# A Study on Entrepreneurship and Growth Nexus in High and Low-Income Countries - The Application of Panel Regression Estimation

AKU-SIKA BUAH
PHD STUDENT

UNIVERSITY OF MISKOLC
e-mail: akusikabuah@gmail.com
https://orcid.org/0009-0003-1958-1511

*SUMMARY*

*While common sense would suggest that entrepreneurship and economic growth are positively related, it remains unclear whether entrepreneurship is a primary predictor of economic growth conceptually and empirically. Evidence from the literature has revealed a mixed result. Some authors conclude that entrepreneurship drives economic growth positively and significantly. However, others found an inverse relationship between entrepreneurship and growth. Within the paper's framework, entrepreneurship's actual impact on growth across some selected high- and low-income countries has been brought to light. The discussion starts by measuring the degree of association among the variables across the selected clusters of countries. A panel estimation technique, more specifically the Generalized Methods of Moments (GMM) technique, is adopted to make the comparison. Data on 39 high-income countries as well as 24 low-income countries from the period of 1999 to 2019 were considered. It was observed that entrepreneurship positively impacts growth across high-income countries. However, entrepreneurship does not necessarily aid growth within low-income countries.*

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## INTRODUCTION

From the eighteenth until the mid-nineteenth century, creating large-scale industries (the so-called Industrial Revolution) was a key driver of economic growth (Burns, 2011). Most of these large-scale enterprises benefited from economies of scale and were considered more efficient. As a result, most economies, particularly industrialized ones, placed a premium on the growth and expansion of huge corporations. In contrast, very little or no attention was given to micro, small, and medium-sized businesses. Notwithstanding the advantages of these large-scale businesses on economic growth, they became unpopular after some historic events. History Crunch (2018) reports that events like the economic crises, the great depression, global competition, and even technological advancement led to the dwindling of the industrial era. Due to this, unemployment rates began to rise, leading to a fall in revenue margins and enormous output losses.

Consequently, in recent years, entrepreneurship has emerged as a major concern, and the focus has switched away from large-scale manufacturing and industrialization toward entrepreneurship. Baumol (2010), Peneder (2009), and other proponent writers have all made similar arguments. In fact, bigger economies like the United States (US) and the United Kingdom (UK) saw the need to encourage the growth of micro, small, and medium-scale enterprises. Their governments started to make policies that stimulated the pursuit of small business (Persson et al., 2006). Other nations also saw the impact of this move on the economy and followed that policy. Although it has been proved that entrepreneurship is an essential tool for growth and development in these economies, whether the influence of entrepreneurship on growth is the same across various

countries with differences in the macroeconomic environments, differences in socio-cultural backgrounds, differences in the political and institutional context and so on, remained an unanswered question. Specifically, does entrepreneurship equally play a positive and significant role in economic growth across high and low-income countries?

The problem statement, therefore, emanates from a gap in the extant literature. There is an undoubtable fact that the number of studies and research works on entrepreneurship is growing. For instance, Acs and Varga (2005), Acs and Armington (2004), Carree and Thurik (2008), Audretsch and Keilbach (2004) etc. elaborate on entrepreneurship's high and significant impact on growth in developed countries. Just a limited number of authors focus on the entrepreneurship growth nexus amongst developing countries, for example, Ogunlana (2018), Omoruyi et al. (2017) and Adusei (2016). The conflict, therefore, stems from the findings of the previous research works. Whereas some authors, Acs and Varga (2005), Carree and Thurik (2008), and Audretsch and Keilbach (2004) found an inverse relationship between entrepreneurship and growth in developing or low-income countries, others, Adusei (2016) and Omoruyi et al. (2017) found a rather positive and significant impact of entrepreneurship on economic growth in developing countries too. The mixed results draw attention to the importance of the topic.

This paper will further investigate entrepreneurship's role in economic growth, focusing on some selected high and low-income countries. The aim is not to provide a conclusive solution but to find the reasons behind the contradictory research results and suggest some operational approaches to understanding or tackling it. Most importantly, this paper seeks to bring a novel perspective into the existing literature and also tries to elucidate the ambiguities in the literature. Understanding the impact of entrepreneurship across diverse economies helps decision-makers to develop specific entrepreneurship-growth policies. With these policies, long-term and sustained economic development can be reached.

