

THE IMPACT OF FINANCIAL CAPITAL ON THE SURVIVAL OF STARTUPS IN THE MEKONG DELTA REGION, VIETNAM

O IMPACTO DO CAPITAL FINANCEIRO NA SOBREVIVÊNCIA DE STARTUPS NA REGIÃO DO DELTA DO MEKONG, NO VIETNÃ

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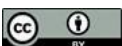
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Abstract

Background: in the Mekong Delta, startups continue to face significant challenges in accessing and effectively utilizing financial capital. Despite national efforts to foster an innovation-driven entrepreneurial ecosystem, the Mekong Delta lags behind major economic centers like Hanoi and Ho Chi Minh City, Vietnam. **Objective:** This study explores the factors influencing startup survival in the Mekong Delta region of Vietnam, based on the inheritance of theory and previous research works from both domestic and international contexts, the proposed research model encompasses the following factors: Financial capital, Human Capital, COVID-19 and Startup Survival. **Methodology:** Using the Cox Proportional Hazards Model, the research examines the impact of various types of financial capital—founder equity, debt capital, venture capital, angel capital, family and friends' funding (FFF), and government support—on startup survival. **Result:** The findings reveal that founder equity increases the risk of failure, while debt capital, venture capital, and angel capital significantly reduce the risk of failure. Family and friends' funding also provides protective benefits during early stages, though over-reliance on it can pose risks. Additionally, the moderating role of human capital, including industry experience and education, is crucial in enhancing the effective use of financial resources and improving survival prospects. **Conclusion:** This study offers valuable insights for managers on optimizing financial capital, leveraging human capital, and building adaptive strategies to improve startup survival, particularly in

Resumo

Contexto: No Delta do Mekong, as startups continuam enfrentando desafios significativos para acessar e utilizar efetivamente o capital financeiro. Apesar dos esforços nacionais para fomentar um ecossistema empreendedor impulsionado pela inovação, o Delta do Mekong permanece à retaguarda de grandes centros econômicos como Hanói e Cidade de Ho Chi Minh, no Vietnã. **Objetivo:** Este estudo explora os fatores que influenciam a sobrevivência de startups na região do Delta do Mekong, no Vietnã. **Com base na herança teórica e em trabalhos de pesquisa anteriores, tanto no contexto nacional quanto internacional, o modelo de pesquisa proposto abrange os seguintes fatores: capital financeiro, capital humano, COVID-19 e sobrevivência de startups. Metodologia:** Utilizando o Modelo de Riscos Proporcionais de Cox, a pesquisa examina o impacto de vários tipos de capital financeiro — capital próprio do fundador, capital de dívida, capital de risco, capital-anjo, financiamento de familiares e amigos (FFF) e apoio governamental — na sobrevivência de startups. **Resultado:** Os resultados revelam que o capital próprio do fundador aumenta o risco de fracasso, enquanto o capital de dívida, o capital de risco e o capital-anjo reduzem significativamente o risco de fracasso. O financiamento de familiares e amigos também oferece benefícios protetores durante os estágios iniciais, embora a dependência excessiva dele possa representar riscos. Além disso, o papel moderador do capital humano, incluindo experiência no setor e formação acadêmica, é crucial para otimizar o uso eficaz



challenging environments like the Mekong Delta. **Unique Contribution:** The study further demonstrates that the COVID-19 pandemic exacerbated failure risks for startups relying on founder equity, while debt financing provided resilience. **Key Recommendation:** The results emphasize that while founder equity may increase the risk of failure, debt financing provides a protective effect, especially during crises like COVID-19. The role of human capital, including industry experience and education, further moderates the impact of financial resources on survival.

Keywords: Startup Survival. Financial Capital. Human Capital. COVID-19. Mekong Delta.

dos recursos financeiros e melhorar as perspectivas de sobrevivência. Conclusão: Este estudo oferece insights valiosos para gestores sobre como otimizar o capital financeiro, alavancar o capital humano e construir estratégias adaptativas para melhorar a sobrevivência das startups, particularmente em ambientes desafiadores como o Delta do Mekong. Contribuição exclusiva: O estudo demonstra ainda que a pandemia da COVID-19 exacerbou os riscos de fracasso para startups que dependem do capital próprio dos fundadores, enquanto o financiamento por dívida proporcionou resiliência. Recomendação principal: Os resultados enfatizam que, embora o capital próprio dos fundadores possa aumentar o risco de fracasso, o financiamento por dívida oferece um efeito protetor, especialmente durante crises como a da COVID-19. O papel do capital humano, incluindo experiência no setor e formação acadêmica, modera ainda mais o impacto dos recursos financeiros sobre a sobrevivência.

Palavras-chave: *Sobrevivência de Startups. Capital Financeiro. Capital Humano. COVID-19. Delta do Mekong.*

1 INTRODUCTION

Entrepreneurship plays a critical role in driving economic growth, fostering innovation, digital transformation, and enhancing labor productivity (Acs *et al.*, 2008; Audretsch & Belitski, 2017). Startups, in particular, are increasingly recognized as key sources of technological breakthroughs (Cumming & Johan, 2016), vital for adapting to climate change, and central to national innovation ecosystems (Zunino *et al.*, 2021). However, despite these contributions, the failure rate of startups remains alarmingly high, especially during the first three years of operation, often referred to as the “Valley of Death” (Audretsch *et al.*, 2024; Linder *et al.*, 2020; Nanda, 2010). As a result, survival ability has become a critical metric for assessing the effectiveness of startup ecosystems and the impact of policy support (Block *et al.*, 2024; Howell *et al.*, 2018).

