**Scientific Annals of Economics and Business**
**68 (2), 2021, 145-162**
**DOI: 10.47743/saeb-2021-0014**

# The Impact of Entrepreneurship on Economic Growth in 95 Developing and Emerging Countries

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**Abstract**

This paper examines the effects of entrepreneurship on economic growth in 95 developing and emerging countries during the period 2006-2018. It develops aggregate and disaggregate empirical analyses by decomposing the full sample according to income level and geographic distribution. Moreover, it controls for the role of institutions when assessing the effects of entrepreneurship on economic growth. The empirical study consists of estimating a growth model using the fixed effects, random effects and system GMM estimators. The findings show that entrepreneurial activity exerts a positive and robust effect on economic growth in the full sample. The highest impact is reported in Asia, followed by the Middle East and North Africa, Latin America and Caribbean countries, and Sub-Saharan Africa. Furthermore, the impact of entrepreneurship on growth is higher in low-income economies than in high-income economies. Finally, the regulatory quality enhances the positive effects of entrepreneurship on economic growth.

**Keywords:** economic growth; entrepreneurship; institutions; emerging countries.

**JEL classification:** L26; O43; O47.

## 1. INTRODUCTION

During the last decades, there has been a widespread commitment towards reducing the intervention of governments in the economy. As Biersteker (1990) mentioned, almost all developing countries have carried out various policy reforms, such as the removal of sectoral barriers, the liberalization of the economy, privatization, and the adoption of structural adjustment programs in order to minimize their interventions in the economic activity. In this situation, more responsibilities have been assigned to the private sector, specifically small- and medium-sized enterprises (Acs and Virgill, 2010). At the same time, entrepreneurship has gained the attention of both scholars and policymakers as a potential instrument that allows improving the ability of the private sector to participate in economic activity. It is crucial to highlight that the promotion of entrepreneurship in developing countries has been encouraged

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by leading international financial institutions. For instance, the World Bank has implemented a set of programs and policies to support entrepreneurship and small- and medium-sized enterprises in developing countries. The support of entrepreneurship and innovation in developing countries by the World Bank has been materialized by many actions, such as supporting the research and development activities, strengthening entrepreneurial capabilities, providing financial support for early-stage firms and finally encouraging the cooperation between the participants in the innovation process.

The assessment of the economic impact of public policies and programs is at the heart of economic research. While there has been abundant literature focusing on the impact of some policy reforms, such as privatization and economic liberalization, entrepreneurship has received less attention in the current debate. Regarding this issue, Carree and Thurik (2010) noted that cross-country studies on the economic effects of entrepreneurship are notably scarce. One of the reasons for the lack of studies evaluating the economic effects of entrepreneurship is the primary difficulty in measuring entrepreneurship (Wong *et al.*, 2005). Although data may be available from various national sources, problems of quality and comparability do not allow conducting panel data studies on the economic effects of entrepreneurship for many countries. Starting from the 2000s, there has been considerable progress in the availability, comparability, and quality of entrepreneurial datasets. Some datasets developed by international institutions, such as the Global Entrepreneurship Monitor, the International Labour Organization, and the World Bank, in the 2000s allowed conducting more in-depth studies on entrepreneurship, focusing mainly on developed countries. Relatively few studies have been carried out in developing countries.

This study fits into this context and contributes to the current literature by examining the impact of entrepreneurship on economic growth in a large sample of developing countries. As Koster and Rai (2008) mentioned, the relationship between entrepreneurship and economic growth has gained relatively little attention over the last decades. Most studies focused on developed countries due partially to data availability (Bosma *et al.*, 2018; Stoica *et al.*, 2020). Some other studies have explored the impact of entrepreneurship on economic growth in both developed and developing countries. It is important to note here that it is crucial to avoid considering mixed samples (both developed and developing) since there has been a difference between developing and developed economies in terms of the development stage, business climate, innovation, and entrepreneurship capacities. This research attempts to fill this gap in the literature by empirically assessing the reaction of economic growth to entrepreneurship in developing and emerging countries between 2006 and 2018. Compared to previous works on the subject, this study considers a large sample covering 95 developing and emerging countries. Indeed, considering almost all developing countries (for which data are available) allows generalizing the study results to other developing countries. The sample considered in this study is not restricted to a specific geographic zone or a specific group of countries according to the development stage. We tried to retain the maximum of countries to get reliable empirical results. Moreover, the study explores the effect of entrepreneurial activity on economic growth in the full sample of 95 countries and for different sub-samples based on geographical distribution. Indeed, countries retained in the analysis belong to four geographic regions: Asia, Sub-Saharan Africa, the Middle East and North Africa, Latin America, and the Caribbean. This decomposition allows making a comparison between the outcomes of entrepreneurship on economic growth in different groups of countries. Moreover, the full sample is decomposed by income level to investigate if the growth outcomes of

entrepreneurship are higher in countries with high economic development levels. Two groups of countries are subsequently retained namely low and high-income countries. Finally, the research also explores whether the economic growth effect of entrepreneurship depends on institutional quality. Three institutional variables are considered: control of corruption, the rule of law, and regulatory quality. To check the robustness of the findings, this study estimates the reaction of economic growth to entrepreneurship using a wide range of estimators. More specifically, it employs static panel data estimators (fixed effect, random effect) and dynamic panel data estimator (generalized method of moments).

The remainder of this paper is organized as follows. Section 2 deals with the relevant literature on the impact of entrepreneurship on economic growth. In Section 3, we describe data used in the empirical analysis. The model and empirical methodology are presented in Section 4, while in Section 5 we discuss empirical findings. Section 6 represents the conclusion.

