i^* is given by

$$Y_i^* = \begin{bmatrix} \Delta V_i \\ u_i \end{bmatrix} \rightarrow \begin{cases} \Delta V_1 = \left[\Delta V_{i3,} \, \Delta V_{i4,} \ldots \ldots \Delta V_{iT} \right] \\ \Delta u_1 = \left[\Delta u_{i2,} \, \Delta u_{i3,} \ldots \ldots \Delta u_{iT} \right] \end{cases} \tag{5}$$

The array of instruments for differences in the model includes information on the explanatory variables and the lagged dependent variable in the following way:

$$\begin{matrix} Y_{i0} & X_i^2 & 0 & 0 & 0 & \ldots & 0 & 0 & 0 & \ldots & 0 & 0 \\ 0 & 0 & Y_{i0} & Y_{i1} & X_i^3 & \ldots & 0 & 0 & 0 & \ldots & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \ldots & 0 & 0 & 0 & \cdots & 0 & 0 \\ \ldots & \ldots & \ldots & \ldots & \ldots & \ldots & \ldots & \ldots & \ldots & \ldots & \ldots & \ldots \\ 0 & 0 & 0 & 0 & 0 & \ldots & Y_{i0} & Y_{i1} & Y_{i2} & \cdots & Y_{T-2} & X_i^T \end{matrix} \tag{6}$$

While the matrix of instruments for the equation in levels only considers the explanatory variables without the lagged dependent variable,

$$\begin{matrix} X_i^2 & 0 & 0 & \ldots & 0 \\ 0 & X_i^3 & 0 & \ldots & 0 \\ 0 & 0 & X_i^4 & \cdots & 0 \\ \ldots & \ldots & \ldots & \ldots & \ldots \\ 0 & 0 & 0 & \cdots & X_i^T \end{matrix} \tag{7}$$

The matrix of instruments takes the following form:

$$Z = \begin{matrix} Z_1 \\ Z_2 \\ Z_3 \\ \vdots \\ Z_N \end{matrix} \quad (8)$$

Finally, the VN matrix is the covariance matrix of valid time constraints for the optimal case:

$$V_N = [Z'\,\Delta V \Delta V'\,Z] \quad (9)$$

Additional tests to ensure the proper functioning of MGM are the first and second orders Sargan tests of over-identification that considers the statistic:

$$S = \hat{V}'\,Z\left[\sum_{i=1}^{N} Z_i'\,\hat{V}\hat{V}'\,Z_i\right]^{-1} Z'\hat{V} \sim x^2(P-K-1) \quad (10)$$

These tests have a χ2m Distribution where v is the vector of residuals, Z the number of conditions imposed, k the number of parameters included in the vector β, and p is the number of columns of the matrix Z. Sargan's tests examine the overall validity of the instruments analyzed.

4. Results and Discussion

4.1. Descriptive Statistics

Descriptive statistics like mean, standard deviation, minimum and maximum values are presented in table 2, while correlations matrix is presented in table 3.

Table 2. Descriptive Statistics.

Variables	N	Mean	Standard Deviation	Min.	Max.
LNGDP	592	9.776	1.178	6.163	11.43
GCF	589	23.41	5.693	9.819	47.69
INF	592	3.304	3.939	-9.173	39.27
TRA	589	86.34	64.04	20.69	441.6
POP	592	0.794	0.691	-1.853	5.321
NS	558	9.255	8.553	-14.70	47.45
HC	481	2.925	0.522	1.521	3.734
GEF	592	0.909	0.888	-1.054	2.437
COC	592	0.831	1.047	-1.087	2.470
PS	592	0.300	0.894	-2.810	1.755
FTI	555	7.736	0.866	2.584	9.494
ETP	592	4.403	1.505	0.830	12.31
TEA	564	11.57	10.78	0.640	129.4
OPPT	563	41.99	21.20	0	173.9

Source: Authors calculations.

Table 3. Matrix of correlations.

Variables	LNGDP	GCF	INF	TRA	POP	NS	HC	GEF	COC	PS	FTI	ETP	TEA	OPPT
LNGDP	1.000													
GCF	-0.115	1.000												
INF	-0.410	-0.018	1.000											
TRA	0.186	0.092	-0.103	1.000										
POP	-0.170	0.127	0.140	0.234	1.000									
NS	-0.159	0.584	0.000	0.434	0.398	1.000								
HC	0.397	-0.149	-0.354	0.017	-0.27	-0.153	1.000							
GEF	0.540	-0.073	-0.372	0.289	-0.09	0.047	0.787	1.000						
COC	0.580	-0.134	-0.356	0.227	-0.09	-0.004	0.746	0.939	1.000					
PS	0.579	-0.027	-0.334	0.290	-0.25	-0.042	0.688	0.794	0.811	1.000				
FTI	0.433	0.507	-0.229	-0.292	0.422	-0.056	-0.026	0.456	0.628	0.674	1.000			
ETP	0.079	-0.081	-0.073	0.051	0.045	-0.294	-0.150	-0.138	-0.108	0.012	0.480	1.000		
TEA	-0.481	0.106	0.263	-0.117	0.254	0.234	-0.359	-0.520	-0.468	-0.538	0.161	-0.053	1.000	
OPPT	-0.241	0.010	0.243	-0.190	0.306	0.147	-0.147	-0.151	-0.063	-0.234	-0.526	-0.061	0.504	1.000

Source: Authors calculations.

