



# AI-Enabled Financial Ecosystems: Rethinking Crowd-Lending and Bank Lending for Next-Gen Entrepreneurs in Industry 5.0 Era

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## Abstract

**Introduction:** In the age of Industry 5.0, entrepreneurial finance is being reshaped by digital innovation and AI-driven platforms. As start-ups and next-generation entrepreneurs adapt to this transformation, understanding the dynamics of emerging financing options such as crowd-lending—alongside traditional bank loans—becomes essential for sustainable growth. **Aims:** This study investigates the evolving financial ecosystem by (1) examining the role of crowd-lending in promoting entrepreneurial finance, (2) analysing the influence of bank loans within digitally enabled economies, and (3) identifying challenges entrepreneurs face in accessing these funding sources. **Problem:** Despite rapid digital advancements, many entrepreneurs still face obstacles in securing capital. The relative effectiveness and accessibility of AI-powered crowd-lending versus conventional bank financing remain underexplored. **Significance:** The study provides critical insights into how digital finance ecosystems can empower entrepreneurs, guiding financial institutions, platform developers, and policymakers toward inclusive and intelligent financing solutions. **Method & Material:** Using a quantitative design, primary data from entrepreneurs were analyzed. Statistical methods assessed the impact and challenges of each financing method. **Results:** Crowd-lending influences entrepreneurial finance by 60.4%, while bank loans show a stronger effect (0.871 probabilities). Both face unique digital-age barriers. **Conclusion:** Both financing methods significantly support entrepreneurship, though bank loans exhibit a stronger influence. In the context of Industry 5.0, intelligent integration of both models is key to future-ready financial ecosystems.

## Keywords

Entrepreneurial Finance, Crowd-Lending, Bank Loans, Industry 5.0, AI-Enabled Financial Ecosystems, Digital Transformation

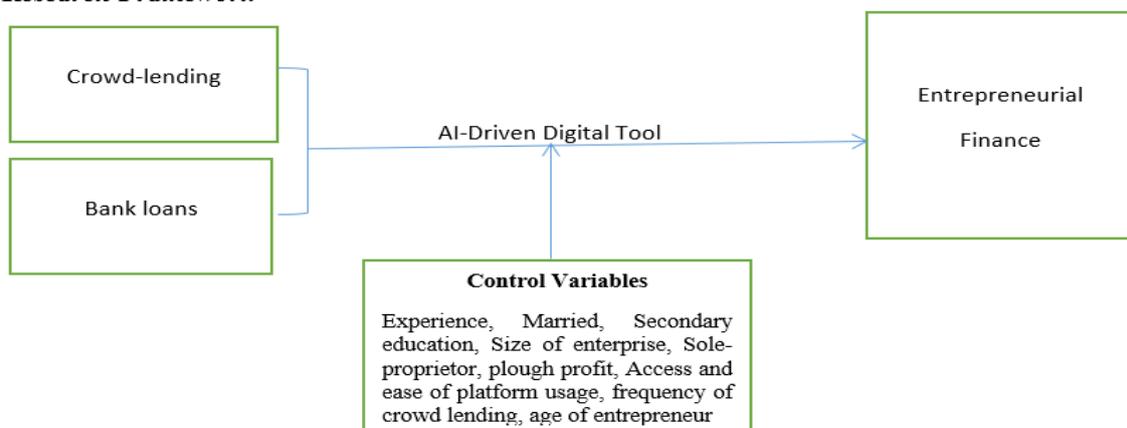
## 1. Introduction

Entrepreneurial finance serves as a vital catalyst for the growth of startups, fostering innovation and promoting sustainable economic development. As we enter the era of Industry 5.0, the increasing incorporation of artificial intelligence (AI) into financial frameworks has transformed the entrepreneurial landscape, allowing for the emergence of AI-driven financial ecosystems that offer novel funding opportunities. Giuggioli and Pellegrini (2023) analyze the role of artificial intelligence in empowering entrepreneurs by means of a systematic review of existing literature. They pinpoint critical themes, benefits, and challenges, and they propose a future research agenda to enhance the understanding of AI's significant influence on entrepreneurial behavior and innovation. Notably, crowd-lending platforms have revolutionized the venture capital acquisition process through digitization. Nevertheless, conventional bank loans remain a crucial component of the financing environment. This research explores the contributions of both these funding mechanisms to the realm of entrepreneurial finance in the context of the digital age.

The engine of economic growth is entrepreneurship. When entrepreneurs in industrialised countries such as Germany or the United States seek funding, they generally turn to well-known sources such as venture capital firms, angel investors, high-interest lending products, and friends and family. Sagar (2024) underscores the role of entrepreneurship as a catalyst for innovation and economic progress. The research illustrates how entrepreneurial endeavors promote technological development, generate employment opportunities, and enhance market competition, thereby establishing entrepreneurs as vital contributors to sustainable economic growth. However, rather than the potential or quality of one's idea, access to venture capital firms and angel investors is typically determined by who one knows and where one lives. Before providing loans to entrepreneurs, banks may require a co-signer or collateral; also, such loans are considered risky by banks and come with high-interest rates. In addition, not everyone will be able to fund their initiatives with the help of friends and family. In other words, traditional sources of money are riddled with processes that inhibit creativity and innovation.

Crowdfunding has emerged as a new business phenomenon as the Internet and web pages have grown in popularity, allowing entrepreneurs to raise funds from anybody with the means and the desire. As noted by Wattal, Burtch and Ghose (2014). Wattal *et al* (2014), Crowdfunding is an alternative means of financing a project, business or venture by raising small amounts of capital from a large number of people, typically via the Internet. Thus, Crowdfunding is a form of crowd-sourcing and alternative financing. The question then becomes why people would donate money to help complete strangers. According to previous studies (Burtch, Ghose, and Wattal., 2013a), suggests that the primary motivations for individual contributions include altruism, reputation, and monetary rewards. Donation-based, reward-based, loan-based, and equity-based crowdfunding formats exist today and are essentially defined by the types of project funded and the incentives that contributors may receive. Projects (campaigns) in donation-based Crowdfunding are mostly philanthropic activities, and contributors are usually not offered any explicit reward for the money they provide. Contributors are offered special benefits for their financial support in reward-based Crowdfunding. Hence, thank you letters, t-shirts, or, as in the case detailed above, a unit of the product being sponsored (e.g., gadgets, games, music albums, or movie digital video discs) are all possible rewards. Contributors to loan-based crowd-funding (e.g., Prosper.com) expect to be repaid (sometimes with interest) for the money they lend. Finally, equity-based crowdfunding (e.g., Symbid. com) is a variant of Crowdfunding in which contributors can buy a stake in the company seeking funds, as the name implies. These investors aim to make a profit as the company grows and its value increases.

### Research Framework



**Fig. 1** Research framework of the link of AI-driven crowd-lending and Bank loans to Entrepreneurial finance

Figure 1 shows that the forthcoming evolution of AI-enhanced crowd-lending and banking loans aimed at supporting entrepreneurship will leverage sophisticated machine learning algorithms to evaluate creditworthiness, forecast repayment patterns, and refine loan conditions. By automating decision-making processes, AI will facilitate more customized lending solutions, mitigate risks, and enhance financial inclusion by pinpointing underserved demographics and providing personalized loan offerings derived from real-time data insights.