Among the factors influencing survival, financial capital is widely regarded as a key determinant. Numerous studies show that capital structure, the ability to secure funding, cash flow stability, and flexibility in financial strategy are closely linked to a

startup's survival and growth potential (Anwar *et al.*, 2020; Cassar, 2004; Fatoki, 2012; Hornuf *et al.*, 2018). Financial resources, such as equity capital, venture capital, crowdfunding, and government grants, play an essential role in helping businesses overcome early-stage cash flow shortages (Block *et al.*, 2024; Howell *et al.*, 2018). However, access to these resources is often constrained by factors such as the structure of the founding team (Bustamante *et al.*, 2021), human capital signals (Pierrakis & Owen, 2023), and local market positioning (Bustamante *et al.*, 2021; Koziol *et al.*, 2025). Studies utilizing configurational approaches (fsQCA), such as those by Del Sarto *et al.* (2021) and Linder *et al.* (2020), indicate that survival is not solely dependent on financial capital, but requires an integration of financial resources, human capital, and external factors, such as the COVID-19 pandemic. Therefore, startups become sustainable when their resource configurations align with their development stage, market conditions, and internal management capabilities (Cassar, 2004; Linder *et al.*, 2020).

In Vietnam, and particularly in the Mekong Delta, startups continue to face significant challenges in accessing and effectively utilizing financial capital. Despite national efforts to foster an innovation-driven entrepreneurial ecosystem, the Mekong Delta lags behind major economic centers like Hanoi and Ho Chi Minh City. The region's startup ecosystem remains fragmented, with limited financial mechanisms tailored to its specific needs (VCCI & Fulbright, 2025). According to the 2024 Annual Economic Report for the Mekong Delta, more than 50% of startups in the region cannot access sufficient financial resources to operate or expand. The "death rate" of startups, defined as those ceasing operations within the first three years, reached 84% in 2022—the highest in the country (Nguyễn Phương Lam & Vũ Thành TỰ Anh, 2024). Despite credit stimulation efforts by the banking system, the rate of business closures continued to rise in the first nine months of 2023. This is primarily due to the region's economic structure, where most businesses are micro-sized, engaged in seasonal agriculture or agricultural product processing, with weak financial management capacity, limited capital accumulation, and a reliance on short-term commercial bank credit. Even with preferential credit policies, many businesses continue to rely on non-banking financial institutions, where high interest rates and unstable terms exacerbate liquidity risks and increase the likelihood of market exit (State Bank of Vietnam, 2024).

The COVID-19 pandemic has further exposed the financial weaknesses of startups in the region. Studies such as Fairlie (2020), Bartik *et al.* (2020), and more recently Howell (2020) and Block *et al.* (2024), show that small businesses and startups are particularly vulnerable during crises, especially when they lack capital reserves, stable cash flow, and access to flexible financing options. While businesses in major economic hubs may have access to venture capital, crowdfunding, or financing from social networks, such alternatives are almost non-existent in the Mekong Delta. The absence of alternative financial instruments and limited capital structures leave businesses more vulnerable to passive exits during crises (Hornuf *et al.*, 2018; Klöhn, 2023).

Given these challenges, it is essential to understand how different types of financial capital, structures, and methods of capital utilization contribute to startup survival. This understanding becomes even more pressing when considering the specific conditions of regions like the Mekong Delta, where financial resources are limited, and external shocks such as the COVID-19 pandemic further exacerbate vulnerability. Therefore, this study aims to examine how financial capital influences the survival of startups in this region, focusing on the role of different types of financial capital and the interaction between financial capital and human capital, as well as the effects of external factors.

In addressing this, the study seeks to answer the following two primary research questions:

1. What types of financial capital influence the survival of startups in the Mekong Delta region, and how do the impacts of each type of financial capital differ when regulated by human capital and COVID-19?
2. What management implications can optimize the use of financial capital by startups, contributing to enhanced survival rates and improved operational efficiency of the businesses?

This research will provide valuable insights into the financial dynamics that influence startup survival, particularly in emerging economies and regions facing similar financial and institutional challenges. The findings are expected to offer practical recommendations for optimizing the use of financial capital to enhance survival prospects and improve operational efficiency in the context of high uncertainty and limited resources.

2 LITERATURE REVIEW

The survival of startups, particularly in emerging markets and resource-constrained regions, has attracted significant attention in both theoretical and empirical research. Understanding the factors that influence the survival of nascent firms is critical, as these businesses often face higher risks and limited access to resources. Among the factors that significantly impact startup survival, financial capital plays a pivotal role, especially in the early stages of business development. However, the role of financial capital in ensuring survival is not independent but rather shaped by internal capabilities (e.g., human capital) and external conditions (e.g., COVID-19).