## EMPIRICAL LITERATURE REVIEW

Entrepreneurship is one of the most widely discussed concepts in economics. The concept's precise meaning is uncertain, making the academic discourse difficult. Entrepreneurship has a myriad of definitions; for instance, Schumpeter (1934), Dao (2018), and Hornaday (1992), as well as Lumpkin and Dess, (1996) have used innovation as a focal point to define entrepreneurship. By extension, Kirzner (1997), Drucker (2007), and Shane and Venkataraman (2000) have relied on the concept of opportunity to explain entrepreneurship. Entrepreneurship, according to Stevenson and Jarillo (1990), is the process through which people look for possibilities, whether on their own or as a part of an organization, regardless of the resources available to them at the moment. According to the Global Entrepreneurship Monitor (GEM), any effort at new business or venture creation, such as a new business organization, self-employment, or the extension of an existing business, by an individual, a team of individuals, or an established business is entrepreneurship (GEM Reports, 2001).

One significant work worth mentioning when issues of entrepreneurship and growth are being discussed is the work of O'Connor et al. (2018). In their work "The Role of Entrepreneurship in Stimulating Economic Growth in Developing and Developed Economies," they investigate how different measures of entrepreneurship can explain economic growth. Using the Gross Domestic Product (GDP) per capita as the proxy for economic growth and fourteen indicators of entrepreneurship to evaluate entrepreneurial activity, entrepreneurial attitudes, and entrepreneurial aspirations, they examine how entrepreneurship varies across high-income and middle/low-income countries using 55 countries over eight years (2004-2011). The results showed that entrepreneurship is an essential tool for economic growth. However, the different types of entrepreneurship (entrepreneurial attitude, entrepreneurial activity, and entrepreneurial aspirations) have a negative relationship with growth in middle/low-income countries and a strong positive relationship in high-income countries. According to O'Connor et al. (2018) the main reason is that entrepreneurship's impact on growth varies based on the stages of economic development. From the results obtained, it was concluded that entrepreneurial attitude is positively correlated with GDP per capita.

In contrast, entrepreneurial activity is negatively related to the GDP per capita. However, their observation showed that in high-income countries, positive entrepreneurial attitudes directly influence economic growth. On the other hand, the type of entrepreneurial activity in the middle/low-income countries also had an inverse relation to growth. In most high-income countries, most individuals have the natural enthusiasm to become entrepreneurs; this is the entrepreneurial attitude. This is because the individual's readiness to explore new opportunities, self-efficacy, and entrepreneurial role models are easy to achieve. The same cannot be said for low-income countries, as they lack an entrepreneurial attitude, and even if people start businesses, their entrepreneurial activity is driven by necessity.

Following from the above Acs (2010) compared the relationship between entrepreneurship and growth using three stages of growth. Acs (2010) adopted the three stages of development model of Porter et al. (2002). These factors are the factor-driven stage, efficiency-

driven stage, and innovative-driven stage, and established a connection between entrepreneurship and growth for developed and developing countries. Porter et al. (2002), explain the three stages of development as follows; the first stage, which is the factor-driven stage, is mainly associated with high levels of agricultural self-employment, low cost of production of goods, and minimum value-added products. In the second stage of development, which is the efficiency-driven stage, countries are characterized by competent production of goods and services in large markets, which allows them to enjoy economies of scale. Countries in this stage are mostly noted for industrialization, manufacturing of goods, and provision of essential services. Onn the other hand, the innovation-driven stage is marked by an upsurge in knowledge-demanding activities (Romer, 1990). In the innovation-driven stage, knowledge provides the critical input, and also, much focus is on technology. With this assertion, Acs (2010), concluded that the relationship between entrepreneurship and growth varies across countries with different growth stages. Acs (2010), posits that entrepreneurship's impact on growth is minimal at the factor-driven stage; however, when the economy progresses to the efficiency and innovative-driven stages, the impact of entrepreneurship on growth increases as well. Entrepreneurial activity increases quickly through the efficiency-driven stage and climaxes at the innovation-driven stage, which has a massive impact on growth as well.