Entrepreneurship, in general, is perceived by many as a viable option. This is according to the Global entrepreneurship monitor (GEM), which recorded that 69% of the adult population believe that there are many entrepreneurial opportunities and 74% believe that they have the necessary capabilities to exploit those opportunities. Many such nations have taken the initiative to promote entrepreneurship through different respective platforms and ministries, among other things providing training to young entrepreneurs, providing legislative support, as well as financing entrepreneurial activities (Kareem, 2015). Despite all the above revelations from scholars and the World Bank, a great number of entrepreneurs still find it difficult to raise money for entrepreneurship, and so they continue to face decreased expansion and potential investment. As a result, this research is out to investigate the following: to examine the role of Crowd-lending in the promotion of entrepreneurial finance, to explore the influence of bank loans on entrepreneurial finance, and to verify the challenges associated with the acquisition of entrepreneurial finance.

## 2. Related Literature

The rise of diverse financing options, propelled by digital transformation and artificial intelligence, has not alleviated the challenges faced by many entrepreneurs, particularly in emerging economies, in accessing sufficient capital. Abuzaid and Alsou (2024) investigate the impact of artificial intelligence on entrepreneurship, emphasizing its dual function as both a facilitator and a hindrance. They analyze how startups play a vital role in shaping the future economy by embracing AI, fostering innovation, and addressing the challenges of implementation within rapidly changing market conditions. Empirical evidence comparing the effectiveness and operational issues of AI-supported crowd-lending platforms with traditional bank loans remains limited. This gap presents a vital question: Which financing method is more effective in facilitating entrepreneurial success in an increasingly digital and intelligent financial context?

It is vital for entrepreneurs, policymakers, and financial institutions engaged in an Industry 5.0 environment to comprehend the comparative impact and accessibility of diverse financial channels. Kumar (2024) investigates the contribution of startups to economic advancement by facilitating innovation and generating employment opportunities. The study underscores the significance of entrepreneurship in optimizing resources, including capital and labor, and discusses how government initiatives, through incentives, streamlined procedures, and intellectual property protections, play a vital role in enhancing job creation and fostering innovation. This study delivers insights grounded in data that can facilitate strategic decision-making, foster inclusive financial innovation, and strengthen entrepreneurial ecosystems through sophisticated, AI-integrated financial solutions.

Both AI-enabled crowd-lending and traditional bank loans significantly contribute to the enhancement of entrepreneurial finance. Nurhayati (2024) examines the role of entrepreneurial finance, particularly venture capital and crowdfunding, in fostering growth and innovation within startups. The research emphasizes the impact of government regulations, market dynamics, and the entrepreneurial culture on the efficacy of these funding methods. Also, the research conducted by Kwilinski, Lyulyov, and Pimonenko (2024) explores the influence of entrepreneurial transformation on green economic development in EU countries between 2007 and 2022. Their analysis indicates a strong positive correlation, which emphasizes the critical role of green initiatives in driving economic prosperity. However, bank loans are perceived to have a greater impact and are generally favored due to their accessibility, lower costs, and simpler procedures. In the context of Industry 5.0, where human-centered innovation intersects with intelligent technology, the integration of AI into both financial systems can further optimize access and efficiency. Another study by Mah et al. (2023) examine the influence of Artificial Intelligence and Robotic Process Automation (RPA) on the Fintech sector, highlighting the transition to digital customer services and improved operational efficiency. They underscore the role of RPA in automating financial processes, which leads to more streamlined operations, enhanced service delivery, and increased customer satisfaction, ultimately fostering innovation and transformation in the financial services industry. This study recommends emphasizing bank loans while also advancing AI-enhanced crowd-lending platforms to improve inclusivity and scalability. Future research should focus on utilizing cross-country, longitudinal datasets to generalize the findings and explore specific contextual dynamics in entrepreneurial finance.

The 'lifeblood' of every economic development, as noted by Metelka (2014), is entrepreneurship. The process involves coming up with ideas that lead to the launch of a business, coordinating, directing, organising, and controlling the required resources, while facing the risks and rewards involved. In terms of research, entrepreneurship is one of the most investigated areas of entrepreneurial finance. In the past, entrepreneurs have typically relied on formal funding sources such as business angels, banks, and venture capitalists. Crowdfunding has emerged as a financing source and has become increasingly popular since 2008. The crowd - or a large number of people - can come together and help fund ideas they find worthwhile. As of 2013, the global scale exceeded \$5,1 billion in revenue, according to Metelka (2014). Unlike traditional funding, crowdfunding enables debt- and equity-based financing as well as reward-based financing.

The concept of crowdfunding is actually not new, although there is little literature on the topic. Wattal *et al* (2014) explore the numerous dimensions of the burgeoning phenomenon of crowdfunding as a powerful tool for entrepreneurship financing. They examine the potential upsides and potential risks of this rapidly evolving industry and the several attempts underway to better understand and regulate it. Furthermore, they argue that crowdfunding can be used as a means to foster social and economic improvement by reducing barriers to entrepreneurship in the developed and developing worlds (Winton and Yerramilli, 2008).

Crowdfunding is becoming an increasingly important mode of raising funds, particularly in microfinance, charity, and entrepreneurship. An increase in crowdfunding was triggered by the 2008 financial crisis and the lack of funding for startups. Based on a recent report by Metelka (2014), over one million projects were funded through crowdfunding websites worldwide in 2012, contributing to more than US\$1.5 billion raised. The number of such markets worldwide was estimated at 536 in December 2012. Moreover, the number of crowdfunding marketplaces has been increasing at a compound annual growth rate (CAGR) of 49%, while funds raised have grown at an average CAGR of about 63%. As a result of President Barack Obama signing the JumpStart Our Business Startup (JOBS) Act in 2012, which legalised the sale of certain types of equity through crowd-sourcing markets, crowdfunding has gained prominence in the United States.

Based on a recent report by Winton and Yerramilli (2008), the developing world is poised to surpass the developed world in terms of leveraging crowdfunding to create new jobs and stimulate innovation. The paper highlights several projects, including a highly efficient stove in Kenya, a flywheel storage device for wind and solar energy in Haiti, and an African cell phone charger that harnesses solar energy. (Winton and Yerramilli, 2008) estimate that crowdfunding will reach US\$95 billion in developing countries within 20 years. As crowdfunding has emerged as a viable source of entrepreneurial seed capital, it has also captured the attention of the academic community. In recent years, a few but rapidly growing pieces of literature have attempted to explain this new phenomenon. Here, a review of the major empirical crowdfunding literature is presented, focussing on presenting key findings. Generally, crowdfunding platforms differ in terms of whether contributors are primarily motivated by the prospect of a financial return on their investment. For example, Wefunder, SellaBand, and Wefunder are among crowdfunding platforms that offer consumer investors equity or some form of profit-sharing agreement (Agrawal, Caalini, and Goldfarb., 2015). Prosper and Zopa, among others, are crowdfunding platforms that offer peer-to-peer lending, which requires the original principal to be repaid plus a fixed interest rate (Zhang and Liu, 2012).

