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ENTREPRENEURSHIP, FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH

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ABSTRACT

This study adds to the current body of research on economic growth by demonstrating how the interplay between financial development and entrepreneurship fosters economic advancement. By utilizing the two-step Generalized Moment Method (GMM), we have identified three primary outcomes. Firstly, entrepreneurship has a beneficial influence on economic growth. Secondly, financial development has a conditional effect that stimulates economic growth. Lastly, the combined effect of entrepreneurship and financial development on economic growth is largely positive, suggesting that financial development can amplify the already positive but weak entrepreneurship's influence on economic growth. The research investigation also delves into the empirical significance and policy implications of these findings.

Keywords: Financial development; Entrepreneurship; Economic growth; GEM.
JEL Classifications: C23; O16; O40.

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I. INTRODUCTION

We have multiple reasons for conducting research on the significance of financial development in bolstering entrepreneurial endeavors for the purpose of fostering economic progress in diverse economies. These motivations include: 1) understanding the influence of entrepreneurship on economic growth; 2) recognizing financial development's contribution to stimulating economic progress; 3) acknowledging the contribution of the financial sector in fostering entrepreneurial activities; and 4) addressing the gaps present in previous studies. The subsequent sections will provide a more comprehensive exploration of these ideas.

First, the main focus of this article is to delve into the factors that contribute to varying economic growth processes by examining the disparities in background between developed and developing countries. Specifically, the objective of this study is to provide insights into how entrepreneurship impacts economic results, which have generated significant interest among researchers, particularly in the context of national-level analysis (Terjesen *et al.*, 2016; Hessels and van Stel, 2011; Chowdhury and Audretsch, 2021). On this basis, some authors began to explore the possible impact of entrepreneurship on unemployment, exports, and economic growth (Contractor and Kundu, 2004; Hessels and van Stel, 2011; Galindo and Mendez-Picazo, 2013; Urbano and Aparicio, 2016; Aghion, 2017; Cumming and Johan, 2017; Acs *et al.*, 2018; Erken *et al.*, 2018).

Second, in recent years, there has been significant policy discussion and research emphasizing the connection between the advancement of financial systems and the expansion of the economy due to its crucial role in the growth literature. As a result, financial development has gained significant importance in the field. In this context, some theoretical studies have modeled the services provided by intermediaries and financial markets. They show that by providing information about possible projects, monitoring investments in execution, controlling the management of financing enterprises, improving risk management, mobilizing savings, and promoting trade in goods and services, financial development stimulated capital accumulation, increased overall factor productivity, and accelerated long-term growth (Levine, 1997; Bencivenga *et al.*, 1995; Greenwood and Smith, 1997). Empirically speaking, most surveys have confirmed theoretical predictions and concluded that financial development has significant benefits to long-term growth rates (Rajan and Zingales, 1998; Demetriades and Hussein, 1996; McCaig and Stengos, 2005; Ang, 2008).

Third, one of the key factors affecting entrepreneurial activities in various countries is financial development (Gaies *et al.*, 2021). According to Levine (2005), financial development is a mechanism that allows financial instruments, markets, and intermediaries to improve information processing, contract execution, and transaction execution, so that the financial system can better perform its functions. Recently, several existing studies conducted on economies of different levels of development agree that a well-functioning financial sector can promote entrepreneurial activity and new business registration (for example, see Aparicio *et al.*, 2016; Cole *et al.*, 2016; Cumming and Zhang, 2016; Wujung and Fonchamnyo, 2016; Cumming *et al.*, 2017). They present compelling proof to endorse the notion that financial advancement plays a crucial role in determining entrepreneurial

engagement across various countries. Similarly, due to the interconnectedness of entrepreneurship and financial development, both of which contribute positively to economic growth, our objective is to illustrate how financial progress can bolster entrepreneurial endeavors and subsequently impact the economic growth of both developing and developed economies. In essence, financial development is employed as a policy variable that can amplify entrepreneurial activities to foster economic growth. To our knowledge, this study represents the initial exploration of the synergistic relationship between entrepreneurial activity and the evolution of the financial sector, highlighting their joint role in promoting economic growth.

Finally, this study also addresses the relevant gaps in the previous literature. First, previous empirical studies only focused on individuals or specific groups of variables, such as economic conditions, resources and capabilities, or culture (Fraser *et al.*, 2015), and did not consider all these variables together. To the best of our knowledge, there hasn't been any empirical research that examines the combined impact of these variables on economic growth. Additionally, the existing body of literature primarily concentrates on the correlation between entrepreneurship and growth (Manolova *et al.*, 2008; Tracey and Phillips, 2011; Thai and Turkina, 2014; Williams and Shahid, 2016), or the association between financial development and growth (Thai and Turkina, 2014; Wujung and Fonchamnyo, 2016; Dutta and Sobel, 2018; Munemo, 2018). However, these studies fail to acknowledge how financial development conditions facilitate entrepreneurial activities in order to achieve higher levels of economic growth.

In view of the above motivations, our survey provides some theoretical and empirical contributions to the ongoing literature. Initially, from a theoretical perspective, this study broadens the existing body of research on economic expansion by demonstrating the ways in which the progress of the financial sector can amplify entrepreneurial endeavors, consequently fostering overall economic growth. In addition, we are based on the views of Gnyawali and Fogel (1994) on the institutional factors of entrepreneurship and economic development. Here, we propose entrepreneurship as an additional mechanism to transfer the impact of financial development to economic results. Second, policymakers may be interested in the significant differences between developed and developing countries (Fainshmidt *et al.*, 2018).

