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# Determinants of firms' access to finance through fintech: An empirical study of startup firms in Vietnam

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## *ABSTRACT*

This study examines the determinants influencing Vietnamese startup firms' access to finance through Fintech platforms. Drawing on survey data and employing the Heckman two-stage estimation procedure, this research investigates how internal firm characteristics, such as R&D investment intensity, capital sources, industry classification, and revenue growth, affect the likelihood of securing Fintech-based funding. The results reveal that firms with prior capital access, high R&D-to-revenue ratios, and recent capital-raising activity are more inclined to access Fintech finance. Conversely, startups that rely predominantly on government support or external equity tend to have lower engagement with Fintech solutions. Moreover, sectoral variation exists, with specific industries displaying greater compatibility with Fintech models due to differing capital needs and innovation profiles. The study contributes to the growing literature on entrepreneurial finance and Fintech by providing empirical evidence from an emerging market context. It also offers policy implications to enhance financial inclusion and support innovation, emphasizing the need for legal frameworks to foster Fintech development, targeted support for R&D-driven startups, and stronger collaboration between Fintechs and traditional financial institutions. By identifying key enablers and constraints of Fintech adoption, this research provides practical insights for startups, policymakers, and investors seeking to navigate Vietnam's evolving financial landscape.

**Contribution/ Originality:** This study offers novel evidence on how R&D intensity, industry type, and capital-raising behavior influence Vietnamese startups' access to Fintech financing. Using a Heckman two-stage estimation, it challenges conventional assumptions and provides new insights into financing behavior in emerging markets, contributing to the literature on Fintech adoption and entrepreneurial finance.

## 1. INTRODUCTION

In recent years, the rapid and transformative evolution of emerging technologies particularly financial technology (Fintech) has opened numerous opportunities to advance financial development in Vietnam. Fintech broadly refers to the integration of innovative and modern technological solutions into financial services, aiming to provide users with more efficient, transparent, and accessible financial products at lower costs compared to traditional financial systems. The key domains of Fintech include credit provision, deposit-taking, and capital mobilization; payment, clearing, and settlement systems particularly those involving digital currencies; investment management services, including trading; and insurance (Bank for International Settlements, 2018; Da Silva, 2018; Thakor, 2020). Among these, capital mobilization via Fintech platforms has demonstrated notable progress.

The vibrant expansion of Vietnam's startup ecosystem has played a critical role in accelerating the development of Fintech, particularly concerning financing accessibility. The Fintech ecosystem in Vietnam consists of a diverse range of actors, including Fintech startups, technology developers, traditional financial institutions, government agencies, regulators, and users of financial services. Vietnam has emerged as one of the most attractive investment destinations for venture capital funds within Southeast Asia. The country's startups have experienced substantial growth and are characterized by a pressing demand for external capital to sustain their expansion and gain a competitive advantage. Access to finance is, therefore, a vital element in determining the success and market positioning of these enterprises. Consequently, the advent of Fintech-enabled financing mechanisms has significantly expanded funding opportunities for Vietnamese startups.

Startups play a crucial role in promoting sustainable development across economic, social, and environmental dimensions on a global scale. According to the OECD (2019), startups and small and medium-sized enterprises (SMEs) constitute approximately 99% of all businesses and contribute around 50–60% of global value added. They are widely recognized for their role in generating employment (Haltiwanger, Jarmin, & Miranda, 2013), stimulating both local and international markets, and advancing innovation and problem-solving capabilities (Decker, Haltiwanger, Jarmin, & Miranda, 2014). Furthermore, startups contribute significantly to innovation-led economic growth and structural transformation by reducing bureaucratic inefficiencies and promoting R&D-oriented initiatives (Megginson, 2005; Ravenscraft & Scherer, 1991). In developing nations, startups are expected to drive sustainable economic progress without compromising future environmental and social well-being (Dean & McMullen, 2007; Dhahri & Omri, 2018; McMullen, 2011; Vuong, 2020).

Despite the increasing relevance of Fintech in Vietnam, empirical studies examining factors influencing startups' access to Fintech-based finance remain limited. This scarcity may be attributed to the relatively recent emergence of Vietnam's startup ecosystem and the novelty of Fintech in the domestic market. Although the startup landscape has expanded rapidly, the demand for external financing remains substantial, and Fintech-enabled financing has garnered growing interest among entrepreneurs. The concept of "innovation" has become a focal point in recent discourse. Nevertheless, most existing research has primarily employed qualitative methodologies and concentrated on other Fintech areas rather than financing access. Hence, this study aims to identify and analyze the determinants that influence startup firms' ability to obtain financing through Fintech platforms in Vietnam.

The study relies on primary data collected through a structured survey administered to individuals in key leadership roles, including CEOs, CFOs, and specialists, within startups operating in Vietnam. The Heckman two-step estimation procedure was employed. In the first step, a probit model was used to determine whether the firm secured external financing during the study year. In the second step, a linear regression model was applied to investigate the factors influencing the degree to which Fintech channels were utilized to raise capital. The findings reveal that key determinants of Fintech-based financing include a firm's creditworthiness, the ratio of R&D expenditure to total revenue, engagement in external fundraising activities, and revenue growth rate. Additionally, capital access through Fintech was observed to vary among firms with family members in key managerial roles. Drawing on these findings, the study proposes practical implications to enhance Fintech-based financing strategies for startups in Vietnam.

