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Title: **Nexus among Entrepreneurial Activities, Human Capital, and Economic Growth to achieve Sustainable Development Goals (SDGs): Moderating Role of Financial Development**

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Nexus among Entrepreneurial Activities, Human Capital, and Economic Growth to achieve Sustainable Development Goals (SDGs): Moderating Role of Financial Development

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Abstract

Every economy invests heavily to achieve Sustainable Development Goals (SDGs). SDGs attempt to provide everyone with an access to a high-quality education. The more access to schooling individuals have, the more likely they are to think creatively and take entrepreneurial initiatives. It is vital to invest in personnel to generate economic activities that are suitable for the intricacies of a sustainable economy. The current study attempted to examine the effects of human capital and economic growth on entrepreneurial activities, considering the moderating impact of financial development. The study employed a fixed effects estimation technique to unbalance panel data in various economies using the time period from 2011-2019. The results indicated that human capital, through secondary and tertiary education, significantly and positively stimulates the entrepreneurial activities to achieve SDGs worldwide. In contrast, human capital acquired through primary education doesn't affect entrepreneurial activities positively. Financial development has a positive and statistically significant effect as an explanatory variable, however, the moderating effects of financial development remain poorly grasped. The current study provided policymakers, researchers, and academia with valuable information to foster an environment conducive to entrepreneurial activities in order to achieve the SDGs.

***Keywords*:** economic growth, entrepreneurial activities, financial development, human capital, SDGs

Introduction

The Sustainable Development Goals (SDGs) provide insights into numerous worldwide issues. Moreover, they also emphasize the significance of collaboration among governments, businesses, and civil

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societies. As of right now, the SDGs for 2030 are the most important policy targets for the majority of governments in both developed and developing countries around the world. The attainment of these ambitious targets leads towards the creation of a more prosperous future for individuals. The fourth goal of the SDGs is to ensure everyone has a standard education. Furthermore, according to Human Capital Theory, getting higher education (HE) is an excellent public and private investment (Becker, 2009; Mincer, 1974; Schultz, 1961). This investment in public and private education pays dividends in the form of a more prosperous society and healthier citizens. On the other side, individuals who choose to invest in their education reap the benefits in the form of higher income throughout their lives, entry into higher-paying professions with less searching time, and a smoother transition into more promising careers for economic well-being (Wahrenburg & Weldi, 2007). Education is a valuable resource for entrepreneurs since it provides them with knowledge, skills, networks, and inspiration they need to start and run a successful business and achieve the SDGs.

According to Arshad et al. (2021), there is little uncertainty that acquiring education may lead towards the starting of a business. However, the existing literature shows that this effect varies across education levels. Dutta and Sobel (2018) examined the association between HE and entrepreneurial activities. It was concluded that an increase in human capital through tertiary education enrollment benefits entrepreneurial activities at the lowest and highest levels of financial development. Human capital serves as a link between inputs (or resources used) and outputs (or goods produced) and thus, may contribute to economic growth (Shidong et al., 2022). Depending on their level of education and the frequency of that education, entrepreneurs' intents, motivations, and environment can change to increase economic, social, and ecological sustainability (Thathsarani et al., 2021). Knowledge competencies and expertise are essential for an entrepreneur because they offer a sensation of autonomy and independence as well as the ability to manage the enterprise (Arshed et al., 2021; Bowen & De Clercq, 2008; Jiménez et al., 2015).

Entrepreneurial ventures can foster innovation and healthy competition, resulting in increased output and efficiency. Entrepreneurs need general and specific education to drive the effective and efficient entrepreneurial activities. Fleming (2005) concluded that education encourages

entrepreneurship since it provides people with self-assurance that they need to start businesses by implementing their ideas in real life. Human capital, which includes education, experience, and skills, is a significant factor for both entrepreneurs and the rest of the population. Educated individuals with good experience are more likely to take the initiative since they can better recognize and seize the opportunities. Economic growth also plays an essential role to inspire a new business world for the betterment of societies. When the economy grows, new markets open up, and the demand for goods and services rises. It gives entrepreneurs more chances to launch and expand their business ventures. However, many other factors influence the relationship between human capital, economic growth, and entrepreneurial activities including the financial development. The term "financial development" is used to describe the ability and accessibility of a country's financial markets and financial institutions which determines the ease with which entrepreneurs may gain access to funds they need to launch and expand their businesses. Human capital, economic growth, and financial development are all interconnected as they influence the entrepreneurial activities and raise income levels. In particular, financial development may strengthen the effect of human capital and economic growth on entrepreneurship by providing business owners with more accessible resources they need to flourish. Zhu (2023) investigated the impact of human capital and environmental conservation on China's SDGs. The study determined that the human capital index positively impacts the SDGs. Additionally, to nurture a green society, human-caused environmental concerns necessitate aspects, such as education and awareness (Payab et al., 2023).

The current study, therefore, examined the impact of human capital and economic growth on entrepreneurial activities with the moderating impact of financial development to fill the existing gap in the literature. By examining these relationships, the study at hand contributed to the existing body of knowledge in entrepreneurship. Moreover, it also shed light on factors that drive entrepreneurial activities in various ways. Firstly, the study highlighted that understanding the importance of education in developing human capital to take entrepreneurial initiatives is crucial for entrepreneurs for a sustainable economy to achieve the SDGs. Secondly, it also shed light on the significance of economic growth in instigating entrepreneurial initiatives and for the well-being of societies to achieve the SDGs. Thirdly, the current study discussed how financial development as a

moderator influences the proposed relationship between human capital and economic growth for entrepreneurial activities to achieve the SDGs. In summary, the current study aimed to investigate the relationship between human capital, economic growth, and entrepreneurial activities with a specific focus on the moderating role of financial development.

