PRIMARY RESEARCH

Does Equity Finance Improve Entrepreneurship Potency of Financial Sector Development?

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Abstract.
Purpose: This study is exploring the holistic quadratic financial market development effect on entrepreneurship at the macroeconomic level and assesses the contrast of patterns because of the increase in the share of Islamic equity financing as a risk-sharing instrument.
Method: An unbalanced panel data is acquired for selected Islamic banks of 21 nations to estimate Panel Quantile Regression (PQR) measuring the curvilinear financial market development effect and moderating role of Islamic equity financing in explaining the macroeconomic entrepreneurship index.
Results: The results show that higher equity financing dissipates the debt burden of financing by sharing risks, thus motivating entrepreneurship at a macroeconomic level.
Implications: Central Banks and Islamic advisory boards regulating banking systems innovate to integrate and increase equity based financial instruments as a financial inclusion policy in promoting a risk-sharing entrepreneurial ecosystem.
KAUJIE Classification: O3, Q91
JEL Classification: C23, E44, E59, L26

INTRODUCTION

Importance of Entrepreneurship

Naudé (2011) defines entrepreneurship as "making judgments about the firm and available resources". Entrepreneurship is risky because business and profit prospects are unknown and this uncertainty entails random and unpredictable dangers (Knight, 2009). Entrepreneurship has a potential to create jobs (Arshed et al., 2021; Dhaliwal, 2016; Manullang, 2018), economic growth (Ács et al., 2018; Davidsson et al., 1995; Manullang, 2018) and boosts productivity (Dhaliwal, 2016; Manullang, 2018) and reduces unemployment rate (Audretsch & Fritsch, 2003; Decker et al., 2014; Mouhammed, 2010). Entrepreneurs boost competitiveness,

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product supply, and economic progress (Mead & Liedholm, 1998; Minniti & Lévesque, 2010). Entrepreneurship is a business opportunity that individuals, businesses, and society use to boost economic growth. An entrepreneur is a person who finds opportunity and convert it in the progress and development of the economy (Tripathi et al., 2022). New business promotion emphasizes innovation, risk management, new technology, and institutional activity. Azmat & Samaratunge (2009) say entrepreneurs combine resources, labour, materials, and other assets to create something new.

Empirical Determinants of Entrepreneurship

There are many ways to get finance in the market but mainly three ways are used to arrange finance: use own resources, from banks, or from acquiring equity. There are different entrepreneurship determinants discussed in literature, one of them is business environment (Peng, 2002; Peng et al., 2009). Studies showed that environmental dynamism has an impact on the success of entrepreneurship and profitability (Bamford et al., 2000; Dean, 2016; Eisenhardt & Schoonhoven, 1990). Studies showed that the culture of an organization is a key determinant of entrepreneurship (Kang et al., 2016), other indicators include the higher education impacts entrepreneurship (Arshed et al., 2021; Martin et al., 2013; Mentoor & Friedrich, 2007), role of good managerial skills as the key factors affecting entrepreneurship success (Benzing et al., 2009; Martins, 2007; Mughan et al., 2004) and, many include financial resource availability as a determinant (Arshed et al., 2021; Kauermann et al., 2005). While studying the macroeconomic factors, GDP is the factor that affects entrepreneurship (Noorderhaven et al., 2004; Parker & Robson, 2004). If entrepreneurs get sustainable finance, it helps businesses to grow more efficiently (Kauermann et al., 2005).

Role of the Financial Market

Financial development is a crucial component of economic progress. Financial market development is a process that improves financial inclusion quality and quantity (Abu-Bader & Abu-Qarn, 2005). Entrepreneurship requires financing capital, they need reliable and sustainable financing to sustain their product, idea or business cycles where liquid resources play an important role (Lawal et al., 2018).

Numerous papers used financial development proxies like Bist (2018) and Wen et al. (2022)used domestic credits to the private sector. Jalil & Ma (2008) investigated economic progress and financial market development by using financing to the private sector. Recent research has examined equity financing acquired from business angels, venture capitalists, and stock/capital markets. PLS-based equity financing differs from conventional/usurious financing (Azmat et al., 2015). However, government rules, commercial bank interest rates (*ribā*) and pseudo transactions made the financial market problematic for the economy (Abu-Bader & Abu-Qarn, 2005; Ibrahim & Alagidede, 2018), while interest rate is use as an instrument of monetary policy under fiat currency mechanism this tool has failed to control inflation globally (Egri & Orhan, 2021).

Equity Financing as a Motivating Factor

Islam inspires Muslims to become ethical entrepreneurs (Kayed & Hassan, 2010). While conventional entrepreneurs ignore divine rule and risk market conditions. They desire a profit-focused economy without target consumers (Kuratko, 2016). But, Muslim entrepreneurs observe Sharī'ah financial rules.