This study makes significant contributions to the literature in several important ways. First, it provides one of the earliest empirical assessments of Fintech financing adoption among startup firms in Vietnam—an emerging market context that remains underexplored. Second, the use of the Heckman two-stage model offers a robust methodological framework for correcting sample selection bias in entrepreneurial finance studies. Third, by identifying both firm-specific and contextual drivers of Fintech-based funding, the research provides practical insights for entrepreneurs, Fintech developers, and policymakers seeking to enhance financial inclusion and startup support ecosystems.

The remainder of this paper is organized as follows: Section 2 synthesizes prior literature and outlines hypotheses related to determinants of Fintech-enabled capital access. Section 3 discusses data characteristics and the empirical methodology. Section 4 presents the regression results, and the final section provides concluding remarks and policy recommendations for improving access to Fintech-based finance for startup firms in Vietnam.

## 2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

### *2.1. Literature Review*

The concept of startup financing emerged prominently in the 1950s and 1960s, marking a novel financial mechanism that significantly facilitated the commercialization of technological innovations and supported the proliferation of entrepreneurial ventures. Since then, the body of literature on startup financing has expanded substantially in both volume and thematic scope over the past six decades. Numerous scholars, primarily based in North America and Europe, have contributed foundational research to this field, including widely cited figures such as Zahra. His early works deepened scholarly understanding of how various internal and external factors influence startup potential and their linkage to corporate performance (Zahra, 1991, 1993; Zahra & Covin, 1995). Research activity on startup financing notably intensified during the post-1990s era, coinciding with the rapid rise of Dotcom enterprises. These technology-driven firms, often backed by private investment, secured large capital inflows and generated successful exits following public listings. Within the context of this study, it is crucial to examine various startup financing channels, including Fintech, to gain a comprehensive and comparative understanding of capital access decisions and their influencing factors.

Depending on the phase of the business lifecycle, startups are likely to encounter multiple operational and financial constraints, including challenges in capital acquisition, workforce management, and securing production inputs (Salamzadeh, 2015; Shepherd, Douglas, & Shanley, 2000; Tanha, Salamzadeh, & Allahian, 2011). A significant concern for early-stage startups is overcoming financial limitations and improving access to capital. These firms often suffer from undeveloped cash flow streams, limited fixed assets, and significant information asymmetry vis-à-vis investors. Consequently, startups face a heightened risk of rejection when applying for conventional bank loans. Considering these constraints, equity financing has emerged as a preferred capital strategy particularly through venture capital, angel investors, startup accelerators, incubators, and seed investment funds. Nevertheless, some startups still turn to alternative sources, such as commercial bank credit, self-financing, crowdfunding, or peer-to-peer (P2P) lending facilitated by online platforms.

The term "venture capital" first appeared in academic literature in 1978 (based on Scopus data), and since then, the discourse surrounding venture capital has remained vibrant and increasingly diversified. Research on venture capital accounts for over 75% of academic contributions related to startup financing. Venture capitalists (VCs) do not merely deploy their capital but also raise funds from limited partnerships, financial institutions, and seed funds, leveraging a variety of financial instruments to form structured investment vehicles (Bonnet & Wirtz, 2012). These funds primarily target high-potential, innovation-driven projects that promise superior returns albeit accompanied by high levels of investment risk (Barry, 1994; Fenn, Liang, & Prowse, 1997; Gompers & Lerner, 1994; Gompers & Lerner, 2001; Sahlman, 1990). VCs actively participate in the funding process by screening investments, negotiating terms, monitoring performance, and planning exit strategies (Gompers & Lerner, 2001; Gorman & Sahlman, 1989; Sahlman, 1990; Sapienza, Manigart, & Vermeir, 1996).

In many cases, venture capitalists adopt a hands-on approach, becoming strategic partners and directly influencing the business operations and strategic direction of portfolio companies (Berger & Udell, 1998). Warne (1988) further characterized VCs as hybrid actors who serve simultaneously as financial backers and strategic advisors. Extensive empirical evidence confirms that both angel investors and venture capital funds play crucial roles not only in financing but also in providing startups with managerial guidance, strategic advice, and networking support elements that are vital for scaling and long-term sustainability.

An increasingly recognized channel of financial access for startups, particularly those in the scientific and technological sectors, involves mobilizing capital through non-traditional sources such as accelerators, incubators, university-affiliated seed funds, crowdfunding platforms, and financial instruments backed by intellectual property assets like patents (Bruton, Khavul, Siegel, & Wright, 2015; Lerner, 2022). Contrary to conventional entrepreneurial frameworks, recent studies have identified a tendency among new ventures to rely on debt-based external capital, especially in the form of bank loans (Robb & Robinson, 2014). Simultaneously, other research findings suggest that some entrepreneurs manage to build and scale their businesses without resorting to outside financing by depending on personal equity and adopting operational models that are favorable to internal cash flow (Baker & Nelson, 2005; Winborg & Landström, 2001). Moreover, the internationalization of financial markets has enabled startup firms to tap into cross-border investment capital from foreign investors (Devigne, Vanacker, Manigart, & Paeleman, 2013; Mäkelä & Maula, 2005).