In the subsequent sections of this study, section 2 discusses literature review by focusing on the existing studies on each proposed relationship of this study, research questions, and proposed research hypothesis. Section 3 discusses the empirical methodology, description of data, econometric models, and estimation techniques. Section 4 portrays the results of analysis and discusses the findings in reference to the existing studies. Section 5 shows the limitations of the study and future research directions. Section 6 presents practical implications and section 7 concludes the study.

Literature Review

By synthesizing and analyzing the relevant literature, the current study identified various dimensions and mechanisms by which human capital, economic growth, and financial development influence the entrepreneurial success. SDGs are a necessity for the entire globe, and a sharing economy may be the best approach to fulfil them, a phenomenon that should be highlighted. The findings indicated that social and economic gains are positively and significantly related to the accomplishment of the SDGs (Sadiq et al., 2023). Over the past few years, the relationship between human capital and entrepreneurial activity has garnered an increasing amount of attention from both the academic leaders and policymakers. Understanding this relationship is essential to foster a more economic growth, innovation, and job creation to achieve SDGs. Previous studies have revealed mixed findings by examining the relationship between formal education and business success. There is a need to explore the role of different education levels as human capital and economic growth for entrepreneurial activities and the achievement (Karim et al., 2022; Munir et al., 2019).

Many studies have linked human capital with business success (Bosma et al., 2004; Cassar, 2006; Dutta & Sobel, 2018). Additionally, Haber and Reichel (2007) showed that the growing human capital is essential to foster entrepreneurial activity. Furthermore, Baum and Silverman (2004) argued that entrepreneurship and human capital are the two key concepts frequently

overstated. Even these contradicting findings about HE and entrepreneurship rates are seen among students in HE taking entrepreneurship and business planning courses and these results are duplicated in many nations (Martin et al., 2013). For instance, Oosterbeek et al. (2010) reproduced their study and found that by attending an entrepreneurship course, university students' intentions to start a firm have reduced. In another example, Mentoor and Friedrich (2007) found that several entrepreneurship-related attitudes towards starting a firm, as well as entrepreneurial abilities and knowledge, are negatively connected with the attractiveness of undergraduate business management and entrepreneurship courses in South Africa. This inverse association may have multiple causes, such as an increased awareness of the challenges and risks to launch an enterprise.

However, contrary to what basic human capital theory (Becker, 2009) predicted, improved educational outcomes sometimes translate into higher transfer rates of entrepreneurship. It is due to additional intervening factors. Most studies based on human capital theory posit that individuals and organizations with more capabilities and resources including education, training, and experience, would also have better entrepreneurial outcomes. The results from the studies of association between human capital and entrepreneurial outcomes at a variety of analysis levels have been generally favorable, lending credence to the theory (Martin et al., 2013).

According to empirical studies, there is a connection between academic achievement and entrepreneurship, however, the effect of education varies depending upon its level (Arshed et al., 2021). The current study aimed to determine the relationship between specific forms of education and the growth of applied financial sector in the hopes that such a relationship would influence the aspirations and circumstances of aspiring entrepreneurs to initiate entrepreneurial activities. Following the study of Eftimoski (2022), Arshed et al. (2021), and Chirwa (2008), the current study used three levels of education as proxies for human capital, namely, primary, secondary, and tertiary school enrolment (Sghaier, 2022). Although, many studies have used separate primary, secondary, and tertiary education for the proxy of human capital as this study required, three proxies were taken. These three proxies were selected because it was hypothesized that a higher level of entrepreneurial activity is associated with a higher level of

education. The data for the explanatory variables was extracted from the World Development Indicators (WDI) of the World Bank.

The financial development index for the current study comprised the development of financial institutions and financial markets by the International Monetary Fund (IMF). This index is extracted from IMF's database. It covers the dimensions of financial institutions as well as financial markets, that is, access, depth, efficiency, and stability. The IMF has created a comprehensive index that takes into account all the dimensions of financial system institutions and markets (Dutta & Sobel, 2018). It has been shown that the efficiency of a nation's human capital investments and its overall economic growth can be significantly affected by its financial development levels. Larger financial stocks result from a more developed financial sector, raising the opportunity cost of starting a business and encouraging people to take economic well-being initiatives. Resultantly, more well-paying jobs are available that boost labor productivity in big corporations (Dutta & Meierrieks, 2021). It also proved that financial development is steadily associated with entrepreneurship in the case of sound and weak institutions. Financial development and technical innovation are seen to control the nexus between energy use and economic growth to minimize the BRICS countries' emission growth rate (Manigandan et al., 2023).

