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Do Human Capital, Economic Growth, and Trade Openness Instigate Entrepreneurial Activities? The Moderating Role of Financial Development

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Abstract

This research dives into the complex interplay of human capital, economic growth, trade openness, and entrepreneurial activities, while also investigating the moderating influence of financial development. The study uses two steps generalized method of movement (GMM) and the random effect estimation technique by using the data from 2011 to 2019. The results indicate that human capital has a significant and positive impact on entrepreneurial activities through secondary and tertiary education. Also, financial development has a strong moderating effect on the relationship between human capital and entrepreneurial activities especially at secondary and tertiary levels of education. Economic growth and trade openness also instigate entrepreneurial activities in primary, secondary, and tertiary education. Our empirical findings suggest that financial development benefits entrepreneurial activities by satisfying entrepreneurs' demand for accessible, cheap, and extensive credit, as well as investors' demand for efficient and cost-effective risk and information management. This research provides policymakers, researchers, and academia with valuable information for fostering an environment conducive to entrepreneurial activities.

Keywords: Entrepreneurial Activities Human Capital, Economic Growth, Financial Development.

INTRODUCTION

In today's modern and global world, activities related to entrepreneurship are in fact playing a very significant for the development of economies (Tahir & Burki, 2023). According to (Wang, 2022), entrepreneurial activities should address societal issues and positively contribute to achieving sustainable development of the economies. Entrepreneurial activities are one of the most important factors in promoting economic growth within the economies around the globe. It is not only advantageous for the growth of the economy to encourage young people to seek jobs in the field of entrepreneurship, but it also has the ability to address the issue of unemployment for the youth of those economies (Doran et al., 2018; Tahir & Burki, 2023). Innovative entrepreneurs challenge existing companies that aren't performing well and promote healthy competition, which helps economies grow. Entrepreneurial activity promotes the development of successful enterprises, raises overall levels of productivity, and thus benefits economic growth (Kim et al., 2022; Acs, 2006). Entrepreneurial endeavors are a primary driver of innovation and competition, which, in turn, leads to increased levels of

production and efficiency. (Chung et al., 2022; Peris et al., 2018; Li et al., 2022; Dutta & Meierrieks, 2021; Fritsch & Changoluisa, 2017). Establishing new businesses and the attraction of investments can both contribute to the growth and revitalization of communities by improving infrastructure, employment opportunities, and overall quality of life. Researchers and policymakers have recently paid tremendous of attention to the link between entrepreneurship and economic growth. Because of the many employment opportunities they create and the ideas they bring to life, business owners play a crucial part in the growth and development of a prosperous economy (Surya et al., 2021; Skare & Porada-Rochon, 2022). This paper discusses the role of innovative individuals, economic growth and opportunities of trade across the countries on entrepreneurial activities. The paper also focusses the moderating role of financial development for the relationship of human capital and entrepreneurial activities.

Human capital, often known as an individual's knowledge, skills, and talents, is a significant predictor of entrepreneurial activity. Entrepreneurs rely on their human capital to find opportunities, develop new solutions, and negotiate the business environment's intricacies. In this regard, a well-educated and talented workforce is more likely to pursue entrepreneurial endeavors. Education gives information, skills, exposure, and a mindset necessary for startups to cultivate the human capital for entrepreneurial endeavors. It helps to produce valuable human capital, which may be used to take initiatives. People with more education, skills and experience are more likely to start businesses because they can better recognize and seize opportunities for business startups. Adeleye et al., 2022 found that the human capital proxied with education is relevant for economic growth. Economic Growth is also essential to inspiring new business ventures. When the economy expands, new markets open up, and the demand for goods and services rises, giving entrepreneurs more chances to launch and expand their ventures.

However as predicted by basic human capital theory, Becker, (1964) presents that better educational performance seems to lead to improved economic outcomes but this does not always observed into increases transfer rates of individuals towards entrepreneurship because of additional intervening factors. Most of the 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. Results from studies of the association between human capital and entrepreneurial outcomes at a variety level of analysis have been generally favorable, lending credence to the theory (Martin et al., 2013a). There is a connection between academic achievement and entrepreneurship, according to empirical studies, however, the effect of education varies depending on the level of education (Arshed et al., 2021). This research aims to determine the relationship between a specific level of education and the growth of the 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); Mohamed Sghaier, (2022); Arshed et al.,(2021) and Chirwa, (2008), we have used three levels of education in this study as proxies for the human capital i.e., primary, secondary, and tertiary school enrolment. Although many studies have used separate primary secondary and tertiary education for the proxy of human capital but in order to achieve the objectives of this study, we have taken together these three proxies. The reason behind the selection of these three proxies is that we hypothesized the higher level of