Two fundamental issues consistently arise in the context of external capital acquisition: information asymmetry and moral hazard. Founders and early-stage business managers possess superior knowledge of their company's current performance, technological capabilities, and prospects information that external financiers are often unable to observe fully. Since small and emerging businesses are typically unlisted and exempt from formal disclosure obligations, the absence of transparent financial reporting exacerbates the degree of asymmetric information. Firms may therefore engage in adverse selection by selectively presenting favourable performance metrics or profitable projects while concealing loss-generating operations, thereby enhancing the appearance of financial health to attract investment (Bellavitis, Kamuriwo, & Hommel, 2019). This imbalance places investors at a disadvantage, as they lack the means to validate firm disclosures independently. In turn, prudent investors with limited risk tolerance may refrain from investing in early-stage ventures, even when the underlying potential is considerable, due to these unresolved informational concerns (Pasillaki & Daskalakis, 2009). Moral hazard arises when, after securing external financing, entrepreneurs allocate capital in a manner that prioritizes personal objectives over the interests of shareholders. For instance, a founder or technical lead may choose to channel funds into research that generates reputational gains or intellectual property rights such as patents despite the low likelihood of financial return for investors (Bergemann & Hege, 1998; Mishra & Zachary, 2014).

The pecking order theory, developed by Myers and Majluf (1984), provides an explanatory framework for financing preferences among entrepreneurs. Given that startups are typically characterized by high innovation and uncertainty, the resulting information asymmetry and agency costs elevate the implicit cost of external finance. As issuing new equity often leads to ownership dilution and diminished managerial control, founders tend to prefer debt financing where feasible. Cochrane (2005) outlines several reasons for the differential return structures observed in private equity investments compared to those in publicly traded markets. Firstly, the illiquid nature of private equity instruments necessitates higher expected returns as compensation. Secondly, the concentrated ownership typical of such investments leads to lower diversification, resulting in higher risk premiums. Lastly, private equity financing is often coupled with non-financial roles such as governance oversight and strategic advisory performed by investors, which justifies additional compensation. Continuous changes in entrepreneurial business models, alongside persistent financing obstacles, have driven the emergence of new mechanisms for capital access. These innovations serve to broaden the range of funding options and enable better alignment between a firm's financing needs and investors' risk preferences. Among the most prominent of these developments are internet-based financing tools, including crowdfunding, peer-to-peer (P2P) lending, and initial coin offerings (ICOs), which have gained attention for their flexibility, scalability, and decentralized structure (Kleemann, Vob, & Rieder, 2008; Lambert & Schwienbacher, 2010).

In recent years, crowdfunding has emerged as a prominent alternative financing mechanism for small and medium-sized enterprises (SMEs) and early-stage ventures, complementing traditional sources of funding such as angel investment and venture capital. As a result, an increasing number of academic studies have sought to explore various dimensions of crowdfunding. One of the foundational contributions to the literature was made by Belleflamme,

Lambert, and Schwienbacher (2014), who identified crowdfunding as an outgrowth of crowdsourcing. This concept involves leveraging the collective input of the public to gather capital, knowledge, feedback, and innovative solutions to support business development. They defined crowdfunding as an open call for financial contributions, generally issued via the Internet, which may involve donations or exchanges for rewards or participatory rights. Similarly, Schwienbacher and Larralde (2010) characterized crowdfunding as a mechanism for direct financial engagement, where entrepreneurs raise capital directly from the public rather than through conventional financial intermediaries. Despite this direct nature, the increasing role of online crowdfunding platforms such as Fundable, Kickstarter, Kiva, and SellaBrand has introduced a level of intermediation between capital seekers and retail investors (Belleflamme et al., 2014; Schwienbacher & Larralde, 2010). Hemer (2011) argued that these platforms serve a critical intermediary role, as their technical expertise and experience in managing crowdfunding processes often exceed that of both funders and entrepreneurs. Robb and Robinson (2014), in their exploration of the dynamics of startup capital structure, found that ventures with higher leverage levels often report more rapid growth in both revenue and employment. Their findings suggest that debt financing may catalyze early-stage expansion. Supporting this conclusion, Cole (2011) demonstrated that startups receiving bank loans tend to outperform those that do not in terms of financial performance.

The development of a supportive ecosystem for entrepreneurial finance is often justified by the belief that innovation generated by startups produces significant economic value. However, a persistent gap remains between startups' funding needs and the actual capital they can secure, particularly for activities related to innovation and research and development (Hall & Lerner, 2010). This disparity has led to calls for policy interventions that aim to incentivize and facilitate investments in innovation-driven ventures. In this context, the work of Kortum and Lerner (2001) is particularly noteworthy. Their empirical analysis revealed a strong positive correlation between venture capital activity and the volume of patents granted, indicating that greater venture capital investment is associated with higher innovation output. Based on this evidence, the authors, along with other scholars, have argued for a closer examination of the relationship between public policy initiatives and the evolution of venture capital markets. Further contributions in this domain highlight the influence of tax regimes on startup investment behavior. For instance, they examined the impact of personal income tax policy on the scale and dynamics of venture funding, concluding that fiscal policy plays a non-negligible role in shaping entrepreneurial investment trends. Another important policy area involves the allocation of institutional capital. In the United States, regulatory reforms enacted after 1978 permitted pension funds to allocate capital to private equity and venture funds, contributing to significant growth in startup financing. Black and Gilson (1998) expanded this perspective by emphasizing the interplay between venture capital and stock markets. Their research demonstrated that venture capitalists often anticipate exit opportunities through initial public offerings (IPOs) and, thus, are more active in countries with mature and liquid stock exchanges. Consequently, markets such as the United States, the United Kingdom, and Ireland have attracted greater volumes of venture capital investment, in contrast to markets with less developed equity ecosystems, such as Japan and Germany.

Academic research in Vietnam has primarily focused on applied topics and the practical aspects of business operations. Consequently, scholarly interest in the mechanisms through which Vietnamese startups raise capital has grown increasingly prevalent. Much of this literature addresses the current state of capital acquisition activities (Nguyen & Tran, 2016), with findings indicating that such efforts remain in a formative stage but have experienced notable improvements in both volume and quality of successfully closed funding deals. Several studies have examined available financing options for startups (Hoàng, 2020; Luu, 2020), demonstrating that Vietnamese startups have access to a comprehensive set of capital-raising mechanisms. These include both conventional methods and emerging alternatives such as angel investing, venture capital, and crowdfunding platforms.