In relation to bank lending and entrepreneurial financing, Oghojafor, Okpoyomare, Olabode, Olayemi, and Okonji (2011) argue, entrepreneurial economies differ greatly from nonentrepreneurial economies in many respects. The same applies to their economic structure as well as to their economic quality, as well as to the quality of life and social vitality they offer. There have been rapid changes in the structure of our economy due to the rapid creation of new companies and the exit of stagnant and declining companies. This is the reason entrepreneurship is said to be a prime mover in a nation's development and if any nations, regions, and communities that embrace and actively promote entrepreneurship development display higher growth rates, and thus higher levels of development than other nations, regions, and communities whose institutions, politics, and culture impede entrepreneurship.

In addition to hard information collected from financial statements, years of personal relationships, and credit risk scores from third parties, banks also collect soft information about their customers. In the event a customer is approved for credit, the contract will be structured according to the perceived risk level by asking for collateral and personal guarantees, designing covenants, varying maturity terms, or offering menu pricing (Kareem, 2015). In empirical studies (mainly in the UK and US) based on the varying use of these contract types and techniques, little evidence of credit rationing is found in general and over time (Agrawal *et al.*, 2015; Storey, 2003). However, specific groups of SMEs are reported to face financial constraints (sometimes perceived) with respect to innovative firms (Riding, Orser, Spence and Belanger, 2012; Myers and Majluf, 1984; Winton and Yerramilli, 2008) and ethnic minorities (Metelka, 2014; Rahaman, 2011). Among other things, these studies examine whether the characteristics of SMEs' entrepreneurs can affect their ability to access banks, such as bank structure and firm demographics.

There is more to the SME-bank relationship than simply "access" issues, and these have an impact on the nature and quality of the relationship itself. They include charges such as loans and interest rates (Burtch *et al.*, 2014; Zhang and Liu, 2012), soft and hard support for SMEs in alleviating credit constraints (Xiang, Worthington, Higgs., 2015), and cost of capital (Kareem, 2015; Ravina, 2012). Additionally, understanding the methods small companies use to get loans is important to understand the challenges of getting credit from entrepreneurs.

The term financial risk can be used as an umbrella term to encompass multiple varieties of risk related to financing, including financial transactions that include company loans at risk of default (Stephen, Ali and Ali., 2017). According to (Joel, 2013) financial risk is the unexpected variability or volatility of returns. Many risks are usually for all financial institutions, which can lead to variability or volatility in their returns. From banks to microfinance institutions, these include credit risk (bank loans), liquidity risk, market or pricing risk, operational risk, compliance and legal risk, and strategic risk (Jane, 2016). For microfinance institutions to remain viable and sustainable over time, these risks must be checked. These diverse risks can be addressed through a process of identifying these risks, assessing these risks, monitoring these risks, and controlling the risks known as financial risk management. According to Joel (2013), financial risk management can be defined as a set of financial activities that maximise the performance of a financial institution (in this case, a microfinance institution) by reducing costs associated with the cash flow volatility. Joel (2013) further posits that the manager's behaviour toward risk (risk appetite and risk aversion) and corporate governance is like to affect the choice of risk management activities.

From global statistics, entrepreneurship until now has practically drawn out six million individuals out of abject and absolute poverty in China since new market reforms were unleashed in late 1970. Implying entrepreneurship is very important in alleviating poverty as before then in human history many people have not been drawn out of poverty within a

short period of time (Shefiu, 2011). The geographic width in the per capita income of South Korea from \$291 in 1970 to \$20 000 in 2012 is due to participation in entrepreneurship and financial support from financial institutions and state institutions (Reuben, 2012). Most European union member countries (France, Portugal, and the United Kingdom) have fully embraced entrepreneurship and so increased in the gross domestic products in the same way some countries (Germany, Italy and Denmark) within the same region are yet to fully adopt high level entrepreneurship (Verschelden, 2014; Ofori, 2003).

Poverty is one of the main economic problems facing most developing and developed countries of the world today. Unemployment has been seen as the main route through the oceans to poverty in most countries around the world. Although the level and extent of poverty and unemployment have been observed to be different within and between nations, it remains a significant obstacle to the optimal utilisation of human resources for the social and economic development of nations (World Bank, 2014; Misango & Ongiti, 2013). In most developed countries, America, precisely, poverty, is measured in two ways; -absolute and relative poverty (Wujung and Mbella, 2014; Zhang and Liu, 2012). Entrepreneurship is at the center of the economic activity of every developed country (Tambi and Nanyongo, 2018). As such, it is logical to state that if the number of entrepreneurs of any given country increases, the poverty indicators will decrease and vice versa (Tambi and Nanyongo, 2018). Although entrepreneurs around the world started creating private enterprises and increased the income of their families, the value of their expansion has not been proportional to all regions, especially now that the world is seen to be plagued with the Coronavirus pandemic. The COVID\_19 climate has slowed many private businesses and even initiated the closing of many companies as such, leaving most private workers unemployed (Kareem, 2015). The financial crisis level of financial institutions contradicts the world's immense wealth, among other things. Countries are enormously endowed with agricultural, petroleum, gas, and large untapped solid mineral resources; unfortunately, rather than making remarkable progress in terms of business growth and development, entrepreneurship has instead retrogressed from a growth rate of 4.4% in 2016 to 3.7% in 2017 (World Bank, 2017). Going by regions, the 2018 Index of Economic Freedom on developing countries revealed that the unemployment rate increased to 4.5% in 2018 from 4.3% in 2014 with an industrial production rate of 4%. This can only be explained by a massive drop in entrepreneurial capital. However, one of the Sustainable Development Goals to be achieved by 2035 of the United Nations aims to alleviate extreme poverty and hunger by improving business performance. Giving the result that the proportion of people living below the poverty line remained virtually stable, dropping from 40.2% to 39.9% in most developing countries (World Bank, 2017). The growth and employment strategy tackles unemployment from three angles, namely (i) expanding chances for respectable work, (ii) meeting the demand for work, and (iii) enhancing market effectiveness.: (i) increasing decent employment opportunities; (ii) satisfying the demand for employment; and (iii) improving market efficiency. These can only be achieved by increasing multiple business financing in the world. However, such new technologies are yet to be exploited by most potential and aspiring entrepreneurs.

When we examine the World Banks most recent Economic Memorandum in Africa and other developing countries in the world issued in April 2017, one can discover that the memorandum pointed out clearly that if the lower-income developing countries are to become upper-middle-income countries by 2035 as targeted in their long term planning documents, they will have to increase productivity and unleash the potentials of their private sector (World Bank, 2017). Therefore, the role of entrepreneurship in job creation and poverty reduction cannot be disregarded; unfortunately, this is still far-fetched due to inadequate entrepreneurial financing, especially in the adoption of new technologies. As such, it is logical to state that if the number of entrepreneurs in any given country increases, the poverty indicators will decrease, and vice versa. Although entrepreneurs started creating private enterprises and increased the income of their families, the rate of growth has continuously been slow, especially now that the world has been plagued with a covid\_19 pandemic. This crisis has slowed many private businesses and even instigated the closing of many companies as such, rendering most businesses want.