4.2. Impact of Entrepreneurship on Economic Growth: Exploring the Role of Institutions

GMM method provides reasonable as well as logical results even in the presence of heterogeneity and endogeneity. (Blundell & Bond, 1998) introduced dynamic panel system GMM estimations which is used to estimate the System GMM model. Stata xtabond2 command was introduced by (Roodman, 2009) to analyze System GMM model. We started our estimations by OLS then we applied fixed and random effect models. Since the results of these models are not reliable therefore, we applied system GMM. The results of two 2 step system GMM improves the estimated baseline model which used instrumental variables to detect the endogeneity problem and give us valuable and reliable results as compared to fixed and random effect so relying on two step system GMM to report the findings one by one for all the proxies of Entrepreneurship.

While to measure the impacts of entrepreneurship on growth by investigating the role of institutions, we used different panel models along with system GMM. To ensure greater reliability of results, we started our estimation with fixed effect and random effect models. After that we applied system GMM technique. To check whether fixed or random effect model is suitable, we used Hausman and Breusch & Pagan LM tests. The results of these tests proposed that fixed effect model is suitable for analysis. In similar lines,

Sargan over identifying restrictions test and test for autocorrelation have also been used to examine system GMM estimates consistency. The results of these tests showed that the estimates of system GMM were consistent.

Table 4. Entrepreneurship, Institutions & Economic Growth (Results of Two Step SGMM)

	(1)	(2)	(3)	(4)	(5)
VARIABLES	**Baseline**	**GEF**	**COC**	**PS**	**FTI**
L.LNGDP	0.991***	0.985***	0.978***	0.980***	0.984***
	(0.00140)	(0.00193)	(0.00249)	(0.00255)	(0.00125)
INF	-0.00208***	-0.00238***	-0.00287***	-0.00220*	-0.00158*
	(0.000727)	(0.00112)	(0.00101)	(0.00111)	(0.000864)
GCF	0.000567***	0.000602***	0.00110***	-0.000170	0.00132***
	(0.000195)	(0.000239)	(0.000218)	(0.000364)	(0.000279)
POP	-0.0109***	-0.0144***	-0.0157***	-0.00590***	-0.0124***
	(0.00135)	(0.00169)	(0.00151)	(0.00191)	(0.00131)
NS	0.00176***	0.00144***	0.00133***	0.00180***	0.00168***
	(0.000126)	(0.000220)	(0.000189)	(0.000231)	(0.000190)
TRA	0.00137***	0.00136***	0.00127***	0.00115***	0.00106***
	(8.46e-05)	(8.88e-05)	(0.000113)	(8.82e-05)	(7.88e-05)
L.TRA	-0.00141***	-0.00147***	-0.00136***	-0.00134***	-0.00125***
	(8.40e-05)	(9.52e-05)	(0.000109)	(7.64e-05)	(8.35e-05)
HC	0.0900	-0.00433	-0.0177	-0.167	0.306**
	(0.122)	(0.0904)	(0.104)	(0.151)	(0.117)
L.HC	-0.0495	0.164	0.236	0.503*	-0.359
	(0.236)	(0.179)	(0.215)	(0.273)	(0.217)
L2.HC	-0.0423	-0.207*	-0.271**	-0.380***	0.0321
	(0.119)	(0.103)	(0.117)	(0.137)	(0.108)
OPPT	0.000489***	0.000352***	0.000185**	0.000394***	0.000395***
	(0.000845)	(0.000117)	(9.02e-05)	(0.000128)	(0.000102)
Institutions		0.0324***	0.0383***	0.0466***	0.0365***
		(0.00551)	(0.00417)	(0.00764)	(0.00399)
Constant	0.0761***	0.259***	0.335***	0.324***	-0.0864***
	(0.0234)	(0.0415)	(0.0387)	(0.0477)	(0.0266)

Observations	388	388	388	388	388
Countries	36	36	36	36	36
AR(1)	-2.98	-3.03	-3.25	-3.30	-3.18
	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)
AR(2)	-2.50	-2.49	-2.72	-2.86	-2.49
	(0.012)	(0.013)	(0.007)	(0.004)	(0.013)
Hansen	31.50	31.35	30.26	25.53	31.04
	(0.391)	(0.349)	(0.401)	(0.651)	(0.364)

Note: P values are presented in parentheses. p<0.1 *, p<0.05 **, p<0.01***. Dependent variable: GDP per capita growth in logarithm. OPPT is the proxy of entrepreneurship. GCF, POP, NS, TRA and HC are control variables. GEF, COC, PS, FTI, are institutions and regressed one by one from second column. Hansen test is used to check over identifying restrictions on instruments. AR (1) and AR (2) are tests to check the presence of auto correlation in the residual terms.