Regarding the determinants of startups' ability to secure funding, Nguyễn (2020) investigated the factors that influence the likelihood and scale of capital mobilization in Vietnam's entrepreneurial sector. In particular, startup

age was shown to be a significant predictor of fundraising success the longer a firm has been operating, the more extensive its capital requirements, and the greater its chances of securing external investment. Despite the growing volume of research on capital access for Vietnamese startups, a notable gap remains in the literature regarding the application of financial technology in fundraising practices. To date, no existing studies have undertaken a focused examination of Fintech adoption among Vietnamese startups for capital access, nor have they investigated the specific factors that influence the intention to utilize Fintech platforms in this process.

### *2.2. Hypothesis Development*

Himmelberg and Petersen (1994) investigated early-stage high-tech firms and highlighted their frequent exposure to capital constraints. Similarly, Storey and Westhead (1997) observed that even when controlling for firm size and age, high-tech startups face greater financial restrictions than their low-tech counterparts. Goodacre and Tonks (1995) further emphasized that high-tech innovations are inherently difficult to value, making them less appealing to traditional financial institutions. As a result, newly established ventures that prioritize innovation and are heavily engaged in research and development (R&D) often require substantial external funding. However, their limited operating history and unstable cash flows make it more difficult for them to access conventional financing sources, such as commercial banks. Against this backdrop, the following hypothesis is proposed:

*$H_1$: Startup firms that focus on research and development (R&D) are more likely to access finance through Fintech.*

In their empirical examination of Fintech-driven financing among small and medium-sized enterprises in China, Xiang, Zhang, and Worthington (2020) reported that businesses with more than three family shareholders are less inclined to use Fintech platforms for capital mobilization. Family-controlled firms often prefer internal sources of funding, such as capital contributions from family members or retained earnings, over external financing options. Extending this insight to the Vietnamese context, we anticipate that startups with multiple family members serving on the board of directors will exhibit lower engagement with Fintech-based capital sources.

*$H_2$: Startup firms with two or more family members on the board of directors have a lower ability to access finance through Fintech.*

Firm age, typically measured by the number of years since incorporation, serves as a proxy for a company's position within its business life cycle. In credit assessments, financial institutions often consider operational tenure as a factor reflecting market experience, brand recognition, and business continuity. Firms with a longer market presence are more likely to establish consistent cash flows and build enduring relationships with customers. Given these characteristics, it is reasonable to expect a positive correlation between firm age and the likelihood of utilizing fintech platforms for financing.

*$H_3$: The higher the number of years of operation of startup firms, the greater their ability to access finance through Fintech.*

An enterprise's historical growth rate is commonly viewed as a signal of business vitality and investment potential. Stable and consistent growth suggests a firm's long-term viability and profit potential qualities that are particularly attractive to investors. In the context of Fintech-based financing, revenue growth serves as a key metric for platform algorithms and investor evaluations. Startups demonstrating robust growth are, therefore, more likely to receive financing through technology-enabled funding models.

*$H_4$: The growth rate is positively related to access to finance through Fintech for startup firms.*

Total assets are often used to approximate firm size. Prior research has shown that smaller firms, due to lower asset bases, are often disadvantaged in securing external financing. This is primarily attributed to heightened information asymmetry, weaker financial positions, and limited collateral, which collectively reduce their borrowing credibility. However, the emergence of Fintech as an alternative funding channel has helped mitigate some of these traditional barriers. Fintech lending models, particularly in rapidly evolving markets such as China (Xiang et al., 2020) and increasingly in Vietnam, provide faster, less collateral-intensive financing solutions. Thus, smaller firms may be more inclined and better positioned to leverage Fintech for capital access.

*$H_5$: The smaller the startup firm size, the higher the ability to access finance through Fintech.*

Firms engaged in export activities are often viewed as having broader market potential and stronger international growth prospects, as evidenced by their ability to distribute products beyond domestic markets. This export orientation signals not only internal competitiveness but also enhances external investor appeal particularly through Fintech platforms that favor firms with cross-border scalability. As such, export-oriented startups are expected to exhibit greater access to Fintech-based financing.

*$H_6$: Exporting startup firms have a higher ability to access finance through Fintech.*

Corporate financing strategies typically involve a mix of retained earnings, equity capital, and debt instruments. Brown, Fazzari, and Petersen (2009) suggest that equity financing may offer distinct advantages to small firms: it avoids collateral requirements, minimizes risks related to financial distress, and does not generate the same degree of adverse selection as debt. However, in emerging markets such as Vietnam, where underdeveloped financial systems limit access to equity markets, startups often rely heavily on debt financing. Nonetheless, Brown et al. (2009) also outline several challenges that render debt unsuitable for startups. These include mismatched debt structures for R&D-intensive firms (Stiglitz, 1985), heightened risk of adverse selection due to the uncertain nature of early-stage ventures (Stiglitz & Weiss, 1981), moral hazard stemming from suboptimal project selection, and an increased cost of financial distress due to high leverage and future-growth dependency (Cornell & Shapiro, 1988). Xiang et al. (2020) found that financially constrained enterprises are more inclined to pursue Fintech as an alternative debt source when traditional credit is inaccessible. Based on these insights, the following hypothesis is proposed:

*$H_7$: Startup firms using long-term debt have a lower likelihood of accessing finance through Fintech.*

Although external equity capital offers a viable financing alternative for startups, it typically requires relinquishing partial ownership and exposes firms to high investor return expectations. In their study of Chinese SMEs, Xiang et al. (2020) observed a tendency for equity-financed firms to use Fintech; however, this association was not statistically significant. Extending this exploration to Vietnam, the current study anticipates a positive relationship between external equity use and Fintech-based capital access.