2.1 Theoretical foundations

Several theoretical frameworks underpin the study of startup survival, especially in relation to the role of financial capital. One of the most prominent theories is the Resource-Based View (RBV), which posits that the competitiveness and sustainability of a firm depend on the unique, valuable, and non-substitutable resources it possesses (Barney, 1991). For startups, these resources include financial capital, human capital, and social capital. While financial capital provides the liquidity necessary for survival and growth, human capital—comprising the skills, knowledge, and experience of the founders—determines how effectively these resources are utilized. According to Davidsson & Honig (2003), the ability to make sound decisions and adapt to environmental challenges is largely driven by the human capital of the entrepreneurs, which makes it a key determinant of survival.

Another theoretical framework that informs the survival of startups is the Firm Life Cycle Theory, which suggests that firms progress through distinct stages of development: startup, growth, maturity, and potential decline (Miller & Friesen, 1984). Startups are particularly vulnerable in the early stages, often described as the “valley of death” due to high risks and uncertainty. In these stages, the role of financial capital is especially crucial for maintaining operations and supporting key investments that enable the business to move past the high-risk initial phase.

In addition, Dynamic Capability Theory expands on the RBV by emphasizing that firms need the ability to adapt and reconfigure their resources to respond to changing market conditions and external shocks (Teece *et al.*, 1997). This theory highlights that financial capital alone is not sufficient for survival; rather, firms need the capacity to transform and adjust their financial and operational strategies in response to disruptions. For example, during periods of economic instability, such as the COVID-19 pandemic, the capacity to reallocate resources and pivot business models becomes essential for survival.

2.2 Empirical research on financial capital and startup survival

Empirical research has consistently demonstrated that financial capital plays a critical role in the survival of startups. Studies by Colombo & Grilli (2010), Hornuf *et al.* (2018), and Keogh & Johnson (2021) have found that startups with better access to financial capital have higher survival rates. Financial capital provides the necessary funds to maintain cash flow, make investments, and sustain operations. In the early stages, when businesses face significant uncertainty, financial capital can provide the flexibility needed to navigate challenges, including product development, market penetration, and operational scaling.

However, access to financial capital alone is insufficient for ensuring survival. The ability to use these financial resources effectively is crucial. According to Human Capital Theory, the entrepreneurs' skills, experience, and decision-making capabilities significantly influence how financial capital is utilized. Studies by Davidsson & Honig (2003) and Bosma *et al.* (2004) have shown that entrepreneurs with higher levels of human capital, such as industry experience and education, are better equipped to manage financial resources, adapt to challenges, and make strategic decisions that increase the likelihood of business survival.

Furthermore, Environmental Factors also play a significant role in shaping the effectiveness of financial capital. For instance, the COVID-19 pandemic has had profound effects on the ability of startups to survive. Research by Audretsch *et al.* (2025) and Howell (2020) highlights how economic disruptions, changes in consumer behavior, and supply chain disruptions have intensified the challenges faced by startups. The

pandemic has particularly affected the flow of financial capital, increasing transaction costs and creating an environment of financial uncertainty that may reduce the effectiveness of financial resources in ensuring survival.

2.3 Research hypotheses

Building on the theoretical foundations and empirical evidence, the following hypotheses are proposed to guide the research:

First, numerous studies have shown that financial capital is crucial for the survival of startups. Financial capital supports liquidity, investment, and operational flexibility, especially during the critical startup phase, often referred to as the “valley of death.” Given this, the first hypothesis is:

H1: Financial capital has a positive impact on the survival of startups.

Second, while financial capital is essential, its effectiveness in enhancing survival is significantly influenced by the internal capabilities of the firm, particularly human capital. According to the RBV, firms with strong human capital—such as skilled and experienced entrepreneurs—are better positioned to utilize financial resources effectively. In the absence of sufficient organizational capabilities, even significant financial resources may be underutilized or mismanaged, leading to inefficient use of capital. Thus, the second hypothesis is:

H2: Human capital moderates the positive impact of financial capital on the survival of startups.

Third, external factors such as economic crises can significantly impact the ability of startups to effectively use financial capital. In periods of uncertainty, like the COVID-19 pandemic, startups face increased challenges in accessing and utilizing financial resources due to heightened transaction costs, market instability, and information asymmetry. Therefore, the third hypothesis is:

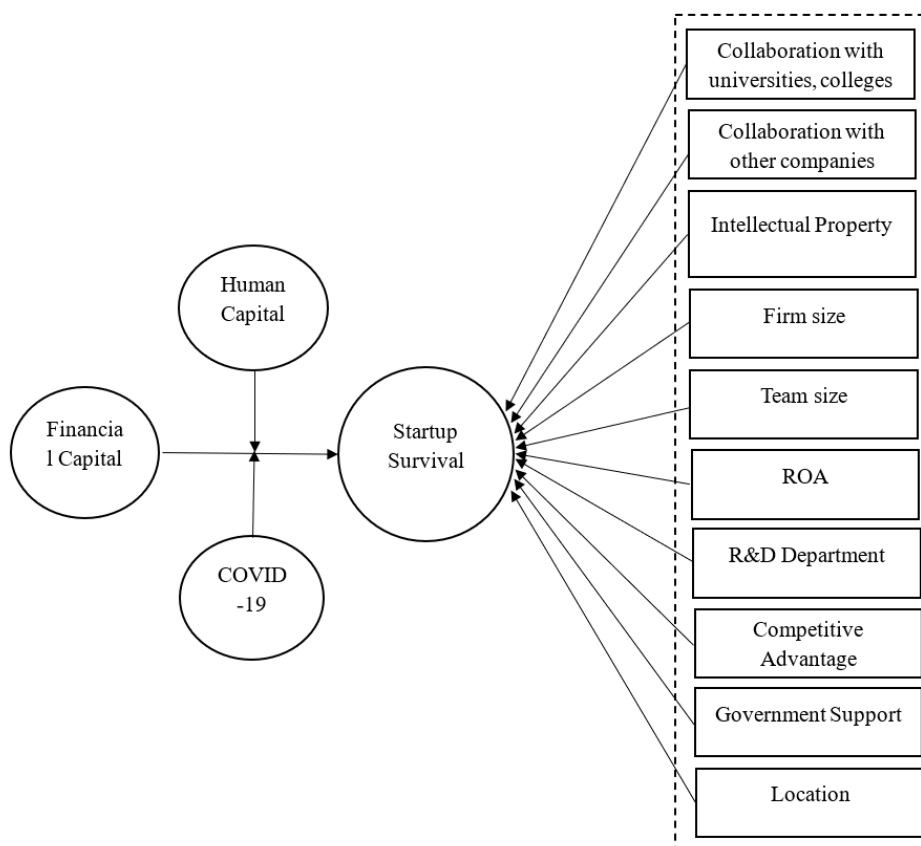
H3: The COVID-19 pandemic negatively moderates the positive impact of financial capital on the survival of startups.

2.4 Proposed Research Model

The research model integrates the three hypotheses, seeking to understand how financial capital influences the survival of startups, with particular attention to the moderating effects of human capital and the COVID-19 pandemic. The model reflects a conditional approach, where the impact of financial capital is not fixed but depends on both the firm's internal resources and the external environment. Specifically, the research will test the hypothesis that financial capital's effect on survival is amplified by human capital and diminished by external crises like the COVID-19 pandemic. This model will be empirically tested using data from startups in the Mekong Delta region, which faces specific environmental and resource constraints that could further illuminate these dynamics.

Figure 1

Proposed research model



Source: Author's elaboration.

3 METHODOLOGY

This study uses both secondary and primary data. Secondary data were collected from sources such as the General Statistics Office of the Mekong Delta provinces, the Vietnam Chamber of Commerce and Industry in Can Tho (VCCI Can Tho), the Fulbright School of Public Policy and Management (FSPPM), the State Bank of Vietnam, and reputable academic journals.

Primary data were collected through surveys targeting startups in the Mekong Delta, using personal interviews, phone interviews, and online surveys (Google Forms). Startups were selected using a convenience sampling method, focusing on those founded between 2021-2022 from the Mekong Delta Entrepreneurship Support Network. The survey collected data on business characteristics, financial capital, human capital, organizational features, and the impact of COVID-19 on startup survival.

Data collection involved convenience sampling, focusing on startup founders in the Mekong Delta. The final sample size comprised 301 respondents, deemed sufficient for statistical analysis.

The analysis of financial capital’s impact on startup survival used the Cox Proportional Hazards Model, which effectively manages censored data and does not assume a specific survival time distribution (Cox, 1972). This model examines how explanatory variables influence the hazard rate of business failure over time. The Cox model’s flexibility is particularly valuable for examining varied financial and human capital factors’ impact on startup survival.

In the Cox model, the hazard rate $h_j(t|X)$ of an observation j at time t is determined by the following formula:

$$h_j(t|X) = h_0(t)\exp(\beta'X_j) \tag{1}$$

where:

- $h_j(t|X)$ is the hazard rate at time t , conditioned by the explanatory variables X_j .
- $h_0(t)$ is the baseline hazard rate, indicating the underlying risk level unaffected by the explanatory variables and changing over time.

- $\exp(\beta'X_j)$ represents the exponential function of the product of regression coefficients β and explanatory variables X_j , reflecting the extent of these variables' effects on the hazard rate.

In this study, the dependent variable is startup survival, measured using a combination of two variables: (1) a binary variable indicating survival status at the survey time and (2) a duration variable representing the number of months the startup has been operational. This combination is required by the Cox Proportional Hazards model, which needs both the time at risk (duration) and the event occurrence (binary). The observation period spans from 2021 (startup formation) to 2025 (survey), ensuring a minimum of 36 months for each startup. This period is considered critical in the startup lifecycle, often referred to as the “death valley” (Block *et al.*, 2024; Howell *et al.*, 2018).

To ensure the robustness of the results from the Cox model, a binary logistic regression is used as a supplementary method. Using both models—dynamic (Cox) and static (logit)—improves the reliability of the findings and allows cross-validation of variable effects and significance.

In the logistic regression, the dependent variable is binary, indicating whether the startup is still operational (1) or not (0) at the survey time. Unlike the Cox model, which focuses on time to event, the logistic model assesses the probability of the event at a specific point. It is suitable for cross-sectional data and used as a sensitivity analysis in survival studies (Hosmer *et al.*, 2013).