Muslim entrepreneurs must follow Sharī'ah law (*'āqidah*, *fiqh*, *akhlaq*) in financial concerns. It recognizes Khalifah (Caliph) role of humans in world growth and prosperity. Entrepreneurship should benefit society. Because Islam forbids injury, Muslim entrepreneurs must avoid *ḥarām* goods and services. In other words, a Muslim entrepreneur should observe the *maqāṣid al*-Sharī'ah, which protects riches, religion, lineage, life, and intelligence. Muslim entrepreneurs should grasp *maqāṣid al*-Sharī'ah and know what is *ḥalāl* and *ḥarām* while starting firms (Abdullah & Azam, 2020). Entrepreneurs should avoid high-risk, unclear transactions (Nkwabi & Mboya, 2019). Islamic finance allows Sharī'ah compliance.

Within *fiqh al-mu'āmalāt*, Islam has provided several rules pertaining to businesses in the Holy Qur'ān and *ḥadīth* of the Prophet Muhammad (PBUH) with an aim to improve human brotherhood, verdicts for nurturing businesses have a special place in Islam. Allah (SWT) says: "by men whom neither traffic nor merchandise can divert from the remembrance of Allah, nor from regular Prayer, nor from the practice of regular charity" (Qur'ān, 24:37), similarly, the *ḥadīth* of the Prophet (PBUH) narrates *"nine out of 10 sources of income are coming from business activities"* (Salwa et al., 2013). Having a business or starting a new business are treated as religious beliefs or rituals (*'ibādāt*) to Allah (SWT) if done justly and for the right reason (Vargas-Hernández et al., 2010; Yaacob & Azmi, 2012).

Kuran (2002) wrote that "many hardworking, active and eager Muslims are reluctant to start business due to lack of knowledge and accessibility to permissible finance". Islamic financial system promotes entrepreneurs using equity participation via SME financing. Islamic finance shares profits and losses make equity involvement beneficial. Before it, the collateral and fixed returns have prevented conventional banks from helping entrepreneurs by demanding significant security or collateral for risk coverage. In Islamic finance, equity ownership guaranteed enterprise success and increased returns.

Muqāraḍah and *mushārakah* could be used in medium-sized businesses (Sadique, 2008). Agribusiness benefits from Islamic bank financing. Islamic banking PLS benefits other sectors in the economy (Sutawi, 2008). It boosts SME performance (Grönroos, 1996). Asset-based products from Islamic banks can aid entrepreneurs in which successful ventures benefit both banks and entrepreneurs (Kuran, 2002). Interest-based finance should learn from the success of Islamic financial system. Islamic financing is asset-based or profit-and-loss-based and is the finest solution for debt-based financing and an opportunity for businesses. Islamic financing allows new businesses to share the risk and establish a new enterprise without all the load (Kayed, 2012).

Research Gap

Instead of picking the proxy which is new business registered or other indicators for entrepreneurship which are discussed in literature from Global Entrepreneurship Monitor

(GEM), empirical research did not analyses the financial development and entrepreneurship link. This study has created an entrepreneurship index utilizing 9 factors from a wide range of potential metrics provided by (Martins, 2007).

At the same time, this study expands the literature using developing a holistic financial market development indicator. The developed indicator embraces numerous indicators of the quality and quantity of financial development (Ang & McKibbin, 2007; Gautam, 2015). This study has identified 6 indicators proposed in Global Competitive Index by World Economic Forum (WEF) (Schwab, 2018).

Factor analysis has been used to develop macroeconomic entrepreneurship and financial development indicators that provide an efficiently reduced single-dimension index while keeping the essence of all 9 and 6 dimensions of entrepreneurship and financial development, respectively.

This study identified few studies on how Islamic equity/asset-based finance promotes entrepreneurship through financial system risk-sharing. Islamic financing has been studied for its effects on economic progress (Arshed et al., 2021; Kayed & Hassan, 2010; Nawaz et al., 2019), but its impact on entrepreneurship is unknown. This study shows how risk-sharing-based products can benefit entrepreneurs and reduce the finance accessibility gap. Tawfiqi et al. (2018) found that Islamic banks promote entrepreneurship. This study modifies financial sector development with Islamic equity financing, hoping to improve entrepreneurship with financial sector stability and extensiveness.

Objectives of the Study

Building on the financial market development role, empirical studies conclude mixed (positive and negative) results with economic progress (Hassan & Kalim, 2017). Further, it is shown by previous studies that there must have a nonlinear relation with growth. But, the nonlinear/quadratic effect is underexplored against new business development (Arshed et al., 2021). This study discusses this nonlinear/quadratic financial market development index effect. Hence the objectives of the study are:

- Construction of multidimensional financial sector development and macroeconomic entrepreneurship index.

- Investigating the presence and nature of the quadratic financial sector development effect on entrepreneurship.

- Exploring the Islamic equity financing's moderating role in financial development and nonlinear/quadratic entrepreneurship relationship.

The recent inauguration of the Kamyab Jawan program of Pakistan Government to promote new businesses in youth Startup Pakistan Program in 2020 with a lack of interest by the public presents itself as scope of the study. Further, several nations are working on developing an entrepreneurial ecosystem macroeconomic policy framework that may help in entrepreneur promotion (Bosma et al., 2020). The Islamic participatory financing as an important potential of entrepreneurial success is discussed in this study.

Research Questions
The objectives motivated research questions are following:

- What is the constructs' composition for the financial sector development and macroeconomic entrepreneurship index?