## 2. LITERATURE REVIEW

Entrepreneurship was generally assumed to be a core determinant of economic growth since it contributes to promoting innovation and intensifying competition between existing firms. Historically, the debate on the economic impact of entrepreneurship and entrepreneurs dates from the 1900s. Acs and Virgill (2010) outlined that the entrepreneur, as a source of economic change, has been mostly ignored in economic theory, despite the notion of entrepreneur emerged in the writings of Jean Baptiste Say in the early 1800s. Schumpeter (1934) was among the pioneer economists that paid much attention to entrepreneurship and entrepreneurs. As outlined by Smith and Chimucheka (2014), the Schumpeterian perspective considers that the entrepreneur is a leading agent in the economy, having a chief role in stimulating innovations. By doing so, the entrepreneur plays a vital role in determining the economic growth rate in any economy. Schumpeter (1934) particularly evoked the concept of "innovating entrepreneur" (Wennekers and Thurik, 1999). According to Shane and Eckhardt (2005), the leading role of the "innovating entrepreneur" is to discover new processes, new products, and new markets. Berthold and Grundler (2012) suggested that previous studies on the response of economic growth to entrepreneurship have been scarce until the end of the 1980s. Later, the literature extended with the theory of endogenous growth (Aydoğan and Sevencan, 2018). However, Carree and Thurik (2010) noted that most endogenous growth models overlooked the technological and economic impacts of entrepreneurship. In an essay to discuss a simple mechanism by which entrepreneurship affects economic growth, Acs (2006) stressed that entrepreneurs create new firms that enable new jobs to be developed, competition intensified, and productivity increased by technological change. This statement has also been confirmed by Wong *et al.* (2005), who argued that entrepreneurship enhances economic development by encouraging innovation, competitiveness, and rivalry. Wennekers and Thurik (1999) highlighted that the entrepreneur has additional functions other than being an innovator. They also suggested that innovation includes not only the implementation of inventions in the production process but also the entry into new markets.

The existence of a wide range of theoretical explanations of the linkages between economic growth and entrepreneurship has flaunted the ambiguity of the relationship. According to Almodóvar-González *et al.* (2020), the impact of entrepreneurship on economic growth is far from being understood, and scholars are confronted with many challenges when tackling the subject. Consequently, the subject is still purely an empirical one. Regarding this

issue, Wong *et al.* (2005) argued that relatively few econometric studies had been carried out on the subject. As previously mentioned, the lack of a dataset on entrepreneurial activity is considered as the main obstacle facing empirical studies. However, the existence of datasets in the early 2000s has resulted in a growing number of empirical investigations. In what follows, we delimit the review of empirical studies to those devoted to developing countries. However, given the scarcity of these studies, those focusing on developing and developed countries are also explored. In a sample of 20 Middle East and North African countries over the period 1971-2014, Aydoğan and Sevencan (2018) used a linear Cobb-Douglas production function to examine the response of economic growth to entrepreneurship. The self-employment rate has been used as a proxy of entrepreneurship, while the empirical analysis has been done using the panel fixed effects estimator. Two main results have been reached. First, entrepreneurial activity harms economic growth. Second, the study concludes that education plays a vital role in the entrepreneurship-economic growth relationship. Dvouletý *et al.* (2018) studied the case of 48 developing countries between 2000 and 2015. The authors concluded that the established business ownership rate, as a proxy of entrepreneurship, negatively impacts GDP. Koster and Rai (2008) focused on the reaction of economic growth to entrepreneurship in India using data from the Global Entrepreneurship Monitor. The authors revealed that entrepreneurship, more specifically small firm development, positively affects the Indian economy. They conclude that small-scale industries are essential in the development process of the Indian economy. Abid Bashir and Akhtar (2016) concentrated on the impact of entrepreneurial activity on per capita GDP in G20 countries and reported that growth is positively correlated with both entrepreneurship and innovation. Another empirical study of the impact of entrepreneurship on economic growth in 43 countries between 2004 and 2012 was performed by Aparicio *et al.* (2016). The authors employed the 3SLS technique and concluded that entrepreneurship positively affects economic growth.

It is clear from the above-discussed review that mixed results have been reached, and consequently, there is controversy about the impact of entrepreneurship on economic growth in developing countries. From our part, we propose the following first hypothesis:

***$H_1$: Entrepreneurship has a positive effect on economic growth in developing countries.***

Stam and Van Stel (2011) carried out an empirical study of the economic growth impacts of entrepreneurship (measured by the percentage of the adult population that is the owner/manager of an under 42-month-old company) in 36 developed, transition, and emerging economies. The authors concluded that entrepreneurial activity exerts a positive impact on economic growth only in developed and transition countries, while there is no evidence of such an impact in developing countries. Doran *et al.* (2018) concentrated on the effects of entrepreneurship on GDP per capita in 55 middle/low-income and high-income countries during the period 2004-2011. An important conclusion that emerges from this study is that the entrepreneurial activity outcomes are not similar in the two groups of countries. Indeed, entrepreneurship has a positive impact on the economic development of high-income countries, although in medium- and low-income countries, the effect is negative. Almodóvar-González *et al.* (2020) studied the reaction of economic growth to entrepreneurship in 74 developing and developed countries between 2004 and 2009. The economic activity is measured by GDP per capita, while entrepreneurship is measured by the percentage of persons aged between 18–64 years that have been involved in an entrepreneurial initiative that does not exceed 42 months. The empirical analysis shows that factors that intensify

entrepreneurship in developed countries have positive impacts on economic growth. On the contrary, the same factors have a detrimental effect on economic development. In a sample of 42 OECD and non-OECD countries between 2002 and 2012, Urbano and Aparicio (2016) conducted an empirical analysis on economic growth response to entrepreneurial activity. Two important conclusions have been drawn from the analysis. First, entrepreneurship boosts economic growth in the full sample of countries. The effect of entrepreneurship is always positive, but when the full sample is disaggregated, it is higher in OECD countries than in non-OECD countries. Stoica *et al.* (2020) analyzed the response of economic growth to entrepreneurship in 22 European countries between 2002 and 2018. The full sample has been decomposed according to the stage of development. Two sub-samples are considered: transition economies (GDP per capita between $9000 US and $17000 US) and innovation-driven economies (GDP per capita higher than $17000 US). Findings show that early-stage entrepreneurship and opportunities-driven entrepreneurship are driving full-sample economic growth. Furthermore, in innovation-driven economies, entrepreneurship outcomes on economic development are higher than in transition economies.