This study employs a stepwise estimation strategy to test the relationship between financial capital and startup survival in the Mekong Delta, while evaluating the moderating effects of human capital and the COVID-19 pandemic. In the first step, the base model analyzes the direct impact of financial capital on survival, controlling for organizational characteristics and contextual factors. In the second step, human capital variables such as the founder's education, experience, and motivation are added to assess their moderating effect. Finally, in the third step, the impact of the COVID-19 pandemic is introduced to examine how it influences the relationship between financial capital and survival. This stepwise approach ensures theoretical coherence and enhances the reliability of the study's conclusions in the unique context of the Mekong Delta region. Each variable in the model is defined and explained in Table 1, detailing their expected impact based on prior studies.

Table 1

Detailed explanation of independent variables in the Proportional Hazards Model

Variables	Definition and Measurement	Expected Sign	Source
Financial capital			
Founder Equity (FE)	The natural log of the founder’s capital contribution at the time of business establishment.	+	Colombo & Grilli (2010); Linder <i>et al.</i> (2020); Waleczek <i>et al.</i> (2018)
Debt Capital (DC)	The natural log of the average yearly debt capital throughout the business’s existence.	+	Audretsch <i>et al.</i> (2025); Hornuf <i>et al.</i> (2018); Howell (2020); Özsucu (2023)
Venture Capital (VC)	The natural log of the average yearly venture capital received.	+	Howell (2020); Keogh & Johnson (2021)
Angel Capital (AC)	The natural log of the average yearly capital from angel investors.	+	Colombo & Grilli (2010); Haeussler <i>et al.</i> (2019); Honoré (2022)
Government Support (GS)	The natural log of the average yearly financial support from the government.	+	Del Sarto <i>et al.</i> (2021); Nguyen <i>et al.</i> (2024); Zhang <i>et al.</i> (2018)
FFF Capital (FFF)	The natural log of the average yearly capital raised from family, friends, and acquaintances (informal capital).	+	Cutrini & Ninivaggi (2024); Hornuf <i>et al.</i> (2018); Özsucu (2023)
Organizational structure, intellectual property, and contextual factors (control variables)			
UniversityCollab	Binary variable: 1 if collaboration with a university/research institution exists; 0 if not.	+	Colombo & Grilli (2010); Del Sarto <i>et al.</i> (2021); Hornuf <i>et al.</i> (2018); Kacer <i>et al.</i> (2025)
FirmCollab	Binary variable: 1 if collaboration with other firms exists; 0 if not.	+	Boudreaux <i>et al.</i> (2025); Keogh & Johnson (2021); Soto-Simeone <i>et al.</i> (2020); Zhang <i>et al.</i> (2023)
Copyright	The number of copyrights owned by the business at the time of the survey (ratio scale).	+	Haeussler <i>et al.</i> (2019); Liu <i>et al.</i> (2021); Ortiz-Villajos & Sotoca (2018); Zhang & Luo (2023)
Trademark	The number of registered trademarks (ratio scale).	+	Boudreaux <i>et al.</i> (2025); Keogh & Johnson (2021); Liu <i>et al.</i> (2021); Soto-Simeone <i>et al.</i> (2020)
Patent	The number of patents granted (ratio scale).	+	Haeussler <i>et al.</i> (2019); Honoré (2022); Keogh & Johnson (2021); Liu <i>et al.</i> (2021); Zhang <i>et al.</i> (2023)
FirmSize	Measured by the average yearly number of employees during the period the business was operational until the time of the survey (ratio scale); can be log-transformed for analysis.	+	Audretsch <i>et al.</i> (2025); Boudreaux <i>et al.</i> (2025); Howell (2020); Robb & Watson (2012)
TeamSize	The number of co-founders (ratio scale).	+	Colombo <i>et al.</i> (2004); Honoré (2022); Keogh & Johnson (2021); Soto-Simeone <i>et al.</i> (2020)
ROA	Return on Assets = Net Profit / Average Total Assets (%), measured on a ratio scale.	+	Audretsch <i>et al.</i> (2025); Del Sarto <i>et al.</i> (2021); O’Reilly <i>et al.</i> (2025); Liu <i>et al.</i> (2021)