*$H_8$: Startup firms that use external equity capital are more likely to access finance through Fintech.*

Compared to bank loans, fintech financing generally involves fewer procedural complexities and is more accessible to younger or less established firms. Feng, Lu, and Wang (2015) compared the attributes of conventional bank lending with those of Fintech-based lending models, noting that each method suits distinct firm profiles depending on size, operational maturity, and creditworthiness. Xiang et al. (2020) reported that firms failing to meet bank lending standards tend to adopt Fintech for their funding needs. Traditional lenders remain the preferred option for risk-averse enterprises such as state-owned firms or those with well-established financial systems. In contrast, startup firms due to their limited credit history are more inclined to pursue equity or Fintech financing. Accordingly, this study hypothesizes the following:

*$H_9$: Startup firms that borrow from banks have a lower ability to access finance through Fintech.*

Startups that interact with non-bank financial institutions often display diversified financing strategies but may also signal difficulties in obtaining credit from mainstream sources. Such firms may face elevated borrowing costs and less favorable lending conditions. From a Fintech financing perspective, this may reflect inefficiencies in capital allocation or greater financial risk, reducing the likelihood of successful Fintech-based fundraising. Therefore, the following hypothesis is advanced:

*$H_{10}$: Startup firms that transact with non-financial institutions have a lower ability to access finance through Fintech.*

Public support for R&D initiatives can alleviate immediate funding pressures for startups, reducing their reliance on external capital markets. Moreover, receiving government grants may imply a firm's dependence on public sector support rather than private capital, which could lower its engagement with Fintech platforms. Consequently, an inverse relationship is expected between government-funded enterprises and their likelihood of using Fintech-based financing mechanisms.

*$H_{11}$: Startup firms receiving government support have a lower ability to access finance through Fintech.*

## 3. RESEARCH METHODOLOGY

### 3.1. Research Design and Data Collection

This study employed a mixed-methods approach, integrating both qualitative and quantitative techniques to explore the determinants of Fintech-based financing decisions among startup firms in Vietnam. The primary data collection was conducted through a structured survey administered from December 2023 to March 2024. The target respondents were individuals holding key managerial or strategic roles within startup firms, including Chief Executive Officers (CEOs), Chief Financial Officers (CFOs), and finance or investment specialists. These firms operate across diverse industry sectors in Vietnam, ensuring heterogeneity in firm characteristics.

The survey instrument was developed based on the conceptual framework and proposed research model. It was structured using Google Forms and designed to capture both demographic information and perceptions related to Fintech financing. The questionnaire consisted of two sections:

- Section 1: Respondent profile

This part includes a brief introduction to the study's objectives and relevance, followed by questions related to the respondent's position and the startup's industry sector.

- Section 2: Core survey items

This section comprised 14 observed variables, of which 12 were independent and two were dependent. The items were designed to assess firm characteristics and capital access behavior through Fintech channels. Responses were collected using either binary (Yes/No) questions, an ordinal value from 1 to 5, or a 7-point Likert scale.

The primary dependent variable, Finance_fintech, was used to measure the frequency with which startups sought funding via Fintech platforms. Respondents were asked to rate their firm's Fintech engagement on a scale from 1 (Extremely Rarely) to 7 (Extremely Frequently). The use of the 7-point Likert scale is well-supported in empirical research due to its ability to capture nuanced behavioral data and the intensity of perception.

To ensure data reliability and validity, all responses were screened prior to analysis. Incomplete questionnaires or those exhibiting identical answers throughout were excluded. A total of 104 valid responses were retained for subsequent statistical processing. Regarding sampling, the study followed a non-probability convenience sampling strategy. Survey links were disseminated online via social media platforms and email. Based on the rule of thumb by Bollen (1989) for structural modeling suggesting a minimum ratio of 5 observations per variable the required sample size for 14 variables was 70. The actual sample size exceeded this threshold.

### 3.2. Research Model and Variable Construction

To control for the possible sample selection issue and potential endogeneity, this study followed the approach of Ghoul, Guedhami, Wang, and Kwok (2016) and Xiang et al. (2020) employing the Heckman two-stage estimation procedure. In the first stage of the Heckman model, the Probit regression model was used to estimate the probability of startup firms gaining access to finance in 2023 (also known as Finance_apply).

$$P = F(\alpha + \beta X) = \frac{1}{1+e^{-(\alpha+\beta X)}} \quad (1)$$

*In which*: $F(\alpha + \beta X)$ represents a model as $Finance\_apply = \alpha + \beta X + \varepsilon_i$; *Finance_apply* = 1 if startup firms got access to finance in 2023 and was calculated as $P_i = \frac{1}{\sqrt{2\pi}}\int_{-\infty}^{BX} e^{-z^2/2}dz$; *Finance_apply* = 0 if startup firms did not get access to finance in 2023 and was calculated as $(1 - P_i)$; *i* represents startup firms; X represents a matrix of independent variables representing the determinants of startup firms' access to finance (See Table 1 for description of variables in the models). Model (1) can be rewritten as follows:

$$Finance\_apply_i = \alpha_0 + \alpha_1.R\&D\_intensity_i + \alpha_2.Family\_member_i + \alpha_3.Firm\_year_i + \alpha_4.Growth_i + \alpha_5.Asset_i + \alpha_6.Export_i + \alpha_7.External\_debt_i + \alpha_8.Internal\_fund_i + \alpha_9.Bank_i + \alpha_{10}.Non\_bank_i + \alpha_{11}Gov\_fund_i + \alpha_{12}.Industry_i + \varepsilon \quad (2)$$