The current study attempted to empirically investigate the connection between education attainment for the development of human capital and the levels of entrepreneurial activities for startups. Considering the major objectives, the study contributed to the existing stream of literature in many ways. Firstly, it made a comparison and explored the association of human capital and entrepreneurial activities by considering three vital levels of formal education, that is, primary, secondary, and tertiary. Secondly, the explanatory variables' results were investigated on two outcome variables, that is, new business registration and new business density. Thirdly, the current study introduced the moderating role of financial development index, comprising the development of financial institutions and financial markets in the nexuses of human capital and entrepreneurial activities. Fourthly, the study also highlighted how entrepreneurial activities contribute to achieve the SDGs through economic growth, human capital, and financial development. Based on the above discussion, the studies have formulated the following research questions and hypotheses:

Research Questions

RQ1: How does human capital affect the launch of new ventures to contribute to SDGs?

RQ2: How does economic growth affect the launch of new ventures to contribute to SDGs?

RQ3: How does financial development moderate the relationship between human capital, economics, and the launch of new ventures to contribute to SDGs?

Research Hypotheses

H1: Human capital has a positive effect on the launch of new ventures to contribute to SDGs.

H2: Economic growth has a positive effect on the launch of new ventures to contribute to SDGs.

H3: Financial development has a positive moderating effect on the relationship between human capital, economic growth, and the launch of new ventures to contribute to SDGs.

Empirical Methodology

Data Description

The Global Development Indicators' database of World Bank and IMF provides secondary data for all variables across nations. The current study conducted an empirical review using an unbalanced panel data set across the countries. Panel data was used which incorporates both longitudinal and cross-sectional information. It is preferable to other data settings, such as time series and longitudinal data settings. The current study used data collected from 139 nations between the time period 2011 and 2019 to conduct this research. It was chosen because the data on entrepreneurial activities and other relevant explanatory and control variables was readily available throughout this time frame. The dependent, explanatory, and control variables have been defined (measured) and shown in Table 1. A list of selected countries has also been provided in the appendix. The dependent, independent, and control variables have been elaborated below. The summary statistics of the selected variables are reported in Table 2

Table 1
Variables Definitions

Variables	Definitions
1 HC_PSE	Number of school enrollment, primary education (% gross)
2 HC_SSE	Number of school enrollment, secondary education (% gross)
3 HC_TSE	School enrollment, tertiary education (% gross)
4 GDP	GDP growth (annual %)
5 FDIND	Financial development index
6 LNTRDOPEN	Natural logarithm of trade openness
7 FDI	Foreign direct investment, net inflows (% of GDP)
8 LNTAXB	Natural logarithm of tax burden
9 GCONS	General government final consumption expenditure (% of GDP)
10 INFL	Inflation, GDP deflator (annual %)
11 LNNBR	Natural logarithm of new business registration
12 NBDENS	New Business Density (new registrations per 1000 people ages 15-64

Note. Source: World Bank, International Monitory Fund

Entrepreneurship encourages a culture of creativity and problem-solving, which can result in novel approaches in addressing complex global concerns. This makes new ventures an important asset in the overall drive to attain the SDGs. Our primary dependent variables measuring the extent of entrepreneurial activities in the selected countries are new business registration and new business density. The data on these two outcome variables is drawn from the World Development Indicators (WDI) of the World Bank. The measure of new business density is constructed using the information on the annual number of newly registered limited liability firms 1000 people per year between the ages 15 and 64 obtained from the registrars of the companies. As the term "limited liability" suggests, business owners' legal responsibility is capped at the value of their initial capital investment. Due to the lack of international consensus on defining partnerships and sole proprietorships, they are excluded, and only limited liability companies are included. The second outcome measure is the number of new business registrations which refers to the new limited liability companies registered on the calendar year for the first time. Both outcome variables are measured and reported on an annual basis by the World Bank. We turn entrepreneurial activities into an operational concept by employing the WDI's measure of new business density and new business

registration to achieve the SDGS by considering two reasons. The first reason is the availability of data related to the large set of developing, emerging, and developed nations across the world that's why the study conducted on global data. The initiative of new ventures around the globe shed light on the importance to achieve the SDGs of each economy. Secondly, both outcome measures of the entrepreneurial activities focused on formal entrepreneurship, which makes it an appropriate choice for our analysis to explore the impact of human capital on entrepreneurial activities to reach the SDGs. On the other hand, entrepreneurial activity connected with need and other types of entrepreneurships not subject to formal norms may be more strongly associated with informal finance, making this relationship both more challenging to operationalize due to lack of data on informal economic activity and less attractive from a public policy perspective (Dutta & Meierrieks, 2021). The study conducted by Usman et al. (2022) investigated the sustainable economic growth in Sub-Saharan Africa (SSA). The study determined that SSA may meet its long-term economic growth target by 2030, particularly by formalizing remittances, human capital flight, and brain drain into the SSA financial and economic system. The current study focused to foster entrepreneurial ventures and creative start-ups since they contribute significantly to achieve the SDGs by bringing innovation in technology, creating employment opportunities, providing resource efficiency, creating awareness of getting education, and spreading social impact.

Econometric Models

To empirically examine the impact of human capital and economic growth on entrepreneurial activities along with an array of control variables, two estimation equations were considered. Equation 1 is for the dependent variable, the natural logarithm of new business registration (LNNBR), whereas equation 2 is for the dependent variable, new business density (NBDENS).

$$LNNBR_{it} = \alpha_0 + \alpha_1 HC_{it} + \alpha_2 GDP_{it} + \alpha_4 \sum_{j=1}^{j} Xj_{it} + \varepsilon_{it} \quad (1)$$

$$NBDENS_{it} = \alpha_0 + \alpha_1 HC_{it} + \alpha_2 GDP_{it} + \alpha_4 \sum_{j=1}^{j} Xj_{it} + \varepsilon_{it} \quad (2)$$

To examine the moderating impact of financial development on the proposed relationships of human capital and economic growth on entrepreneurial activities, two further estimation equations were considered.