entrepreneurial activities is associated with a higher level of education. The data for the explanatory variables are extracted from the World Development Indicators (WDI) of the World Bank. The financial development index for this study comprises the development of the financial institutions and financial markets by the international monetary fund. This index is extracted from the International Monetary Fund (IMF) database and used in this study as a moderator. It covers the dimensions of financial institutions as well as financial markets i.e., access, depth, efficiency and stability. The International Monetary Fund (IMF) has created a comprehensive index that takes into account all the dimensions of financial system, financial institutions and financial markets. We have chosen financial development index as a moderator because (Dutta & Sobel, 2018) showed 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, which in turn raising the opportunity cost of starting a business and encouraging people to take initiatives for economic well-being. As a result, there are more well-paying jobs available that boosts the productivity of labor in big corporations. Dutta & Meierrieks, (2021) also proved that financial development sturdily associated with entrepreneurship both in case of sound and week institutions. However, there are many other factors, including financial development, that influence the relationship between human capital, economic growth, and entrepreneurial activities. The term "financial development" is used to describe the ability and accessibility of a country's financial markets and institutions, which determines the ease with which entrepreneurs can gain access to the funds they need to launch and expand their businesses.

Human capital, economic development, and entrepreneurial activity are all interconnected in some way that can be influenced by rising incomes. In particular, financial development may strengthen the effect of human capital and economic growth on entrepreneurship by giving business owners easier access to the resources they need to get flourishing. This paper's aim is to empirically investigate the connection between the level of education for the development of human capital and the levels of entrepreneurial activities for startups. Keeping in view the major objectives, the paper contributes in the existing stream of literature by many ways. Firstly, in order to make comparison, it explores the association of human capital and entrepreneurial activities by considering three vital level of formal education primary, secondary and tertiary. Secondly, the study investigates the role of economic growth with the association of human capital and entrepreneurial activities.

Thirdly this research explores the impact of trading opportunities for the entrepreneurial activities. Fourthly this paper introduces the moderating role of financial development index, comprising on the development of financial institutions and financial markets in the nexuses of human capital, economic growth, trade openness and entrepreneurial activities. The subsequent sections of this paper present the literature review, theoretical underpinning, empirical methodology, data analysis, findings, followed by a discussion of the results and their implications for theory and practice, conclusion, limitations and future research directions.

LITERATURE REVIEW

The existing literature presents mixed results for the relationship between education and entrepreneurial endeavors. Many studies demonstrated a strong correlation between human capital and organizational success in the business context (Bosma et al., 2004; Cassar, 2006; Dutta & Sobel, 2018). Also, Haber & Reichel, (2007) showed that growing human capital is essential for fostering entrepreneurial activity. Moreover, Baum & Silverman, (2004) argued that entrepreneurship and human capital are two key concepts that are frequently overstated. Dutta & Sobel, (2018) examined the association between higher education and entrepreneurial activities and concluded that the increase in human capital benefits entrepreneurial activities both at low and the highest levels of financial development. Human capital serves as a link between inputs & outputs and can thus contribute to the economic growth (Shidong et al., 2022).

Even these contradicting findings about higher education and entrepreneurship rates are seen among students in higher education, taking entrepreneurship and business planning courses, and these results are duplicated in many nations (Martin et al., 2013b). For instance, Oosterbeek et al., (2010) have reproduced their study and found that by attending an entrepreneurship course, university students' intentions to start a firm have reduced. In another example, Mentoor & Friedrich, (2007) found that several entrepreneurship-related elements of attitudes towards starting a firm, as well as entrepreneurial abilities and knowledge, are negatively connected with the attractiveness of undergraduate courses in business management as well as entrepreneurship in South Africa. This inverse association may have multiple causes, such as an increased awareness of the challenges and risks of launching an enterprise. On the other hand the second strand of literature depicts that to strengthen economic, social, and ecological sustainability, the intentions, motivations, and environment of entrepreneurs can shift depending on their level of education and the frequency with which they receive that education (Thathsarani et al., 2021).