Secondly, taking an empirical perspective, this research made a valuable contribution to the existing body of growth literature by evaluating and analyzing the overall effect of the interplay between entrepreneurship and financial development on the advancement of the economy. More specifically, we take financial development as a conditional variable that promotes entrepreneurial activities to affect economic growth, that is, financial development can regulate the weak impact of entrepreneurship on economic growth. This article also expands on previous research in this area by focusing on a global sample including developing and developed countries. As mentioned above, we believe that a worldwide sample of countries provides an important framework for investigating this interaction. The remaining sections of the paper are structured in the following manner. In Section II, a concise overview of the existing literature and the development of hypotheses is provided. Section III outlines the data and methodology used in

this study. The empirical findings are presented in Section IV, while the paper is concluded in Section V.

II. REVIEW OF EXSISTING LITERATURE AND DEVELOPMENT OF HYPOTHESES

A. *Entrepreneurship and Economic Growth*

Since the pioneering work of Adam Smith (1776) "The Wealth of Nations", several theories have contributed to the interpretation of economic development. The neoclassical growth theory is one of the first major contributions of the growth model to explain growth (Solow, 1956; Swan, 1956). The theory of Traditional neoclassical growth models relied on exogenous factors such as technological progress and capital accumulation to explain long-term economic growth. However, the literature on endogenous growth, spearheaded by economists like Romer (1986) and Lucas (1988), introduced the idea that economic growth is not solely determined by exogenous forces but can be actively influenced by endogenous factors within the economic system. Historically, Schumpeter (1934) first introduced the important role of entrepreneurship in economic growth. Romer (1990) further argued that well-educated entrepreneurs created new technological advancements and ultimately promoted economic growth. Alongside the endogenous growth theory, the entrepreneurial knowledge spillover theory (KSTE) can also be elucidated (Carlsson *et al.*, 2009). The primary significance of this theory in entrepreneurship lies in its perspective that entrepreneurs serve as the crucial intermediary who converts public knowledge into economic and business knowledge, thereby fostering growth in a positive manner.

Regarding the influence of entrepreneurship on the economy's growth, numerous theoretical and experimental investigations employ supplementary frameworks, such as the generalized growth model developed by Solow (1956; 1957), to regard entrepreneurship as a key factor that drives growth (González-Pernía and Peña-Legazkue, 2015; Capello and Lenzi, 2016; Prieger *et al.*, 2016; Acs *et al.*, 2018). Furthermore, numerous theoretical justifications exist concerning the correlation between economic growth and entrepreneurship. These include studies by Baumol (1990), Van Stel *et al.* (2005), Thurik *et al.* (2008), Boudreaux (2014), Ihugba *et al.* (2014), and Bosma *et al.* (2018).

Therefore, a large amount of literature confirms that the higher the entrepreneurial activities of different countries, the better their economic performance. Based on this, the first assumption is as follows:

H1: Entrepreneurship is positively correlated with economic growth.

B. *Financial Development and Economic Growth*

During the early 1990s, the primary focus was not on achieving long-term growth, and developing countries generally did not consider financial policies as a viable option (Stiglitz, 2000). According to Apergis *et al.* (2007), theoretical research suggests there could be four different ways that having better financial systems might help a country's economy grow.

There are four hypotheses that explain the relationship between financial development and economic growth:

- a) **Supply-Led Response Hypothesis:** This hypothesis suggests that financial development leads to economic growth. It argues that when the financial sector becomes more developed, it provides the necessary funding and resources for investment and entrepreneurship, leading to increased productivity and economic growth.
- b) **Demand Response Hypothesis:** According to this hypothesis, economic growth drives financial development. It posits that as the physical sector of the economy expands and economic activities increase, the demand for financial services also grows. In response to this demand, new financial institutions emerge to cater to the needs of the growing economy.
- c) **Mutual Influence Hypothesis:** This hypothesis suggests a two-way causal relationship between finance and growth. It implies that financial development and economic growth mutually influence each other. As the financial sector develops, it supports economic growth, and in turn, economic growth creates demand for further financial development.
- d) **Non-Causal Hypothesis:** This hypothesis argues that there is no direct causal relationship between financial development and economic growth. It suggests that the relationship between the two variables is coincidental or influenced by other factors. Some proponents of this hypothesis believe that financial development and economic growth are outcomes of a common underlying factor, such as institutional quality or technological progress.

These four hypotheses provide different perspectives on how financial development and economic growth are related, and their validity may depend on specific contexts and empirical evidence.

However, a substantial body of literature and theory supports the notion of a relationship between finance and economic growth (Cheng and Degryse, 2010; Akingunola, 2011; Pacewicz, 2012; Menyah *et al.*, 2014; Taiwo *et al.*, 2016; Mason and Harrison, 2017; Mo, 2018).

The findings from the survey provide compelling evidence of the substantial and statistically significant impact of finance sector progress on economic development. Therefore, we can formulate the second hypothesis as follows:

H2: an increase in financial development is associated with higher levels of economic growth.

C. Financial Development, Entrepreneurship, and Economic Growth

Promoting financial development through diversification of financial tools and improving financial service channels can reduce the external financing costs of enterprises and help enhance entrepreneurial activity. This is why financial development has become a prerequisite for entrepreneurial motivation.