R&D	Binary variable: 1 if there is an R&D department/person in charge; 0 if not.	+	Haeussler <i>et al.</i> (2019); Honoré (2022); Kato & Honjo (2015); Kato <i>et al.</i> (2022); Soto-Simeone <i>et al.</i> (2020)
Competitive Advantage	5-point Likert scale for self-assessed level of superiority over competitors (product, service, price, etc.).	+	Boudreaux <i>et al.</i> (2025); Marvel <i>et al.</i> (2016); Ortiz-Villajos & Sotoca (2018); Robb & Watson (2012)
GovSupport	Binary variable: 1 if financial or non-financial support from the government is received; 0 if not.	+	Del Sarto <i>et al.</i> (2021); Hornuf <i>et al.</i> (2018); Kacer <i>et al.</i> (2025); Nguyen <i>et al.</i> (2024)
Location	Binary variable: 1 if the business is located in an urban area; 0 if in a rural/suburban area.	+	Boudreaux <i>et al.</i> (2025); Glaeser <i>et al.</i> (2010); Liu <i>et al.</i> (2021); Zhang <i>et al.</i> (2023)
Founder Gender	Binary variable: 1 if the founder is male; 0 if female.	+	Liu <i>et al.</i> (2021); Marvel <i>et al.</i> (2016); Robb & Watson (2012)
Founder Ethnicity	Binary variable: 1 if the founder belongs to a minority group; 0 if from the majority group.	-	Boudreaux <i>et al.</i> (2025); Keogh & Johnson (2021); Liu <i>et al.</i> (2021); Robb & Watson (2012)
Founder Age	The founder's age at the time of business establishment (ratio scale).	+	Boudreaux <i>et al.</i> (2025); Honoré (2022); Liu <i>et al.</i> (2021); Ortiz-Villajos & Sotoca (2018); Zhou <i>et al.</i> (2023)
Human capital (moderating variable)			
Education	Binary variable: 1 if the founder has a university degree or higher; 0 if lower.	+	Honoré (2022); Kacer <i>et al.</i> (2025); Keogh & Johnson (2021); O'Reilly <i>et al.</i> (2025)
Industry Experience	The number of years of industry-related work experience before starting the business (ratio scale).	+	Haeussler <i>et al.</i> (2019); Honoré (2022); Linder <i>et al.</i> (2020); Soto-Simeone <i>et al.</i> (2020); Zhou <i>et al.</i> (2023)
Entrepreneurial Experience	The number of previous businesses founded (non-negative integer scale).	+	Boudreaux <i>et al.</i> (2025); Honoré (2022); Ortiz-Villajos & Sotoca (2018); Soto-Simeone <i>et al.</i> (2020)
EntreMotivation	Binary variable: 1 if the motivation to start the business was for opportunity; 0 if for necessity.	+	Boudreaux <i>et al.</i> (2025); Keogh & Johnson (2021); Marvel <i>et al.</i> (2016); Robb & Watson (2012)
Fulltime Founding	Binary variable: 1 if the founder is full-time; 0 if part-time.	+	Colombo <i>et al.</i> (2004); Keogh & Johnson (2021); Marvel <i>et al.</i> (2016); Robb & Watson (2012); Soto-Simeone <i>et al.</i> (2020)
COVID-19 (moderating variable)			
COVID-19	Binary variable: 1 if the business was established during the COVID-19 pandemic; 0 if before or after.	-	Hornuf & Mattusch (2025); Hornuf <i>et al.</i> (2018); Howell (2020); Kacer <i>et al.</i> (2025); Keogh & Johnson (2021)

4 RESEARCH RESULTS

The analysis conducted using the Cox Proportional Hazards Model provides valuable insights into the factors influencing startup survival in the Mekong Delta region. The study systematically evaluated the impact of various types of financial capital, human capital, and the external shock of COVID-19 on startup survival.

In the first model, the analysis highlights the impact of financial capital on startup survival in the Mekong Delta region. Founder equity (HR = 2.6894, $p < 0.05$) significantly increases the failure risk, with startups having higher founder equity being 2.7 times more likely to fail compared to those without it. Debt capital (HR = 0.8052, $p < 0.01$) shows a protective effect, with startups using debt financing having a 0.8 times lower risk of failure. Similarly, venture capital (HR = 0.8722, $p < 0.001$) and angel capital (HR = 0.8521, $p < 0.01$) both reduce the failure risk, with startups receiving these forms of capital being less likely to fail. On the other hand, government support (HR = 0.9907, $p = 0.948 > 0.1$) had no significant effect on survival, while family and friends' funding (HR = 0.4659, $p < 0.01$) reduced failure risk by 0.47 times. These results suggest that formal financial resources, such as debt, venture, angel and FFF capital, positively contribute to startup survival, while founder equity may increase the risk of failure. Therefore, the findings support Hypothesis H1, confirming that financial capital has a positive impact on the survival of startups.

In the second model, the analysis revealed several significant moderating effects of human capital on the relationship between financial capital and startup survival. Debt Capital (DC) and Industry Experience (HR = 0.9697, $p < 0.05$) had a significant positive moderating effect, suggesting that startups with founders who possess industry experience are better able to leverage debt capital, reducing the risk of failure. Similarly, Angel Capital (AC) and Education (HR = 0.8607, $p < 0.01$) showed that well-educated founders could utilize angel investments more effectively, enhancing survival chances. Family and Friends Funding (FFF) and Industry Experience (HR = 0.9412, $p < 0.01$) also demonstrated a positive moderating effect, indicating that the combination of industry experience and financial support from family and friends reduces failure risk. Venture Capital (VC) and Entrepreneurial Experience (HR = 0.9193, $p < 0.1$) showed a significant interaction at the 10% level, suggesting that experienced founders are more capable of

utilizing venture capital to enhance survival prospects. However, Founder Equity (FE) and Full-time Founding ($p = 0.481$) and Government Support (GS) and Entrepreneurial Motivation ($p = 0.928$) did not have significant moderating effects, indicating that these factors do not significantly influence the relationship between financial capital and startup survival in this context. Overall, the findings support Hypothesis H2, confirming that human capital, particularly industry experience and education, plays a crucial role in moderating the positive impact of financial capital on startup survival.