Knowledge expertise and Competencies are essential for an entrepreneur because they offer a sensation of autonomy and independence, as well as the ability to manage the enterprise (Bowen & De Clercq, 2008; Jiménez et al., 2015; Arshed et al., 2021b). Innovation and healthy competition are stimulated by entrepreneurial endeavors, leading to gains in production and efficiency. An entrepreneur needs both a specific and general education to effectively drive entrepreneurial activities. Fleming, (2005) concluded that education encourages entrepreneurship since it gives people the self-assurance; they need to start their businesses and implement their ideas in their real life. By synthesizing and analyzing the relevant literature, this review seeks to identify the various dimensions and mechanisms by which human capital economic growth and financial development influences entrepreneurial success. The relationship between human capital and entrepreneurial activities has received increasing attention from academia and policymakers in recent years. The understanding of this relationship is essential for fostering more economic growth, innovation, and job creation to achieve

sustainable development goals SDGs. Previous studies examining the relationship between formal education and business success have revealed mixed findings.

THEORETICAL UNDERPINNING

Within the framework of human capital theory, investing human capital, such as education and training, can lead to greater productivity and economic growth. This is due to the notion that human capital can assist workers in acquiring the skills and knowledge required to be more productive. Increased productivity can result in increased wages and salaries, generating an abundance of resources to support entrepreneurial activities. Human Capital Theory (see, for example, (Schultz 61, Human Capital Theory. Pdf, n.d., Becker, 2009, Mincer, 1974) Higher Education (HE) for human capital is an excellent public and private investment. The basic case for public funding of education is that it 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 incomes over the course of their lives, entry into higher-paying professions, less time spent searching for work, and a smoother transition into more promising careers for economic well-being (Wahrenburg & Weldi, 2007). Education can be a valuable resource for entrepreneurs. It can provide them with the knowledge; skills, networks, and inspiration they need to start and run a successful business (Adeleye et al., 2022). The Resource-Based View (RBV) emphasizes on the importance of resources and capabilities in providing organizations with a competitive edge. The article utilizes an RBV approach to examine how human capital and economic growth serve as valuable resources that entrepreneurs can use to start and grow their businesses. It investigates how financial development, as a beneficial resource, affects the use of human capital and its effectiveness, as well as economic growth, in entrepreneurial activities.

This research article aims to investigate the relationship between human capital, economic growth, and entrepreneurial activities, with a specific focus on the moderating role of financial development. By examining these relationships, we seek to contribute to the existing body of knowledge in the field of entrepreneurship and shed light on the factors that drive entrepreneurial activities. Understanding how human capital and economic growth instigate entrepreneurial initiatives, and how financial development influences this relationship, has practical implications for policymakers, entrepreneurs, and stakeholders involved in fostering entrepreneurial ecosystems.

Following is a list of research questions that we have developed based on our study of the relevant prior literature.

- What is the relationship between human capital and entrepreneurial activities?
- What is the relationship between economic growth and entrepreneurial activities?
- What is the relationship between trade openness and entrepreneurial activities?
- Does financial development moderate the nexus among human capital, economic growth, trade openness and entrepreneurial activities?

RESEARCH HYPOTHESES

In this study, the following hypotheses are tested using empirical evidence.

H1: "Human capital is positively related to the entrepreneurial activities".

H2: "Economic growth is positively related to the entrepreneurial activities".

H3: "Trade openness is positively related to the entrepreneurial activities".

H4: "Financial development positively moderates the relationship of human capital, economic growth, trade openness and entrepreneurial activities

EMPIRICAL METHODOLOGY

Data and measurement of variables

World Development Indicators database of the World Bank and the International Monetary Fund (IMF) provide the secondary data for all variables across nations. In this paper, we conducted an empirical review using an unbalanced panel data set across the countries. We used unbalanced panel data, which incorporates both longitudinal and cross-sectional information. This makes it preferable to other types of data settings, such as time series and longitudinal data settings. We have used data from 139 nations between 2011 and 2019 to conduct our research. This time period is chosen because the data of entrepreneurial activities and rest of the variables is readily available for this time frame. The dependent, explanatory, and all control variables are defined (measured) and shown in Table 1. A list of selected countries is provided in the appendix. The summary statistics of the selected variables are reported in table2.

The dependent variable measuring the extent of entrepreneurial activities in the selected countries is new business registration. The data for this variable is drawn from the World Development Indicators (WDI) of the World Bank. The number of new business registration, which refers to the new limited liability companies registered on the calendar year for the first time. This is measured and reported on annual bases by the World Bank. We turn entrepreneurial activities into an operational concept by employing the WDI's measure of new business registration 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.