From a theoretical point of view, Schumpeter (1912) is still the first in this sense. He emphasized the important role of bankers in identifying entrepreneurs with promising innovation processes and contributed to this innovative activity. Provide the necessary credit. According to Patrick (1966), the financial system serves two primary purposes: transferring resources from the traditional sector to the modern sector and fostering entrepreneurial drive within the modern sector. Some scholars have developed models that point out the role of financial

intermediaries as a means of leveraging innovation. These include King and Levine (1993a), Blackburn and Hung (1998), Acemoglu *et al.* (2006) and Omri *et al.* (2015), they show that these intermediaries promote technology by supporting entrepreneurs with the most suitable characteristics to succeed in developing innovative projects and thus promote productivity growth.

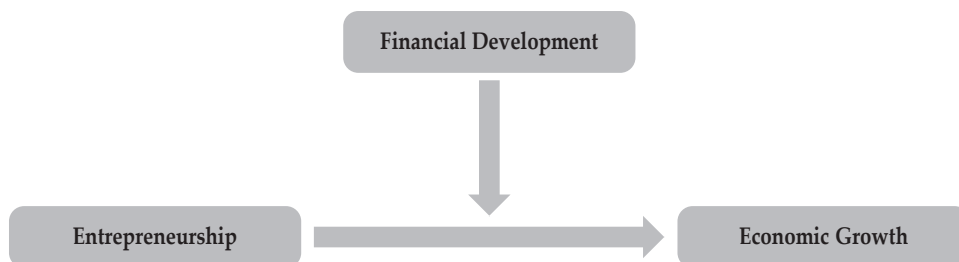
Recent literature extensively examines the connection between financial development and entrepreneurship from an empirical standpoint. One example is the work of King and Levine (1993a; 1993b), who employ the endogenous growth model to demonstrate that financial development positively influences entrepreneurship, its productivity, and successful innovation, thereby fostering sustainable economic growth. Similarly, Klapper *et al.* (2007) establish a positive correlation between a country's financial development and the number of companies operating within it. Moreover, scholarly research emphasizes the critical role played by financing channels in entrepreneurship, as highlighted by Ayyagari *et al.* (2008); Demirgüç-Kunt and Maksimovic (1998); Merton and Bodie (1995); and Omri and Ayadi-Frikha (2014). Likewise, Klapper *et al.* (2006) observe a positive association between financial development and entrepreneurship, indicating that the availability of financial resources, particularly through banking institutions, cultivates an environment conducive to prosperous entrepreneurship and strengthens the ability to establish new ventures (Kibler 2013; Wujung and Fonchamnyo, 2016; Fan and Zhang, 2017; Gu and Qian, 2019).

Unlike the papers discussed above, we advocate for a comprehensive framework that examines the interplay of financial advancement, entrepreneurial activities, and economic expansion. In addition, we can observe that researches tend to ignore the theoretically related ways in which financial development regulates the relationship between entrepreneurship and overall economic performance. The study conducted by King and Levine (1993a) using the endogenous growth framework showed that finance has a positive impact on future entrepreneurship, productivity, risk diversification, profitability, and successful innovation for sustainable economic growth. Cheng (2007) shares the perspective that finance plays a supportive role in fostering entrepreneurship, leading to favorable effects on economic growth. Evidence in the literature also shows that finance can promote growth is also essential for entrepreneurship to enable them to contribute to the economy. This is because entrepreneurs must have resources, mobilize them, and deploy them effectively before they can contribute to overall economic growth (Naudé, 2007; Van Hemert, 2008).

Figure 1 below shows a schematic diagram of our extended model. In the lower part of the figure, we show the current state of mainstream growth experience, where financial development (as the fundamental cause) affects economic growth through the accumulation of production factors (as the proximate cause). In the upper part, we expand the model by clearly explaining the importance of entrepreneurship in driving economic growth. We propose to model entrepreneurship as a proximate cause and study how financial development influences growth through such entrepreneurial activities. Then the only assumption we need to impose is that financial development influences growth (primarily) through their impact on entrepreneurial activity. In this way, financial development has an indirect impact on economic growth through its ability to promote and support entrepreneurial activities.

Figure 1.
The Diagram of the Theoretical Framework

This figure shows the theoretical framework.



To sum up, based on the theoretical premise expressed in Figure 1, this study aims to clarify this relationship by examining two research questions: 1) Does the level of financial development influence the impact of entrepreneurship on economic growth; 2) If research question 1 is proved to be correct, what is the strength or direction of this moderating effect. Therefore, the following hypothesis emerged:

H3: Financial development fosters entrepreneurial spirit, which in turn promotes economic growth.

III. DATA AND METHODOLOGY

A. Data

This research utilizes yearly panel data spanning from 2001 to 2018 in 42 countries that participated in the Global Entrepreneurship Monitor (GEM) program. The choice of these countries is determined by the presence of data pertaining to the variables under scrutiny in the analysis. In order to obtain a balanced data panel, we limit the data used to the years that cover all data sets. This hypothesis was tested in a sample of 42 countries, which were divided into two groups based on income levels. This classification is based on calculations by the World Bank in 2018 using the World Bank Atlas method.

Developing countries refer to all countries with a per capita income of less than US\$12,236, including Argentina, Brazil, Chile, Colombia, Ecuador, Egypt, Guatemala, India, Iran, Malaysia, Mexico, Panama, Russia, South Africa, Thailand, and Turkey.

Developed countries refer to all countries with a per capita income of US\$12,236 or more, including Australia, Belgium, Croatia, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Latvia, Netherlands, Norway, Poland, Portugal, Slovakia Republic, Slovenia, South Korea, Spain, Sweden, Switzerland, United Kingdom, United States, and Uruguay.

In our study, GDP per capita serving as the dependent variable, indicating the level of economic growth. We obtain the data for GDP per capita from the World Bank's World Development Indicators (WDI) database, which is a reliable source for economic indicators.