From the preceding discussion, it is obvious that the impact of entrepreneurship on economic growth depends on the development level. We, therefore, propose the following hypothesis:

***$H_2$: The effects of entrepreneurship on economic growth are higher in countries with high development levels.***

Recent but limited studies have argued that the impact of entrepreneurship on economic growth might depend on other factors. Among others, few studies focused on the trivariate relationship between entrepreneurship, institutions and economic growth, i.e. the role of institutional quality in mediating the impact of entrepreneurship on economic growth. Regarding this issue, Bosma *et al.* (2018) stressed that two distinct strands of the literature exist. The first discussed the relationship between entrepreneurship and economic growth, while the second instead concentrated on the impact of institutions on entrepreneurship. Baumol (1996) argued that institutions might be responsible for driving innovative entrepreneurs to more productive entrepreneurship. In the same vein, North (1990) stated that rules of the game in any economy are determined by institutions. In such a situation, entrepreneurs would be less interested in developing productive entrepreneurship if institutions allow making profits by developing unproductive entrepreneurship. Consequently, by channeling resources to productive entrepreneurship, institutions play an important role in the entrepreneurship-economic growth linkages. According to Bosma *et al.* (2018), institutions play an essential role for entrepreneurs, as they determine when, how, and under what circumstances entrepreneurs may acquire the needed resources for any economic activity. Urbano and Alvarez (2014) stressed the importance of institutions in explaining the role of entrepreneurship in boosting economic growth across countries with different development levels.

Urbano *et al.* (2019) analyzed the findings of 104 theoretical and empirical studies focusing on the relationship between entrepreneurship, institutions and economic growth published between 1992 and 2016. The main conclusion is that institutions may affect economic growth through entrepreneurship. Aparicio *et al.* (2016) investigated the outcomes of entrepreneurial activity on economic growth in 43 economies between 2004 and 2012. The authors introduce a battery of institutional factors that could influence the effects of

opportunity entrepreneurship on economic growth. More specifically, the control of corruption, the number of procedures to start a new business, and the access to bank credits have been considered. The empirical analysis shows that the control of corruption and access to bank credits positively affect entrepreneurship and economic growth, while the number of procedures to start a new business harm both of them. Bosma *et al.* (2018) conducted an empirical analysis of the importance of institutions on the effects of entrepreneurship on economic growth in a sample of 25 European countries during the period 2003-2014. The authors considered three measures of institutional quality, namely the size of government, the regulation of credit, labor, and business, and finally, the access to sound money. Findings of the Three-Stage Least Squares approach reveal that the regulation of credit, labor, and business has positive effects on entrepreneurship, while the size of the government exerts negative effects on it. The authors came to the conclusion that institutional quality affects economic growth by enhancing the quality of entrepreneurship. These results corroborate those of Hall and Sobel (2008), who pointed out that institutions affect economic growth via their influence on entrepreneurship. The authors conducted an empirical investigation on a sample of U.S. states and showed that institutional quality differences might explain differences in entrepreneurship and economic growth rates across states.

Based on the previous discussion, we formulate the following hypothesis:

***$H_3$: The impact of entrepreneurship on economic growth is determined by the quality of institutions***[1].

## 3. DATA

Data used in the empirical investigation comes from different sources. The entrepreneurial activity, measured by the new business density, is obtained from the World Development Indicators (World Bank, 2020). The new business density is defined as new registrations per 1,000 people ages 15-64. The advantage of using new business density as a measure of entrepreneurship is that it is available for a big number of developing countries. Following many previous studies, such as Urbano and Aparicio (2016), Doran *et al.* (2018), and Stoica *et al.* (2020), economic growth is measured by GDP per capita. This variable is also available from the World Development Indicators. Other variables have also been introduced in the specification as control variables. These variables are population growth, government expenditure, inflation, trade openness, and credit to the private sector. All these variables are regarded as possible determinants of economic growth in the preceding literature (De Gregorio and Guidotti, 1995; Gylfason and Herbertsson, 2001; Wu *et al.*, 2010; Keho, 2017; Peterson, 2017; Guru and Yadav, 2019). All control variables are also extracted from the World Development Indicators (World Bank, 2020). Finally, a set of institutional variables have been introduced in the growth model. More specifically, we use the regulatory quality, the rule of law, and the control of corruption. These variables have been obtained from the Worldwide Governance Indicators developed by the World Bank. Our objective in this paper was to include the maximum developing countries in the analysis. The final sample retained comprises 95 developing and emerging countries during the period 2006-2018[2]. It was impossible to cover the period before 2006 since data on new business density starts from 2006.

## 4. THE MODEL AND EMPIRICAL METHODOLOGY

To assess the impact of entrepreneurship on economic growth, the following model is estimated:

$$GDP_{it} = \alpha + \beta_1 POPG_{it} + \beta_2 GOVEXP_{it} + \beta_3 INF_{it} + \beta_4 TOPEN_{it} + \beta_5 DCPS_{it} + \gamma ETP_{it} + \sigma_i + \varphi_t + \varepsilon_{it} \quad (1)$$

where the dependent variable $GDP$ is GDP per capita, $POPG$, $GOVEXP$, $INF$, $TOPEN$ and $DCPS$ represent the control variables of the growth model discussed above, namely population growth, government expenditure, inflation rate, trade openness and the domestic credit to private sector. $ETP$ is the new business density. $\sigma_i$ and $\varphi_t$ are the country and time-specific effects and finally $\varepsilon_{it}$ is the error term. $t$ and $i$ are years and countries.

To ensure the robustness of the results, the model in Equation 1 is estimated using static and dynamic panel data estimators. Regarding the static panel data estimator, we employ the fixed effect estimator and random effect estimator. The Hausman test is applied to decide which of the two estimators is appropriate. Finally, the study employs a dynamic panel data estimator, namely the generalized method of moments (GMM). The advantage of the GMM estimator is that it enables the estimation of a dynamic panel data model that integrates the lagged dependent variable (GDP per capita) as an explanatory variable. This means that the one-period lagged GDP is an explanatory variable of GDP. A model in which the lagged dependent variable is introduced cannot be estimated using the fixed or random effects estimators. The GMM estimator is based on instrumental variables to avoid endogeneity. The dynamic panel data model may be written as follows:

$$GDP_{it} = \alpha_0 + \alpha_1 GDP_{it-1} + \beta_1 POPG_{it} + \beta_2 GOVEXP_{it} + \beta_3 INF_{it} + \beta_4 TOPEN_{it} + \beta_5 DCPS_{it} + \gamma ETP_{it} + \sigma_i + \varphi_t + \varepsilon_{it} \quad (2)$$

where $GDP_{it-1}$ is the lagged dependent variable introduced among the independent variables to capture the dynamics of economic growth.