Secondly this measure of the entrepreneurial activities focused on formal entrepreneurship that makes it an appropriate choice for our analysis to explore the impact of human capital on entrepreneurial activities. In contrast, entrepreneurial activity connected with need and other types of entrepreneurship not subject to the 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 interesting from a public policy perspective (Dutta & Meierrieks, 2021).

Diagnostic tests for the normality of the data: To check the normality of the data, we have applied various tests.

The Skewness and Kurtosis (SK) Test

Sk-test describes the normal distribution of the data if the value of skewness is close to zero and the value of kurtosis is around three (3). This test finds the significant value of skewness and kurtosis(p-value<0.05), which indicates that the data is normally distributed.

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 LNTRDOP	Natural logarithm of trade openness
7 FDI	Foreign direct investment, net inflows (% of GDP)
8 LNTAXB	Natural logarithm of tax burden
9 INFL	Inflation, GDP deflator (annual %)
10 LN_NBR	Natural logarithm of new business registration
11 NBDENS	New Business Density (new registrations per 1000 people ages 15-64

Source: World Development Indicators of World Bank, International Monitory Fund (IMF)

The Shapiro-Wilk Test

Due to the fact that the Shapiro-Wilk test yielded a significant value, we are able to draw the conclusion that the residuals are normally distributed for this data set.

The Jarque-Bera Test

In addition to this, the Jarque-Bera Test for Normality is carried out, and the results show that our data set is consistent with the normality assumption.

Multicollinearity

Multicollinearity can provide artificially exaggerated standard errors, leading to the incorrect conclusion that the coefficients of interest are not significant. Since the VIF values for all variables in this study are less than 10, it can be concluded that multicollinearity does not exist in this specific framework.

Table 2.
Variance inflation factor (VIF)

	VIF	1/VIF
HC_TSE	2.382	.42
LNTRDOP	2.201	.454
HC_SSE	2.167	.461
GDP	1.454	.688
LNTAXB	1.262	.792
HC_PSE	1.123	.89
FDI	1.056	.947
INFL	1.048	.954
Mean VIF	1.587	.

The econometric models, methods, and data

The major objective of this study is to see the impact of human capital, economic growth, and trade openness on entrepreneurial activities with and without the moderating role of financial development. To empirically examine, this impact we consider the following fundamental form of the models.

$$\text{LN\_NBR}_{it} = \alpha_0 + \alpha_1 HC\_PSE_{it} + \alpha_2 GDP_{it} + \alpha_3 LNTRDOP_{it} + \alpha_4 \sum_{j=1}^{j} X\,j_{it} + \varepsilon_{it} \quad (1)$$

$$\text{LN\_NBR}_{it} = \alpha_0 + \alpha_1 HC\_SSE_{it} + \alpha_2 GDP_{it} + \alpha_3 LNTRDOP_{it} + \alpha_4 \sum_{j=1}^{j} X\,j_{it} + \varepsilon_{it} \quad (2)$$

$$\text{LN\_NBR}_{it} = \alpha_0 + \alpha_1 HC\_TSE_{it} + \alpha_2 GDP_{it} + \alpha_3 LNTRDOP_{it} + \alpha_5 \sum_{j=1}^{j} X\,j_{it} + \varepsilon_{it} \quad (3)$$

$$\text{LN\_NBR}_{it} = \alpha_0 + \alpha_1 HC\_PSE_{it} + \alpha_2 GDP_{it} + \alpha_3 LNTRDOP_{it} + \alpha_4 FDIND_{it} + \alpha_5 HC\_PSE_{it} FDIND_{it} + \alpha_6 \sum_{j=1}^{j} X\,j_{it} + \varepsilon_{it} \quad (4)$$

$$\text{LN\_NBR}_{it} = \alpha_0 + \alpha_1 HC\_SSE_{it} + \alpha_2 GDP_{it} + \alpha_3 LNTRDOP_{it} + \alpha_4 FDIND_{it} + \alpha_5 HC\_SSE_{it} FDIND_{it} + \alpha_6 \sum_{j=1}^{j} X\,j_{it} + \varepsilon_{it} \quad (5)$$

$$\text{LN\_NBR}_{it} = \alpha_0 + \alpha_1 HC\_TSE_{it} + \alpha_2 GDP_{it} + \alpha_3 LNTRDOP_{it} + \alpha_4 FDIND_{it} + \alpha_5 HC\_TSE_{it} FDIND_{it} + \alpha_6 \sum_{j=1}^{j} X\,j_{it} + \varepsilon_{it} \quad (6)$$

LN_NBR_{it} is the natural logarithm of new business registration for country i and year t. GDP is the proxy for economic growth, $LNTRDOP_{i,t}$ represents trade openness and $FDIND_{i,t}$ showed the measure of financial development index. The vector X represents an aray of control variables discussed below whereas ε_{it} represents unobserved error term.