Table 5. Entrepreneurship, Institutions & Economic Growth (Results of Two Step SGMM)

	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Variables	**Baseline**	**GEF**	**COC**	**PS**	**FTI**
L.LNGDP	0.991***	0.986***	0.978***	0.985***	0.985***
	(0.00151)	(0.00164)	(0.00189)	(0.00213)	(0.00171)
INF	-0.00200***	-0.00251***	-0.00390***	-0.000352	-0.00187*
	(0.000690)	(0.000906)	(0.00115)	(0.000749)	(0.000949)
GCF	0.000474***	0.000454**	0.000828***	-0.000441	0.00127***
	(0.000161)	(0.000200)	(0.000279)	(0.000421)	(0.000238)
POP	-0.00646***	-0.00938***	-0.0133***	-0.00437**	-0.00952***
	(0.00140)	(0.00185)	(0.00203)	(0.00197)	(0.00184)
NS	0.00170***	0.00140***	0.00160***	0.00203***	0.00171***
	(0.000160)	(0.000211)	(0.000204)	(0.000213)	(0.000141)
TRA	0.00146***	0.00145***	0.00130***	0.00114***	0.00114***
	(6.72e-05)	(9.67e-05)	(9.11e-05)	(7.21e-05)	(0.000105)
L.TRA	-0.00151***	-0.00157***	-0.00141***	-0.00134***	-0.00135***
	(7.04e-05)	(0.000104)	(8.64e-05)	(5.90e-05)	(0.000110)
HC	0.0547	0.00654	-0.0341	-0.0944	0.221**
	(0.103)	(0.0835)	(0.114)	(0.0843)	(0.0882)
L.HC	-0.0684	0.0289	0.194	0.255	-0.223
	(0.214)	(0.186)	(0.261)	(0.234)	(0.168)
L2.HC	0.0154	-0.0721	-0.219	-0.201	-0.0179
	(0.114)	(0.105)	(0.157)	(0.175)	(0.0979)
TEA	0.000837***	0.000821***	7.62e-05	0.00140***	0.000601**
	(0.000179)	(0.000173)	(9.59e-05)	(0.000296)	(0.000232)
Institutions		0.0286***	0.0382***	0.0467***	0.0370***
		(0.00330)	(0.00247)	(0.00981)	(0.00434)
Constant	0.0762***	0.231***	0.362***	0.266***	-0.0915**
	(0.0242)	(0.0267)	(0.0253)	(0.0435)	(0.0364)

Observations	389	389	389	389	389
Countries	36	36	36	36	36
AR(1)	-2.69	-2.81	-3.34	-3.05	-3.13
	(0.007)	(0.005)	(0.001)	(0.002)	(0.002)
AR(2)	-2.84	-2.71	-2.74	-3.27	-2.79
	(0.005)	(0.007)	(0.006)	(0.001)	(0.005)
Hansen	31.60	31.69	31.22	27.47	32.65
	(0.387)	(0.334)	(0.355)	(0.547)	(0.292)

Note: P values are presented in parentheses. p<0.1 *, p<0.05 **, p<0.01***. Dependent variable: GDP per capita growth in logarithm. OPPT is the proxy of entrepreneurship. GCF, POP, NS, TRA and HC are control variables. GEF, COC, PS, FTI, are institutions and regressed one by one from second column. Hansen test is used to check over identifying restrictions on instruments. AR (1) and AR (2) are tests to check the presence of auto correlation in the residual terms.

Table 6. Entrepreneurship, Institutions & Economic Growth (Results of Two Step SGMM)