- What is the impact of financial sector development on entrepreneurship?

- Can Islamic equity financing help increase the effectiveness of financial sector development on entrepreneurship?

The challenges faced by entrepreneurs are discussed in the literature which will be followed by the theoretical and empirical contribution of financial development in the literature review. Later in the study, the methodology section was added, which explained the variables and methods. There will be results and discussion afterwards. Finally, this study provided some policy implications and findings.

LITERATURE REVIEW

Theoretical Review
One of the challenges that entrepreneurs encounter is obtaining timely financing (Ayyagari et al., 2008; Fowowe, 2017; Ullah, 2020) for their SMEs from traditional/usurious banks (Jagoda & Herath, 2010). The commercial banks typically require some guarantees or some backup to mitigate high risk (Harrington, 2009; Nawai, 2011; Zavatta, 2008), which makes it difficult for SMEs to obtain a loan from commercial lenders (Ramlee & Berma, 2013).

The domestic credit provision by the private sector helps in increasing the credit accessibility for new businesses (Aghion et al., 2007; Vidal-Suñé & López-Panisello, 2013) and expansion into a sustainable business (Onyeneke & Iruo, 2012; Nkwabi & Mboya, 2019; wang, 2016). Several hypotheses advocating the role of financing in entrepreneurship were provided by Sohail & Arshed (2022) like Entrepreneurship Signaling Theory (Bhattacharya, 1979), Real Options Theory, Pecking Order Theory (Bowman & Hurry, 1993), Information Asymmetry Theory and Stewardship Theory are among these theories (Arshed et al., 2021). The discussed theories assert a connection between financial progress and new businesses. This demands effect quantification.

Equity Financing/Venture Capital
Global Entrepreneurship Forum discusses the link between equity financing and entrepreneurship. Some products or financing products can help SMEs to grow, like *mushārakah* and textitmuqārada̦h. These products are useful because they resolve the issues of information problems like moral hazards and adverse selection (Arshed et al., 2021; Fried & Hisrich, 1994; Yousfi, 2012). It also helps distribute the risk in assisting entrepreneurship (Fried & Hisrich, 1994).

There are some studies related to equity finance with entrepreneurship like Riyadi et al. (2021) worked on the optimization of PLS. Widarjono (2021) worked on the relationship between equity finance and the profitability of Indonesian Islamic banks. Maikabara et al. (2021) worked on debt and equity comparison in increases profitability of new business. Kauermann et al. (2005) worked on the challenging equity finance market reforms for entrepreneurship. De Bettignies & Brander (2007) worked on bank financing versus venture capital in aiding entrepreneurship. Kamel (2019) states that Islamic banks provide many solutions, like participatory and custom-designed products. But SMEs do not fully utilize them due to a lack of awareness. Abdul Rahman et al. (2020) said that *mushārakah*-based financing is not widely available for people because of the relatively high-risk commercial banks face (Kauermann et al., 2005). Usmani (2002) said that the obstacle to implementing Islamic products like *mushārakah* faces some practical problems, such as working in isolation and mostly without government support. According to Ashraf (2013), the main obstacle to implementing *mushārakah* is the absence of tax incentives, it the reason for low performance in equity financing. Islamic banks avoid using *mushārakah* due to the unfair treatment of taxation Dar & Presley (2000). Equity-based financing is ideal for Islamic banking due to its ability to address moral hazard issues, such as agency problems (R. K. Aggarwal & Yousef, 2000).

Previous studies have shown that Islamic banks are better than their usurious counterparts (Aldeen et al., 2020; Aslam, 2016; Sohel, 2017). Kuswara et al. (2019) prove through their study that PLS products are useful for banks' performance. Agustin et al. (2018) revealed that textitmuqāraḍah and *mushārakah* are good products for Islamic banks to facilitate the entrepreneurs of all kinds of economies. Bensalem & Bouherb (2021) tried to find the issues Islamic banking faces while using PLS products for SMEs. Their study showed that these products are risky for banks to finance SMEs. Hence, the conventional banking system is not expected to provide equity financing and share the risks.

Islamic Finance, Economic Progress, and Entrepreneurship Martins (2007) discussed several indicators which can be used to explain entrepreneurship in a country. He proposed several variables like survival rates of new enterprises, employment rate in services, rate of social economy enterprises, and newly created enterprises/existing enterprises.

Tabash & Dhankar (2014) investigated UAE for the Islamic financial market and economic progress association. For data from 1990 to 2010, the results showed that the Islamic banks' financing has increased long-run investment in UAE. Further, an immature financial sector harms the economy (Chong et al., 2017; Ductor & Grechyna, 2015).