The main explanatory variable in our analysis is the level of entrepreneurial activity at the national level, measured by the total amount of early entrepreneurial activity (TEA). To obtain this data, we rely on the Global Entrepreneurship Monitor (GEM), which is a reputable source for entrepreneurial data. The GEM collects information through an adult population survey, with a minimum sample size of 2,000 respondents per country. The survey questions used across participating countries are standardized, ensuring comparability, and facilitating cross-country analysis. TEA represents the percentage of working-age individuals actively involved in starting new businesses or managing businesses for a duration of less than 42 months.

Additionally, we include several control variables in our analysis to account for various factors that influence economic growth, as suggested by economic growth theory. These control variables encompass the investment ratio (expressed as a percentage of total capital formation in GDP), indicators of knowledge such as Research and Development (R&D) expenditure and education level, the unemployment rate, government expenditure, population growth, and the degree of economic openness. These variables help us capture the multifaceted aspects of economic growth and control for potential confounding factors. Table 1, provided detailed information about the variables and their sources.

Table 1.
Data Description

This table provides detail data description of all variables considered in this study.

Variables	Description	Source
Dependent Variables		
<i>GDP per capita (constant 2010 US\$) (GDPC)</i>	GDP per capita is gross domestic product divided by midyear population. Data are in constant 2010 U.S. dollar	World Bank's World Development Indicators (WDI) database
Independent Variables		
Total early-stage entrepreneurial activity rate (<i>TEA</i>)	The percentage of working age population who are either actively involved in starting a new business (nascent entrepreneurs) or are running a new business that is less than 42 months old (new entrepreneurs).	Global Entrepreneurship Monitor
Domestic credit to private sector by banks (% of GDP) (<i>DCPB</i>)	Domestic credit to private sector by banks refers to financial resources provided to the private sector by other depository corporations (deposit taking corporations except central banks), such as through loans, purchases of no equity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries these claims include credit to public enterprises.	WDI
Control Variables		
Gross capital formation (% of GDP) (<i>GCF</i>)	Gross capital formation (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories.	WDI

Table 1.
Data Description (Continued)

Variables	Description	Source
Research and development expenditure (% of GDP) (<i>RD</i>)	Gross domestic expenditures on Research and Development (R&D), expressed as a percent of GDP. They include both capital and current expenditures in the four main sectors: Business enterprise, Government, Higher education, and Private non-profit. R&D covers basic research, applied research, and experimental development.	WDI
Education, total (%) (Cumulative). (<i>EDU</i>)	The percentage of population ages 25 and over that attained or completed post-secondary non-tertiary education.	WDI
Unemployment (<i>UNE</i>)	Unemployment refers to the share of the labor force that is without work but available for and seeking employment.	WDI
Government expenditures as percentage of GDP (<i>GOV</i>)	General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees)	WDI
Population growth (annual %) (<i>POP</i>)	Annual population growth rate for year <i>t</i> is the exponential rate of growth of midyear population from year <i>t-1</i> to <i>t</i> , expressed as a percentage.	WDI
Trade (% of GDP) (<i>TR</i>)	The sum of exports and imports of goods and services measured as a share of gross domestic product.	WDI
Inflation, consumer prices (annual %) (<i>INF</i>)	Annual % change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or change at specific intervals (yearly).	WDI

Table 2 below demonstrates the descriptive statistics of 42 selected countries dividing 2 groups developing and developed countries over the period 2001 to 2018. The average entrepreneurial activities in all countries are 9.81% with the highest number at 36% in working age population. Developing countries have an average TEA value of 14.27% and on developed countries this figure is 7.53%. During the research period, the average economic growth of all selected countries is positive. In developing countries, banks exhibit a credit range of 10.62% to 121.94% when it comes to domestic lending to the private sector, while this range in developed countries is from 0.186% to 192%. Figure 2 below shows the average of main variables in the study.

Table 2.
Descriptive Statistics

This table provides descriptive statistics of all variables considered in this study. GDP per capita (*GDPC*), total early-stage entrepreneurial activity rate (*TEA*), domestic credit to private sector by banks (*DCPB*), Gross Capital Formation (*GCF*), research and development expenditure (*RD*) Education (*EDU*), Unemployment (*UNE*), Government expenditures as percentage of GDP (*GOV*), Population growth (*POP*)Trade (*TR*), Inflation (*INF*).

Vars.	All Countries				Developing Countries				Developed Countries			
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
<i>GDPC</i>	1.67	2.78	-8.55	9.51	2.27	3.24	-8.55	9.51	1.38	2.49	-8.38	8.42
<i>TEA</i>	9.81	5.72	1.6	36	14.3	6.89	2.5	36	7.53	3.13	1.6	19.4
<i>DCPB</i>	74.92	40.25	0.186	192	44.2	24.51	10.62	121.9	89.84	37.9	0.19	192
<i>GCF</i>	21.58	3.67	10.78	34.3	21.8	4.24	14.27	34.31	21.46	3.37	10.8	30.87
<i>RD</i>	1.43	1.008	0.029	4.42	0.58	0.33	0.029	1.44	1.85	0.96	0.32	4.43
<i>EDU</i>	23.86	10.77	2.83	63.06	14.7	6.03	2.83	63.06	28.33	9.69	7.57	47.67
<i>UNE</i>	8.98	5.35	1.22	32.31	9.88	7.062	1.22	32.31	8.55	4.23	2.49	26.49
<i>GOV</i>	18.27	4.17	8.51	26.36	14.5	3.24	8.51	20.80	20.09	3.27	11.2	26.36
<i>POP</i>	0.71	0.75	-3.85	2.90	1.27	0.31	0.045	2.09	0.43	0.74	-3.85	2.89
<i>TR</i>	77.06	40.74	22.11	189.5	53.9	25.78	22.11	162.5	88.25	42.1	24.3	189.5
<i>INF</i>	4.20	5.51	-6.02	41.12	8.48	7.49	-6.02	41.12	2.13	2.19	-5.21	11.04

Figure 2.
Average of Main Variables (TEA Entrepreneurship Index)

These figures provide average of all variables considered in this study.