### 3. Methodology

This study is carried out among entrepreneurs raising funds for their businesses and aspiring entrepreneurs across the world. Entrepreneurs are randomly selected across the world for our study. Using survey planet, at least 20 questionnaires were sent to the different continents including: Africa, Europe, South America, North America, Asia, and Australia, respectively. This work makes use of a quantitative-based research design. The study used the probability technique of sampling; specifically the simple random sampling probability technique is applied here. Focusing on the economic model of Becker (1965), the study econometrically modeled the implication of crowd-funding and bank lending on entrepreneurial finance. Following the distinction made by Tambi and Nanyongo (2018), this research adopts a quantitative design, particularly a survey research design. The time spent by entrepreneurs to raise money for their businesses, especially the source of the finance, has a lot of implications on the growth of their business.

#### 3.1 Methods and Materials

The study employed a quantitative research approach, analyzing primary data collected from entrepreneurs who had utilized either crowd-lending platforms or traditional bank loans. Statistical tests were used to estimate the significance of each financing method on entrepreneurial finance, using percentage point and probability effect measurements. Hypotheses were tested at the 1% significance level to ensure robustness.

### 3.2 Methodological Aims of the Study Various Applications

The study pursues three primary objectives:

1. To examine the role of crowd-lending in promoting entrepreneurial finance.
2. To explore the influence of bank loans on entrepreneurial finance.
3. To verify the key challenges faced by entrepreneurs in acquiring finance through these channels.

The hypotheses tested are:

- $H_{01}$ : Crowd-lending is not relatively important in enhancing entrepreneurial finance.
- $H_{02}$ : Bank loans are not positively associated with higher levels of entrepreneurial finance.

### 3.3 Mixed method and Research Philosophical Applications

This study adopts a quantitative research design precisely survey research design in which primary data was collected via a well-structured questionnaire after due cleansing it was process and result estimated in stata software via a maximum likelihood technique probit model. In the questionnaire used, the study equally had opened qualitative questions that gave room for the respondent's views as far as crowd lending, bank funding and entrepreneurial finance is concern. This mixed research method spice our results for robustness. It should be noted that a mixed methods study combines quantitative and qualitative data collection and analysis in one study as these approaches answered different questions and so combining them has provided this paper with more in-depth findings. It's worth mentioning that, the benefit of mixed methods is the ability to overlap the advantages of quantitative and qualitative research while mitigating their weaknesses. Unfortunately, a mixed-method design can be complex and difficult to implement.

### 3.4 Empirical Specification

The generic model for this study of entrepreneurial finance for entrepreneur  $i$  can econometrically be presented as:

$$EF_i = \ell_1 Q_i + k_1 SF_i + u_{1i} \dots\dots\dots 1$$

Whereby  $EF_i$  is a binary variable representing entrepreneurial finance, in this case 0 = entrepreneurs with venture capital <10,000USD and 1= entrepreneurs with venture capital >10,000USD. Scaling entrepreneurial finance in this way allows us to overcome issues related to outliers in reporting entrepreneurial finance. As noted in equation 1,  $Q_i$  is a vector of entrepreneur characteristics such as gender, size of business, other sources of finance, type of business, position in business, etc. which are factors complementing crowd-funding and bank loan in affecting entrepreneurs.  $SF$  is entrepreneur's sources of finance, which in our case it can either be: crowd-funding or Bank loan from financial intermediaries. Further,  $u_i$  is a stochastic error term while the coefficient  $k_1$  is parameter estimate representing the impact that the source of finance (crowd-funding and bank-loan) has on entrepreneurial finance while  $\ell_i$  shows the effect of the other factors apart from the source of finance.

Equation (1) measures the marginal effects estimate arising from the probit model of crowd-funding and bank loan on entrepreneurial finance. This estimate of the probit model clearly captures the impact of any additional crowd-funding and bank loan on the entrepreneur's capital. To avoid any endogeneity bias, the variables used in the equation are carefully scrutinized.

In addition, as reviewed, the marginal effects of the probit estimate of the source of finance on entrepreneurial finance is computed on the basis of our study as follows;

$$ME(\chi^k) = \frac{1}{N} \sum_i \frac{\partial p(EF_i = 1 | Q_i, SF_i, \hat{\ell}, \hat{K})}{\partial \chi_i^k} \dots\dots\dots 2$$

Where:  $\chi^k$  as the average of the marginal effect of the entrepreneur in the sample and  $\chi_i$  is the explanatory variables while the  $\chi_i^k$  is simply the k'th element in the explanatory variables. Econometrically, the marginal effect of crowd-funding and bank loan on entrepreneurial finance is given as follows:

$$ME(\chi) = 1 / N \sum (P(SF_i = 1) - P(SF_i = 1 | SF_i = 0)) \dots\dots\dots 3$$

The marginal effect of the source of finance on entrepreneurial venture capital will be estimated in STATA 14.0 as clearly demonstrated in the result section.

### 3.5 Data Presentation

In terms of data setting, the study applied both qualitative and quantitative paradigm. In order for us to realize the purpose of this paper, the primary data is the actual source of data that was used to analyze our result. The population under study consisted of entrepreneurs from all over the world. We targeted 600 entrepreneurs, but recovered only 520 questionnaires

from volunteered businessmen. Unfortunately, close to 80 questionnaires were incomplete, so only 520 questionnaires were processed to meet our target. Among the questionnaires used, approximately 120 questionnaires were collected from Africa, 100 questionnaires from Europe, 200 questionnaires from North America, 40 questionnaires from South America, 20 questionnaires from Asia, and 60 from Australia. The entrepreneurs targeted are; sole-proprietorship business, joint stock, partnership and managers of cooperative societies. The considered entrepreneurs use various sources of finance to generate their venture capital including crowd-funding, loan from banks, support from business angels, etc. The philosophy applied in this study was such that, the selection of the entrepreneurs and issuing of questionnaires was all done in a random manner without following any specific order.

### 3.5.1 Study Design

In this work, questionnaires were used to collect the relevant information. The researcher delivered and collected questionnaires to the different entrepreneurs managing personal, partnership, cooperative, and joint-stock companies around the world. Thus, the main primary data gathering tool was a well-configured questionnaire adopted in this study in order to identify and answer our research questions. The researcher opted to deliver the questionnaires online via survey planet to the various randomly selected entrepreneurs around the world.

### 3.5.2 Data Sampling Method

The basic design of the questionnaire was particularly based on closed-ended questions to avoid outliers and poorly filled questions. Closed-ended questions are questions with answer sections, and the respondent selects the preferred answer. In this study the questionnaire incorporated closed-ended questions in the form of continuous, dichotomous ordinal, and categorical questions. More so, the questionnaire was divided into two distinct sections; the first being the introductory part specifying the identity of the respondent entrepreneurs, the second specifying the research problem with closed ended questions. Technical experts were consulted to validate the questionnaire before it was administered. However, few qualitative questions were added to the questionnaire to get firsthand information from the entrepreneurs.

## 4. Results

The analysis reveals the following:

- Crowd-lending impacts entrepreneurial finance with a 60.4% potential effect, statistically significant at the 1% level.
- Bank loans exhibit a probability effect of 0.871, indicating a stronger and more consistent influence on entrepreneurial finance.
- Challenges with crowd-lending include access to platforms, availability of donors, knowledge of fundraising, trust, and payment duration.
- Bank loan challenges include interest rates, collateral security, loan procedures, payment modes, and loan duration.