The inverse Mills ratio (IMR) was computed to serve as a correction term, enabling the identification of selection bias and accounting for key unobserved factors that influence the underlying relationship. It was derived by taking the ratio of the standard normal probability density function to the cumulative distribution function. In the second phase of the Heckman two-step procedure, the dependent variable was regressed on the IMR (λ), which had been estimated during the first stage. Using the same set of explanatory variables as in the initial model, an ordinary least squares (OLS) regression was conducted to evaluate the extent to which startup firms obtain financing through Fintech.

$$Fintech\_finance_i = \beta_0 + \beta_1.R\&D\_intensity_i + \beta_2.Family\_member_i + \beta_3.Firm\_year_i + \beta_4.Growth_i + \beta_5.Asset_i + \beta_6.Export_i + \beta_7.External\_debt_i + \beta_8.Internal\_fund_i + \beta_9.Bank_i + \beta_{10}.Non\_bank_i + \beta_{11}Gov\_fund_i + \beta_{12}.Industry_i + \beta_{13}.Finance\_apply + \beta_{14}.\lambda + \epsilon \quad (3)$$

*Where:* $\lambda$ represents inverse Mills ratio correction variable (IMR); $\varepsilon$ and $\epsilon$ represent error term of the model.

To correct the potential downward biases of the standard least squares estimator, the standard errors were bootstrapped in the first and second stages of the Heckman model. Table 1 summarizes the details of our variable construction for use in our models. All variables were collected through the survey.

**Table 1.** Description of variables in the models.

| Variable | Description | Expected sign. | References |
|---|---|---|---|
| Fintech_finance | Variable for the degree of startup firms' access to finance through Fintech using Likert 7 scales (from 1 (Extremely low) to 7 (Extremely high)). | -- | Xiang et al. (2020) |
| Finance_apply | A dummy proxy equals 1 if the firm raised capital during the fiscal year and 0 otherwise. | -- | Xiang et al. (2020) |
| R&D_intensity | An ordinal proxy for R&D expenditure over total revenue that takes values from a 1-5 scale, corresponding to the ratios <1%; 1–3%; 3–5%; 5–10%; and >10%, respectively. | (+) | Himmelberg and Petersen (1994); Storey and Westhead (1997) and Xiang et al. (2020) |
| Industry | An ordinal proxy for the firm's industry sector: (1) Information Technology; (2) Industrial; (3) Services; (4) Pharmaceuticals and Healthcare; (5) Consumer Goods; (6) Telecommunications; (7) Finance; (8) Utilities; (9) Materials. | -- | |
| Family_member | A dummy proxy that takes the value of 1 if there are two or more family members in management and 0 otherwise. | (-) | Villalonga and Amit (2006); Miller, Le Breton-Miller, Lester, and Cannella (2007); Chen, Chen, and Cheng (2008) and Xiang et al. (2020) |
| Firm_year | No. of operating years since the establishment of a firm. | (+) | Berger and Udell (1998) and Xiang et al. (2020) |
| Growth | An ordinal variable for the revenue growth rate: <10% (1), 10% –20% (2), 20–30% (3), 30–40% (4), and >40% (5). | (-)/(+) | Allen (2012) and Xiang et al. (2020) |
| Assets | Total assets measured in trillion VND. | (-) | Pasillaki and Daskalakis (2009); Serrasqueiro and Nunes (2008) and Xiang et al. (2020) |
| Export | A dummy proxy that takes the value of 1 if the firm is export-oriented and 0 otherwise. | (+) | Allen (2012) and Xiang et al. (2020) |
| External_debt | A dummy proxy that equals 1 if the firm relies on external debt and 0 otherwise. | (-) | Stiglitz (1985); Stiglitz and Weiss (1981); Cornell and Shapiro (1988); Brown |

| Variable | Description | Expected sign. | References |
|---|---|---|---|
| | | | et al. (2009) and Xiang et al. (2020) |
| External_equity | A dummy proxy that equals 1 if the firm relies on external equity, and 0 otherwise. | (+) | Xiang et al. (2020) |
| Bank | A dummy proxy that equals 1 if the firm has loans from banks and 0 otherwise. | (-) | Xiang et al. (2020) |
| Non_bank | A dummy proxy that equals 1 if the firm has loans with non-bank financial companies and 0 otherwise. | (-) | Xiang et al. (2020) |
| Gov_fund | A dummy proxy that equals 1 if the firm receives government support and 0 otherwise. | (-) | Xiang et al. (2020) |

## 4. RESEARCH RESULTS AND DISCUSSION

### *4.1. Descriptive Statistics*

Most of the surveyed businesses are in the information technology sector, with 37 out of 104 firms accounting for 35.53% of the sample. Following that, the consumer services sector comprises 23 companies, accounting for 22.12%. Regarding the participation of family members in firm management, 21 out of 104 firms, or 20.19%, have family members involved in management. In terms of export activities in the survey sample, 96.15% of the firms are not engaged in export business. Regarding debt financing, 57 out of 104 surveyed firms use external debt financing, representing 54.81% of the sample. In terms of external capital raising, 87 out of 104 companies raise external capital, accounting for 83.65%. Among those raising external capital, 53 out of 104 firms use bank financing, which is 50.96%. In addition to bank financing, companies also utilize funding from non-bank financial institutions. Specifically, 65.38% of the firms use non-bank financial institution funding. Regarding the use of government subsidies, 79 out of 104 companies (75.96%) did not use subsidies in 2023. Besides qualitative characteristics, some other characteristics of the startup firms are described in Table 2.