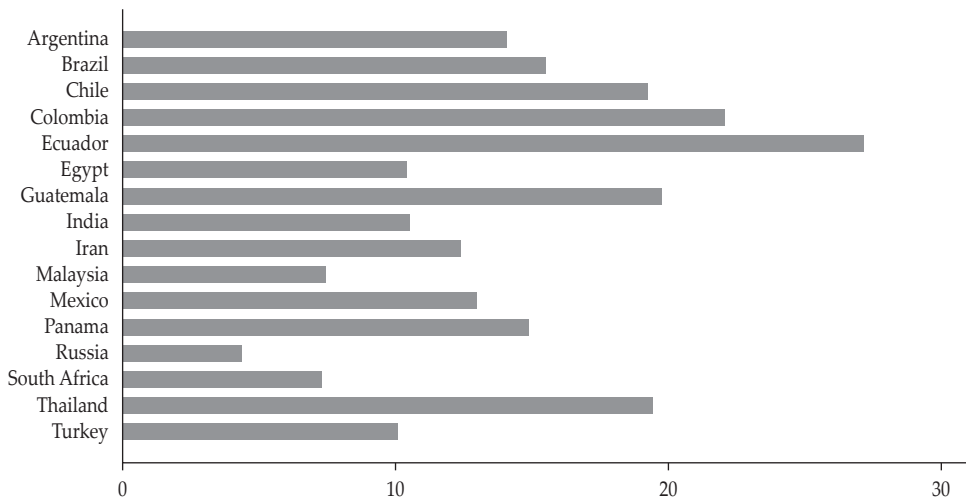


Figure 2.
Average of Main Variables (Financial Development) (Continued)

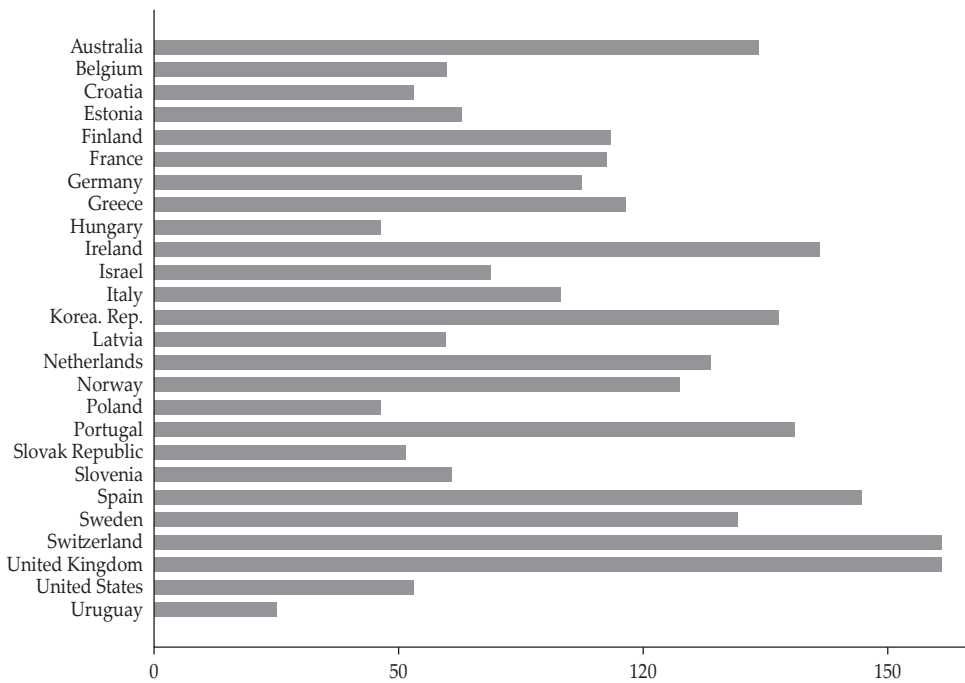
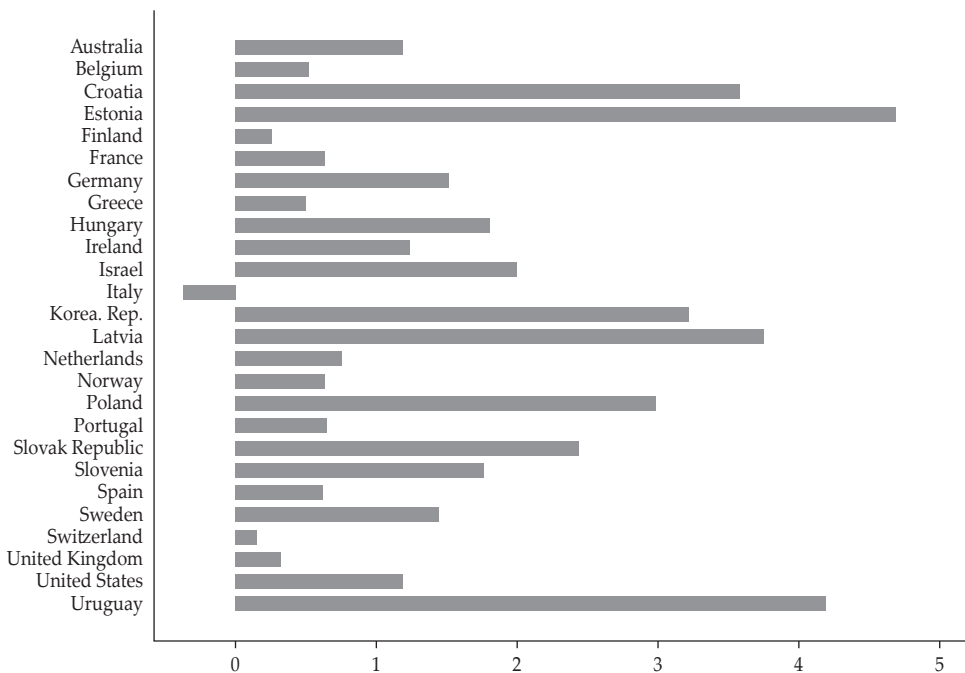