The empirical methodology of this paper consists of estimating different versions of growth models in Equations 1 and 2 for different samples. We start by estimating the two equations for the full sample of developing and emerging countries. This will allow us to verify the validity of the first hypothesis. Then, we estimate the same equations for different groups of countries classified according to geographic distribution. To this end, four groups of countries are considered, namely Asia, Latin America and the Caribbean, the Middle East and North Africa, and finally Sub-Saharan Africa. Afterwards, we estimate the models in Equations 1 and 2 for different groups of countries according to the income level. Based on the World Bank (2020) classification, two groups of countries are retained, namely low-income countries (below $3995) and high-income countries (more than $3995). The current analysis allows verifying the validity of the second hypothesis.

Finally, we augment the growth models in Equations 1 and 2 with variables measuring the quality of institutions to test the third hypothesis. Interactive variables are also introduced in Equations 1 and 2. Accordingly, three institutional variables are selected: regulatory quality, the rule of law, and control of corruption. The augmented model in Equation 1 may be written as follows:

$$GDP_{it} = \alpha + \beta_1 POPG_{it} + \beta_2 GOVEXP_{it} + \beta_3 INF_{it} + \beta_4 TOPEN_{it} + \beta_5 DCPS_{it} + \gamma ETP_{it} + \delta INST_{it} + \rho(ETP_{it} * INST_{it}) + \sigma_i + \varphi_t + \varepsilon_{it} \quad (3)$$

While the augmented model in Equation 2 may be written as follows:

$$GDP_{it} = \alpha_0 + \alpha_1 GDP_{it-1} + \beta_1 POPG_{it} + \beta_2 GOVEXP_{it} + \beta_3 INF_{it} + \beta_4 TOPEN_{it} + \beta_5 DCPS_{it} + \gamma ETP_{it} + \delta INST_{it} + \rho(ETP_{it} * INST_{it}) + \sigma_i + \varphi_t + \varepsilon_{it} \quad (4)$$

where $(ETP_{it} * INST_{it})$ is the interactive term between entrepreneurship and institutions. The impact of entrepreneurship on economic growth is obtained by differentiating Equation 3 for the static model and Equation 4 for the dynamic model:

$$\frac{\partial GDP_{it}}{\partial ETP_{it}} = \gamma + \rho INST_{it} \quad (5)$$

It is clear from Equation 5 that the impact of entrepreneurship on economic growth depends on the quality of institutions. More specifically, the more the quality of institutions is improved, the more the impact of entrepreneurship on economic growth. It is, therefore, expected that the coefficient $\rho$ is positive.

## 5. DISCUSSION OF EMPIRICAL RESULTS

### 5.1 The full sample

Results of estimating the models in Equations 1 and 2 are reported in Table no. 1. As outlined earlier, three different estimators are employed, namely the fixed effect, random effect, and system GMM. The table shows no significant differences regarding the sign and significance of coefficients of new business density when using the three estimation techniques. The most important result is that the coefficient of new business density is positive and statistically significant at the 1% level in all cases. Consequently, there is strong evidence of the positive effects of entrepreneurship on economic growth. These results align with the previous literature, suggesting that entrepreneurship allows creating new firms, intensifying competition, and increasing productivity through technological change, which spurs economic growth. The estimation of Equation 1 allows also verifying the significance of the determinants of economic growth in developing and emerging countries. As shown, the population growth and the domestic credit to private sector have both positive and significant economic growth effects. A rise in population growth induces an improvement in human capital, which boosts economic growth. The level of domestic credit to the private sector is an indicator of the degree of financial development. More credits to the private sector result from a developed financial system that allows financing new firms and boosting economic growth. This is also in line with the previous literature suggesting the adverse effects of financial repression and the positive effects of financial development on economic growth (McKinnon, 1973; Bist, 2018). As expected, government expenditure and inflation have both adverse effects on economic growth. More government expenditure may harm economic growth by deteriorating public and private investments. Inflation is also harmful to economic growth since it is a synonym of uncertainty and may negatively affect investment and consumption expenditures. Finally, trade openness is found to affect negatively economic

growth, which contradicts the previous literature. Indeed, trade openness may damage economic growth if domestic firms are not well prepared for international competition.

**Table no. 1 – Entrepreneurship and economic growth – The full sample**

| Dependent variable: GDP | FE | RE | SGMM |
|---|---|---|---|
| **Population growth** | 0.205*** | 0.063* | 0.003*** |
| | (0.044) | (0.036) | (0.005) |
| **Government expenditure** | -0.121*** | -0.110*** | -0.007*** |
| | (0.026) | (0.027) | (0.001) |
| **Inflation** | -0.205** | -0.249*** | -0.015*** |
| | (0.085) | (0.087) | (0.006) |
| **Trade openness** | -0.157*** | -0.158*** | 0.015*** |
| | (0.025) | (0.026) | (0.001) |
| **Credit to the private sector** | 0.194*** | 0.223*** | 0.003*** |
| | (0.017) | (0.017) | (0.001) |
| **New business density** | 0.019*** | 0.022*** | 0.003*** |
| | (0.004) | (0.004) | (0.0003) |
| **Lagged GDP** | - | - | 0.986*** |
| | | | (0.001) |
| **Constant** | 6.047*** | 8.348*** | 0.082*** |
| | (0.848) | (0.754) | (0.026) |
| Number of countries | 95 | 95 | 95 |
| R-squared | 0.355 | 0.344 | NA |
| Fischer / Wald statistics | 0.000 | 0.000 | 0.000 |
| Hausman test | 62.96 (0.000) | | NA |
| AR(2) test | NA | NA | 0.161 |
| Hansen test | NA | NA | 0.270 |

*Notes*: FE, RE, and SGMM are the fixed effect, random effect and system generalized method of moments. *, ** and *** represent 10%, 5% and 1% significance level, respectively. Standard errors are in parenthesis. For the Fischer / Wald statistics, AR(2) and Hansen tests, p-values are reported.

The lagged dependent variable of the system GMM (column 4) is positive and significant, suggesting the appropriateness of the dynamic specification and the GMM estimator. Many statistics are reported at the bottom of Table no. 1 to check the goodness-of-fit of the model. The Hausman test for the fixed effects estimator versus the random effects estimator is also reported to select the appropriate model. The p-value of the Hausman test is lower than the 5% level, suggesting that the fixed effects model is more efficient than the random effects model. Furthermore, the table reveals that the system GMM results are acceptable given the validity of the used instruments and the absence of second-order serial correlation.