Stam and Van-Stel (2009) examine the impact of entrepreneurship on economic growth at the country level, focusing on high-income, transition, and low-income nations. To obtain data from a wide range of countries to enable them to make a good cross-country analysis, they use data from the Global Entrepreneurship Monitor (GEM). Based on this, they could make a comparative analysis on high-income and transition countries (China, Russia, Poland, Hungary, and Slovenia) as well as low-income countries (Brazil, Chile, Argentina, South Africa, Mexico, Thailand, and India). Stam and Van-Stel (2009) realized that most previous authors used self-employment or new firm registration to measure entrepreneurship. However, this was not a reliable indicator when applied to developing countries (low-income countries). Hence, they introduced a new indicator, Young Businesses (YB), into the equation and defined it as "the percentage of the adult population that is the manager/owner of a business that is less than 42 months old (a young business)". Using OLS regression, the YB for the high, transition, and low-income countries were used as independent variables at each country level. A simple model was therefore created, as shown below.

$$GDP_{it} = a + b1\ YBrich_{t-1} + c1\ YBtransition_{t-1} + d1\ YBpoor_{t-1} + e \quad \ldots \quad (1)$$

The primary conclusion was that entrepreneurship does not affect economic growth in low-income countries, but this was in contrast to transition and high-income countries, where especially growth-oriented entrepreneurship seems to contribute strongly to macroeconomic growth. This is because entrepreneurship in the developing countries is mainly driven by necessity. As explained by Acs (2010), self-employment is often the common occupational choice in most developing countries with high unemployment rates. In short, even though YB was introduced into the equation as a new indicator, it does not erase the fact that the percentage of the adult population that owns businesses in low-income countries is necessity-based entrepreneurship and not growth-oriented entrepreneurship.

Vinco et al. (2016) also test the impact of entrepreneurship on growth with much focus on developed and developing countries. They, however, emphasize that entrepreneurship contributes to growth in diverse economies due to differences in the features of the macroeconomy, differences in entrepreneurial activity, and so on. They outline three main types of entrepreneurship: Opportunity Entrepreneurial Activity (OEA), High-expectation Entrepreneurial Activity (HEA), and Necessity Entrepreneurial Activity (NEA). They then study the impact of the different kinds of entrepreneurship mentioned above on economic growth by comparing 22 developed and developing countries (14 developed and eight developing countries) over three years. Similarly, their results show the effect of entrepreneurship on economic growth in developed countries is higher than that of the developing countries. To attain these results, they specified a regression model as shown below:

$$GDPG = b_0 + b_1 GCF + b_2 FDI + b_3 LF + b_4 OEF + b_5 HEA + b_6 NEA \quad \ldots (2)$$

Where GDPG is the GDP Growth Rate (dependent variable), GCF is the Gross Capital Formation, FDI is Foreign Direct Investment, LF is Labour Force, OEA is Opportunity Entrepreneurial Activity, HEA is High-expectation Entrepreneurship, and NEA is Necessity Entrepreneurial Activity. With the help of the

hierarchical multiple regression approach, they found that in the developed countries, the highest impact on economic growth was Opportunity Entrepreneurial Activity (OEA), followed by High-expectation Entrepreneurial Activity (HEA), and the lowest impact was Necessity Entrepreneurial Activity (NEA). With regards to the developing countries, the highest impact on growth was High-expectation Entrepreneurial Activity (HEA), followed by Necessity Entrepreneurial Activity (NEA), and the lowest was Opportunity Entrepreneurial Activity (OEA). Consequently, it can be summarized that entrepreneurship symbolizes an increasing driving force of economic growth. However, its contribution differs considerably for developed and developing countries. Bruns et al. (2017) also argue in favour of the motion and concluded that, using a sample of 107 European regions from 16 EU member states, they accept the hypothesis that multileveled entrepreneurship promotes regional growth in advanced countries.