Equation 3 is for the dependent variable, the natural logarithm of new business registration (LNNBR), and equation 4 is for the dependent variable, new business density (NBDENS), with the moderating variable of financial development.

$$LNNBR_{it} = \alpha_0 + \alpha_1 HC_{it} + \alpha_2 GDP_{it} + \alpha_3 FDIND_{it} + \alpha_4 FDIND_{it} * HC_{it} + \alpha_5 FDIND_{it} * GDP_{it} + \alpha_6 \sum_{j=1}^{j} Xj_{it} + \varepsilon_{it} \quad (3)$$

$$NBDENS_{it} = \alpha_0 + \alpha_1 HC_{it} + \alpha_2 GDP_{it} + \alpha_3 FDIND_{it} + \alpha_4 FDIND_{it} * HC_{it} + \alpha_5 FDIND_{it} * GDP_{it} + \alpha_6 \sum_{j=1}^{j} Xj_{it} + \varepsilon_{it} \quad (4)$$

$LNNBR_{it}$ is the natural logarithm of new business registration for country i and year t, and $NBDENS_{it}$ is the new business density (new registrations per 1000 people ages 15 – 64. HC_{it} represents human capital measured with primary, secondary and tertiary school enrolment. GDP_{it} is the proxy for economic growth and FDIND represents the financial development index. The vector X represents the control variables discussed below, whereas ε_{it} represents the unobserved error term.

Control Variables

Several control variables were adjusted to avoid detecting only erroneous correlations between entrepreneurship and human capital. The natural logarithm of trade openness, foreign direct investment, the natural logarithm of tax burden, general government expenditures, and inflation were the control variables used for the current study.

Fixed Effect Estimation

To decide which estimation technique is appropriate for the analysis of the current study, Hausman test was used that directed the use of fixed effect estimation technique. The study began by using the fixed-effects estimator to estimate equations (1) and (2). The associated regression results can be clearly understood and this estimator has well-known features. As was previously emphasized, the fixed-effects method is also used to implicitly consider a variety of time-invariant characteristics that might be relevant to disparities in entrepreneurship among the countries. Therefore, following the directions of the Hausman test, the use of fixed effects estimation technique was preferred over the random effect.

Results and Discussion

The results of the current study, obtained by using the STATA software, have been presented and discussed below. Table 2 presents the results of descriptive statistics. Table 3 portrays the pairwise correlation of each variable in the study. Table 4 presents the results of baseline model considering new business registrations as a dependent variable, whereas Table 5 discusses the same results while considering new business density as a dependent variable. The results of Tables 6 and 7 show the moderating effect of financial development on the proposed relationships of both dependent variables.

Table 2

Summary Statistics

Variables	*N*	Mean	Std. Dev.	Skewness	Kurtosis	Min	Max
LNNBR	1139	8.857	2.079	-.668	3.906	.693	13.437
NBDENS	1139	3.604	4.719	2.36	9.154	.03	27.033
HC PSE	977	104.679	10.502	.923	6.476	72.99	149.957
HC SSE	826	92.459	26.483	-.607	3.781	9.689	163.935
HC TSE	869	46.676	27.723	.273	2.468	.593	148.531
GDP	1138	3.347	3.013	-.444	5.705	-10.31	13.793
FDIND	1139	.359	0.224	.751	2.611	.033	.989
NTRDOPEN	975	23.517	2.274	-.115	2.176	16.876	27.147
FDI	1137	4.344	4.808	1.796	5.738	-1.094	18.828
LNTAXB	848	3.403	0.585	-4.17	30.173	-2.692	4.13
GCONS	1050	16.953	6.741	2.421	14.745	5.21	56.104
INFL	1138	4.056	5.742	2.485	13.39	-8.977	37.095

Note. Source: World Bank, International Monitory Fund

The descriptive statistics for all the variables in the current study has been shown in Table 2. From the time period 2011–2019, entrepreneurial activities for new business registration ranged in value from a low of 0.693 to a high of 13.437, with an average of 8.857, and a standard deviation of 2.079. In contrast, for new business density, the value of entrepreneurial activities ranged from a low of 0.03 to a high of 23.37, with an average of 3.604, and a standard deviation of 4.719. The range of economic growth values is from -10.31 at the low end to 13.793 at the high end, with an average of 3.347. The mean values of human capital for primary school observations are higher than those for secondary and territorial school observations, suggesting that primary education is the principal means by which most countries build their human capital.