### 5.2 Decomposition of the sample according to the geographic distribution

The full sample of countries is decomposed into four groups, namely Asia (25 countries), Latin America and Caribbean (23 countries), the Middle East and North Africa (15 countries), and Sub-Saharan Africa (32 countries). More details on the distribution of countries are reported in Table A in the Appendix. The estimation results are presented in Tables 2A (Asia and Latin America and Caribbean) and 2B (the Middle East and North Africa and Sub-Saharan Africa).

**Table no. 2A – Entrepreneurship and economic growth – Regional analysis (1)**

| Dependent variable: GDP | Asia | | | Latin America and Caribbean | | |
|---|---|---|---|---|---|---|
| | **FE** | **RE** | **SGMM** | **FE** | **RE** | **SGMM** |
| **Population growth** | 1.611*** | 0.361*** | 0.004 | 0.159 | 0.080 | 0.018 |
| | (0.125) | (0.082) | (0.003) | (0.110) | (0.063) | (0.015) |
| **Government expenditure** | -1.632*** | -0.091 | 0.026 | 0.116* | 0.134** | 0.187*** |
| | (0.046) | (0.058) | (0.027) | (0.061) | (0.058) | (0.053) |
| **Inflation** | -0.014 | -0.134 | -0.074 | 0.050 | 0.044 | 0.242 |
| | (0.110) | (0.138) | (0.065) | (0.170) | (0.171) | (0.150) |
| **Trade openness** | -0.081* | -0.296*** | 0.027* | -0.062 | -0.068 | -0.011 |
| | (0.044) | (0.049) | (0.016) | (0.041) | (0.041) | (0.037) |
| **Credit to the private sector** | 0.151*** | 0.220*** | 0.046** | 0.295*** | 0.304*** | -0.048* |
| | (0.019) | (0.023) | (0.017) | (0.031) | (0.030) | (0.026) |
| **New business density** | 0.018 | 0.067*** | 0.027*** | 0.011*** | 0.011*** | 0.034*** |
| | (0.013) | (0.015) | (0.007) | (0.003) | (0.003) | (0.005) |
| **Lagged GDP** | - | - | 0.896*** | - | - | 0.812*** |
| | | | (0.031) | | | (0.100) |
| **Constant** | -18.614*** | 3.201** | 0.743* | 4.850** | 6.003*** | -0.121 |
| | (2.255) | (1.604) | (0.366) | (1.962) | (1.288) | (0.940) |
| Number of countries | 25 | 25 | 25 | 23 | 23 | 23 |
| R-squared | 0.702 | 0.577 | NA | 0.681 | 0.680 | NA |
| Fischer / Wald statistics | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Hausman test | 9.67 (0.139) | | NA | 99.71 (0.000) | | NA |
| AR(2) test | NA | NA | 0.271 | NA | NA | 0.818 |
| Hansen test | NA | NA | 0.235 | NA | NA | 0.344 |

**Table no. 2B – Entrepreneurship and economic growth – Regional analysis (2)**

| Dependent variable: GDP | Middle East and North Africa | | | Sub-Saharan Africa | | |
|---|---|---|---|---|---|---|
| | **FE** | **RE** | **SGMM** | **FE** | **RE** | **SGMM** |
| **Population growth** | 0.208*** | -0.211*** | -0.015 | 0.680*** | 0.146** | 0.001 |
| | (0.048) | (0.047) | (0.017) | (0.085) | (0.068) | (0.002) |
| **Government expenditure** | -0.134** | -0.137** | -0.024 | -0.051 | -0.119*** | -0.022*** |
| | (0.057) | (0.057) | (0.041) | (0.035) | (0.040) | (0.006) |
| **Inflation** | -0.156 | -0.159 | 0.210*** | -0.534*** | -0.573*** | -0.057*** |
| | (0.145) | (0.144) | (0.054) | (0.144) | (0.166) | (0.021) |
| **Trade openness** | 0.064 | 0.065 | -0.030 | -0.020 | -0.004 | 0.049*** |
| | (0.060) | (0.060) | (0.051) | (0.035) | (0.040) | (0.007) |
| **Credit to the private sector** | 0.195*** | 0.197*** | -0.023* | 0.072** | 0.220*** | 0.014*** |
| | (0.036) | (0.035) | (0.011) | (0.035) | (0.036) | (0.004) |
| **New business density** | 0.020* | 0.021* | 0.034*** | 0.011** | 0.015*** | 0.005*** |
| | (0.012) | (0.012) | (0.007) | (0.004) | (0.005) | (0.000) |
| **Lagged GDP** | - | - | 0.926*** | - | - | 0.971*** |
| | | | (0.029) | | | (0.001) |
| **Constant** | 12.682*** | 12.681*** | 0.195 | -1.028 | 7.137*** | 0.278** |
| | (1.054) | (1.084) | (0.699) | (1.520) | (1.381) | (0.111) |
| Number of countries | 15 | 15 | 15 | 32 | 32 | 32 |
| R-squared | 28.42 | 28.42 | NA | 46.05 | 36.60 | NA |
| Fischer / Wald statistics | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Hausman test | 6.19 (0.402) | | NA | 68.45 (0.000) | | NA |
| AR(2) test | NA | NA | 0.318 | NA | NA | 0.122 |
| Hansen test | NA | NA | 0.881 | NA | NA | 0.593 |

First, the Hausman test indicates that the fixed effects model is more appropriate than the random effects model for Latin America and Caribbean, and Sub-Saharan Africa. Contrarily, in Asia and the Middle East and North Africa, the random effects model results are more suitable than the fixed effects model. Moreover, the various validation statistics indicate the reliability of the results. The R-squared varies from one group to another but is almost acceptable. The AR(2) and Hansen tests also show the validity of the system GMM findings. Regarding the impact of the entrepreneurial activity on economic growth, the estimation results suggest that almost all coefficients associated with new business density are positive and statistically significant, regardless of the used technique. However, when comparing the magnitude of coefficients, interesting findings emerge. It is clear that the highest impact of entrepreneurship on economic growth is observed for Asian countries when using the fixed effects and random effects models.