Using the Generalized Method of Moments (GMM) as an adopted methodology Mthanti and Ojah (2018) illustrate how institutions and human capital encourage entrepreneurship, aiding economic growth and development. It is interesting how Mthanti and Ojah (2018) begin by providing solid evidence for Adam Smith and Joseph Schumpeter's well-known view that human capital and institutions must be strengthened for the economy to grow in the long run. They propose the Entrepreneurship Orientation (EO) using the Generalized Method of Moments as the basic model, which consists of innovativeness, risk-taking, and proactiveness. They utilize the Generalised Method of Moments (GMM) and a sample of 93 nations from 1980 to 2008 to evaluate institutions and human capital as potential determinants of so-called Schumpeterian entrepreneurship. From the broader literature, however, institutional variables and human capital act as major determinants of growth (Barro, 2000; King & Levine, 1993; Acemoglu et al., 2001), but from the work of Mthanti and Ojah (2018), the major conclusion drawn is that institutions and human capital are seen as catalysts which boost entrepreneurship and in turn aids growth. From the work of these authors, we can critically observe that the causal trend for growth to occur is from institutional growth to human capital growth and then to productivity-enhancing entrepreneurship. According to these authors, we will gradually approach economic growth once this pattern is followed. With the help of the GMM, the overall sample of 98 countries suggests that the quality of institutions, reflected in the reduction of corrupt activities and the development of the banking sector, enhances Entrepreneurship Orientation (EO). On the other hand, human capital has a strong positive correlation with EO, is robust to controlling for institutional quality, and generates economic growth.

Based on the preceding literature, this study adopts a panel estimation approach. It specifies the Generalized Method of Moments (GMM) model, as shown in equation 5 below. Some specific variables of interest like self-employment, Domestic Credit to Private Sector, Employment to Population Ratio, Inflation, Savings, Labour Force Participation Rate, and Economic Openness were used to analyse entrepreneurship and growth across high- and low-income countries. These variables were selected based on the evidence from the literature as well as the availability of data in the respective databases.

## METHODOLOGY

To analyze the role of entrepreneurship in economic growth, and more specifically, to analyze the degree of responsiveness of entrepreneurship on economic growth across a cluster of high and low-income countries, a more robust estimation technique is required. A Multilevel modelling is preferred in this situation since it provides a method for dealing with clustered or grouped data (Browne & Rasbash, 2004). Thus, the system Generalized Methods of Moments (GMM) approach is adopted to examine the impact of entrepreneurship on economic growth within the framework of this paper. The concept was formalized by Hansen (1982) and has since been popularized by Arellano and Bond (1991). The system GMM is an improved version of the difference GMM and as such, it is proven to be more efficient. The original version of the model takes the form:

$$y_{it} - y_{i,t-1} = \theta + X'_{it}\gamma + \varphi_t + u_{it} \quad \dots (3)$$

Correspondingly,

$$y_{it} = \theta + \tilde{\rho} y_{i,t-1} + X'_{it}\gamma + \varphi_{it} + u_{it} \quad \dots (4)$$

Transforming this model, the specification of the model to be used in the study can be written as:

$$lnGDPPCG_{it} = \theta + \tilde{\rho}(lnGDPPCG)_{i,t-1} + \gamma(lnSELF)'_{it} + \varphi(controlVar)_{it} + u_{it} \quad (5)$$

From equation 4, $y$ is the natural logarithm of the dependent variable (GDP per capita growth as elaborated in equation 5), $i$ is a country, $t$ is a period of time, $\tilde{\rho}$ is coefficient of the lagged dependent variable, $X'$ represents the set of explanatory variables (Self-employment in this context). $\varphi_{it}$ is the time-specific effect of the controlled variables and $u_{it} = \mu_i + \nu_{it}$, where $\mu_i$ is the observable specific effect and $\nu_{it}$ is the corresponding error term.