Table 3

Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1 LNNBR	1.000											
2 NBDENS	0.327	1.000										
	(0.00)											
3 HC_PSE	-0.086	-0.096	1.000									
	(0.007)	(0.003)										
4 HC_SSE	0.386	0.378	-0.007	1.000								
	(0.000)	(0.000)	(0.831)									
5 HC_TSE	0.399	0.341	-0.201	0.743	1.000							
	(0.000)	(0.000)	(0.000)	(0.000)								
6 GDP	-0.026	-0.067	0.108	-0.265	-0.392	1.000						
	(0.375)	(0.024)	(0.001)	(0.000)	(0.000)							
7 FDIND	0.589	0.435	-0.141	0.648	0.584	-0.229	1.000					
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)						
8 LNTRDOPEN	0.765	0.213	-0.216	0.555	0.597	-0.472	0.774	1.000				
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)					
9 FDI	-0.090	0.294	0.018	0.030	0.041	0.162	0.035	-0.075	1.000			
	(0.002)	(0.000)	(0.585)	(0.392)	(0.228)	(0.000)	(0.240)	(0.019)				
10 LNTAXB	0.110	0.038	-0.143	-0.080	-0.070	0.018	-0.057	-0.055	0.091	1.000		
	(0.001)	(0.272)	(0.000)	(0.040)	(0.062)	(0.607)	(0.099)	(0.122)	(0.008)			
11 GCONS	-0.214	0.088	0.077	0.324	0.285	-0.259	0.156	-0.007	-0.142	-0.426	1.000	
	(0.000)	(0.004)	(0.020)	(0.000)	(0.000)	(0.000)	(0.000)	(0.822)	(0.000)	(0.000)		
12 INFL	0.002	-0.157	0.093	-0.146	-0.083	0.005	-0.247	-0.107	-0.035	0.010	-0.103	1.00
	(0.945)	(0.000)	(0.004)	(0.000)	(0.015)	(0.855)	(0.000)	(0.001)	(0.240)	(0.781)	(0.001)	

Note. (i) Standard errors are shown in brackets; (ii) ***, **, and * indicate a 1%, 5%, and 10% level of significance, respectively

Table 4

Fixed Effects Results: New Business Registration

Entrepreneurial Activities	(1) Primary	(2) Secondary	(3) Tertiary	(4) Primary	(5) Secondary	(6) Tertiary	(7) Primary	(8) Secondary	(9) Tertiary
HC_PSE	-0.010***			-0.010***			-0.007**		
	(0.003)			(0.003)			(0.003)		
HC_SSE		0.010***			0.009***			0.009***	
		(0.002)			(0.002)			(0.002)	
HC_TSE			0.016***			0.015***			0.012***
			(0.002)			(0.002)			(0.002)
GDP				0.004	0.013***	0.007	0.008	0.023	0.024**
				(0.005)	(0.005)	(0.005)	(0.012)	(0.014)	(0.011)
FDIND				2.114***	1.387***	1.475***	2.537***	1.232**	2.196***
				(0.481)	(0.494)	(0.480)	(0.468)	(0.503)	(0.483)
LNTRDOPEN							0.005	0.034	0.030
							(0.038)	(0.044)	(0.033)
FDI							-0.003	-0.001	-0.002
							(0.003)	(0.003)	(0.003)
LNTAXB							0.156***	0.217***	0.257***
							(0.052)	(0.064)	(0.072)
GCONS							-0.004	-0.001	0.008
							(0.010)	(0.012)	(0.009)
INFL							-0.003	-0.003	-0.002
							(0.003)	(0.003)	(0.003)
_cons	10.122***	8.183***	8.512***	9.235***	7.662***	7.976***	8.628***	6.556***	6.252***
	(0.311)	(0.167)	(0.102)	(0.369)	(0.242)	(0.198)	(1.080)	(1.133)	(0.885)
Observations	977	826	869	977	826	868	679	595	643
R-squared	0.014	0.043	0.070	0.036	0.063	0.084	0.080	0.105	0.140

Note. (i) the standard errors are shown in parentheses; (ii) the ***, **, and * indicate the 1%, 5%, and 10% levels of significance, respectively (iii) All models are fixed effect models

All the pairwise correlations between the variables in the current study have been shown in Table 3. Each variable's association with the entrepreneurial activities has been displayed in this Table. The results show that all variables can be included in the analysis without introducing undue complications due to significant collinearity. In secondary and tertiary education, human capital is positively connected with entrepreneurial activities, while primary education is inversely correlated with these activities.

The results from baseline model of entrepreneurial activities, proxied with new business registrations, have been reported in Table 4. These results describe the estimated change in human capital at primary, secondary, and tertiary education levels for the outcome variable entrepreneurial activities. Firstly, the study focused on the effects of human capital at each of the three levels of education on entrepreneurial activities, followed by the effects of economic growth and financial development. In single impact model, the effects of secondary and tertiary education were positive and significant at 1% level. In comparison, the effects of primary school education on human capital were negative and significant at the 1% level. Columns 8 and 9 show that the coefficient of human capital with primary, secondary, and tertiary education was -0.007**, 0.009***, and 0.012***, respectively. It shows that human capital with secondary and tertiary education has a greater impact on entrepreneurial activities and primary school education has a negative impact. The economic growth (0.004, 0.013***, 0.007, 0.008, 0.023) and financial development (2.114***, 1.387***, 1.475***, 2.537***, and 1.232**) also yield the same positive and significant results across the models. Further control variables were added to the basic model to test the robustness of results and the results for human capital at the levels of education previously discussed, remained constant. All models show a beneficial effect of economic growth on entrepreneurial endeavors, while the relevance of this factor varies widely. At 1% significance level across all the models, a positive relationship exists between financial growth and business registration. Certain control variables, such as inflation and government spending, have an expected negative impact on new business registration. A couple of control factors do not produce the predicted outcomes, such as the positive association between trade openness and entrepreneurial activities being statistically insignificant. The impact of foreign direct investment is consistently negative and small, while the impact of tax burden is consistently positive and significant.