Finally, when implementing the system GMM estimator, the highest impact of entrepreneurial activity on economic growth is found for Latin America and the Caribbean, and MENA countries. However, the coefficient associated with Asian economies is close to those of the MENA and LAC countries. Finally, results suggest that the lowest new business density coefficients are associated with Sub-Saharan African countries, regardless of the used estimation method. Findings also show that the impact of credit to the private sector is positive and statistically significant in all groups of countries, highlighting the importance of financial deepening in the development process of developing and emerging countries. Moreover, there is evidence that population growth positively impacts economic development in all countries, except Latin America and the Caribbean. As in the whole sample, government expenditure is negatively linked to economic growth in Asia, MENA, and SSA. In Latin America and Caribbean countries, the impact is positive and statistically significant, highlighting the role of government expenditure in boosting public investments and, consequently, economic growth in these countries. To summarize, results indicate that the highest effect of entrepreneurial activity on economic growth is observed in Asian countries, followed by MENA and LAC. However, the effects in the two latter groups of countries are close. Another notable result is that SSA countries have the lowest impact of entrepreneurship on economic growth. Differences highlighted above regarding the impact the entrepreneurial activity on economic growth suggest that not all developing countries are alike and confirm the importance of making such a geographic decomposition.

### 5.3 Decomposition of the sample according to the income level

The current section aims to examine the validity of the second hypothesis by estimating the effects of entrepreneurial activity on economic growth for two sub-samples according to the income level. By doing so, two groups of countries are considered, namely low-income countries (below $3995) and high-income countries (more than $3995). The estimation results of models in Equations 1 and 2 are reported in Table no. 3. The Hausman test yields a value of 97.75 (p-value= 0.000) for low-income countries and a value of 9.17 (p-value= 0.164) for high-income countries. Consequently, the fixed effects model is appropriate for low-income countries, while for high-income countries, the random effects model is suitable. Estimation results suggest that the three estimation techniques confirm that the new business density coefficients are positive and statistically significant in all cases. Hence, the entrepreneurial activity exerts a positive impact on GDP per capita in the two groups of countries, regardless of the income level. However, the

table shows that the impact of entrepreneurship on economic growth is higher in low-income countries than in high-income ones. This statement holds whether the fixed effect, random effect, or system GMM estimator is considered. These findings suggest that entrepreneurial activity has no comparable impact on economic growth in countries with different income levels. These results contradict the second hypothesis, according to which the impact of entrepreneurship on economic growth is higher in countries with high economic development levels. One potential explanation of these findings is that most previous studies have focused on mixed samples of developed and developing countries. For those samples, the authors often conclude that the impact of entrepreneurship is positive for developed countries and negative in developing ones. The analysis is different from those studies because it only considers developing countries, even if differences regarding their income levels characterize them. Furthermore, one may note that low-income countries are characterized by a weak supply of goods and services, and consequently, more opportunities and less competition are present in those markets.

**Table no. 3 – Entrepreneurship and economic growth – Analysis by income level**

| **Dependent variable: GDP** | **Low-income economies** | | | **High-income economies** | | |
|---|---|---|---|---|---|---|
| | **FE** | **RE** | **SGMM** | **FE** | **RE** | **SGMM** |
| **Population growth** | 0.910*** | 0.240*** | 0.008** | -0.071 | -0.054 | 0.004*** |
| | (0.075) | (0.047) | (0.003) | (0.045) | (0.036) | (0.0009) |
| **Government expenditure** | -0.020 | -0.024 | 0.009 | -0.147*** | -0.151*** | -0.021*** |
| | (0.032) | (0.037) | (0.008) | (0.033) | (0.033) | (0.005) |
| **Inflation** | -0.389*** | -0.591*** | -0.062*** | -0.069 | -0.076 | -0.066*** |
| | (0.135) | (0.153) | (0.017) | (0.089) | 089 | (0.010) |
| **Trade openness** | -0.092*** | -0.134*** | 0.015 | -0.215*** | -0.202*** | 0.024*** |
| | (0.029) | (0.033) | (0.009) | (0.035) | (0.034) | (0.003) |
| **Credit to the private sector** | 0.124*** | 0.196*** | 0.078*** | 0.196*** | 0.196*** | -0.001 |
| | (0.020) | (0.021) | (0.005) | (0.024) | (0.023) | (0.002) |
| **New business density** | 0.057*** | 0.106*** | 0.034*** | 0.018*** | 0.018*** | 0.003*** |
| | (0.018) | (0.020) | (0.002) | (0.003) | 003 | (0.0005) |
| **Lagged GDP** | - | - | 0.842*** | - | - | 0.954*** |
| | | | (0.006) | | | (0.004) |
| **Constant** | -6.228*** | 5.752*** | 0.930*** | 11.167*** | 10.856*** | 0.606*** |
| | (1.494) | (1.119) | (0.106) | (0.847) | (0.726) | (0.060) |
| Number of countries | 50 | 50 | 50 | 45 | 45 | 45 |
| R-squared | 59.23 | 49.80 | NA | 32.07 | 32.02 | NA |
| Fischer / Wald statistics | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Hausman test | 97.75 (0.000) | | NA | 9.17 (0.164) | | NA |
| AR(2) test | NA | NA | 0.166 | NA | NA | 0.050 |
| Hansen test | NA | NA | 0.984 | NA | NA | 0.999 |

In high-income developing countries, markets may contain a considerable number of domestic and foreign businesses. Therefore, newly created businesses may not compete with other firms, and their contribution to economic growth may be weak. Regarding the control variables, results show that domestic credit to private sector and population growth positively affect economic growth in both groups of countries, while trade openness negatively impacts

both. Finally, inflation affects negatively economic growth in low-income countries, and government expenditure has the same impact in high-income developing countries. The lagged dependent variable is positive and statistically significant for both groups, confirming the suitability of the dynamic specification.