Control variables: We adjust for a number of control variables to avoid detecting only erroneous correlations between entrepreneurship and human capital. Natural logarithm of trade openness, foreign direct investment natural logarithm of tax burden, and inflation are the control variables for this study.

METHODOLOGY FOR ESTIMATION

In order to accomplish the study's objective, panel data with two separate dimensions (such as time and a cross-sectional dimension) were collected from 2011 to 2019. Several issues arise as a result of the data's dimensionality throughout the estimating process. Several estimating strategies for dealing with panel data have been implemented throughout the years by researchers. The fixed effects (FE) and random effects (RE) tools, in particular, have gained popularity and are commonly utilized in applied research investigations. FE modeling is widely employed in research because it can effectively manage fluctuations in both temporal and cross-sectional dimensions (Kim et al., 2022; Tahir et al., 2019; Tahir and Azid, 2015, Tahir, 2020). RE modeling is also employed by researchers in initiatives for applied research since it allows them to investigate the impact of time-invariant features. For this study we used both random and fixed effect estimation technique and find random effect results as more appropriate for the study. The Hausman test (1978) was carried out, which demonstrate the superiority of fixed or random effect modeling according to nature and objectives of the study. As a result, we approximated the main model using the random effect approach. In addition, the two-step system GMM estimation technique is used in this study for the robustness analysis.

The rationale for selecting this methodology is multiple. Firstly the GMM technique is only applicable if the number of cross-sections is greater than the time dimension (Roodman, 2009; (Nkemgha et al., 2023). Our data set is of the same nature, comprised of 137 economies and covering the time period of nine (9) years in this study. Secondly the two step GMM estimation technique addresses the issues related to the serial and auto correlation in the data. The results of the main models are positive and significant for human capital, economic growth and trade openness with the entrepreneurial activities. The results are also positive and significant for the relationship of human capital with the entrepreneurial activities by incorporating the moderating effect of financial development.

Table 2.
Summary Statistics

	N	Mean	Std. Dev.	skewness	kurtosis	min	max
LN_NBR	1139	8.857	2.079	-.668	3.906	.693	13.437
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
LNTRDOP	975	23.517	2.274	-.115	2.176	16.876	27.147
FDIND	1139	.359	0.224	.751	2.611	.033	.989
FDI	1137	4.344	4.808	1.796	5.738	-1.094	18.828
INFL	1138	4.056	5.742	2.485	13.39	-8.977	37.095
LNTAXB	848	3.403	0.585	-4.17	30.173	-2.692	4.13

Source: World Development Indicators of World Bank, International Monitory Fund (IMF)

Table3.
Pairwise Correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) LN_NBR	1.000									
(2) HC_PSE	-0.086	1.000								
	(0.007)									
(3) HC_SSE	0.386	-0.007	1.000							
	(0.000)	(0.831)								
(4) HC_TSE	0.399	-0.201	0.743	1.000						
	(0.000)	(0.000)	(0.000)							
(5) GDP	-0.026	0.108	-0.265	-0.392	1.000					
	(0.375)	(0.001)	(0.000)	(0.000)						
(6) LNTRDOP	0.765	-0.216	0.555	0.597	-0.472	1.000				
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)					
(7) FDIND	0.589	-0.141	0.648	0.584	-0.229	0.774	1.000			
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)				
(8) FDI	-0.090	0.018	0.030	0.041	0.162	-	0.0	1.000		

						0.075	35			
	(0.002)	(0.585)	(0.392)	(0.228)	(0.000)	(0.019)	(0.240)			
(9) INFL	0.002	0.093	-0.146	-0.083	0.005	-0.107	-0.247	-0.035	1.000	
	(0.945)	(0.004)	(0.000)	(0.015)	(0.855)	(0.001)	(0.000)	(0.240)		
(10) LNTAXB	0.110	-0.143	-0.080	-0.070	0.018	-0.055	-0.057	0.091	0.010	1.000
	(0.001)	(0.000)	(0.040)	(0.062)	(0.607)	(0.122)	(0.099)	(0.008)	(0.781)	

*Standard errors are in parentheses *** p<.01, ** p<.05, * p<.1*

RESULTS AND DISCUSSION

Table 5 presents the baseline results of the study. As consistent with H1, H2 and H3 we find that higher the level of human capital associated with higher the level of entrepreneurial activities. The coefficient for human capital with primary school education, HC_PSE is -0.010, although it is statistically significant ($p < 0.01$) but with opposite direction. Whereas the coefficients for human capital with secondary HC_SSE and tertiary school education, HC_TSE are positively and significantly ($p < 0.01$) associated with entrepreneurial activities. The coefficient of gross domestic product, GDP, trade openness, LNTRDOP, and financial development index, FDIND are positive and significant throughout all the levels of education in each model. Inflation and FDI behave negatively and insignificantly.