### 4.1 Socioeconomic Characteristics of Entrepreneurs Considered in this Study

Table 1 shows the identification of entrepreneurs by gender. Of the 520 respondents in total, 88% are male entrepreneurs who responded to our questions, while 12% were females, respectively. This descriptive information confirms the fact that there are more male entrepreneurs in the world than female entrepreneurs. Businessmen across the world have been proven to be more dynamic and flexible in matters of entrepreneurship as compared to their female counterparts. Table 1 reveals that most of the entrepreneurs sampled are in the age range 50 and above, with about 5% for entrepreneurs of <30 years. Generally, access to capital for entrepreneurs has not always been easy. Therefore, this explains why most of the respondents fall within this age group. Some of them may have retired from other services and conventional employments to start up with business, as entrepreneurship is known to be the nerve centre of wealth across the world. The growth of the modern economy lies in their ability to do business either in the extraction, manufacturing or distribution stage.

**Table 1** Socioeconomic Characteristics of Entrepreneurs

Description	Percentage
<i>Distribution of respondents with respect to gender</i>	
Male	88
Female	12
<i>Distribution of respondents related to age group of the respondents</i>	
<30	10
30 – 39	10
40-49	50
50+	30
<i>Distribution of respondents according to marital status</i>	
Married	67
Single	33
<i>Distribution of respondents as regards to level of education</i>	
No education	7

Primar	13
Secondary	47
Tertiary	33
<i>Distribution of respondents with respect to years of experience as an entrepreneur</i>	
Less than 2 years	22
Between 2 years and 5 years	35
Between 6 years and 10 years	30
More than 10 years	12
<i>Distribution of respondents according to household size</i>	
Small	44
Average	33
Large	23
<i>Distribution of respondents according to the type of business</i>	
Sole proprietorship	54
Partnership	44
Joint Stock	0
Cooperative	2

Source: Author

About 675% of the respondents are married entrepreneurs, while 33% are single entrepreneurs. According to marital status, this distribution of respondents confirms that most entrepreneurs are 50 years or older. Moreover, this age group is characterizing by independence, responsibility, and stability, reflecting more the characteristics of married entrepreneurs. The majority of the entrepreneurs are secondary school graduates with about 47% followed by graduates (33%). Taking into account the relevance characteristics and functions of entrepreneurs, those without education are 7% while those with primary school are 13%. As often said, experience is the best teacher.

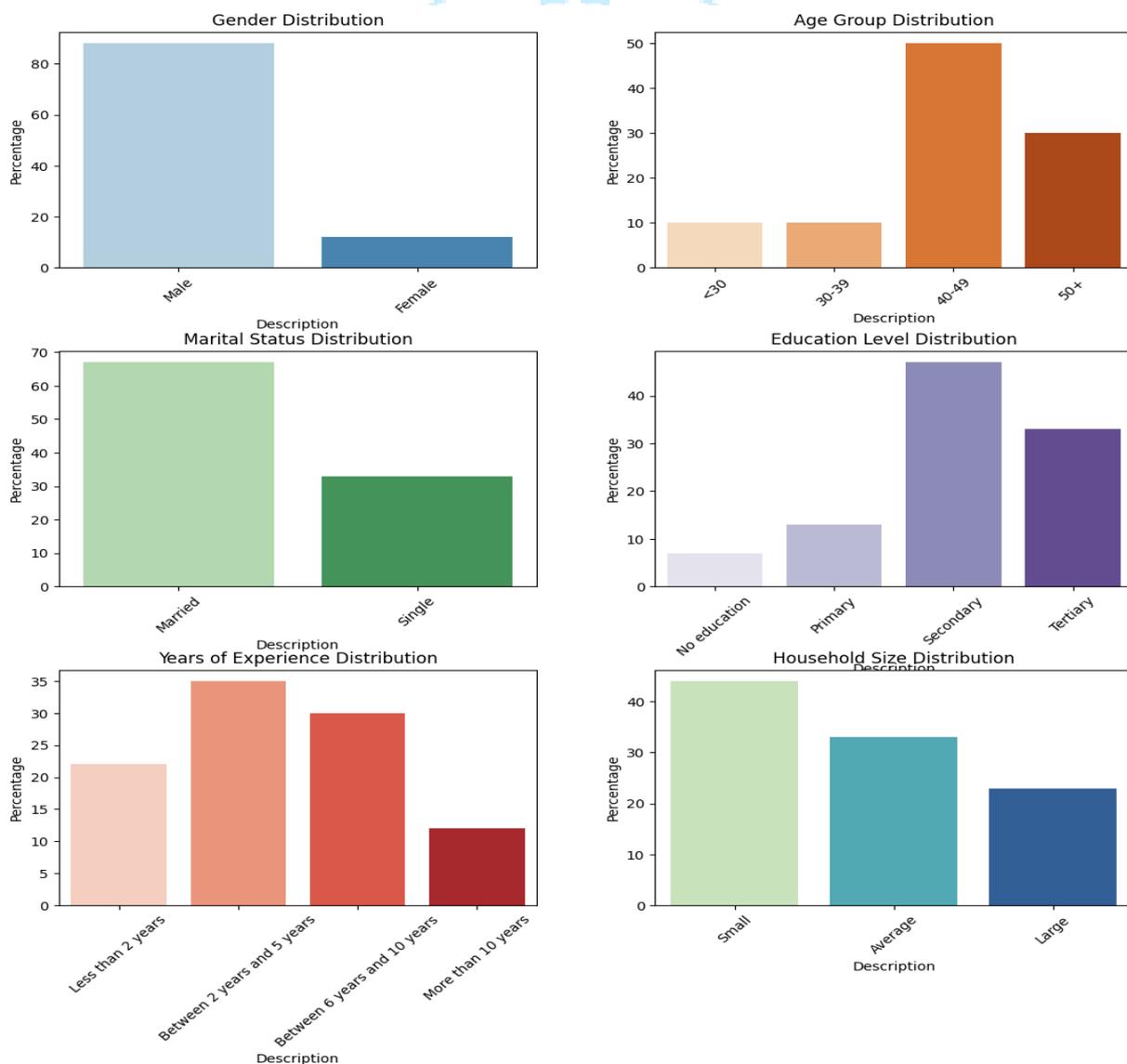


Fig. 2 Crowd-lending and the promotion of entrepreneurial finance

Figure 2, 2 Crowd-lending and the promotion of entrepreneurial finance visualize the study variable of present in table 1. Table 1 which maintained that entrepreneurs with <2 years' experience are 22%, between 2 and 5 years are 35%, between 6 and 10 years are 30% meanwhile >10 years' experience are 12%. The distribution of respondents according to household size implies that: the small household size is 44% that is < 5 persons, the average household size is 33% that is 5-7 persons, and the large household size is 23% that is >7 persons. The distribution of respondents according to the type of business reveals that sole-proprietorship business is 54%, partnership business is 44%, cooperative business is 2%, and 0% joint-stock companies.