Table 5

Fixed Effects Results: New Business Density

Entrepreneurial Activities	(1) Primary	(2) Secondary	(3) Tertiary	(4) Primary	(5) Secondary	(6) Tertiary	(7) Primary	(8) Secondary	(9) Tertiary
HC_PSE	-0.021*			-0.019			-0.022		
	(0.012)			(0.012)			(0.016)		
HC_SSE		0.018**			0.015*			0.031***	
		(0.008)			(0.008)			(0.010)	
HC_TSE			0.032***			0.027***			0.032***
			(0.009)			(0.009)			(0.011)
GDP				0.030	0.073***	0.043**	0.083	0.161**	0.125**
				(0.019)	(0.021)	(0.020)	(0.060)	(0.075)	(0.055)
FDIND				6.918***	6.465***	5.717***	7.950***	4.813*	6.916***
				(1.971)	(2.323)	(1.955)	(2.284)	(2.661)	(2.380)
LNTRDOPEN							0.043	0.205	0.129
							(0.184)	(0.231)	(0.162)
FDI							-0.002	-0.001	-0.002
							(0.015)	(0.017)	(0.015)
LNTAXB							-0.199	-0.008	-0.567
							(0.253)	(0.339)	(0.353)
GCONS							0.012	0.002	0.103**
							(0.049)	(0.062)	(0.044)
INFL							-0.004	0.004	0.004
							(0.014)	(0.018)	(0.014)
_cons	6.043***	2.356***	2.450***	3.175**	-0.102	0.314	2.427	-6.233	-3.490
	(1.271)	(0.786)	(0.418)	(1.511)	(1.137)	(0.805)	(5.275)	(5.998)	(4.355)
Observations	977	826	869	977	826	868	679	595	643
R-squared	0.004	0.006	0.017	0.020	0.032	0.033	0.034	0.047	0.060

Note. (i) the standard errors are shown in parentheses; (ii) the ***, **, and * indicate the 1%, 5%, and 10% levels of significance, respectively (iii) All models are fixed effect models

Table 5 shows the predicted change in entrepreneurial activities proxied by new business density with the changes in human capital at primary, secondary, and tertiary education levels as well as economic and financial development. The impact of human capital at each of the three levels of education was examined first based on the baseline model and the impact of economic growth and financial development on entrepreneurial activities was discussed after that. For human capital, the single impact model finds statistically substantial positive impacts of secondary (0.018**, 0.015*, 0.031***) and tertiary education (0.032***, 0.027***, 0.032***), however, statistically significant adverse effects of primary school education (-0.021*, -0.019, -0.022). The results across the models remained unchanged even after including economic growth (0.030,0.073***,0.043**,0.083,0.161**,0.125**) and financial development (6.918***, 6.465***, 6.717***, 7.950***, 4.813**, 6.916***) in the model. The results for human capital at the levels of education previously addressed stay constant despite the addition of additional control variables to the basic model to test for results robustness in case of new business density as an outcome variable. While, the important change this outcome variable has brought is that economic growth has a positive and significant impact in most of the models. This component varies significantly across the models, they can all agree that economic development is good for startups. A positive correlation between financial development and entrepreneurial activities was discovered at 1% significance level across all models, just like the results discussed in Table 4. The rest of the control variables also have mixed results, as discussed previously, however, with a small quantity of variation.

Finally, the results of new business registration as an outcome variable have been explained in Table 6. It presents the results of complete models including the outcome, explanatory, and control variables. These models also include the interaction of financial development with human capital at all three levels of education and the interaction term with economic growth.

Table 6

Fixed Effects Results with Moderation of Financial Development and Dependent Variable New Business Registration

Entrepreneurial Activities	(1) Primary	(2) Secondary	(3) Tertiary	(4) Primary	(5) Secondary	(6) Tertiary	(7) Primary	(8) Secondary	(9) Tertiary
HC_PSE	-0.021***			-0.007**			-0.021***		
	(0.006)			(0.003)			(0.006)		
HC_SSE		0.027***			0.009***			0.027***	
		(0.005)			(0.002)			(0.005)	
HC_TSE			0.030***			0.012***			0.030***
			(0.005)			(0.002)			(0.005)
GDP	0.005	0.022	0.023**	-0.003	0.017	0.020	-0.006	0.017	0.020
	(0.012)	(0.014)	(0.011)	(0.017)	(0.019)	(0.016)	(0.017)	(0.019)	(0.016)
FDIND	-1.671	4.185***	4.638***	2.393***	1.161**	2.150***	-1.830	4.121***	4.602***
	(1.573)	(0.899)	(0.724)	(0.492)	(0.526)	(0.504)	(1.582)	(0.915)	(0.740)
FDINDHC_PSE	0.040***						0.040***		
	(0.014)						(0.014)		
LNTRDOPEN	-0.005	0.023	0.025	0.007	0.036	0.031	-0.003	0.025	0.025
	(0.038)	(0.043)	(0.032)	(0.038)	(0.044)	(0.033)	(0.038)	(0.043)	(0.032)
FDI	-0.002	-0.000	-0.002	-0.003	-0.001	-0.002	-0.003	-0.000	-0.002
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
LNTAXB	0.161***	0.177***	0.228***	0.155***	0.216***	0.257***	0.161***	0.177***	0.228***
	(0.052)	(0.064)	(0.071)	(0.052)	(0.064)	(0.072)	(0.052)	(0.064)	(0.071)
GCONS	-0.005	0.000	0.008	-0.003	0.000	0.009	-0.004	0.001	0.008
	(0.010)	(0.011)	(0.009)	(0.010)	(0.012)	(0.009)	(0.010)	(0.012)	(0.009)
INFL	-0.002	-0.002	-0.002	-0.003	-0.003	-0.002	-0.002	-0.002	-0.002
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
FDINDHC_SSE		-0.030***						-0.030***	
		(0.008)						(0.008)	