Table 5.
Baseline Regression Results

Entrepreneurial Activities	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Primary	**Secondary**	**Tertiary**	**Primary**	**Secondary**	**Tertiary**
HC_PSE	-0.010***			0.000		
	(0.003)			(0.003)		
HC_SSE		0.012***			0.009***	
		(0.002)			(0.002)	
HC_TSE			0.018***			0.011***
			(0.002)			(0.002)
GDP				0.039***	0.061***	0.044***
				(0.012)	(0.013)	(0.011)
LNTRDOP				0.118***	0.152***	0.109***
				(0.034)	(0.037)	(0.032)
FDIND				3.055***	1.760***	2.379***
				(0.395)	(0.414)	(0.398)
FDI				-0.003	-0.001	-0.003
				(0.003)	(0.003)	(0.003)
INFL				-0.003	-0.002	-0.003
				(0.003)	(0.004)	(0.003)
LNTAXB				0.236***	0.239***	0.333***
				(0.055)	(0.065)	(0.075)
_cons	9.906***	7.781***	8.244***	4.383***	3.200***	4.120***
	(0.356)	(0.225)	(0.172)	(0.952)	(0.926)	(0.819)

Observations	977	826	869	690	603	651
R Square (R^2)	0.0073	0.1488	0.1591	0.4211	0.4248	0.3825
Wald chi2	12.73	47.65	83.97	118.01	121.51	159.27
Prob > chi2	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000

Standard errors are in parentheses *** p<.01, ** p<.05, * p<.1

These findings show that human capital, economic growth, trade openness, and financial development are the predictors of entrepreneurial activities. Gross domestic product, trade openness, and financial development coefficients are also positive and significant at the secondary and tertiary education levels, but positive and insignificant at the primary level. Inflation and FDI have a negative and minor impact on entrepreneurial activities. Tax burden also has a positive and statistically significant effect on entrepreneurial activity, implying that entrepreneurs can regulate the amount of tax to boost entrepreneurship. The R^2 values provide a measure of the extent to which the independent factors account for the variability observed in the dependent variable. Models with higher R^2 values indicate a stronger degree of fit. The model accounts for 38.25% of the variance in tertiary education and 42.48% in secondary education for entrepreneurial activities. The value of Wald Chi-square evaluates the combined significance of all model coefficients. Higher chi-square values suggest more significant models, and all models are highly significant in this scenario. The discussion based on the above findings shows the goodness of fit for the results of overall models.

Table 6.
Regression Results with Moderating Effect of Financial Development

Entrepreneurial Activities	**(1)**	**(2)**	**(3)**
	Primary	**Secondary**	**Tertiary**
HC_PSE	-0.005		
	(0.006)		
HC_SSE		0.022***	
		(0.004)	
HC_TSE			0.024***
			(0.004)
GDP	0.037***	0.058***	0.041***
	(0.012)	(0.013)	(0.011)
LNTRDOP	0.113***	0.137***	0.098***
	(0.034)	(0.037)	(0.032)
FDIND	1.524	3.935***	4.175***
	(1.629)	(0.788)	(0.642)
FDI	-0.003	-0.000	-0.003
	(0.003)	(0.003)	(0.003)
INFL	-0.003	-0.001	-0.003
	(0.003)	(0.003)	(0.003)
LNTAXB	0.239***	0.211***	0.312***
	(0.055)	(0.065)	(0.074)
FDINDHC_PSE	0.015		
	(0.015)		
FDINDHC_SSE		0.023***	
		(0.007)	
FDINDHC_TSE			0.033***
			(0.009)

_cons	5.016***	2.520***	3.889***
	(1.135)	(0.950)	(0.815)
Observations	690	603	651
Pseudo R^2	0.4177	0.3884	0.3724
Wald chi2(8)	118.07	131.69	172.64
Prob > chi2	0.0000	0.0000	0.0000