*Table 1*

*Definition of variables*

| | Variable | Definition | Data Source |
|---|---|---|---|
| ***Dependent Variable*** | Economic Growth (Y) | Gross Domestic Product Per Capita Growth (GDPPCG) | WDI, World Bank |
| ***Explanatory Variable*** | Entrepreneurship (X) | Self-employment (SELF) | ILOSTAT database |
| ***Control Variables*** | Domestic Credit to Private Sector (DCPS) | Readily availability of credit to private sector. | IMF |
| | Employment to Population Ratio (EPR) | Proportion of the population that is employed. | ILOSTAT database |
| | Inflation (INF) | Increase in prices, as measured by Consumer Price index. | IMF, IFS |
| | Savings (SAV) | Gross Domestic Savings. | WDI, World Bank |
| | Labour Force Participation Rate (LFPR) | Percentage of the labour available to work or already working. | ILOSTAT database |
| | Economic Openness (ECONOPEN) | Sum of imports and exports as a share of GDP | WDI, World Bank |

Source: own compilation

The study consists of annual data from 39 high income countries and 24 low-income countries from the period of 1999 to 2019. This sampling frame as well as the variables of interest were chosen based on the availability of data in the respective databases. Also evidence from existing literature as well as the measure of entrepreneurship were taken into consideration.

## HIGH INCOME GROUP OF COUNTRIES

Austria, Bahamas, Bahrain, Barbados, Belgium, Canada, Chile, Croatia, Czech Republic, Denmark, Estonia, France, Germany, Hong Kong SAR China, Hungary, Iceland, Ireland, Italy, Japan, Korea Republic, Kuwait, Latvia, Luxemburg, Malta, Mauritius, Netherlands, Norway, Panama, Poland, Portugal, Romania, Saudi Arabia, Singapore, Slovak Republic, Sweden, Trinidad and Tobago, United Arab Emirates, United Kingdom, United States.

## LOW INCOME GROUP OF COUNTRIES

Afghanistan, Burkina Faso, Burundi, Central African Republic, Chad, Congo Dem Rep, Ethiopia, Gambia, Guinea, Guinea Bissau, Haiti, Liberia, Madagascar, Malawi, Mali, Mozambique, Niger, Rwanda, Sierra Leone, Sudan, Tajikistan, Togo, Uganda, Yemen Republic.

## MAIN FINDINGS

The correlation matrix helps us to measure the degree of association between the variables. More importantly, before conducting the advanced analysis with the Generalized Methods of Moments approach, the correlation matrix diagnoses and summarizes the data between all variables in the dataset. This helps us know if the variables are significantly correlated in the whole system.

*Table 2*

*Correlation Matrix for Low Income Countries*

| | **lnGDPPCG** | **lnSELF** | **lnDCPS** | **lnEPR** | **lnINF** | **lnSAV** | **lnLFPR** | **lnECON** |
|---|---|---|---|---|---|---|---|---|
| lnGDPPCG | 1 | | | | | | | |
| lnSELF | **-0.3324*** | 1 | | | | | | |
| lnDCPS | 0.2305* | -0.1046* | 1 | | | | | |
| lnEPR | 0.3996* | 0.6551* | 0.0960* | 1 | | | | |
| lnINF | -0.1128* | -0.2208* | -0.2573* | -0.1092* | 1 | | | |
| lnSAV | 0.2179* | -0.0842 | 0.0354 | -0.0638 | 0.0212 | 1 | | |
| lnLFPR | -0.3804* | 0.6372* | 0.1029* | 0.9915* | -0.0829 | -0.053 | 1 | |
| lnECONOPEN | 0.0259 | -0.1041* | 0.1153* | -0.0719 | -0.0616 | -0.012 | -0.113 | 1 |

Source: Author's own calculation

*Table 3*

*Correlation Matrix for High Income Countries*

| | **lnGDPPCG** | **lnSELF** | **lnDCPS** | **lnEPR** | **lnINF** | **lnSAV** | **lnLFPR** | **lnECON** |
|---|---|---|---|---|---|---|---|---|
| lnGDPPCG | 1 | | | | | | | |
| lnSELF | **0.3767*** | 1 | | | | | | |
| lnDCPS | 0.2855* | 0.1667* | 1 | | | | | |
| lnEPR | 0.0882* | -0.4083* | 0.3121* | 1 | | | | |
| lnINF | 0.0806* | 0.0664 | -0.2209* | 0.0127 | 1 | | | |
| lnSAV | 0.0827* | -0.4160* | -0.0377 | 0.3163* | -0.1477* | 1 | | |
| lnLFPR | -0.0890* | -0.3609* | 0.2898* | 0.9594* | 0.023 | 0.2132* | 1 | |
| lnECONOPEN | 0.2161* | -0.1157* | -0.0913* | 0.0416 | -0.017 | 0.4469* | 0.0052 | 1 |