#### 4.2 Crowd-Lending and the Promotion of Entrepreneurial Finance

Table 2 presents the estimate of crowd lending on the promotion of entrepreneurial finance and the correlates of crowd lending. The result of column 2 shows that crowdfunding has a probability effect of 0.604 on entrepreneurial finance. This means that crowdfunding has a potential percentage point of about 60.4% in affecting entrepreneurial finance, and this effect is significant at a 1% level. Logically speaking, when an entrepreneur is trusted and accepted and can access the right financial audience on a favourable platform, he will raise sufficient capital to finance the businesses.

**Table 2** Crowd lending and the promotion of entrepreneurial finance

Variable	Estimation Method: Probit-Elasticity Model	
	Crowd-lending	Entrepreneurial Finance
Crowd-lending	n/a	0.604*** (2.59)
Entrepreneurs years of experience (1= 2—5 years, 0 otherwise)	0.002* (1.78)	0.031** (2.38)
Marital Status (1= Married, 0 otherwise)	-0.123 (1.25)	0.309 (1.41)
Level of education (1= Secondary education, 0 otherwise)	0.213** (1.98)	0.039*** (2.91)
Size of the Enterprise	0.003*** (2.67)	0.421*** (3.41)
Type of Business (1= sole-proprietorship, 0 otherwise)	0.110 (1.22)	0.091*** (3.10)
Other sources of finance (1= plough profit, 0 otherwise)	0.114*** (4.06)	0.094*** (3.31)
Access and ease of use of the platform (1= yes, 0 otherwise)	0.006* (1.96)	0.318* (1.80)
Frequency of using crowd lending	0.203** (2.05)	0.901* (1.91)
Age of Respondent (1= 40-49 years, 0 otherwise)	0.123 (1.35)	0.039* (1.77)
Constant	-0.501** (2.13)	-0.305** (2.36)
R-Squared/Pseudo R2	0.0612	0.1150
F statistics / LR chi2	18.61 [9; 0.0000]	26.00[10; 0.0000]
<b>Observations</b>	<b>520</b>	

**Source:** Author from field survey. N/B: values in parentheses are *t*-statistics. Also \*, \*\* and \*\*\* are various significant levels at the 10%, 5% and 1% level.

As explained in the literature, crowdfunding is a term used to describe the wide range of structures under which a wide spectrum of individuals can put in money to a startup or business project. "Crowd lending in the context of starting capital is a startup source of equity capital and can pool from little contributions and collaboration through social media" (Metelka, 2014). Given today's challenging economic situation, crowdfunding has become an alternative funding method that attracts investors and startups' interest. It is common for a vast number of people to invest in ideas that they believe. Alternatively, crowdfunding platforms offer an additional type of funding source in small quantities for new ventures, since practically investors rarely get company shares; instead, they receive alternative compensation (Dapp, 2013).

Other complementary variables associated with crowdfunding in influencing entrepreneurial finance are: years of experience of entrepreneurs (3.1%), secondary level of education (3.9%), Size of Enterprise (42.15), type of Business (9.1%), ploughback profit (9.4%), access and ease of using the platform (31.8%), frequency of using crowd lending (90.1%) and age of the respondent (3.9%). The Pseudo R2 revealed that the different variables have a close relationship with entrepreneurial finance; meanwhile, the chi-square shows that globally the result is good. Hypothetically, we reject our null hypothesis, which stipulates that crowd lending is not relatively important in explaining the enhancement of entrepreneurial finance (see Table 2).

Considering the covariates of crowdfunding, it was observed that several factors are substantial and relatively influencing the functioning of crowdfunding. These variables include entrepreneurs' years of experience, a secondary level of education, size of the company, profit recovery, access and ease of use of the platform, and frequency of using

crowd lending. The rule of Thumb's  $R^2$  and global significance test demonstrate that the result is acceptable for inference (see Table 2).

### 4.3 Bank Loans and Influence on Entrepreneurial Finance

This Table 3 reveals that bank loan has a probability effect of 0.871 in influencing entrepreneurial Finance, which means that everything being equal, access to bank loans has a potential percentage point of 87.1% to affecting entrepreneurial Finance. It is worth considering that it is the easiest and accessible means for all start-ups. It is simply sufficient to have basic collateral security and a guarantee to acquire (see Table 3).

**Table 3** Bank Loans and Influence on Entrepreneurial Finance

Variable	Estimation Method: Probit-Elasticity Model	
	Bank Loan	Entrepreneurial Finance
Bank loan	n/a	0.871*** (2.96)
Years of experience (1= 2—5 years, 0 otherwise)	0.111*** (3.38)	0.670* (1.68)
Marital Status (1= Married, 0 otherwise)	0.121* (1.65)	0.039** (2.01)
Level of education (1= Secondary education, 0 otherwise)	0.072*** (3.17)	0.427*** (2.84)
Size of the Enterprise	0.210** (2.37)	0.040*** (3.12)
Type of Business (1= sole-proprietorship, 0 otherwise)	0.114*** (4.06)	0.094*** (3.31)
Other sources of finance (1= plough profit, 0 otherwise)	-0.206 (0.96)	0.874* (1.83)
Access and ease of using platform (1= yes, 0 otherwise)	0.021* (1.65)	0.022** (2.10)
Frequency of using bank loan	0.633* (1.66)	0.142*** (2.88)
Age of Respondent (1= 40-49 years, 0 otherwise)	0.711*** (3.14)	0.512* (1.77)
Constant	-0.661*** (3.22)	0.344*** (3.41)
Pseudo R2	0.1441	0.2750
F-statistics/ LR chi2	88.27 [9; 0.0000]	72.03[10; 0.0001]
<b>Observations</b>	<b>520</b>	

**Source:** Author from field survey. N/B: values in parentheses are *t*-statistics. Also \*, \*\* and \*\*\* are various significant levels at the 10%, 5% and 1% level.

This finding is consistent with the views of Williams (2017). He further revealed that banks offer various services in their operations, and thus computers have to support all these functions and services. It takes multiple types of computers to make it happen. The complementary variables associated with bank loans in influencing entrepreneurial finance are: bank loans are: years of experience of the entrepreneur (67%), married entrepreneurs (3.9%), secondary level of education (42.7%), size of an enterprise (4%), type of business (9.4%), return of profit (87.45%), access and ease of use of bank loan (2.2%), frequency of use of bank loan (14.2%) and age of the respondent (51.2%). The Pseudo  $R^2$  indicates simply that the exogenous variables are closely connected to the outcome variable; meanwhile, the significant global test confirms the robustness of the result.

**Correlation Heatmap:** This heatmap provides a visual representation of the relationship between "Bank Loan" and "Entrepreneurial Finance," alongside several influencing factors. Each cell contains a correlation coefficient that varies from -1 to 1. The color gradient transitions from blue, indicating a negative correlation, to red, signifying a positive correlation, effectively illustrating the strength of the association between each variable and the two primary financial components.