**Table 2.** Descriptive statistics of quantitative variables in the model.

| Variable | No. of obs. | Mean | S.D. | Min. | Max. |
|---|---|---|---|---|---|
| Fintech_finance | 104 | 4.43 | 1.79 | 1.00 | 7.00 |
| RD_intensity (%) | 104 | 33.60 | 31.30 | 0.40 | 95.90 |
| Firm_year | 104 | 3.81 | 1.74 | 1.00 | 12.00 |
| Growth (%) | 104 | 27.00 | 24.60 | 1.00 | 98.00 |
| Assets (trillion VND) | 104 | 0.0405 | 0.0663 | 0.0020 | 0.3500 |

The frequency of financial access through Fintech, measured on a scale from 1 to 7 (with 1 indicating a very low level and 7 indicating a very high level), has an average value of 4.43, indicating that the level of capital access for startup firms is moderate. The percentage of investment in research and development relative to total revenue has an average value of 33.6%, with a maximum value of 95.9% and a minimum value of 0.4%. The age of the business reflects the number of years since its establishment up to 2022. The average age of the businesses is 3.81 years, ranging from 1 to 12 years old. The average revenue growth rate for the startup firms is 27%. The average total assets of the surveyed startups are approximately VND 0.04 trillion, ranging from VND 0.002 trillion to VND 0.35 trillion.

### *4.2. Reliability Tests*

To assess the suitability of the probit model (Model 2), we use McFadden's R-squared, which is analogous to the R-squared in the ordinary least squares (OLS) model. McFadden's R-squared for the model is 0.487, indicating that the independent variables explain 48.7% of the variance in the firm's access to finance. Additionally, the p-value of the model (Prob > LR) is 0.0000, which is less than 5%, confirming that the model is statistically significant at the 5% level.

We then perform a heteroscedasticity test with the null hypothesis that the model exhibits no heteroscedasticity. The Breusch-Pagan/Cook-Weisberg test result shows a p-value of 0.0029, which is less than 5%, indicating that, at the 5% significance level, the model suffers from heteroscedasticity. To address this issue, we use Huber-White sandwich estimators to obtain robust standard errors in both Probit and OLS models. A multicollinearity test using the variance inflation factor (VIF) was also conducted. The results show that the VIF values for all variables are less than 10, with an average value of 2.16, indicating that the model does not have multicollinearity.

We then proceed to test Model (3). First, the Breusch-Pagan/Cook-Weisberg test is used to detect heteroscedasticity. The result has a p-value of 0.1710, which is greater than 5%, indicating that, at the 5% significance level, the model is free from heteroscedasticity. The VIF results also show that VIF values are less than 10, with an average of 2.19, highlighting that no multicollinearity is detected in Model (3).

### *4.3. Regression Results*

Table 3 summarizes the research results using Heckman's two-stage estimation. In Stage 1, a probit model was employed to identify the factors influencing the financial access of startup firms. Our results showed that the growth rate and sources of funds play significant roles in the capital raising of these firms. The growth rate was found to have a negative relationship with startup firms' access to capital at a 1% significance level. However, after adjusting for robust standard errors, this relationship becomes statistically insignificant. Therefore, we cannot conclude that there is a definitive relationship. It is worth noting that startup firms receiving government subsidies and utilizing funds from both bank and non-bank financial institutions have better capital mobilization capabilities. The model's goodness of fit, indicated by the R-squared value, is 0.489, meaning that the independent variables explain 48.9% of the variance in firms' access to finance.

In Stage 2, using robust OLS regression, it is evident that the factors influencing startup firms' access to finance through Fintech include the firm's access to finance, R&D investment intensity as a percentage of total revenue, and the firm's growth rate (see Table 3). Additionally, the ability to access capital through Fintech also depends on the industry, which implies that the financial needs and investment goals of different sectors lead to varying success in raising finance via Fintech. Furthermore, startup firms that raised capital during the year have greater access to finance through Fintech funding than those that did not. Following the COVID-19 pandemic, the financial markets experienced significant volatility, making traditional borrowing relatively difficult, thereby driving startup firms to seek access to finance through Fintech.

In addition, R&D expenditure intensity is found to have a positive impact on startup firms' access to finance through Fintech. Particularly, new startups with smaller scales that prioritize innovation and R&D investment often have a significant need for external capital. The findings of this study largely support the arguments and expectations presented in the literature. Consistent with Himmelberg and Petersen (1994) and Storey and Westhead (1997), the research results confirm that startups engaging in R&D activities face notable financing constraints, which Fintech financing may alleviate. Additionally, the intensity of R&D investment relative to revenue significantly enhances firms' ability to access finance through Fintech platforms, validating the study hypothesis H1.

Regarding governance structure, while Xiang et al. (2020) highlighted the reluctance of family-owned businesses to seek external financing, the research findings show that Vietnamese startups with diverse ownership structures especially those not concentrated among family members are more open to Fintech, partially supporting the study hypothesis H2. Additionally, the relationship between firm year and access to finance through Fintech (H3) was not statistically significant, possibly due to the unique characteristics of Fintech, which appeal to younger firms regardless of their maturity. However, our results clearly show that revenue growth rate (H4) positively influences startup firms' access to finance through Fintech, aligning with trade-off theory and confirming the importance of performance signals in external financing. Put differently, startup firms with higher revenue growth rates tend to have more access

to finance through Fintech. Since the growth rate is also one of the ratios that signals a firm's capacity to repay debt, firms with higher growth rates will have better access to external finance.