Source: Author's own estimation (* = significantly correlated variables)

Since GMM models include the lagged dependent variable as one of the explanatory variables, the lag of GDP per capita growth was also included in the model. For the high-income countries, as seen in table 4, it can be observed that past GDP values influence the current GDP values. A percentage change in past GDP values is associated with a 0.317% increase in economic growth at a 1% significant level, all other things being equal. The effect of entrepreneurship (represented with lnSELF) on economic growth was 0.3195 at a 5% statistical significance level. This means that for the cluster of high-income countries, a percentage change in entrepreneurship will lead to a 0.320% increment in economic growth, ceteris paribus. In other words, an increase in entrepreneurship seems to positively impact growth.

*Table 4*

*System GMM results for High-income countries*

| Variables | Coefficient | P value |
|---|---|---|
| **L.1 lnGDPPCG** | **0.3165*** ** | 0.000 |
| **lnSELF** | **0.3195** ** | 0.033 |
| **lnEPR** | 0.0746 | 0.970 |
| **lnDCPS** | **0.4694*** ** | 0.000 |
| **lnINF** | **-0.1164** ** | 0.040 |
| **lnSAV** | 0.0329 | 0.896 |
| **lnLFPR** | 0.7874 | 0.728 |
| **lnECONOPEN** | **0.1328** ** | 0.032 |
| **No. of observations** | 438 | |
| **No. of groups** | 38 | |
| **No. of instruments** | 14 | |
| **Wald chi2(7)** | 107.91 | |
| **AR (1)** | 0.001 | |
| **AR (2)** | 0.575 | |
| **Hansen test** | 0.131 | |
| **Sargen test** | 0.274 | |
| **Group variable** | Country | |
| **Time variable** | Year | |

*Note: *****, **, *** represents statistical significance at 1%. 5% and 10% respectively*

Source: Author's own calculation

For the controlled variables, Domestic credit to the private sector, Inflation and Economic Openness play a significant role in economic growth. The Table 4 shows that a unit change in Domestic credit to the private sector positively impacts growth. That is to say, the availability of funds to the private sector will significantly increase economic growth by 0.469%. Also, it was observed that there is an inverse relationship between inflation and growth. A percentage change in inflation will decrease economic growth by 0.116%. This means that persistent increases in the general price levels do not aid growth. Economic openness and economic growth also move in the same direction. The results further reveal that a percentage change in economic openness is associated with a 0.133% increase in economic growth. Employment to population ratio, savings, and Labour force participation rate positively impact growth, but the values were not statistically significant. Hence, the main conclusion is that entrepreneurship plays a positive and significant role in economic growth and development for the cluster of high-income countries.

From the results of the low-income countries as seen in Table 5, it can be observed that past GDP values have an impact on the current GDP values. A percentage change in past GDP values is associated with a 0.801% increase in economic growth at a 1% significant level, all other things being equal. The effect of entrepreneurship (measured by lnSELF) on economic growth took a different turn, as it can be observed that there is an inverse relationship between entrepreneurship and growth. At a 1% statistical significance level, a percentage change in entrepreneurship results in a fall in growth by 0.157%. This means that for the cluster of low-income countries, a percentage change in entrepreneurship does not necessarily lead to economic growth in the short run, ceteris paribus. Salgado (2005) obtained similar results in his study where he considers 22 OECD countries; "he discovers a positive association between the proposed measure of productive entrepreneurship - the degree of innovativeness of various countries - and economic growth, whereas the alternative measure, based on self-employment, appears to be negatively correlated with economic growth. For the controlled variables, Domestic credit to the private sector, Labour force participation rate and Economic Openness play a significant role in economic growth. From the table, it can be observed that a unit change in Domestic credit to the private sector positively impacts growth. That is to say that the availability of funds to the private sector will significantly increase economic growth by 0.0206%.