Figure 2.
Average of Main Variables (GDP per Capita Growth) (Continued)



B. Methodology

We employed the growth model proposed by Aparicio *et al.* (2016) as the framework for our research analysis. It is based on a one-sector standard neoclassical gross production function, in which entrepreneurship is an input. We have extended the panel growth regression model with financial development. Finally, in order to assess the interaction analysis, this study uses the product term method, which is the most commonly used method to test statistical interaction (also known as moderation) effects using linear regression. In this method, when the third variable (moderator) affects the association between the predictor variable and the outcome variable, an interaction/moderating effect will occur. This can be demonstrated when a new variable (X3) is created by multiplying two independent variables (X1*X2), and then using this new variable (X3) together with its constituent items X1 and X2 into the regression model to create a new variable (X3). The specification of the total production function will take the following form:

$$GDPC_{it} = \beta_0 + \beta_1 GDPC_{it-1} + \beta_2 TEA_{it} + \beta_3 DCPB_{it} + \beta_4 (TEA * DCPB)_{it} + \beta_5 GCF_{it} + \beta_6 RD_{it} + \beta_7 EDU_{it} + \beta_8 UNE_{it} + \beta_9 GOV_{it} + \beta_{10} POP_{it} + \beta_{11} TR_{it} + \beta_{12} INF_{it} + \gamma_{it} + \varepsilon_{it} \quad (1)$$

where GDP as dependent variable taken from WDI indicators 2019, entrepreneurship as the independent variable proxies by total early-stage entrepreneurial activity (TEA) was taken from the GEM database, the ratio of private sector credits to GDP as a proxy for financial development was taken from WDI indicators 2019; (TEA*DCPB) shows an interaction effect between financial development and entrepreneurship.

We employ the GMM approach to analyze the correlation among entrepreneurship, financial development, and economic growth. Our study focuses on two distinct groups of countries: developing and developed nations. Moreover, within the context of this study, if the presence of a moderation effect is confirmed, it is necessary to examine three hypotheses in the statistical model of moderation. Specifically, Hypothesis 1 suggests a significant correlation between entrepreneurial activities (TEA) and economic growth (GDPC). Hypothesis 2 suggests that there exists a significant correlation between the development of the financial sector and the rate of economic growth. Hypothesis 3 suggests that the impact of entrepreneurship on economic growth is influenced by the level of financial development, and this moderation effect is significant. It should be noted that Hypothesis 1 serves as a prerequisite for Hypothesis 3. Hypothesis 3 can hold true even if Hypothesis 2 is proven false.

IV. MAIN FINDINGS

We employ a dynamic panel system of General Methods of Moments (GMM). As shown in Table 3, the results of the Sargan tests suggest that the null hypothesis, which states that the over-identification restrictions are valid, cannot be rejected for model 1 and model 3 at 5% significance level, suggesting that the instruments used in this study are appropriate in these models. There is no autocorrelation in all the models as evidenced by the AR (1) and AR (2) test (Arellano and Bond, 1991).

Table 3.
Regression Results

This table reports the estimation results. The dependent variable is $L(GDPC)$ GDP per capita, $GDPC(-1)$ is a lagged dependent variable with a lag of one period. All models are based on GMM approach. Standard Errors is presented in parentheses. ***, **, and * represent significance level at $p < 0.01$, $p < 0.05$, and $p < 0.1$ respectively. Arellano-Bond AR (1) test (AR (1)); Arellano-Bond AR (2) test (AR (2)).