**Table 3.** Estimation results for Heckman two-stage estimators.

| Variable | Heckman two-stage estimators | | |
|---|---|---|---|
| | Stage 1 | | Stage 2 |
| | Probit | Robust Probit | Robust OLS |
| Finance_apply | -- | -- | 2.017*** (0.354) |
| R&D_intensity | -0.340 (0.819) | -0.035 (0.134) | 0.018** (0.320) |
| Industry | -0.010 (0.994) | -0.031 (0.304) | 0.652** (0.291) |
| Family_member | -0.854 (0.597) | 0.022 (0.156) | -0.862* (0.439) |
| Firm_year | -0.029 (0.134) | -0.004 (0.024) | 0.039 (0.067) |
| Growth | -0.384*** (1.138) | -0.003 (0.261) | 1.539** (0.663) |
| Assets | -0.299 (3.200) | -0.086 (0.368) | -0.762 (1.960) |
| Export | 0.105 (0.942) | -0.076 (0.236) | -0.651 (1.067) |
| External_debt | -0.017 (0.497) | -0.035 (0.068) | -0.211 (0.263) |
| Equity | 0.157 (0.690) | 0.016 (0.112) | -0.681*** (0.256) |
| Bank | 1.184* (0.660) | 0.0317* (0.076) | -0.342 (0.288) |
| Non_bank | 2.437*** (0.606) | 0.118** (0.135) | 0.652 (0.412) |
| Gov_fund | 1.513** (0.685) | 0.0378* (0.077) | -0.167 (0.294) |
| λ (IMR) | -- | -- | -0.668** (0.306) |
| Constant | 0.377 (0.812) | 0.886*** (0.204) | 2.566*** (0.529) |
| No. of observations | 104 | 104 | 104 |
| R-squared | | 0.489 | 0.788 |

**Note:** ***, **, and * represent significance levels at the 1%, 5%, and 10%, respectively. Standard errors are presented in the parentheses.

Interestingly, contrary to the study hypothesis H5, smaller firm size was not negatively associated with startup firms' access to finance through Fintech, although this result was not statistically significant. However, this finding may suggest the inclusive and flexible nature of Fintech platforms that help startups overcome traditional borrowing barriers (Xiang et al., 2020). Moreover, firms that rely heavily on traditional bank loans and long-term debt demonstrate lower usage of Fintech suggesting a substitution effect, as posited by Brown et al. (2009). Similarly, startups transacting with non-bank institutions show diminished access to finance through Fintech, likely due to high borrowing costs and perceived inefficiencies.

Lastly, external equity capital raising has a significant and negative effect on startup firms' ability to access finance through Fintech at the 1% level of significance. This result suggests that startup firms that rely more heavily on external equity capital may not prefer to raise capital through Fintech. This result contrasts with findings by Xiang et al. (2020). However, it reflects a unique behavior among Vietnamese startups, which may view access to finance through Fintech and equity as mutually exclusive rather than complementary options. Overall, this study provides empirical evidence that not only supports and refines earlier theoretical expectations but also offers context-

specific insights into how Vietnamese startups strategically leverage Fintech for capital access. The high explanatory power of the regression models (i.e., $R^2$ = 0.489 and 0.788, respectively) underscores the robustness of these relationships.

## 5. CONCLUSION

This study identifies and analyzes key factors influencing Vietnamese startup firms' access to finance through Fintech platforms. The empirical findings demonstrate that firms with prior access to capital, higher R&D investment intensity relative to revenue, and recent fundraising experience are more likely to utilize Fintech for capital mobilization. Conversely, firms heavily reliant on external equity or government support exhibit a lower tendency to engage in capital financing through Fintech, possibly due to a preference for more established or subsidized funding channels. The study also highlights sectoral differences, indicating that the likelihood of accessing Fintech capital varies significantly across industries.

These findings offer several implications for policymakers, financial institutions, and startups. First, startups should develop industry-specific strategies to enhance their visibility and appeal to Fintech investors, emphasizing unique value propositions and innovation potential. Second, given the positive impact of R&D intensity on access through Fintech, firms should prioritize workforce development and strategic investment in research activities to demonstrate long-term value creation. Third, the Vietnamese government should accelerate the development of a comprehensive legal framework to ensure a safe, transparent, and enabling environment for Fintech growth. The continued efforts of the State Bank of Vietnam's Fintech Steering Committee in this regard are commendable and should be expanded. Finally, fostering collaboration between traditional banks and Fintech firms is crucial to expanding financial access. Such integration can leverage idle capital from retail and institutional investors, delivering more diversified financial solutions to startups. By promoting a synergistic and innovation-driven ecosystem, Vietnam can enhance the efficiency and inclusiveness of its financial system and support the sustainable growth of its startup sector.

This research has several limitations. First, it assesses firms' overall access to finance through Fintech without examining specific financing channels such as crowdfunding or peer-to-peer (P2P) lending. Second, most surveyed startup firms are located in Northern Vietnam, which may limit the generalizability of the research findings to other regions and overlook the influence of regional policy variations. Future studies should consider more representative samples, include startups from different geographic regions of Vietnam, and incorporate a broader range of business types to provide a more comprehensive understanding of Fintech-based financing access.

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