Entrepreneurial Activities	(1) Primary	(2) Secondary	(3) Tertiary	(4) Primary	(5) Secondary	(6) Tertiary	(7) Primary	(8) Secondary	(9) Tertiary
FDINDHC_TSE			-0.045***						-0.045***
			(0.010)						(0.010)
FDINDGDP				0.031	0.016	0.011	0.032	0.013	0.008
				(0.033)	(0.035)	(0.034)	(0.033)	(0.035)	(0.033)
_cons	10.409***	5.287***	5.649***	8.585***	6.525***	6.243***	10.371***	5.264***	5.644***
	(1.248)	(1.162)	(0.880)	(1.081)	(1.136)	(0.886)	(1.249)	(1.165)	(0.881)
Observations	679	595	643	679	595	643	679	595	643
R-squared	0.093	0.132	0.171	0.082	0.105	0.140	0.094	0.133	0.171
Country Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note. (i) the standard errors are shown in parentheses; (ii) the ***, **, and * indicate the 1%, 5%, and 10% levels of significance, respectively (iii) All models are fixed effect models.

Table 7

Fixed Effects Results with Moderation of Financial Development and Dependent Variable New Business Density

Entrepreneurial Activities	(1) Primary	(2) Secondary	(3) Tertiary	(4) Primary	(5) Secondary	(6) Tertiary	(7) Primary	(8) Secondary	(9) Tertiary
HC_PSE	-0.015			-0.021			-0.014		
	(0.030)			(0.016)			(0.030)		
HC_SSE		0.030			0.031***			0.029	
		(0.026)			(0.010)			(0.026)	
HC_TSE			0.046**			0.031***			0.045*
			(0.023)			(0.011)			(0.023)

GDP	0.084	0.161**	0.125**	0.010	0.110	0.073	0.012	0.110	0.073
	(0.060)	(0.075)	(0.055)	(0.083)	(0.100)	(0.081)	(0.083)	(0.100)	(0.081)
FDIND	10.138	4.666	8.843**	6.997***	4.193	6.307**	9.114	3.974	8.194**
	(7.739)	(4.832)	(3.629)	(2.404)	(2.782)	(2.477)	(7.777)	(4.918)	(3.706)
FDINDHC_PSE	-0.021						-0.020		
	(0.070)						(0.070)		
LNTRDOPEN	0.048	0.206	0.125	0.059	0.224	0.142	0.064	0.225	0.137
	(0.185)	(0.232)	(0.162)	(0.185)	(0.233)	(0.162)	(0.186)	(0.233)	(0.163)
FDI	-0.002	-0.001	-0.003	-0.002	-0.002	-0.003	-0.003	-0.002	-0.003
	(0.015)	(0.017)	(0.015)	(0.015)	(0.017)	(0.015)	(0.015)	(0.017)	(0.015)
LNTAXB	-0.201	-0.006	-0.589*	-0.202	-0.016	-0.568	-0.204	-0.013	-0.590*
	(0.254)	(0.344)	(0.355)	(0.253)	(0.340)	(0.353)	(0.253)	(0.344)	(0.355)
GCONS	0.013	0.002	0.103**	0.023	0.010	0.110**	0.024	0.010	0.109**
	(0.049)	(0.062)	(0.044)	(0.050)	(0.063)	(0.044)	(0.050)	(0.063)	(0.045)
INFL	-0.004	0.004	0.004	-0.005	0.004	0.003	-0.005	0.004	0.003
	(0.014)	(0.018)	(0.014)	(0.014)	(0.018)	(0.014)	(0.014)	(0.018)	(0.014)
FDINDHC_SSE		0.002						0.002	
		(0.041)						(0.041)	
FDINDHC_TSE			-0.035						-0.034
			(0.050)						(0.050)
FDINDGDP				0.206	0.142	0.147	0.206	0.142	0.144
				(0.163)	(0.185)	(0.166)	(0.163)	(0.186)	(0.166)
_cons	1.500	-6.170	-3.965	2.147	-6.505	-3.603	1.252	-6.412	-4.064
	(6.138)	(6.249)	(4.409)	(5.277)	(6.011)	(4.358)	(6.138)	(6.260)	(4.412)
Observations	679	595	643	679	595	643	679	595	643
R-squared	0.034	0.047	0.061	0.037	0.049	0.061	0.037	0.049	0.062
Country Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note. (i) the standard errors are shown in parentheses; (ii) the ***, **, and * indicate the 1%, 5%, and 10% levels of significance, respectively (iii) All models are fixed effect models.