Standard errors are in parentheses *** p<.01, ** p<.05, * p<.1

Table 6 presents the regression results of the study with moderating effect of financial development. The coefficient for the interaction term of human capital with primary school education and financial development index, FDINDHC_PSE is 0.015, although it is positive but statistically insignificant (p> 0.01). Whereas the interaction term of human capital with secondary school education and financial development index, FDINDHC_SSE is 0.023 which is positive and statistically significant (p<0.01). The interaction term of human capital with tertiary school education and financial development index, FDINDHC_SSE is 0.033 which is also positive and statistically significant (p<0.01). These results show that financial development is associated with entrepreneurial activities and moderates the nexus among human capital and entrepreneurial activities but this moderating impact is more with secondary and tertiary education and less with primary education. The coefficients of GDP, LNTRDOP, and FDIND are also positive and significant at the secondary and tertiary education level whereas positive and insignificant at the primary level of education. Inflation and foreign direct investment have negative and insignificant effects on entrepreneurial activities. tax burden also has a positive and statistically significant effect on entrepreneurial activities which means that the amount of tax can be managed by the entrepreneurs to promote entrepreneurship.

Table 7.
GMM Two Steps Results

Entrepreneurial Activities	(1) Primary	(2) Secondary	(3) Tertiary
L.LN_NBR	0.957***	0.985***	0.993***
	(0.009)	(0.010)	(0.014)
HC_PSE	0.006*		
	(0.003)		
HC_SSE		-0.004***	
		(0.001)	
HC_TSE			-0.005***
			(0.001)
FDIND	2.391*	-1.150***	-0.891***
	(1.276)	(0.411)	(0.307)
GDP	0.014***	0.004	0.009**
	(0.003)	(0.004)	(0.004)
FDI	-0.001	0.004**	0.007***
	(0.002)	(0.002)	(0.002)
INFL	0.003**	0.004**	0.002
	(0.001)	(0.002)	(0.001)
LNTRDOP	0.026***	0.029***	0.039***
	(0.009)	(0.011)	(0.013)
LNTAXB	0.002	-0.000	-0.016
	(0.011)	(0.012)	(0.014)
FDINDHC_PSE	-0.023*		
	(0.012)		
FDINDHC_SSE		0.010***	
		(0.003)	

FDINDHC_TSE			0.010***
			(0.004)
_cons	-0.881**	-0.078	-0.495**
	(0.411)	(0.156)	(0.226)
Observations	589	501	544
Number of Groups	101	91	100
Number of Instruments	50	50	50
Hansen Test (p value)	0.409	0.246	0.447
Arellano-Bond test (AR1)	0.004	0.009	0.000
Arellano-Bond test (AR2)	0.408	0.641	0.259
Wald chi2	3.84e+06***	5.93e+06***	4.29e+06***

*Standard errors are in parentheses *** p<.01, ** p<.05, * p<.1*

Table 7 shows the results of two steps system GMM. The results explain that there is moderating role of financial development in the nexuses of human capital, economic growth, trade openness and entrepreneurial activities. Financial development index strongly moderates the relationship of human capital and entrepreneurial activities when human capital is measured by secondary and tertiary level of education because the coefficient of product term of human capital with financial development index is 0.010 at both the levels, which is positive and statistically significant at 1% level of confidence interval.

The individual effect of secondary and tertiary level of education in these GMM results is negative and significant because the moderator absorbed their effect. Without including the moderating term, the human capital with secondary and tertiary education has strong positive and significant effect on entrepreneurial activities. On the bases of the results in empirical investigation of the study and above discussion we accept the four hypotheses of this study and concludes that human capital, economic growth, and trade openness instigate entrepreneurial activities. Furthermore, the development of financial system strongly moderates the relationship of human capital and entrepreneurial activities. The results of this study are similar with the studies of Dutta & Sobel, (2018) and Tahir & Burki, 2023.

CONCLUSIONS

Following a discussion of the findings, we conclude that human capital contributes to the successful launch of new businesses and that education plays an important role in supporting entrepreneurs for startups and in improving their entrepreneurial activities. Attaining sustainable development goals through higher education and encouraging entrepreneurship to generate economic activity should be a key priority for governments and policymakers worldwide. Despite increasing understanding of the importance of human capital, just a few studies have looked at how it influences startup and small business ventures. The provision of secondary and higher education has been found to boost entrepreneurial activities by increasing human capital, economic growth, and trade opportunities. Additionally, the study examines the moderating effect of financial development for the connection of human capital and entrepreneurship and concludes that financial development strongly moderates this relationship.