	(1)	**(2)**	**(3)**	**(4)**	**(5)**
VARIABLES	**Baseline**	**GEF**	**COC**	**PS**	**FTI**
L.LNGDP	0.989***	0.984***	0.978***	0.983***	0.984***
	(0.00111)	(0.00141)	(0.00110)	(0.00115)	(0.00188)
INF	-0.00134**	-0.00148**	-0.00187***	-0.000484	-0.000681
	(0.000656)	(0.000722)	(0.000648)	(0.000566)	(0.000684)
GCF	-0.000463	-0.000179	0.000496**	-0.000745**	0.000385
	(0.000276)	(0.000264)	(0.000212)	(0.000338)	(0.000346)
POP	-0.0114***	-0.0136***	-0.0138***	-0.00408*	-0.0105***
	(0.00164)	(0.00160)	(0.00135)	(0.00231)	(0.00156)
NS	0.00305***	0.00264***	0.00211***	0.00300***	0.00270***
	(0.000255)	(0.000328)	(0.000202)	(0.000228)	(0.000161)
TRA	0.00123***	0.00131***	0.00126***	0.00114***	0.00105***
	(7.73e-05)	(8.31e-05)	(9.93e-05)	(7.04e-05)	(7.47e-05)
L.TRA	-0.00135***	-0.00147***	-0.00141***	-0.00135***	-0.00133***
	(8.46e-05)	(8.83e-05)	(9.73e-05)	(7.34e-05)	(8.20e-05)
HC	0.103	-0.0324	0.0386	-0.211**	0.231
	(0.196)	(0.114)	(0.135)	(0.103)	(0.203)
L.HC	-0.259	-0.00653	-0.0248	0.270	-0.392
	(0.382)	(0.237)	(0.267)	(0.200)	(0.411)
L2.HC	0.157	0.00421	-0.0581	-0.0862	0.144
	(0.187)	(0.131)	(0.142)	(0.104)	(0.211)
ETP	0.0110***	0.0105***	0.00740***	0.00922***	0.00735***
	(0.00136)	(0.00150)	(0.00119)	(0.00121)	(0.00109)
Institutions		0.0276***	0.0350***	0.0320***	0.0374***
		(0.00391)	(0.00263)	(0.00404)	(0.00430)
Constant	0.0823***	0.212***	0.296***	0.224***	-0.0958**

	(0.0186)	(0.0218)	(0.0152)	(0.0195)	(0.0365)
Observations	395	395	395	395	395
Countries	36	36	36	36	36
AR(1)	-2.79	-2.67	-2.87	-2.84	-2.87
	(0.005)	(0.008)	(0.004)	(0.005)	(0.004)
AR(2)	-1.68	-1.70	-2.13	-2.27	-1.65
	(0.093)	(0.089)	(0.033)	(0.023)	(0.098)
Hansen	29.92	31.70	30.29	24.56	31.31
	(0.470)	(0.333)	(0.400)	(0.701)	(0.351)

Note: P values are presented in parentheses. p<0.1 *, p<0.05 **, p<0.01***. Dependent variable: GDP per capita growth in logarithm. OPPT is the proxy of entrepreneurship. GCF, POP, NS, TRA and HC are control variables. GEF, COC, PS, FTI, are institutions and regressed one by one from second column. Hansen test is used to check over identifying restrictions on instruments. AR (1) and AR (2) are tests to check the presence of auto correlation in the residual terms.

As previously discussed, the purpose of this research is to study the effect of entrepreneurship on economic growth by exploring the role of institutions (formal and informal). Growth is the dependent variable, GDP per capita is used as a proxy of growth in our study. Which is most common macroeconomic variable and also used to check the influence of growth (Aparicio et al., 2016). The independent variable is entrepreneurship which is measured by their three proxies i.e. Total Early Stage Entrepreneurial activity (TEA), Opportunity Entrepreneurship (OPPT) and Employer's Total (ETP). (Bosma et al., 2018) showed that entrepreneurship plays a significant role in economic growth in the presence of sound institutions. Our results support the literature, as entrepreneurship indicators have conclusive and significant influence on economic growth.

Tables 4, 5 and 6 represent results of three indicators of entrepreneurship on economic growth. The effects of Opportunity Entrepreneurship (OPPT), Total Early-Stage Entrepreneurial activity (TEA) and Employer's Total (ETP) on economic growth are significant. It implies that all the three indicators of entrepreneurship impact economic growth positively. The institutional variables Government Effectiveness (GEF), Control of Corruption (COC), Political Stability (PS) and Freedom to Trade Internationally (FTI) have positive and significant impact on economic growth for all the three indicators of entrepreneurship. It implies that entrepreneurial activities flourish in the presence of sound and institutions. (Dreher & Gassebner, 2013) analyzed that corruption discourages the entrepreneurial activity. (Aidis, Estrin, & Mickiewicz, 2008) examined that the control of corruption generates more opportunities to create new business. The other institutional variable government effectiveness is also significant. (Friedman, 2011) revealed that countries with effective governance systems are more biased towards entrepreneurship development as compared to the countries with less effective governance. Political stability also has a positive significant impact on entrepreneurship. It means that when political situations in the countries are stable then entrepreneurial activities are flourishing overtime.

Results of control variables like Gross Capital Formation (GCF), National Savings (NS), Trade Openness (TRA) and Human Capital (HC) are positive and significant, whereas the results of other control variables like Population Growth (POP) and Inflation (IF) are negative and insignificant.

The results of Two Step System Generalized Method of Moments for the interactions (interactions of entrepreneurship and institutional indicators) are reported in tables 7, 8 and 9 respectively as under.