### 5.4 The role of institutions

The final section of this paper is reserved for testing the third hypothesis. It consists of checking whether the economic growth reaction to entrepreneurial activity depends on the quality of institutions. To this end, we estimate the model in Equations 3 and 4 for the full sample of countries. The original growth models in Equations 1 and 2 are augmented with interactive terms between new business density and institutions. The results are summarized in Table no. 4. To start, the Hausman test confirms that the fixed effects model offers more accurate estimates than the random effects model. Coefficients associated with entrepreneurial activity are positive and statistically significant regardless of the used estimation technique. This is important as the effect of entrepreneurship on economic growth is often verified, even when we control for institutions. The fixed and random effects techniques show a positive and significant association between regulatory quality and GDP per capita, while the system GMM suggests no significant impact. The impact of the rule of law is ambiguous since coefficients of the fixed and random effects techniques are positive, while the one of the system GMM is negative and significant at 10%. Finally, there is evidence that the impact of control of corruption on economic growth is positive. Overall, the analysis suggests strong positive effects of the three institutional quality variables on economic growth, with some minor differences between the used estimation techniques.

**Table no. 4 – Entrepreneurship and economic growth – The role of institutions**

| Dependent variable: GDP | FE | RE | SGMM |
|---|---|---|---|
| **Population growth** | 0.163*** | 0.040 | 0.007*** |
| | (0.040) | (0.033) | (0.001) |
| **Government expenditure** | -0.100*** | -0.088*** | -0.015*** |
| | (0.024) | (0.024) | (0.004) |
| **Inflation** | -0.106 | -0.133* | -0.034* |
| | (0.079) | (0.081) | (0.018) |
| **Trade openness** | -0.140*** | -0.136*** | 0.021*** |
| | (0.023) | (0.024) | (0.004) |
| **Credit to the private sector** | 0.177*** | 0.198*** | -0.006* |
| | (0.015) | (0.015) | (0.003) |
| **New business density** | 0.024*** | 0.026*** | 0.007*** |
| | (0.005) | (0.005) | (0.001) |
| **Regulatory quality** | 0.123*** | 0.126*** | -0.008 |
| | (0.030) | (0.031) | (0.006) |
| **Rule of law** | 0.134*** | 0.158*** | -0.017* |
| | (0.037) | (0.038) | (0.009) |
| **Control of corruption** | 0.030 | 0.052* | 0.044*** |
| | (0.030) | (0.031) | (0.008) |
| **New business density x regulatory quality** | 0.024*** | 0.025*** | 0.018*** |
| | (0.007) | (0.007) | (0.003) |
| **New business density x rule of law** | -0.032*** | -0.030** | -0.033*** |
| | (0.011) | (0.012) | (0.003) |

| Dependent variable: GDP | FE | RE | SGMM |
|---|---|---|---|
| **New business density x control of corruption** | -0.007<br>(0.010) | -0.010<br>(0.010) | 0.001<br>(0.002) |
| **Lagged GDP** | - | - | 0.992***<br>(0.003) |
| **Constant** | 6.278***<br>(0.792) | 8.209***<br>(0.696) | 0.087<br>(0.081) |
| Number of countries | 95 | 95 | 95 |
| R-squared | 0.451 | 0.443 | NA |
| Fischer / Wald statistics | 0.000 | 0.000 | 0.000 |
| Hausman test | 59.98 (0.000) | | NA |
| AR(2) test | NA | NA | 0.090 |
| Hansen test | NA | NA | 0.160 |

When concentrating on interactive terms introduced in the model to assess the role of institutions in the studied relationship, some interesting findings emerge. The table shows that we have mixed results regarding the sign and significance of interactive terms. The coefficient associated with the regulatory quality is positive and statistically at the 1% level when using the three estimation techniques. These findings imply that the more the regulatory quality in a country is good, the more the impact of the entrepreneurial activity on economic growth is higher. It is useful to mention that the regulatory quality "*reflects perceptions of the government ability to formulate and implement sound policies and regulations that permit and promote private sector development*" (Kaufmann *et al.*, 2011, p. 223). Therefore, the implementation of suitable policies and regulations to promote the private sector is vital to intensify the impact of entrepreneurship on economic growth. The intervention of policymakers in developing countries by improving the business environment is, particularly of great interest. Measures may touch many areas, such as strengthening market functioning, the enforcement of contracts, and the reduction of procedures and cost to start new businesses. Moving to the interactive term between new business density and the rule of law, results may be seen as surprising at first glance. The interactive term is negative and statistically significant in all cases. These findings are contradictory to what has been expected. These results imply that an improvement in the rule of law reduces the impact of entrepreneurship on GDP per capita. Indeed, in some developing countries, the improvement of contract enforcement quality and the strengthening of property rights may represent an obstacle facing new entrepreneurs and reducing their activities, revenues, and profits. This is the case of most developing countries in which property rights are not generally protected. According to Chen and Puttitanun (2005), there is evidence that protecting intellectual property rights in developing countries may be harmful to them. The cost of protecting property rights may be transmitted in our case via the entrepreneurship channel. Finally, findings suggest that the control of corruption has no significant impact on the effects of entrepreneurship on economic growth. These results are robust to the use of different estimation techniques. Consequently, even if corruption records high levels in developing countries (Olken and Pande, 2012), it seems that it has not affected the impact of entrepreneurship on economic growth. This does not mean that the control of corruption is not important for new entrepreneurs, but that it does not affect the entrepreneurship-economic growth relationship.

## 6. CONCLUDING REMARKS

Over the past decades, the role of entrepreneurship in the economy has sparked considerable research interest. However, the literature core strand concentrated on developed countries, while developing countries received little attention. The purpose of this study is to fill this gap by empirically analyzing the impact of entrepreneurial activity on economic growth in a sample of 95 developing and emerging countries from 2006 to 2018. The full sample has been decomposed according to the geographic distribution and the income level. Finally, the research also explores the role of institutions in the relationship between entrepreneurship and economic development. The paper employs three different estimation techniques to check the robustness of findings, namely the fixed effects, random effects, and system GMM.