The study's implications for practical point of view towards a higher level of education may consider as a prerequisite for launching new business ventures in this challenging era. In the long run, the ventures' ability to generate useful goods and services will be vital in helping to achieve another sustainable goal, the eradication of the world's hunger by

providing quality goods and employment opportunities. Also, these new businesses will create new jobs for the general public. One more sustainable objective will be met as a result of these entrepreneurial endeavors, the alleviation of poverty. Policymakers, researchers, and academia can all look to this study for guidance on how to boost entrepreneurial activities in their own countries in order to attain the sustainable development goals.

LIMITATIONS AND FUTURE RESEARCH

This research study has several limitations despite its substantial contributions. Firstly, using panel data from 137 economies might miss the opportunity to capture region-specific dynamics and features. Secondly, due to a paucity of data, the study couldn't account for the impact of the COVID-19 pandemic on entrepreneurial activities. Thirdly, the study's limited temporal scope, spanning from 2011 to 2019, may offer just a partial depiction of contemporary advancements and their influence on the field of entrepreneurship. These limitations could be overcome in subsequent research by conducting investigations that are more in-depth and region-specific, by capturing recent trends using data that is as current as possible, and by examining the underlying mechanisms that are behind the observed connections. It is possible to conduct additional research into the specific role of human capital and its applications in entrepreneurship as well as the impact of cultural and institutional factors on entrepreneurial activities. This will provide valuable insights for a more comprehensive understanding of the complex dynamics at work in this modern and technologically advanced era.

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Data Availability Statement

The data that was collected for this study can be accessed and will be sent via email to anyone who requests it, if necessary.

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Conflicts of Interests

All of the authors have indicated that they have no competing interests in this study. The authors made major contributions to the publication's entire writing process. Furthermore, we confirmed that all of the writers contributed significantly to the revision process, from the initial draught to the final edition of the work. The authors also state that they have no conflicts of interest to disclose.

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Appendix

List of Countries

Country Name	Country Name	Country Name	Country Name	Country Name
Albania	Dominica	Ireland	Niger	Sierra Leone
Algeria	Dominican Republic	Israel	Nigeria	Singapore
Antigua and Barbuda	El Salvador	Italy	North Macedonia	Slovak Republic
Argentina	Estonia	Jamaica	Norway	Slovenia
Armenia	Eswatini	Japan	Oman	South Africa
Australia	Ethiopia	Jordan	Pakistan	South Sudan
Austria	Finland	Kazakhstan	Panama	Spain
Azerbaijan	France	Kenya	Peru	Sri Lanka
Bahrain	Gabon	Kiribati	Philippines	Suriname
Bangladesh	Georgia	Kuwait	Poland	Sweden
Barbados	Germany	Kyrgyz Republic	Portugal	Switzerland
Belarus	Greece	Lao PDR	Qatar	Tajikistan
Belgium	Grenada	Latvia	Romania	Tanzania
Belize	Guatemala	Lesotho	Russian Federation	Thailand
Benin	Guinea	Liberia	Rwanda	Timor-Leste
Bhutan	Guyana	Lithuania	Samoa	Togo
Bosnia and Herzegovina	Hong Kong SAR, China	Luxembourg	Sao Tome and Principe	Tonga
Botswana	Hungary	Madagascar	Saudi Arabia	Trinidad and Tobago
Brazil	Iceland	Malaysia	Senegal	Tunisia
Brunei Darussalam	India	Maldives	Serbia	Turkey
Bulgaria	Indonesia	Mali	Seychelles	Uganda
Cabo Verde	Dominica	Malta	Niger	Ukraine
Cambodia	Dominican Republic	Mauritania	Nigeria	United Arab Emirates
Central	El Salvador	Mauritius	North Macedonia	United

African Republic				Kingdom
Chad	Estonia	Mexico	Norway	Uruguay
Chile	Eswatini	Moldova	Oman	Uzbekistan
China	Ethiopia	Mongolia	Pakistan	Vanuatu
Colombia	Finland	Morocco	Panama	Vietnam
Costa Rica	France	Mozambique	Peru	Zambia
Cote d'Ivoire	Gabon	Myanmar	Philippines	
Croatia	Georgia	Namibia	Poland	
Cyprus	Germany	Nepal	Portugal	
Czech Republic	Greece	Netherlands	Qatar	
Denmark	Grenada	New Zealand	Romania	