Table 7. Interaction Between Entrepreneurship and Institutions (Results of Two Step System GMM).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VAR	**Baseline**	**GEF**	**OPPT*GEF**	**COC**	**OPPT*COC**	**PS**	**OPPT*PS**	**FTI**	**OPPT*FTI**
L.LNGDP	0.991***	0.985***	0.984***	0.978***	0.980***	0.980***	0.980***	0.984***	0.982***
	(0.00140)	(0.00193)	(0.00187)	(0.00249)	(0.00259)	(0.00255)	(0.00313)	(0.00125)	(0.00167)
INF	-0.00208***	-0.00238**	-0.00495***	-0.00287***	-0.00351***	-0.00220*	-0.00431***	-0.00158*	-0.00321***
	(0.000727)	(0.00112)	(0.00132)	(0.00101)	(0.000964)	(0.00111)	(0.00144)	(0.000864)	(0.00100)
GCF	0.000567***	0.000602***	0.00159***	0.00110***	0.00145***	-0.000170	0.000166	0.00132***	0.00180***
	(0.000195)	(0.000239)	(0.000266)	(0.000218)	(0.000221)	(0.000364)	(0.000330)	(0.000279)	(0.000319)
POP	-0.0109***	-0.0144***	-0.0132***	-0.0157***	-0.0138***	-0.00590***	-0.00302	-0.0124***	-0.0138***
	(0.00135)	(0.00169)	(0.00149)	(0.00151)	(0.00167)	(0.00191)	(0.00239)	(0.00131)	(0.00177)
NS	0.00176***	0.00144***	0.00110***	0.00133***	0.00119***	0.00180***	0.00179***	0.00168***	0.00193***
	(0.000126)	(0.000220)	(0.000166)	(0.000189)	(0.000203)	(0.000231)	(0.000207)	(0.000190)	(0.000149)
TRA	0.00137***	0.00136***	0.00154***	0.00127***	0.00133***	0.00115***	0.00128***	0.00106***	0.00110***
	(8.46e-05)	(8.88e-05)	(0.000105)	(0.000113)	(0.000116)	(8.82e-05)	(0.000106)	(7.88e-05)	(6.89e-05)
L.TRA	-0.00141***	-0.00147***	-0.00164***	-0.00136***	-0.00144***	-0.00134***	-0.00148***	-0.00125***	-0.00138***
	(8.40e-05)	(9.52e-05)	(0.000108)	(0.000109)	(0.000115)	(7.64e-05)	(9.96e-05)	(8.35e-05)	(8.19e-05)
HC	0.0900	-0.00433	-0.209	-0.0177	-0.108	-0.167	-0.508***	0.306**	0.0531
	(0.122)	(0.0904)	(0.139)	(0.104)	(0.119)	(0.151)	(0.182)	(0.117)	(0.251)
L.HC	-0.0495	0.164	0.552**	0.236	0.375	0.503*	1.034**	-0.359	-0.0136
	(0.236)	(0.179)	(0.267)	(0.215)	(0.230)	(0.273)	(0.402)	(0.217)	(0.491)
L2.HC	-0.0423	-0.207*	-0.383***	-0.271**	-0.313**	-0.380***	-0.570**	0.0321	-0.0613
	(0.119)	(0.103)	(0.139)	(0.117)	(0.118)	(0.137)	(0.237)	(0.108)	(0.248)

OPPT	0.000489***	0.000352***	0.00106***	0.000185**	0.000414***	0.000394***	0.000388**	0.000395***	0.00923***
	(8.45e-05)	(0.000117)	(0.000201)	(9.02e-05)	(0.000138)	(0.000128)	(0.000161)	(0.000102)	(0.00201)
Institutions		0.0324***	0.0690***	0.0383***	0.0499***	0.0466***	0.0726***	0.0365***	0.0913***
		(0.00551)	(0.00957)	(0.00417)	(0.00641)	(0.00764)	(0.0141)	(0.00399)	(0.0121)
OPPT*INST			0.000969***		0.000392**		0.000635***		0.00119***
			(0.000144)		(0.000164)		(0.000149)		(0.000262)
Constant	0.0761***	0.259***	0.204***	0.335***	0.284***	0.324***	0.320***	-0.0864***	-0.470***
	(0.0234)	(0.0415)	(0.0403)	(0.0387)	(0.0418)	(0.0477)	(0.0626)	(0.0266)	(0.0983)
Observation	388	388	388	388	388	388	388	388	388
Countries	36	36	36	36	36	36	36	36	36
AR(1)	-2.98	-3.03	-3.32	-3.25	-3.24	-3.30	-3.48	-3.18	-3.14
	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
AR(2)	-2.50	-2.49	-2.58	-2.72	-2.86	-2.86	-2.85	-2.49	-2.62
	(0.012)	(0.013)	(0.010)	(0.007)	(0.004)	(0.004)	(0.004)	(0.013)	(0.009)
Hansen	31.50	31.35	28.34	30.26	28.22	25.53	26.86	31.04	31.79
	(0.391)	(0.349)	(0.447)	(0.401)	(0.453)	(0.651)	(0.526)	(0.364)	(0.283)

Note: P values are presented in parentheses. p<0.1 *, p<0.05 **, p<0.01***. Dependent variable: GDP per capita growth in logarithm. OPPT is the proxy of entrepreneurship. GCF, POP, NS, TRA and HC are control variables. GEF, COC, PS, FTI, are institutions and regressed one by one from second column. Hansen test is used to check over identifying restrictions on instruments. AR (1) and AR (2) are tests to check the presence of auto correlation in the residual terms.