Muhamad et al. (2020) showed a framework in their study for SMEs specifically and most importantly how Islamic banking products help provide equitable financing applications. According to them, the lack of understanding is a hurdle in maximizing the effects of Islamic financing for SMEs. Arshed et al. (2020) examined the financing by Islamic banks with economic progress. The study showed Islamic banking and economic progress positive relationship. Anwar et al. (2020) worked on a paper where they were trying to find the relationship between Indonesian Islamic banks and economic progress. The results showed that there is a relationship that exists which means that Islamic banks somehow contribute to

economic progress in case of Indonesia. Dutta & Meierrieks (2021) talked about financial market development and new businesses. According to them, if the financial system of an economy is stable and cost effective credit will be provisioned for new businesses leading to effective business growth. Numerous papers investigated the economic progress and new businesses relationship (Aparicio et al., 2016; Boudreaux et al., 2019; Doran et al., 2018; Feki & Mnif, 2016) proved that entrepreneurship is the key driver for economic progress. Financial development helps economies expand, according to many research. In their works, Wujung & Fonchamnyo (2016) showed that domestic credit and saving mobilisation affect private entrepreneurship. They also showed that financing entrepreneurship will boost the economy. Financial development spurs economic growth (Dada et al., 2022; Naceur & Ghazouani, 2007; Saci et al., 2009; Ujunwa & Salami, 2010).

Hidiroglu (2017) conducted study in which he attempted to discover a link among financial inclusion and entrepreneurship. The study included four financial development indicators: bank affordability and soundness, venture capital, and loan access. According to the study's findings, there is no substantial association between bank affordability and soundness and new business. There is a strong link among access to loans and venture capital and new businesses. According to certain studies, the financial market and economic growth have a negative and inconsequential link (Naceur & Ghazouani, 2007; Narayan & Narayan, 2013).

In his article, Mauro (1995) shown that corruption has an impact on financial development and economic progress. According to Detragiache et al. (2005), political instability and bad governance are elements that influence the financial market of any country. According to R. Aggarwal & Goodell (2009), regulatory system has an impact on the economy, causing financial development issues.

THEORETICAL MODEL

This study is divided its outcome to achieve 5 objectives. Objectives 1 and 2 are designed to constitute the indices of financial sector development and the macroeconomic entrepreneurship index. Figure 1 is providing the details of each objective. The data has been taken from some reputable sources like World Development Indicators, World Economic Forum, and Global Entrepreneurship Monitor, Worldwide Governance Indicators.

Figure 1 depicts all of the factors and their aims. We chose six metrics to serve as proxies for financial development. Previously, many financial market development indicators such as broad money, domestic lending for the private sector, and market capitalization were utilised to measure the financial market (Beck et al., 2014). Enowbi-Batuo & Kupukile (2010) measured financial development using liquid liabilities and money supply. The indicators employed are taken from Global Competitiveness Reports (WEF) that serve as a comprehensive representation of financial progress. Using available data, 9 variables from (Martins, 2007) list were chosen for entrepreneurship.

This research has resulted in a comprehensive representation of entrepreneurship.
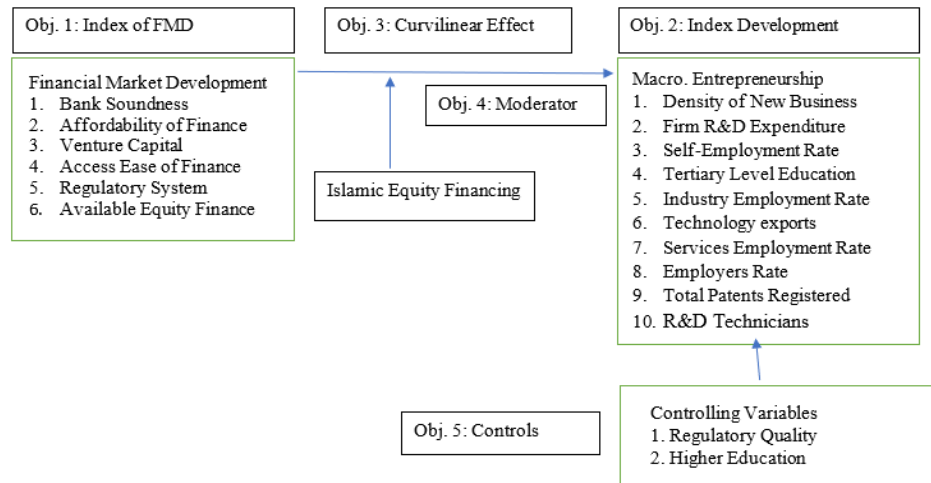
FIGURE 1. Theoretical Model

The influence of individual experiences, the actions of others, and environmental circumstances on individual behaviors is described by Social Cognitive Theory (SCT) (Bandura, 1986). SCT has only been utilized in a few studies to determine entrepreneurship (Boudreaux et al., 2019; Cai et al., 2022; Cui, 2021; Kisubi et al., 2021; Wang et al., 2019). Omri (2020) investigated a link between financial development and entrepreneurship. Their research revealed that there is a positive and negative association. They demonstrated a deterring influence on informal entrepreneurship while having a good influence on formal entrepreneurship. This study proposes a nonlinear influence of financial development on new businesses that depend on its scale. Quadratic or self-moderator relationships depict variable returns-to-scale (Hayes, 2017). The quadratic effect of financial development on economic progress is a diminishing/vanishing effect that raises debt repayment and lowers investment profits (Deidda & Fattouh, 2002; Law & Singh, 2014; Prochniak & Wasiak, 2017). High-income countries' financial sectors support growth with volatility (Beck et al., 2014).