In Model 3, we analyze how the COVID-19 pandemic moderates the relationship between financial capital and the survival of startups in the Mekong Delta. The Harrell's C-statistic of 0.9833 indicates excellent discrimination ability of the model, confirming that it can accurately distinguish between startups that survived and those that failed. The model's goodness-of-fit is further supported by the global test result, $\text{Prob} > \text{Chi}^2 = 0.1461$, which suggests that the Cox Proportional Hazards model fits the data well, providing reliable results for analyzing startup survival. Additionally, the Likelihood Ratio Chi-square statistic ($\text{LR Chi}^2 = 614.28$, $p = 0.000 < 0.01$) supports the model's overall significance and confirms that it is a good fit for the data. The COVID-19 interaction term ($\text{HR} = 1.0977$, $p < 0.01$) shows that the pandemic significantly increases the risk of failure, highlighting the negative impact of COVID-19 on startup survival. The results of the financial capital interactions reveal that founder equity (FE x COVID-19) with $\text{HR} = 5.0083$ ($p = 0.005$) increases the risk of failure during the pandemic, as startups with higher founder equity are 5 times more likely to fail compared to those without it. In contrast, debt capital (DC x COVID-19) with $\text{HR} = 0.5218$ ($p = 0.000$) plays a protective role, reducing the likelihood of failure, with startups using debt financing having a 0.52 times lower risk of failure during the crisis. However, venture capital ($\text{HR} = 1.5922$, $p = 0.310$) and government support ($\text{HR} = 1.0053$, $p = 0.852$) did not show significant moderating effects, suggesting that these forms of financial capital do not significantly influence startup survival during the pandemic. In conclusion, Model 3 provides strong evidence that COVID-19 negatively moderates the positive impact of financial capital on startup survival, confirming Hypothesis H3. While debt capital remains a protective factor, founder equity increases the risk of failure during the pandemic. These findings are further validated by the binary logistic regression, which enhances the robustness of the results.

Table 2

Estimated Results of the Cox Proportional Hazards Model

Variables	Model 1		Model 2		Model 3	
	HR	P > Z	HR	P > Z	HR	P > Z
Financial capital						
Founder Equity (FE)	2.6894	0.016**	2.2657	0.061*	1.0463	0.051*
Debt Capital (DC)	0.8052	0.000***	0.7388	0.000***	0.9274	0.001***
Venture Capital (VC)	0.8722	0.005***	0.8549	0.021**	0.8677	0.069*
Angel Capital (AC)	0.8521	0.001***	0.7371	0.005***	0.9233	0.003***
Government Support (GS)	0.9907	0.948	0.9998	0.999	1.0352	0.895
FFF Capital (FFF)	0.4659	0.000***	0.2116	0.008***	0.4796	0.044**
Organizational structure, intellectual property, and contextual factors (control variables)						
UniversityCollab	0.7981	0.295	0.7220	0.217	0.8080	0.457
FirmCollab	1.1170	0.900	0.9665	0.130	0.9266	0.133
Copyright	0.6119	0.000***	0.6304	0.037**	0.4750	0.004***
Trademark	0.9238	0.247	0.9117	0.228	0.9460	0.187
Patent	0.6140	0.053*	0.8357	0.001***	0.8847	0.043**
FirmSize	0.4986	0.140	0.7567	0.526	0.7954	0.627
TeamSize	0.9217	0.026**	0.9174	0.042**	0.8514	0.056*
ROA	9.9063	0.018**	0.9820	0.024**	0.9811	0.022**
R&D	0.5662	0.041**	0.4502	0.015**	0.9754	0.063*
CompetitiveAdvantage	0.6657	0.000***	0.7125	0.028**	0.7056	0.058*
GovSupport	0.9001	0.669	0.9699	0.101	0.9677	0.108
Location	1.2740	0.345	1.3921	0.259	0.6339	0.171
Founder Gender	0.7395	0.221	0.9262	0.798	0.9528	0.882
Founder Ethnicity	0.6574	0.248	0.7832	0.465	1.0260	0.684
Founder Age	0.9097	0.702	0.6986	0.155	0.7887	0.518
Human capital (moderating variable)						
Education			0.4399	0.021**	0.3875	0.021**
Industry Experience			0.8712	0.019**	0.9531	0.052*
Entrepreneurial Experience			0.5976	0.002***	0.6557	0.035**
EntreMotivation			0.4152	0.003***	0.3515	0.002***
Fulltime Founding			0.9477	0.021**	0.9269	0.005***
Interaction between human capital and financial capital						
FE x Fulltime Founding			0.7985	0.481	0.9573	0.084*
DC x Industry Experience			0.9697	0.014**	0.8302	0.003***
AC x Education			0.8607	0.006***	0.6924	0.000***
VC x Entrepreneurial Experience			0.9193	0.059*	0.9493	0.081*
GS x EntreMotivation			0.9979	0.928	0.6025	0.110
FFF x Industry Experience			0.9412	0.007***	0.7078	0.002***
COVID-19 (moderating variable)						
COVID-19					1.0977	0.000***
Interaction between COVID-19 and Financial capital						
FE x COVID-19					0.5218	0.000***
DC x COVID-19					5.0083	0.005***
VC x COVID-19					1.5922	0.310
GS x COVID-19					1.0053	0.852
Observations		301		301		301
LR chi2		410.51		562.46		614.28
Prob > Chi2		0.000***		0.000***		0.000***
Harrell's C						0.9833
Prob > Chi2 (Global Test)						0.1461

Note: *, **, *** represent statistical significance at a levels of 10%, 5%, and 1%, respectively.

Source: Data analysis from the survey results, 2025.