Table 8. Interaction Between Entrepreneurship and Institutions (Results of Two Step System GMM)

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
VARIA-BLES	**Baseline**	**GEF**	**TEA*GEF**	**COC**	**TEA*COC**	**PS**	**TEA*PS**	**FTI**	**TEA*FTI**
L.LNGDP	0.991***	0.986***	0.986***	0.978***	0.977***	0.985***	0.984***	0.985***	0.985***
	(0.00151)	(0.00164)	(0.00163)	(0.00189)	(0.00219)	(0.00213)	(0.00284)	(0.00171)	(0.00128)
INF	-0.00200***	-0.00251***	-0.00283***	-0.00390***	-0.00316***	-0.000352	-0.000157	-0.00187*	-0.000919
	(0.000690)	(0.000906)	(0.00102)	(0.00115)	(0.000814)	(0.000749)	(0.00126)	(0.000949)	(0.00138)

GCF	0.000474***	0.000454***	0.000606***	0.000828***	0.000625***	-0.000441	-0.000190	0.00127***	0.00139***
	(0.000161)	(0.000200)	(0.000268)	(0.000279)	(0.000244)	(0.000421)	(0.000537)	(0.000238)	(0.000237)
POP	-0.00646***	-0.00938***	-0.00990***	-0.0133***	-0.0107***	-0.00437**	-0.00325	-0.00952***	-0.00942***
	(0.00140)	(0.00185)	(0.00169)	(0.00203)	(0.00263)	(0.00197)	(0.00325)	(0.00184)	(0.00194)
NS	0.00170***	0.00140***	0.00129***	0.00160***	0.00177***	0.00203***	0.00186***	0.00171***	0.00184***
	(0.000160)	(0.000211)	(0.000233)	(0.000204)	(0.000150)	(0.000213)	(0.000311)	(0.000141)	(0.000147)
TRA	0.00146***	0.00145***	0.00138***	0.00130***	0.00165***	0.00114***	0.00125***	0.00114***	0.00119***
	(6.72e-05)	(9.67e-05)	(7.86e-05)	(9.11e-05)	(0.000155)	(7.21e-05)	(0.000116)	(0.000105)	(0.000112)
L.TRA	-0.00151***	-0.00157***	-0.00149***	-0.00141***	-0.00178***	-0.00134***	-0.00147***	-0.00135***	-0.00141***
	(7.04e-05)	(0.000104)	(8.42e-05)	(8.64e-05)	(0.000161)	(5.90e-05)	(0.000120)	(0.000110)	(0.000112)
HC	0.0547	0.00654	0.00380	-0.0341	-0.0481	-0.0944	-0.0925	0.221**	0.328***
	(0.103)	(0.0835)	(0.0833)	(0.114)	(0.112)	(0.0843)	(0.115)	(0.0882)	(0.115)
L.HC	-0.0684	0.0289	0.0893	0.194	0.234	0.255	0.460	-0.223	-0.398*
	(0.214)	(0.186)	(0.194)	(0.261)	(0.299)	(0.234)	(0.337)	(0.168)	(0.224)
L2.HC	0.0154	-0.0721	-0.135	-0.219	-0.237	-0.201	-0.410	-0.0179	0.0575
	(0.114)	(0.105)	(0.117)	(0.157)	(0.194)	(0.175)	(0.253)	(0.0979)	(0.133)
TEA	0.000837***	0.000821***	0.00105***	7.62e-05	-0.000223	0.00140***	0.00154***	0.000601**	-0.00390
	(0.000179)	(0.000173)	(0.000191)	(9.59e-05)	(0.000272)	(0.000296)	(0.000470)	(0.000232)	(0.00333)
Institutions		0.0286***	0.0357***	0.0382***	0.0204***	0.0467***	0.0403***	0.0370***	0.0303***
		(0.00330)	(0.00359)	(0.00247)	(0.00423)	(0.00981)	(0.0110)	(0.00434)	(0.00600)
TEA*INST			-0.000644***		0.00158***		0.000953**		0.000587
			(0.000209)		(0.000580)		(0.000415)		(0.000454)
Constant	0.0762***	0.231***	0.238***	0.362***	0.361***	0.266***	0.265***	-0.0915**	-0.0673
	(0.0242)	(0.0267)	(0.0275)	(0.0253)	(0.0344)	(0.0435)	(0.0648)	(0.0364)	(0.0645)
Observations	389	389	389	389	389	389	389	389	389
Countries	36	36	36	36	36	36	36	36	36