Financial growth increases new business prospects (Gans et al., 2018). This association is explored by a few studies. Hurst & Lusardi (2004) indicated that financial restrictions have a U-shaped effect on business startup likelihood. Pinto & Augusto (2014) found a U-shaped association between soundness of the financial system and Portuguese SME returns. Gaies et al. (2021) examined 22 European economies from 2009 to 2017 and found that banking sector has a U-shaped association in fledgling new businesses that is responsive to economic situations. Others studied the U-shape relationship (Gambacorta et al., 2014; Li et al., 2015). The U-shaped relationship confirms a minimum financial development threshold for entrepreneurs.

De Bettignies & Brander (2007) study developed a theoretical model of venture capitalist (VC) share the role in new venture' payoffs and VC returns following an inverted U-shaped pattern, in which higher VC shared financing increases entrepreneurial gains initially, but this rate eventually reduces to decreasing effect. Tang et al. (2008) find through their study

that there is an inverted U shape relationship exist among entrepreneurial experience and new venture performance. Raharja & Mranani (2019) study calculated the nonlinear debt financing effect on company performance of Indonesia. The study results showed that in case of Indonesian enterprises showed an inverted U shape connection.

Adelekan (2021) determined the Islamic financing effect on the SMEs. According to his findings, Islamic financing has a favorable impact on SMEs. A study by, Faisol (2017) evaluated Islamic funding's impact on Kideri SMEs. According to them, Islamic finance benefits the SMEs. Manzilati (2020) discovered that PLS improves the sustainability of SMEs. PLS minimized the principal-agent problem, according to qualitative research conducted in Indonesia. Tawfiqi et al. (2018) investigated the Islamic banks role in entrepreneurship success. In the instance of Bahrain, the data demonstrate that Islamic banks play a significant impact in business success.
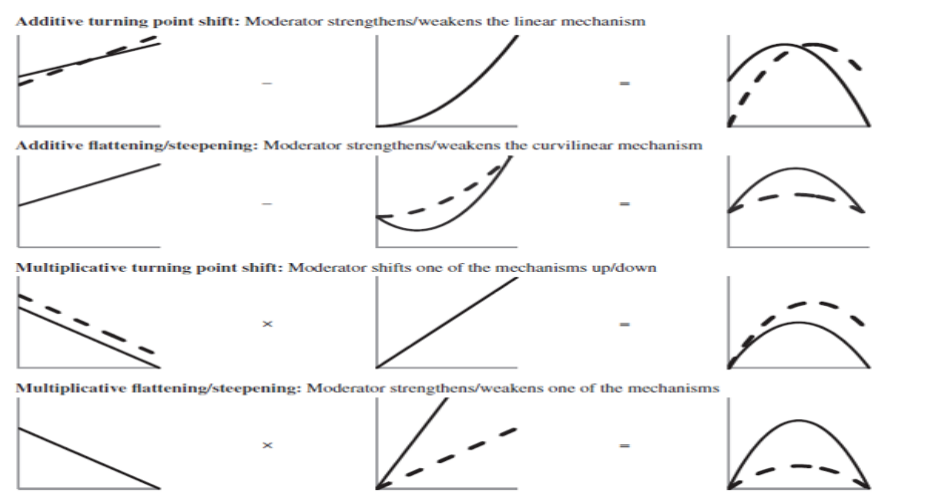

FIGURE 2. Curvilinear relationship moderation types by Haans et al. (2016)

This study empirically and theoretically examines this quadratic relationship and Islamic financing's moderating influence. Haans et al. (2016) explain quadratic function determination and theoretical moderation. Figure 2 displays how increasing Islamic financing can affect the quadratic function's shape because financial development and entrepreneurship have both positive and negative consequences. Modifiers can weaken/strengthen the linear section, flatten/steepen the quadratic part, turn point shift up/down, and flip the curve (Haans et al., 2016).

DATA AND METHODOLOGY

Sample and Variables

This study has used secondary data, and the target population are nations where full-fledged Islamic banks are functional. 13 nations having data of at least one bank each are included

as sample. The unbalanced data which is taken for this study is time 2008-2018. The list, definition and sources of items used for index-making are shown in Tables 1 and 2. The remaining variables are presented in Table 3.

The data sets are acquired from various places like Global Entrepreneurship Monitor (GEM), World Development Indicators (WDI), World Economic Forum (WEF), and Financial Statements (FS) Global Competitiveness Reports (GCR), Worldwide Governance Indicators (WGI), Islamic Financial Services Board (IFSB).