The empirical analysis reveals many interesting issues regarding the impact of entrepreneurship on economic growth in developing and emerging countries. First, it has been shown that entrepreneurial activity boosted economic growth. This result is robust to the used econometric technique. Second, the decomposition of the full sample according to regional distribution indicates that the impact of entrepreneurship on economic growth is positive and statistically significant in all groups of countries. However, the highest impact is reported in Asia, followed by the Middle East and North African and Latin America and Caribbean countries. The Sub-Saharan African economies have the lowest effects. Third, we decompose the full sample according to the income level. Two sub-groups are considered, low-income and high-income countries. Findings show that the impact is positive in both of them. However, there is strong evidence that the impact of entrepreneurship on economic growth is higher in low-income developing economies than in high-income developing economies. Finally, we check the role that may play institutions when assessing the effects of entrepreneurship on economic growth. The empirical investigation indicates the presence of mixed results. The regulatory quality is found to affect the impact of entrepreneurship on economic growth positively. On the contrary, the results prove that the rule of law negatively affects the entrepreneurship-economic growth linkage, while the control of corruption has no significant effects on it. Given the positive effects of entrepreneurship on economic growth, policymakers should make more efforts to support entrepreneurs and entrepreneurship in developing and emerging countries. Boosting entrepreneurship starts by determining its main drivers. More specifically, policymakers should pay special attention to the business environment to boost entrepreneurship and its positive effect on economic growth. This goal may be reached by carrying out a wide range of reforms and policies regarding the reduction of bureaucracy, the enforcement of contracts, the protection of investors and access to credits.

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## APPENDIX 1

**Table A – The sample and classification of countries**

| # | Countries | Income group | Region | # | Countries | Income group | Region |
|---|---|---|---|---|---|---|---|
| **1** | Afghanistan | LIC | ASIA | **49** | Malaysia | UMIC | ASIA |
| **2** | Algeria | UMIC | MENA | **50** | Mali | LIC | SSA |
| **3** | Angola | LMIC | SSA | **51** | Mauritania | LMIC | MENA |
| **4** | Antigua and Barbuda | HIC | LAC | **52** | Mauritius | UMIC | SSA |
| **5** | Argentina | UMIC | LAC | **53** | Mexico | UMIC | LAC |
| **6** | Azerbaijan | UMIC | ASIA | **54** | Moldova | LMIC | ASIA |
| **7** | Bahrain | HIC | MENA | **55** | Mongolia | LMIC | ASIA |
| **8** | Bangladesh | LMIC | ASIA | **56** | Morocco | LMIC | MENA |
| **9** | Belarus | UMIC | ASIA | **57** | Mozambique | LIC | SSA |
| **10** | Belize | UMIC | LAC | **58** | Namibia | UMIC | SSA |
| **11** | Benin | LIC | SSA | **59** | Nepal | LIC | ASIA |
| **12** | Bhutan | LMIC | ASIA | **60** | Nicaragua | LMIC | LAC |
| **13** | Bolivia | LMIC | LAC | **61** | Niger | LIC | SSA |
| **14** | Botswana | UMIC | SSA | **62** | Nigeria | LMIC | SSA |
| **15** | Brazil | UMIC | LAC | **63** | Oman | HIC | MENA |
| **16** | Cambodia | LMIC | ASIA | **64** | Pakistan | LMIC | ASIA |
| **17** | Central African Rep. | LIC | SSA | **65** | Panama | HIC | LAC |
| **18** | Chad | LIC | SSA | **66** | Paraguay | UMIC | LAC |
| **19** | Chile | HIC | LAC | **67** | Peru | UMIC | LAC |
| **20** | Colombia | UMIC | LAC | **68** | Philippines | LMIC | ASIA |
| **21** | Congo, Dem. Rep. | LIC | SSA | **69** | Qatar | HIC | MENA |
| **22** | Costa Rica | UMIC | LAC | **70** | Rwanda | LIC | SSA |
| **23** | Cote d'Ivoire | LMIC | SSA | **71** | Saudi Arabia | HIC | MENA |
| **24** | Dominican Republic | UMIC | LAC | **72** | Senegal | LMIC | SSA |
| **25** | Egypt, Arab Rep. | LMIC | MENA | **73** | Seychelles | HIC | SSA |
| **26** | El Salvador | LMIC | LAC | **74** | Sierra Leone | LIC | SSA |
| **27** | Ethiopia | LIC | SSA | **75** | Singapore | HIC | ASIA |
| **28** | Gabon | UMIC | SSA | **76** | South Africa | UMIC | SSA |
| **29** | Ghana | LMIC | SSA | **77** | Sri Lanka | UMIC | ASIA |
| **30** | Grenada | UMIC | LAC | **78** | St. Vincent and the Grenadines | UMIC | LAC |
| **31** | Guatemala | UMIC | LAC | **79** | Suriname | UMIC | LAC |
| **32** | Guinea | LIC | SSA | **80** | Tajikistan | LIC | ASIA |
| **33** | Haiti | LIC | LAC | **81** | Tanzania | LIC | SSA |
| **34** | India | LMIC | ASIA | **82** | Thailand | UMIC | ASIA |
| **35** | Indonesia | LMIC | ASIA | **83** | Togo | LIC | SSA |
| **36** | Iran, Islamic Rep. | UMIC | MENA | **84** | Tonga | UMIC | ASIA |
| **37** | Iraq | UMIC | MENA | **85** | Tunisia | LMIC | MENA |
| **38** | Jamaica | UMIC | LAC | **86** | Turkey | UMIC | MENA |
| **39** | Jordan | UMIC | MENA | **87** | Uganda | LIC | SSA |
| **40** | Kazakhstan | UMIC | ASIA | **88** | United Arab Emirates | HIC | MENA |
| **41** | Kenya | LMIC | SSA | **89** | Uruguay | HIC | LAC |
| **42** | Korea, Rep. | HIC | ASIA | **90** | Uzbekistan | LMIC | ASIA |
| **43** | Kuwait | HIC | MENA | **91** | Vanuatu | LMIC | ASIA |
| **44** | Kyrgyz Republic | LMIC | ASIA | **92** | Venezuela, RB | UMIC | LAC |
| **45** | Lesotho | LMIC | SSA | **93** | Vietnam | LMIC | ASIA |
| **46** | Liberia | LIC | SSA | **94** | Zambia | LMIC | SSA |
| **47** | Madagascar | LIC | SSA | **95** | Zimbabwe | LMIC | SSA |
| **48** | Malawi | LIC | SSA | - | - | - | - |

*Note*: The classification of countries is based on the World Bank (2020). LIC: low-income economies ($1,025 or less), LMIC: lower-middle income economies ($1,026 to $3,995), UMIC: upper-middle-income economies ($3,996 to $12,375), HIC: High-income economies ($12,376 or more). MENA: Middle East and North Africa, SSA: Sub-Saharan Africa, LAC: Latin America and the Caribbean.

**Notes**

[1] See Table A for details on the sample of countries.

[2] We thank a reviewer for recommending that we develop this hypothesis.