AR(1)	-2.69	-2.81	-2.92	-3.34	-3.01	-3.05	-2.90	-3.13	-2.83
	(0.007)	(0.005)	(0.003)	(0.001)	(0.003)	(0.002)	(0.004)	(0.002)	(0.005)
AR(2)	-2.84	-2.71	-2.88	-2.74	-2.38	-3.27	-3.53	-2.79	-2.58
	(0.005)	(0.007)	(0.004)	(0.006)	(0.017)	(0.001)	(0.000)	(0.005)	(0.010)
Hansen	31.60	31.69	29.95	31.22	27.91	27.47	25.52	32.65	31.51
	(0.387)	(0.334)	(0.366)	(0.355)	(0.469)	(0.547)	(0.600)	(0.292)	(0.295)

Note: P values are presented in parentheses. p<0.1 *, p<0.05 **, p<0.01***. Dependent variable: GDP per capita growth in logarithm. OPPT is the proxy of entrepreneurship. GCF, POP, NS, TRA and HC are control variables. GEF, COC, PS, FTI, are institutions and regressed one by one from second column. Hansen test is used to check over identifying restrictions on instruments. AR (1) and AR (2) are tests to check the presence of auto correlation in the residual terms.

Table 9. Interaction Between Entrepreneurship and Institutions (Results of Two Step System GMM)

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
VARIA-BLES	**Baseline**	**GEF**	**GEF*ETP**	**COC**	**ETP*COC**	**PS**	**ETP*PS**	**FTI**	**ETP*FTI**
L.LNGDP	0.989***	0.984***	0.974***	0.978***	0.973***	0.983***	0.979***	0.984***	0.982***
	(0.00111)	(0.00141)	(0.00277)	(0.00110)	(0.00209)	(0.00115)	(0.00143)	(0.00188)	(0.00205)
INF	-0.00134**	-0.00148**	-0.000741	-0.00187***	-0.00284***	-0.000484	-0.000211	-0.000681	-0.000883
	(0.000656)	(0.000722)	(0.000772)	(0.000648)	(0.000730)	(0.000566)	(0.000923)	(0.000684)	(0.000785)
GCF	-0.000463	-0.000179	0.000197	0.000496**	0.000803***	-0.000745**	-0.000561	0.000385	2.99e-06
	(0.000276)	(0.000264)	(0.000383)	(0.000212)	(0.000280)	(0.000338)	(0.000386)	(0.000346)	(0.000399)
POP	-0.0114***	-0.0136***	-0.00389*	-0.0138***	-0.00800***	-0.00408*	-0.000681	-0.0105***	-0.00562*
	(0.00164)	(0.00160)	(0.00227)	(0.00135)	(0.00232)	(0.00231)	(0.00270)	(0.00156)	(0.00281)
NS	0.00305***	0.00264***	0.00215***	0.00211***	0.00185***	0.00300***	0.00227***	0.00270***	0.00304***
	(0.000255)	(0.000328)	(0.000423)	(0.000202)	(0.000276)	(0.000228)	(0.000248)	(0.000161)	(0.000226)
TRA	0.00123***	0.00131***	0.00131***	0.00126***	0.00131***	0.00114***	0.00124***	0.00105***	0.00123***
	(7.73e-05)	(8.31e-05)	(7.48e-05)	(9.93e-05)	(9.65e-05)	(7.04e-05)	(8.62e-05)	(7.47e-05)	(7.39e-05)
L.TRA	-0.00135***	-0.00147***	-0.00135***	-0.00141***	-0.00139***	-0.00135***	-0.00136***	-0.00133***	-0.00142***
	(8.46e-05)	(8.83e-05)	(7.38e-05)	(9.73e-05)	(9.31e-05)	(7.34e-05)	(8.78e-05)	(8.20e-05)	(7.91e-05)
HC	0.103	-0.0324	-0.110	0.0386	-0.167	-0.211**	-0.170	0.231	0.118
	(0.196)	(0.114)	(0.161)	(0.135)	(0.135)	(0.103)	(0.168)	(0.203)	(0.172)
L.HC	-0.259	-0.00653	0.0929	-0.0248	0.277	0.270	0.108	-0.392	-0.297
	(0.382)	(0.237)	(0.298)	(0.267)	(0.255)	(0.200)	(0.312)	(0.411)	(0.338)