TABLE 1
Items of Financial Development (FSD)

Items	FSD Items (Scale: 1-Worst to 7-Best)	Source
Finance Affordability	"How much does the cost of financial services (e.g. insurance, loans, trade finance) impede business activity in your country?"	GCR
Equity/ Participatory financing	"Degree by which businesses raise money by issuing shares and/or bonds on the capital market?"	GCR
Access to Loans and Finance	"Degree of ease for businesses to obtain a bank loan?"	GCR
Provision of venture capital	"Degree of ease for startup entrepreneurs with innovative but risky projects to obtain equity funding in your country?"	GCR
Bank Soundness	"How sound is your bank?"	GCR
Security Exchange Regulatory Institutions	"Degree by which regulations ensure the soundness of the financial market?"	GCR

Methodology

The constructs of indices (Entrepreneurship and financial development) are adapted from literature; Principal Axis Factoring (PAF) is used for index development using (Spearman, 1904) method. It reduces dimensions (variables) in potentially collinear data without an equivalent reduction in information in data. Thus, they ensure the efficiency and unbiasedness of estimates (Gujarati, 2003). Since the selected data vary across time (years) and cross-sections (banks), appropriate estimation models are required to handle it. Standard panel data models like Fixed (FE) and Random Effect (RE) models are mainly used, but it has a few constraints. Panel Quantile Regression (PQR) is used as a robust approach to estimate the point estimates. The use of medians makes this model robust to extreme values and not normal distributed variables. Numerous previous studies deployed this panel data method (Amjad et al., 2022; Anser et al., 2021; Salman et al., 2019; Wang et al., 2021).

$$ENT_it = \alpha_1 + \alpha_2 FSD_{it} + \alpha_3 FSD_{it}^2 + \beta_4 EQFIN_{it} + \theta_5 EQFIN_{it} * FSD_{it} + \alpha_6 HET_{it} + \alpha_7 RQ_{it} + \mu_t$$
$$(1)$$

Here FSD = Financial Sector Development, ENT = Macroeconomic Entrepreneurship Index, EQFIN = Islamic Equity Financing percent of total financing (log form), and controls include

RQ = Regulatory quality index and HET = Higher Education Index. And "t" denotes time periods, "i" denotes countries, and "μ" denotes white noise residuals. Here EQFIN is an Islamic equity financing indicator whereby all popular Islamic financing tools will be assessed whose data is available across 21 countries.

For the model with nonlinear variables, Haans et al. (2016) study has provided identification of the shifting of the quadratic function identified by slopes. Here the α_2 and α_3 of equation 1 is the linear and curvilinear FSD effect on ENT (addressing obj. 3), respectively. The β_4 is the linear effect of EQFIN, θ_5 is the EQFIN moderation on the linear effect of FSD–ENT relationship (addressing obj. 4). Adding on this, Dawson (2014) given the graphical visualization for the moderator effect on a curvilinear function using the incidence of data.

TABLE 2
Items in Macroeconomic Entrepreneurship

Items	Entrepreneurship variable selection	Source
Tertiary enrollment rate	"Gross enrollment ratio in tertiary school as ratio of students enrolled in tertiary education of any age"	WDI
New business registration density	"The new business entry density is the number of newly registered limited liability corporations per population."	WDI
Patents registered	"This indicates the new inventions and knowledge created by the locals and foreigners within the country."	WDI
Employment in services and industry	"People employed in services and industry sector percent of total employment"	WEF
Technicians in R&D	"The number of specialists who participated in Research & Development, expressed as per million. Technicians and equivalent staff are people who perform scientific and technical tasks"	WDI
Technology exports	"High-technology exports are products with high R&D intensity, such as in aerospace as a percent of GDP"	WDI
Employers % of total	"Employers who are working on their own account or with one or a few partners as a percent of total employment"	WDI
Firm R&D Spending	"Firms percentage that have demonstrated spending on research and development."	WDI

Hypothesis Development

Haans et al. (2016) provided a discussion for hypothesis setting from the context of figure 2 and equation 1 in this study, the hypothesis set by the study are following. The index development

provides significant indicators with their contribution, and it addresses hypothesis 1 for financial market and hypothesis 2 for entrepreneurship indices.

Ha1: The items are suitable for financial sector development

Ha2: The items are suitable for entrepreneurship

TABLE 3
Independent Variables Description

Variables	Islamic Financing and Control Variables	Source
Islamic Equity Financing Institutions	Islamic equity financing as proportion of total financing in the economy.	Audited Financial statements
	"Regulatory Quality is the perceptions of the government ability to formulate and implement sound policies and regulations."	WDI
Higher Education and Training	Index of higher education and training indicators	WEF

Though Islamic financing promotes new businesses, the scarce literature on nonlinear effects provided that literature has discussed mixed outcomes regarding the shape of the FSD – ENT association (Hurst & Lusardi, 2004; Pinto & Augusto, 2014). This study proposes that it will have an inverted U shape effect whereby higher financing-based debt will create a burden. The context of equity financing provided by Islamic banks has defined this shape of FSD. This indicates that FSD has a positive linear and a negative quadratic effects.

Ha3: EQFIN increases entrepreneurship.

Ha4: FSD does have a positive linear effect on ENT prior to a certain threshold

Ha5: FSD does have a negative quadratic effect on ENT beyond a certain threshold

Islamic equity engages in risk-sharing partnerships and addresses moral hazard problems (Arshed et al., 2021). Hence, an increase in the Islamic equity financing share minimizes the negative resource constraint or risk burden effect of the existing conventional and usurious financial system.

Ha6: EQFIN does positively moderate FSD – ENT relationship prior to a certain threshold

Lastly, according to the literature, indicators like institutions and higher education positive impact on entrepreneurship.