Variables	Model 1 All Countries	Model 2 All Countries	Model 3 Developing Countries	Model 4 Developed Countries
$DLn(GDPC(-1))$	0.248 (0.034)	0.248 (0.034)	0.247 (0.083)	0.265 (0.037)
$DLn(TEA)$	0.188*** (0.011)	0.166*** (0.015)	0.076 (0.088)	0.178*** (0.019)
$DLn(DCPB)$	0.134*** (0.025)	0.129*** (0.021)	0.147*** (0.021)	0.136*** (0.013)
$DLn(TEA*DCPB)$	-	0.247*** (0.021)	0.233*** (0.016)	0.224*** (0.018)
$DLn(GCF)$	0.016*** (0.007)	0.013*** (0.005)	0.012*** (0.003)	0.014*** (0.005)
$DLn(RD)$	0.027*** (0.011)	0.032** (0.013)	0.045*** (0.012)	0.049*** (0.011)
$DLn(EDU)$	0.007*** (0.002)	0.006* (0.003)	-0.005* (0.002)	0.008*** (0.002)
$DLn(UNE)$	-0.014*** (0.004)	-0.012*** (0.003)	-0.012** (0.005)	-0.022*** (0.006)
$DLn(GOV)$	0.018*** (0.004)	0.014** (0.005)	0.017*** (0.005)	0.021*** (0.006)
$DLn(POP)$	0.036*** (0.011)	0.039*** (0.012)	0.056*** (0.015)	0.067*** (0.017)
$DLn(TR)$	0.015** (0.004)	0.017** (0.005)	0.016*** (0.003)	0.014 (0.008)
$DLn(INF)$	-0.026 (0.016)	-0.024* (0.011)	-0.039*** (0.011)	-0.031*** (0.009)
Diagnostics Tests				
Sargan Test	146.09 (0.784)	146.09 (0.784)	145.46 (0.743)	144.37 (0.758)
AR (1)	-0.765 (0.452)	-0.765 (0.452)	-0.684 (0.491)	-0.867 (0.387)
AR (2)	-2.331 (0.023)	-2.331 (0.023)	-2.348 (0.019)	-2.316 (0.026)

In Table 3, model 1 includes the direct effect of entrepreneurship on economic growth, whereas model 2 shows the moderating influence of the financial development on the Linkage between Entrepreneurship and Economic Growth. The first two models are central to addressing the research question. In this way, we get to test for hypotheses 1, 2, and 3 by examining the significant difference in the model fit when progressing from model 1 to model 2. Specifically, for more clearness, models 3 and 4 consider country-level stages of economic development. These models developed as it suggested that the financial development as an institutional factor affect entrepreneurial activity differently based on the stage

of economic development (Acs *et al.*, 2014). Accordingly, the sample split into high/low-income per capita countries to distinguish the country-level stage of development for our study; While, models 3 and 4 represent developing and developed countries, respectively.

From Table 3, the coefficients of GDP_{it-1} are positive and significant indicating that the lagged economic growth has self-reinforcing effect. Hypothesis 1 confirmed since TEA was significantly correlated with economic growth ($B=0.166$, $p<0.01$). Then, a 1% increase in TEA augments the economic growth with 0.166% and 0.188% in whole sample and developed countries, respectively. While in models 3 and 4, since both the signs and significance of the TEA differ across two groups of countries, the empirical findings validate the heterogeneous impact of the entrepreneurship on economic progress. Specifically, the estimates in model (3) show that TEA does not exert a noteworthy influence on the growth of developing economies. In developed economies, there is a statistically significant and positive relationship between TEA and economic growth. This suggests that the economic growth in developed countries benefits from the development of entrepreneurial activities. In contrast, developing countries experience a not much economic growth with the development of entrepreneurial activities. These results are in line with the results of (Holcombe, 2000; Van Stel *et al.*, 2005; Valliere and Peterson, 2009; Dvouletý, 2018; Baumol, 1990; Carree and Thurik, 2010; Boudreaux, 2014).

In H2, our prediction indicated a positive association between the advancement of the financial sector and the expansion of the economy. We obtained evidence in favor of H2, which posits that access to finance significantly increase economic growth. In addition, the findings suggest that the effect of financial access on economic growth has been more pronounced in developing countries ($B=0.147$, $p<0.01$) compared to developed countries ($B=0.136$, $p<0.01$), aligning with previous studies such as Cole *et al.* (2016), Cumming and Groh (2018), and Samila and Sorenson (2011). Furthermore, the expansion of the financial sector plays a crucial role in driving GDP growth. Consequently, a 1% increase in the development of the financial sector can lead to a corresponding GDP growth of 0.136% in developed countries and 0.147% in developing countries.

Table 3 highlights that the relationship between entrepreneurship and GDP growth is dependent on the extent of financial access across countries. We found support for H3; as shown in model (2), we see that interaction term is statistically significant, indicating that the impact of entrepreneurship on growth rates is influenced by the level of financial development . The coefficient on TEA is 0.165 and the coefficient on $TEA*DCPB$ is 0.247. This means that while TEA has a positive effect in general, for one unit increases of TEA , GDP expected to increase by 0.247 units in whole sample of countries. As a result, for every one-unit increase in $DCPB$, the effect of a one-unit increase in TEA on GDP becomes more positive by 0.247. Therefore, the effect of TEA seen even more strongly in countries that have higher levels of financial development. The results of Model 2 indicate that financial development has a moderating effect in all the economies examined in the study. This underscores the importance of financial development in promoting entrepreneurial activities across various economic settings; in line with the conclusions drawn by previous studies such as Urbano and Aparicio (2016), Aghion (2017), Acs *et al.* (2018), and Khyareh (2020).

In the context of developing economies, findings in Model 3 demonstrated a notable and anticipated positive correlation between three main variables, as indicated by the magnitude of the interaction effect. Finally, the fourth model examined how financial development influences the connection between TEA and GDP growth in developed economies. The findings revealed a strong and statistically significant interaction ($p < 0.01$) between DCPB and TEA in influencing GDP growth.