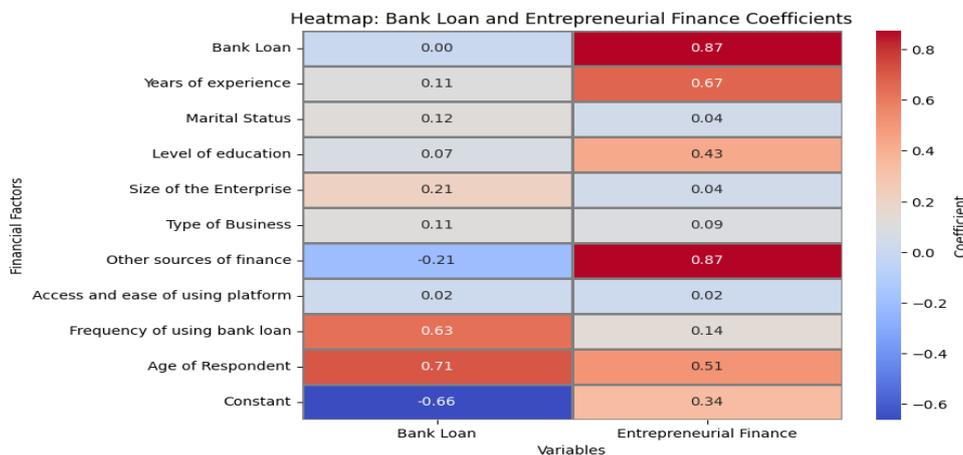


Fig. 3 Heatmap: Bank Loans and Influence on Entrepreneurial Finance Coefficient.

Figure 3, Heatmap: Bank Loans and Influence on Entrepreneurial Finance. Vibrant colors facilitate the quick identification of strong correlations.

**Bar Plots:** The bar plots illustrate the coefficients of various factors affecting "Bank Loan" and "Entrepreneurial Finance." The initial plot depicts the correlation between each factor and bank loans, whereas the subsequent plot highlights their effect on entrepreneurial finance.

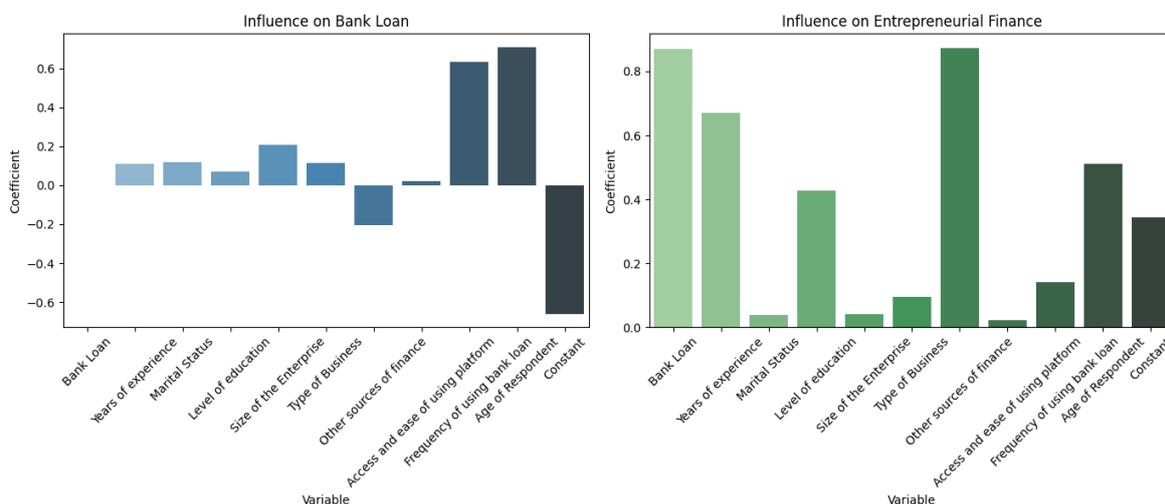


Fig. 4 factors affecting Bank Loan and Entrepreneurial Finance

Figure 4 factors affecting Bank Loan and Entrepreneurial Finance. The length of each bar indicates the strength of the relationship, with significant influences observed from variables such as "Years of Experience" and "Access to Platform." Labels are aimed to enhance readability. Factors affecting Entrepreneurial Finance. Analyzing their interconnections with different factors aids in comprehending the primary elements that contribute to business success and financial resilience. The significance of bank loans and entrepreneurial finance is evident in their profound impact on business development and financial decision-making processes. Bank loans supply essential funding for operational activities, growth initiatives, and innovative projects. Conversely, entrepreneurial finance encompasses the financial strategies and resources accessible to entrepreneurs, which directly affect their capacity to grow and maintain their enterprises.

Hypothetically, we reject the null hypothesis that bank loans are not positively associated with higher levels of entrepreneurial finance. Verifying the factors that fuel entrepreneurial bank loans, we observed that: years of entrepreneurial experience, married entrepreneurs, a secondary level of education, size of the enterprise, type of business, return of profits, access and ease of using bank loan, frequency of using bank loan, and age of the respondent are all positive and significantly complementing in influencing bank loans across the world.

**4.4 t-Test result for America versus Africa and America versus Europe**

Table 4 presents the t-Test result for America versus Africa and America versus Europe with respect to entrepreneurial finance as motivated by crowd-lending and bank loans. Considering America versus Africa, it is observed that the t-statistics ( $t = 1.1658$ ) is not significant with a mean difference of 6.8 percent. In the same way, considering America versus Europe, the t-statistics ( $t = 6.0477$ ) is statistically significant at a level of 1 percent with a mean difference of 31.97 percent revealing that entrepreneurs in America and Europe has a strong propensity of corroborating which has a strong probability of enhancing their entrepreneurial finance with a huge amount of income generated from both crowd-lending and bank loans.

**Table 4** t-Test result for America versus Africa and America versus Europe

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
	America versus Africa					
America	520	.5170068	.0413564	.5014191	[.4352724	.5987412]
Africa	520	.4489796	.0411643	.4990906	[.3676247	.5303345]
Combined	1040	.4829932	.0291934	.5005627	[.4255378	.5404486]
Different		.0680272	.0583511		[-.0468148	.1828692]
diff = mean(America) - mean(Africa)				t =	1.1658	
Ho: diff = 0				degrees of freedom = 1038		
Ha: diff < 0		Ha: diff != 0		Ha: diff > 0		
Pr(T < t) = 0.8777		Pr( T  >  t ) = 0.2446		Pr(T > t) = 0.1223		
America versus Europe						
America	520	.5170068	.0413564	.5014191	[.4352724	.5987412]
Europe	520	.1972789	.0329341	.3993051	[.1321897	.2623681]
Combined	1040	.3571429	.0279927	.4799744	[.3020507	.4122351]
Different		.3197279	.0528678		[.2156776	.4237782]
diff = mean(America) - mean(Europe)				t =	6.0477	
Ho: diff = 0				degrees of freedom = 1038		
Ha: diff < 0		Ha: diff != 0		Ha: diff > 0		
Pr(T < t) = 1.0000		Pr( T  >  t ) = 0.0000		Pr(T > t) = 0.0000		

Source: author

This result is acceptable in the sense that both continents have strong business tides on a win-win approach as they are all developed nations as compared to America and Africa. The combined mean result for America-Africa is 48.29 percent while that of America- Europe is 35.71 percent.

#### 4.5 Challenges Associated with the Acquisition of Entrepreneurial Finance

Table 5 reveals the challenges associated with the acquisition of entrepreneurial finance via crowd-lending and bank loans. Focusing on crowd-funding, the respondents admitted that access to the fundraising platform is a significant concern. According to our Table 5, 65% of the respondents firmly held that access to the platform is a major challenge, while 35% noted a contrary opinion. There are many websites that entrepreneurs can create to raise funds. Unfortunately, finding a particular site that gathers willing and available financial donors is the most significant challenge entrepreneurs face (see Table 5).