Ha7: HET increases ENT

Ha8: RQ increases ENT

RESULTS AND DISCUSSIONS

This study developed the indices of entrepreneurship and financial sector development, table 4 provides the MSA values generated from the principal axis factoring (PAF) with selected indicators based on the threshold of MSA = 0.5. Both indices' Bartlett and KMO values are

above their criteria, indicating that the indicators selected in Table 5 are not independent. Lastly, only one index each could be made as suggested by the scree plot.

TABLE 4
Selected Items of ENT and FSD Index

| Items of ENT			Items of FSD		
Code	Item Name	MSA	Code	Item Name	MSA
ENT1	Tertiary school enrollment	0.58	FSD1	Local equity market financing	0.83
ENT2	New business registered density (new registrations per 1,000 people ages 15-64)	0.55	FSD2	Ease of access to loans	0.66
ENT3	Total patents filed	0.63	FSD3	Venture capital availability	0.66
ENT5	Services employment (% of total employment) (modeled ILO estimate)	0.54	FSD4	Soundness of banks	0.71
ENT6	High-technology exports (% of manufactured exports)	0.5	FSD5	Securities exchange regulation	0.76
ENT9	R&D spending by companies	0.76			
	Overall	0.59		Overall	0.72
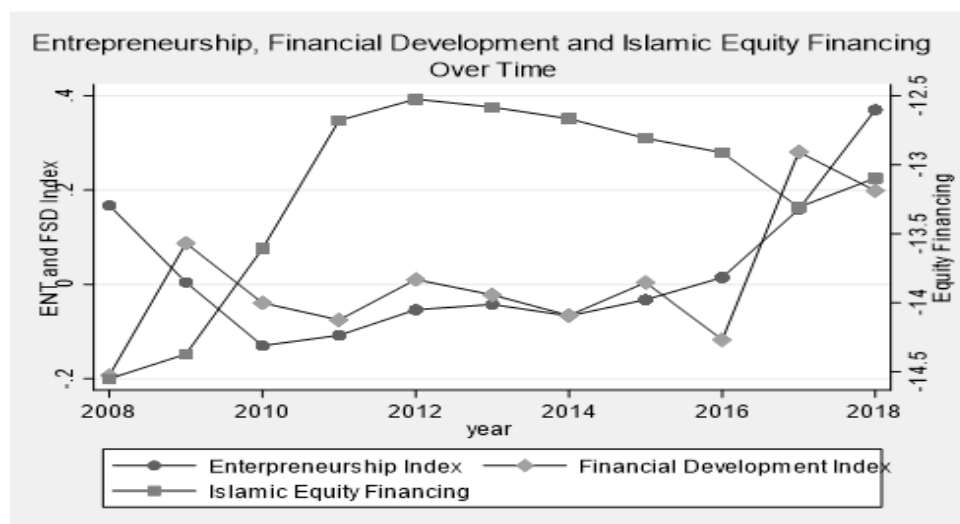
FIGURE 3. Incidence of FSD, ENT and EQFIN across time (Source: self-calculated)

Figure 3 plots the average FSD, ENT, and EQFIN indices between 2008 and 2018. Here it can be seen that from 2010 to 2016, there was a higher variation in the FSD, but the stability of the ENT is evidenced by the high incidence of EQFIN.

TABLE 5
Data Descriptive

Name	Descriptive Statistics				Associations				
	Mean	Std dev	Skew.	Kurt.	ENT	FSD	EQFIN	HET	RQ
ENT	-1.03	0.94	2.05	6.61	1				
FSD	5.26	0.97	-0.55	2.87	0.59	1			
EQFIN	-12.99	2.81	-3.55	3.34	0.49	0.14	1		
HET	4.34	0.71	-0.61	3.09	0.54	0.7	0.3	1	
RQ	0.22	0.72	0.23	2.94	0.53	0.79	0.37	0.81	1

Table 6 provides the data descriptives of variables which are used in equation 1. Here, ENT, HET, EQFIN, and FSD are underdispersed with mean which is higher than the standard deviation in magnitude, while others are overdispersed across nations and years. Further, all the indicators are positively associated with ENT, and the correlations below 0.9 indicate absence of multicollinearity.

TABLE 6
Estimates of PQR (Dep. Var. ENT)

Variable	Coefficients	Standard Error	Probability
FSD	1.22	0.1149	0
FSD2	-0.019	0.008	0.023
EQFIN	0.087	0.0082	0.715
EQFIN*FSD	0.88	0.009	0
HET	0.342	0.039	0
RQ	-0.155	0.028	0
		Post Regression Parameters	
Observations	131	Cross section Countries	21

Table 6 provides the estimates of panel quantile regression, which included 131 observations from 21 countries. Here we can see that a 1% increase in higher education and training leads to a 0.34% increase in entrepreneurship, this outcome conforms with the study by (Arshed et al., 2021). While a 1% increase in regulatory quality leads to a 0.15% decrease in entrepreneurship. This shows that overregulation creates hurdles in compliance costs for nascent firms, as discussed in the case of property rights regulation (Allred & Park, 2007; Gangopadhyay & Mondal, 2012; Helpman, 1993; Lerner, 2009).