Concerning the control variables, the findings reveal a highly significant positive influence of Gross Capital Formation (GCF) on the overall economic growth of both the entire country sample and two specific groups of countries. Regarding Research and Development (R&D) expenditure, all models demonstrate a statistically significant positive coefficient, which indicates that investing in Research and Development (R&D) is expected to play a significant role in driving economic growth. This is because substantial investments in R&D provide individuals and companies with the capacity to assimilate new knowledge and utilize it to innovate new products or uncover fresh business prospects. In turn, this stimulation of innovation is instrumental in fostering economic growth. The findings regarding education indicate that there is a significant positive correlation (except model 3), thus, it suggests that the educational attainment of the populace could play a crucial role in influencing economic advancement. In the context of developing countries, our research reveals an inverse relationship, implying that an increased percentage of individuals between the ages of 25 and 64 who attain a high school education or higher does not guarantee a path to economic growth. In all models, government spending and population growth are significantly positively correlated with economic growth, which indicates that their quality is an important determinant of economic growth.

there is an inverse relationship between unemployment rate and economic growth, meaning that as unemployment increases, economic growth declines. Additionally, results note that trade openness has a positive and statistically significant impact on economic growth, but this effect is observed mainly in developing countries. In developed countries, however, there is a negative and statistically significant coefficient for inflation rate, it tends to have a negative impact on the overall growth of the economy.

In summary, the study examines the link between entrepreneurial activities, access to finance, and economic growth. It finds that the availability of finance positively affects entrepreneurship, particularly in developing countries. The research demonstrates that domestic credit plays a significant role in stimulating start-up activity, with a 1 percent increase associated with a 0.39 percent increase in developed countries and a 0.41 percent increase in developing countries. The findings align with previous studies emphasizing the importance of financial development in creating an environment conducive to entrepreneurship. Access to finance is identified as a crucial constraint on both growth and entrepreneurship, especially for startups.

V. CONCLUSION

This research examines the relations of entrepreneurship, financial development, and GDP growth from 2001 to 2018, using a dataset that includes 26 developed nations and 16 developing nations. We found that entrepreneurship development is more efficient to increase *GDP* in the developed countries than the developing countries according. In addition, we found that financial development is detected as more efficient to increase *GDP* in the developing countries compared to the developed countries. Based on these results, we can conclude that the developed countries, had made more entrepreneurial activities than developing countries.

Furthermore, the findings suggest that the entrepreneurship-growth nexus is not the same across all countries. It varies depending on the development stages of each country. Specifically, the findings derived from the Generalized Method of Moments (GMM) analysis revealed that the extent of entrepreneurial activity does not exert a noteworthy effect on economic growth in developing countries. Conversely, it positively contributes to economic growth in developed countries. This disparity between countries may be attributed to factors such as limited human capital among entrepreneurs or the quality of institutions in impoverished nations. Furthermore, in developed countries, a significant proportion of entrepreneurship stems from opportunity-driven ventures, which have a positive impact on economic growth. On the other hand, it can be observed that in developing countries, a significant portion of entrepreneurial activity primarily stems from the need for survival or necessity-driven circumstances; that do not significantly impact economic growth. Consequently, it can be concluded that if developing countries aspire to achieve sustainable economic growth, policymakers should focus on reducing the necessity for entrepreneurship to bolster economic growth.

Moreover, results show the positive and significant correlation between the progress of financial systems and the advancement of economic growth, especially in developing countries. To clarify this important point, it can be said that in developed countries, due to the existence of alternative jobs and low unemployment rates, the opportunity cost of doing business is higher. However, the high self-employment rate in less developed countries, which arises from the scarcity of alternative jobs, has a substantial influence on business operations and, consequently, on economic growth. It further points out that easier access to bank credit and a greater reliance on bank-oriented finance are additional factors contributing to this scenario in developing countries compared to developed countries. In regard to the interaction between entrepreneurship and finance, we have discovered compelling proof that entrepreneurship, even after accounting for financial development, exerts a noteworthy and positive influence on economic growth. In simpler terms, our findings demonstrate that entrepreneurship not only has a direct impact on economic growth but also indirectly contributes to it by enhancing access to finance and fostering financial development.

Based on the results, one of the greatest challenges to entrepreneurship is financing and the sources of financing typically depend on the extent of the financial development of the economy. The lack of credit availability is a significant challenge for Small and Medium-sized Enterprises (SMEs), as highlighted by Ayandibu and Houghton (2017) and supported by existing literature. Access to financial resources plays a vital role in the prosperity of SMEs. To facilitate their

contribution to the economic development of a country, it is crucial to ensure sufficient access to financing for SMEs. With increased availability of financial assets, entrepreneurs can carry out other entrepreneurial activities that increase the production and productivity of the economy. Hence, promoting entrepreneurship through support programs for SMEs is now a major goal for policy makers and governments around the world. Thus, the policy implications of this paper are quite clear. To stimulate and enhance economic growth, countries should create an environment that increases better access of finance for entrepreneurs, which may consequently develop economic growth. Moreover, our study suggests that policy makers should devote at least some of its resources towards promoting entrepreneurship and capital investment directly instead of concentrating exclusively on the conventional aspects of economic expansion, particularly in developing nations.

The current research expands our knowledge of the entrepreneurship-growth relation in specific GEM countries, utilizing the GMM framework. However, the findings are subject to some limitations. The present study focuses only on one type of entrepreneurship. Nevertheless, a more enlightening approach would involve capitalizing on the potential interplay between various types of entrepreneurial activities (such as early-stage, opportunity-driven, and necessity-driven entrepreneurship) and financial development. Additionally, investigating the impact of other types of entrepreneurs, such as nascent entrepreneurs and owner-managers of established businesses, on economic growth. It would also be fruitful to test the entrepreneurship-growth nexus using the regional panel data. As there might be significant differences across continents, using separate models for each of the continents (to cluster countries first and have separate findings for Europe, Asia, etc.) is also insightful.

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