Furthermore, it was discovered that a unit change in the Labour Force Participation rate leads to an increase in economic growth by 0.0205%. Regarding economic openness, the results reveal that a percentage change in economic openness is associated with a 0.031% increase in economic growth. The employment-to-population ratio and saving rate positively impacted growth, but the values were not statistically significant. Also, inflation has an inverse relationship with growth but is not statistically significant. Hence, the main conclusion that can be drawn is that entrepreneurship does not aid economic growth and development positively in the short run for the cluster of low-income countries.

*Table 5*

*System GMM results for Low-income countries*

| Variables | Coefficient | P value |
|---|---|---|
| **L.1 lnGDPPCG** | **0.8013*** ** | 0.000 |
| **lnSELF** | **-0.1565*** ** | 0.009 |
| **lnEPR** | 0.0545 | 0.931 |
| **lnDCPS** | **0.0206*** ** | 0.006 |
| **lnINF** | -0.0025 | 0.760 |
| **lnSAV** | 0.0053 | 0.886 |
| **lnLFPR** | **0.0205** ** | 0.018 |
| **lnECONOPEN** | **0.0309** ** | 0.045 |
| **No. of observations** | | 210 |
| **No. of groups** | | 18 |
| **No. of instruments** | | 14 |
| **Wald chi2(7)** | | 652.42 |
| **AR (1)** | | 0.008 |
| **AR (2)** | | 0.741 |
| **Hansen test** | | 0.631 |
| **Sargen test** | | 0.110 |
| **Group variable** | | Country |
| **Time variable** | | Year |

*Note: ***, **, * represents statistical significance at 1%. 5% and 10% respectively*

Source: Author's own calculation

## DISCUSSION AND CONCLUSION

This study's findings show that entrepreneurship generally has a positive and significant impact on growth in high-income countries, but in low-income countries, entrepreneurship does not aid growth. It is interesting to know that the above results conform with some findings in the literature. For instance, O'Connor et al. (2018) found similar results in this work, "The Role of Entrepreneurship in Stimulating

Economic Growth in Developing and Developed Economies". He concludes that entrepreneurship is an essential tool for economic growth. However, the different types of entrepreneurship (entrepreneurial attitude, entrepreneurial activity, and entrepreneurial aspirations) have a negative relationship with growth across middle/low-income countries but a strong positive relation across high-income countries. Stam and Van-Stel (2009) share a similar viewpoint on this argument. According to these authors, entrepreneurship does not affect economic growth in low-income countries; however, entrepreneurship contributes strongly to macroeconomic growth in the transition and high-income countries. In the same vein, Salgado (2005) discovered that the measure of entrepreneurship also plays an important role. According to Salgado (2005), productive entrepreneurship has a positive impact on economic growth as compared with mere self-employment.

The results from both high- and low-income countries vividly demonstrate that it is not necessarily the quantity or number of people who venture into entrepreneurship that is important, but rather the type of entrepreneurship that is practised should be the primary focus. Comparing the results on GDP per capita growth and self-employment for the cluster of countries, as well as evidence from the literature, we can notice that, for the high-income group of countries, entrepreneurship aids growth in a positive and significant manner. However, there is an inverse relationship with growth for the low-income group of countries. This could be attributed to the type of entrepreneurship practised, and evidence from the empirical literature has proven this assertion true. For instance, Valliere and Peterson (2009), using data from the Global Entrepreneurship Monitor (GEM) on 44 countries, found that a major share of economic growth rates in developed countries can be attributed to high-expectation entrepreneurs (entrepreneurs who expect to achieve rapid growth in employment size) who leverage government investments in knowledge creation and regulatory

independence. However, this effect does not exist in developing countries. Baumol (1990) also emphasises that productive entrepreneurship, backed by innovation, leads to growth, while unproductive entrepreneurship, like rent-seeking, does not aid growth. Acs (2010) is also of the view that the so-called opportunity-based entrepreneurship aids growth, but the necessity-based entrepreneurship does not aid growth.

Weighing the pros and cons of the matter, the novel conclusion drawn is that qualitative entrepreneurship, or, simply put, the type of entrepreneurship practised, is necessary for growth to occur but not quantitative entrepreneurship.

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