For the case of financial market development, a linear coefficient is positive, while the curvilinear coefficient is negative, which shows an inverted U-shaped effect of financial sector development. This outcome points to the notion that financial market development facilitates entrepreneurship at the start, but with its increase, the debt-based structure presents itself

as a cost to the new ventures. Hence below the threshold value of 38 of the FSD index, FSD promotes entrepreneurship, while beyond 38, it is restrictive with an assumption that there is no equity financing (EQFIN = 0), but since the equity financing is included in the model the hence the turning point depends on the incidence of EQFIN. Equity financing itself has an insignificant effect on entrepreneurship, it might be because of its small incidence, but its moderating effect increases the positive effect of financial sector development on new businesses. This means that a higher incidence of equity financing increases the financial sector's risk-sharing capacity, which makes many risky businesses viable. Figure 4 visualizes the incidence of the relationship where higher equity financing increases the entrepreneurship-promoting effect. This shows that financial market development generally harms entrepreneurship, but an increase in equity financing proportion leads to transforming the financial sector to start promoting entrepreneurship.
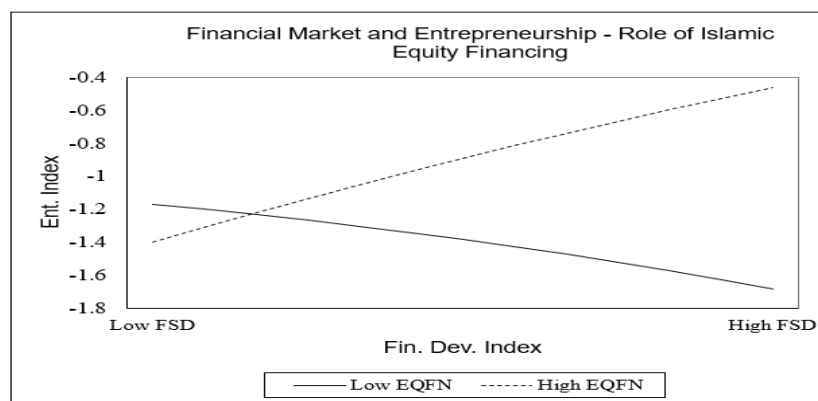

FIGURE 4. Visualization of the moderating effect of EQFIN (Source: (Dawson, 2014)
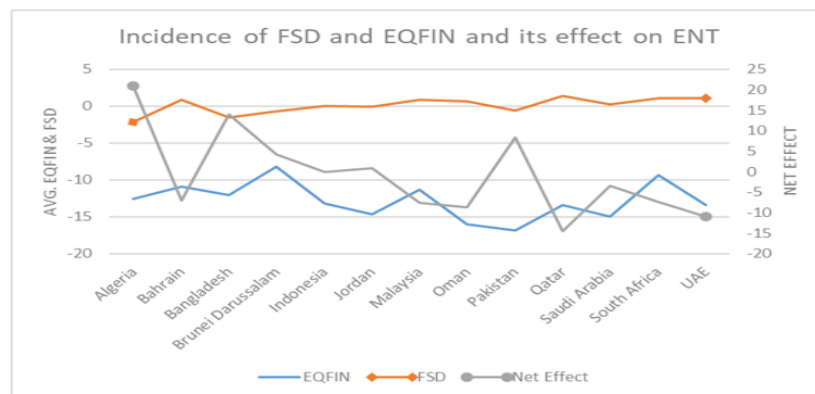

FIGURE 5. Effects of average incidence of FSD and EQFIN

Since the model is nonlinear, the net effects are based on the incidence of the data, here in figure 5. This graph compares the actual values of equity financing and financial development country-wise and resultantly observes their net effect on entrepreneurship. It is seen that the average incidence of financial sector development and Islamic equity financing and its effect on ENT. Here countries like Algeria, Bangladesh, Brunei Darussalam, Jordan, and Pakistan depict positive effects on entrepreneurship.

Conclusion and Policy Implication

Empirically financial development has presented itself as a perspective for growth and entrepreneurship, but it could not share the risks associated with new businesses. The debt overhang burden associated with interest-based financing tends to discourage entrepreneurship. The literature points towards the merits of venture capital in promoting entrepreneurship. The qualities of venture capital are inherited in the equity financing modes provided by Islamic banks.

This study firstly develops the holistic financial development and entrepreneurship index using the proposed different dimensions in literature. This study further envisages exploring the promotion of Islamic equity financing and the financial sector's stability. The robust panel data model results indicate that increasing Islamic equity financing promotes macroeconomic entrepreneurship. This study hence promotes that central banks should introduce measures that will increase the banks' capacity to fund equity financing so that the new businesses' risks are shared. This will have benefits in two dimensions. Firstly, there will be decreased risks for the new ventures (Abdul Rahman et al., 2020). Secondly, there will be an increase in profitability for Islamic banks engaged in equity financing (Arshed et al., 2021).

The results are applicable to the countries and timeframe selected, but they improve over time and pave way for quadratic effects-based studies for Islamic funding in economic progress and new businesses. Islamic bank products are not totally interchangeable, thus future studies can include debt financing or product-based financing.

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