L2.HC	0.157	0.00421	-0.00331	-0.0581	-0.155	-0.0862	0.0326	0.144	0.151
	(0.187)	(0.131)	(0.147)	(0.142)	(0.137)	(0.104)	(0.154)	(0.211)	(0.172)
ETP	0.0110***	0.0105***	0.0212***	0.00740***	0.0102***	0.00922***	0.00489***	0.00735***	0.175***
	(0.00136)	(0.00150)	(0.00215)	(0.00119)	(0.00134)	(0.00121)	(0.00108)	(0.00109)	(0.0223)
Institutions		0.0276***	0.113***	0.0350***	0.0730***	0.0320***	0.0839***	0.0374***	0.129***
		(0.00391)	(0.0124)	(0.00263)	(0.00615)	(0.00404)	(0.00954)	(0.00430)	(0.0136)
ETP*INST			0.0220***		0.00936***		-0.0133***		0.0230***
			(0.00265)		(0.00152)		(0.00149)		(0.00298)
COC									
Constant	0.0823***	0.212***	0.209***	0.296***	0.332***	0.224***	0.294***	-0.0958**	-0.706***
	(0.0186)	(0.0218)	(0.0382)	(0.0152)	(0.0329)	(0.0195)	(0.0264)	(0.0365)	(0.0995)
Observations	395	395	395	395	395	395	395	395	395
Countries	36	36	36	36	36	36	36	36	36
AR(1)	-2.79	-2.67	-2.50	-2.87	-2.70	-2.84	-2.32	-2.87	-2.61
	(0.005)	(0.008)	(0.012)	(0.004)	(0.007)	(0.005)	(0.020)	(0.004)	(0.009)
AR(2)	-1.68	-1.70	-1.87	-2.13	-1.87	-2.27	-1.30	-1.65	-1.30
	(0.093)	(0.089)	(0.062)	(0.033)	(0.061)	(0.023)	(0.195)	(0.098)	(0.193)
Hansen	29.92	31.70	28.11	30.29	30.60	24.56	26.42	31.31	29.15
	(0.470)	(0.333)	(0.459)	(0.400)	(0.335)	(0.701)	(0.550)	(0.351)	(0.405)

Note: P values are presented in parentheses. p<0.1 *, p<0.05 **, p<0.01***. Dependent variable: GDP per capita growth in logarithm. OPPT is the proxy of entrepreneurship. GCF, POP, NS, TRA and HC are control variables. GEF, COC, PS, FTI, are institutions and regressed one by one from second column. Hansen test is used to check over identifying restrictions on instruments. AR (1) and AR (2) are tests to check the presence of auto correlation in the residual terms.

Proxies of entrepreneurship (Opportunity Entrepreneurship, Total Early-Stage Entrepreneurial activity & Employer's Total) are interacted one by one with formal (Government Effectiveness & Political Stability) and informal (Control of Corruption and Freedom to Trade Internationally) institutional indicators and found significant results.

5. Conclusion

This study analyzed the influence of entrepreneurship on economic growth using multiple proxies of entrepreneurship i.e. Opportunity Entrepreneurship, Total Early Stage Entrepreneurial activity and Employer's Total by exploring the role of formal and institutions like Government Effectiveness, Control of Corruption, Political Stability and Freedom to Trade Internationally (FTI) using data of thirty-six developed and developing countries for a time period 2002-2017. The empirical results of the study showed that Total Early-Stage Entrepreneurial Activity, Opportunity Entrepreneurship, Employer's Total, Government Effectiveness, Freedom to Trade Internationally, Control of Corruption, Political Stability, Gross Capital Formation, Human Capital, National savings, and Trade Openness have positive while Inflation and Population Growth have a negative impact on economic growth in the sample countries. The study concludes that entrepreneurship has a significant and conclusive impact on economic growth in the presence of strong formal and informal institutions.

5.1. Policy Recommendations

As the study results showed that entrepreneurship is the major driver of economic growth therefore, the study recommends following recommendations for policy makers and other stake holders to enhance entrepreneurial activities in a particular region.

- Along with reduction in tax liabilities and provision of subsidies on entrepreneurial activities to encourage entrepreneurship, government should improve entrepreneurship education and training to enhance the capabilities of entrepreneurs in order to strengthen the justifiable formation of new businesses.
- Economic policies should focus on financial inclusion, build solid capital management systems, elevating human capital, easy accessibility to technology and innovations in entrepreneurial activities which are prerequits for successful enterprises development in a particular region.
- Good governance improves entrepreneurial activities therefore it is recommended that government and other line institutions should make positive efforts to stun the bad governance issues like corruption and ensure rule of law.

5.2. Limitations and Suggestions for Future Research

One obvious limitation of the study is that this study is restricted to few indicators of entrepreneurship, institutions and economic growth for the sample countries due to time and data constraints. There are several paths on which future research can be steered to determine more determinants of entrepreneurship and economic growth by exploring the role of different institutions. Further research on this special topic can be conducted by including more institutional factors like, bureaucratic quality, fear of failure, skills etc. and structural variables like capital control, exchange rate and financial literacy rate etc. for a longer time period to investigate the relationship among entrepreneurship and institutions and the impact of their interactions on economic growth for lager sample countries.

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Appendix: List of Sample Countries

Australia	Italy	
Austria	Ireland	
Brazil	Iran, Islamic Republic	Spain
Belgium	Jamaica	Switzerland
Canada	Japan	Thailand
Chile	Netherlands	United Kingdom
China	Norway	United States
Croatia	Malaysia	
Colombia	Mexico	
Denmark	Peru	

Ecuador	Pakistan
Finland	Uruguay
France	South Africa
Germany	Sweden
Greece	Singapore
Hungary	Slovenia

Note: Countries are selected on the availability of their Entrepreneurship data.