**Table 5** Challenges associated with the acquisition of entrepreneurial finance

Variable	Obs	Non-challenge ((NC) No)	%NC	Challenge ((C) Yes)	%C
<b>Challenges associated with Crowd-funding</b>					
Access to the platform	520	242	35	278	65
Availability of financial donors	520	260	50	260	50
Knowledge on fundraising	520	224	20	296	80
Trust and Acceptance	520	224	20	296	80
Duration of payment	520	372	60	248	40
<b>Challenges associated with bank loans</b>					
Interest Rate	520	256	46.6	264	73.4
Loan Procedure	520	233	27.5	287	72.5
Guarantee/collateral security	520	261	50.83	259	49.17
Mode of payment	520	274	61.66	246	38.34
Duration of payment	520	262	51.66	258	48.34

Source: Author

About 50% of the respondents revealed that financial donors are difficult to obtain. As noted in the literature, the recruitment of financial donors is a matter of relationship, belief, and exposure. Entrepreneurs who have worked under closed doors need to create relevant acquaintances to gain the interest of donors. Recommendation and support from other entrepreneurs can be a significant push toward this. Other challenges hampering this domain are appropriate knowledge about fundraising (80%), trust and acceptance (80%), and duration of payment (40%).

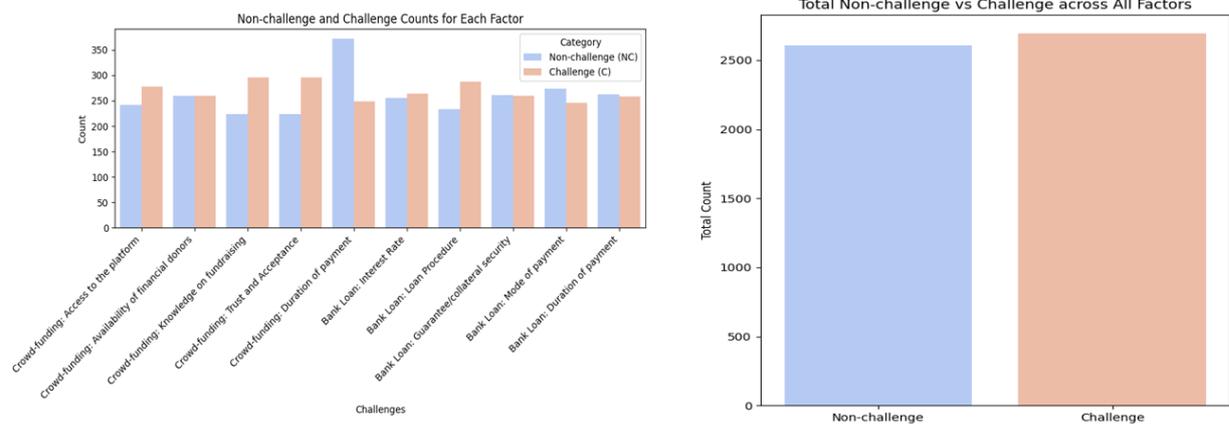


Fig. 5 Challenges associated with the acquisition of entrepreneurial finance

Figure 4 Challenges associated with the acquisition of entrepreneurial finance. For entrepreneurs to be accepted, they must clearly write the business's vision and mission statement. In addition, the goals and management strategy should be acceptable in terms of norms and standards. These results are consistent with the view of Metelka (2014), who had a similar observation. The challenges in terms of bank loans are enormous; the respondent of our study revealed that: interest rate (73.4%), loan procedure (72.5%), guarantee/collateral security (49.17%), mode of payment (38.34%), and duration of payment (48.34%) are all plaguing the entrepreneurs from collecting bank loans.

In summary, both crowd-funding and bank loans have more potent effects on entrepreneurial finance. For example, we assume that crowd-funding is a marginal probability effect of 60.4% in augmenting entrepreneurial finance if successfully manage while bank loan has a marginal probability effect of 87.1% in enhancing entrepreneurial finance. This result is in line with the declaration of Williams (2011) and Dapp (2013). They respectively found out that crowd-funding and bank loans are all excellent sources of capital to startups with a strong probability of increasing the capital of business people. However, we observed that bank loans have a more substantial marginal probability effect compared to crowd-funding. Considering that crowd-funding is still relatively in need, entrepreneurs have not yet fully engaged in using it as a platform to raise capital.

A bank loan is the usual conventional method, popular and easily accessible for all entrepreneurs, since it is a place where businessmen keep their money. However, as observed in the study, other sources of finance, such as plowing profits, support from families, friends, and business angels, have a strong probability of raising funds for start-up entrepreneurs. The challenges to raise capital for business are enormous and ranging from access to the platform, availability of financial donors, knowledge on fundraising trust and acceptance and duration of payment in the case of crowd-funding to interest rate, loan procedure, guarantee/collateral security, mode of payment, and period of payment in the case of bank loans.

## 5. Conclusion

The principal goal of this paper has been to investigate the actual contribution of crowd-lending and bank Loans in enhancing entrepreneurial finance among entrepreneurs. Specifically, to examine the role of crowd lending in the promotion of entrepreneurial finance, to explore the influence of bank loans on entrepreneurial finance, and to verify the challenges associated with the acquisition of entrepreneurial finance. The hypotheses targeted are the following: Crowd-lending is not relatively important in explaining enhancement of entrepreneurial finance and bank loans is not positively associated with higher levels of entrepreneurial finance.

The main result shows that, in examining the role of crowd lending in the promotion of entrepreneurial finance, we observed that crowd funding has a potential percentage point of about 60.4% in affecting entrepreneurial finance, and the effect is significance at one percent level. Meanwhile in exploring the influence of bank loans on entrepreneurial finance the result reveals that bank loan has a probability effect of 0.871 in influencing entrepreneurial finance. To verify the challenges associated with the acquisition of entrepreneurial finance, we observed that the challenges associated with Crowd-funding are: access to the platform, availability of financial donors, knowledge on fundraising, trust and acceptance, and duration of payment. Meanwhile, challenges associated with bank loans are: interest rate, loan procedure, collateral security, modes of payment, and duration of payment.

From the foregoing, we observed that crowd funding and bank loans are positively and significantly influencing entrepreneurial finance, but with a higher magnitude in bank loans than otherwise. Implying that entrepreneurs are more use of bank-loans to raise their venture capital given that it is easily accessible, has a lower cost and more easy going procedure. Based on our findings, the study recommends that entrepreneurs should use bank-lending more augment their venture capital as to crowd-funding. This is a wise step towards increasing entrepreneurial finance. After the verification of the implications of crowd-funding and bank loans on entrepreneurial finance, we suggest that future research should focus on country cross-section data and panel data to observed similar issues. This will go a long-way to ascertain the existing empirical results in this domain.

**Data available Statement**

Data is available on request due to restrictions e.g. privacy or ethical. The data presented in this study are available on request from the corresponding author.

**Conflict of Interest**

No conflict of interest

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