Similar with the previous results, each model in Table 6 showed adverse and insignificant effects of human capital with primary school education (-0.021***, -0.007*, -0.021***). In contrast, positive and significant results were found at 1% level of secondary school education (0.027***, 0.009**, 0.027***) and tertiary school education (0.030***, 0.012***, 0.030***). At 1% significance level across all models, a positive relationship between financial growth and business registration exists. The results of interaction term of human capital and economic growth with financial development are mixed across the models and even in most of the models, these results are negative and insignificant. The results demonstrate that although, financial development has a direct impact on entrepreneurial activities, it is not a strong moderator for the relationship of human capital and economic growth with entrepreneurial activities.

Table 7 also shows all these results as similar. Interestingly, for these results, primary school education separately has a negative impact throughout the study. Still, its interaction term has positive and significant results. In contrast, secondary and tertiary school education have positive and significant results in all the models. However, their results are also vice versa with interaction terms, just like the results explained in Table 6, Table 7 also shows the same results. These results reveal that financial development plays an important role in boosting the entrepreneurial activities. However, moderation is also a concern; it does not play a strong moderating role in the relationship described in hypotheses 1 and 2.

Furthermore, the results of certain control variables, such as inflation and government spending, have an expected negative impact on new business registration with a small quantity of variation for new business density. Some control factors do not produce the predicted outcomes, such as the positive association between trade openness and entrepreneurial activities being statistically insignificant. The impact of foreign direct investment is consistently negative and small, while the impact of tax burdens is always positive and significant. The overall results of the current study match the findings of the existing studies (Dutta & Sobel, 2018; Dutta & Meierrieks, 2021; Manigandan et al., 2023; Usman et al., 2022).

Conclusion

The study concluded that human capital contributes to the successful launch of new ventures. By focusing on economic growth, human capital,

and financial development, entrepreneurial activities considerably influence and contribute to achieve the SDGs. Here are some ways through which entrepreneurial ventures can control the SDGs:

Economic Growth

Entrepreneurship promotes diversification of the economy, creation of employment, and innovation. Entrepreneurs generate new markets, products, and services by launching enterprises, thus contributing to economic progress. This expansion directly impacts SDG 8 (Decent Work and Economic Growth) which aims to foster inclusive, long-term economic growth, full and productive employment, and decent work for all.

Human Capital

Entrepreneurship encourages the development of skills, knowledge sharing, and education. Entrepreneurs frequently invest in educational programs, mentorship initiatives, and training programs that empower individuals and communities. Ensuring inclusive and equitable quality education along with encouraging lifelong learning opportunities for all contribute to SDG 4 (Quality Education).

Financial Development

Entrepreneurs frequently drive financial innovation, capital access, and market expansion. Entrepreneurs can help to achieve SDG 1 (No Poverty) and SDG 9 (Industry, Innovation, and Infrastructure) by developing new financial instruments, increasing access to credit for small businesses, and by supporting microfinance initiatives. Thus, to attain SDGs through HE and foster entrepreneurship to produce economic activity, human capital development should be a top priority for governments worldwide. Despite widespread recognition of human capital's significance, only a few studies have examined how it affects start-ups and small business endeavors. Human capital and economic growth stimulate entrepreneurial activities through the provision of secondary and HE. Besides this, the current study examined the moderating effect of financial development on this connection and drew contradictory conclusions. This study has implications for a practical point of view towards a higher level of education as a prerequisite to launch new ventures in this challenging era. In the long run, the ventures' ability to generate valuable goods and services would be vital in helping to achieve another sustainable goal, that is, the eradication of world hunger. Additionally, these new businesses would create new jobs for general

public. One more sustainable objective, that is, the alleviation of poverty, would be met due to these entrepreneurial endeavors. Policymakers, researchers, and academics can all take help from this study for guidance to boost entrepreneurial activities in their own countries.

Limitations and Future Research Directions

The current study constrained the availability of data for this combination of variables. Moreover, the data collection period employed in this study, which spans from the time period 2011-2019, is insufficient to account for the impact that human capital and economic growth are thought to have on entrepreneurial activities during the pandemics. Future researchers may gather the data till 2024 to differentiate this relationship before and throughout the pandemic. The methodology utilized in the study was fixed effects, however, additional investigations can also be undertaken using generalized methods of movement or other appropriate methodologies to overcome the problems of multi-collinearity, endogeneity, and omitted variable biases. Future researches can also test the robustness of these findings by modifying the proxies for explanatory variables. The current study employed cross-country analysis, however, given the geographical disparities, future researchers can perform the analysis by creating subgroups from this dataset. These subgroups may be based on regions, developed countries, and developing countries. Additionally, the findings from the separate analysis of these subgroups may provide better insights to generalize the results of this study and to achieve the SDGs. Potential researchers also need to focus on assessing how well policy interventions that support human capital development, entrepreneurship, economic growth, and financial development contribute to the achievement of SDGs. Furthermore, creating comprehensive theoretical frameworks that take into account the interactions between entrepreneurial activities, human capital, economic growth, financial development, and SDGs should also be focused on in future research studies.

Practical Implications

The current study has several practical implications for policymakers and academia.

- The study should be used to encourage the level of education to boost human capital and promote entrepreneurial activities.

- Countries should focus on their economic growth to promote entrepreneurial activities for the production of innovative goods and services.
- Financial development covers the development of financial institutions and financial markets and policymakers should focus on the betterment of financial markets and financial institutions to achieve sustainable goals.

Conflict of Interest

The authors of the manuscript have no financial or non-financial conflict of interest in the subject matter or materials discussed in this manuscript.

Data Availability Statement

The data associated with this study will be provided by the corresponding author upon request.

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