5 DISCUSSION OF FINDINGS

The results from the binary logistic regression model closely align with those from Models 2 and 3 of the Cox model, further enhancing the credibility of the Cox model. Specifically, both models show similar findings regarding the significant impact of financial capital, such as founder equity and debt capital, on startup survival, as well as the moderating effects of human capital and COVID-19. For instance, the interaction between debt capital and industry experience ($p = 0.026$) and the impact of COVID-19 ($p = 0.020$) were similarly significant in both the logistic and Cox models. The high classification accuracy of 97.01% and the strong fit indicated by the LR $\chi^2 = 356.23$ ($p < 0.01$) in the logistic regression confirm the robustness and consistency of the results. These consistent findings across both models provide strong support for the reliability of the Cox model and its ability to accurately reflect the dynamics influencing startup survival.

Financial capital plays a crucial role in the survival of startups, with different types of financial capital having varying impacts on business survival. Founder equity can increase the risk of failure, as startups that rely heavily on personal capital may face challenges in raising external resources or lack financial flexibility during times of crisis. In contrast, debt capital has a protective effect, reducing the likelihood of failure, as startups using debt financing can maintain stable cash flow and sustain operations during difficult times. Venture capital and angel capital provide not only financial support but also strategic guidance, helping startups overcome early-stage challenges. Family and friends' funding is also an important financial source during the initial stages, although over-reliance on this capital can create risks. Government support plays an important role, particularly in providing favorable loans, grants, and other financial assistance to help startups overcome initial difficulties. However, the study shows that government support did not have a significant impact on startup survival, which may reflect inefficiencies in the implementation of supportive policies, especially during the COVID-19 pandemic. The findings suggest that, while financial capital is essential for survival, the type of capital and its effective use are key factors in determining the resilience of startups.

The role of human capital further complicates the relationship between financial capital and startup survival. The results show that industry experience moderates the effect of debt capital, with startups led by experienced founders better able to leverage debt financing effectively, which reduces their risk of failure. Similarly, education was found to enhance the ability of founders to utilize angel capital effectively, thus increasing the chances of survival. These findings demonstrate that human capital, including industry experience and education, is crucial in enabling entrepreneurs to maximize the potential of financial resources and adapt to challenges.

The COVID-19 pandemic was found to have a significant moderating effect on the relationship between financial capital and startup survival. The results indicate that startups with higher founder equity faced an increased risk of failure during the pandemic, while startups using debt capital experienced a lower risk of failure. This highlights the crucial role that financial flexibility, such as having access to debt financing, plays in helping startups survive during external shocks like the pandemic. However, venture capital and government support did not show significant moderating effects, suggesting that these forms of financial capital may not have been as effective in ensuring startup survival during the pandemic.

Overall, the study reinforces the importance of financial capital in determining startup survival, but emphasizes that its effect is influenced by human capital and external factors like COVID-19. Startups relying on debt financing tend to have a better chance of survival, whereas those dependent on founder equity are more vulnerable to failure, especially in times of crisis. These findings underscore the need for startups to build both strong financial strategies and human capital to improve resilience and ensure long-term survival, particularly during challenging periods.

6 CONCLUSIONS AND MANAGERIAL IMPLICATIONS

6.1 Conclusions

This study highlights the crucial role of financial capital in startup survival, with different forms of financial capital—such as debt capital, venture capital, and angel capital—demonstrating varying impacts. The findings emphasize that while founder

equity may increase the risk of failure, debt financing provides a protective effect, especially during crises like COVID-19. The role of human capital, including industry experience and education, further moderates the impact of financial resources on survival. The COVID-19 pandemic exacerbated failure risks for startups with high founder equity, while those with debt financing showed resilience. The study underscores the importance of strategic financial management, diverse funding sources, and a skilled founding team in enhancing startup survival and long-term success.

6.2 Managerial implications

The findings from this study highlight several key managerial implications for optimizing the use of financial capital, enhancing startup survival, and improving operational effectiveness.

First, the results emphasize the importance of diversifying financial capital sources. Founder equity alone was found to increase the risk of failure, particularly during crises like the COVID-19 pandemic. Therefore, startups should aim to diversify their sources of financial capital by incorporating debt capital, venture capital, and angel capital. These alternative sources not only provide crucial financial support but also offer strategic insights and flexibility, which are vital for long-term survival. Reducing reliance on personal capital can help mitigate risks and provide startups with the financial resources necessary to navigate challenging times.

Second, debt capital plays a protective role in reducing the likelihood of startup failure. The study shows that startups utilizing debt financing tend to have a lower risk of failure, especially during times of uncertainty. Managers should consider using debt strategically to maintain cash flow and support ongoing operations. However, it is important to strike a balance, as excessive debt can strain a startup's financial position. By carefully managing debt and ensuring the ability to repay, startups can improve their resilience and ability to survive financial hardships.

The study also highlights the crucial role of human capital in moderating the relationship between financial capital and startup survival. Startups with founders who possess industry experience and education are better positioned to leverage financial resources effectively, reducing the risk of failure. Managers should prioritize investing in

human capital by building a skilled and experienced founding team. This can be achieved through training programs, mentorship, and knowledge-sharing opportunities within the industry. Enhancing human capital equips the startup team with the necessary skills to make informed financial decisions and adapt to changing market conditions.

Moreover, the COVID-19 pandemic significantly impacted startup survival, with startups relying on debt capital faring better during the crisis. Managers should build financial strategies that incorporate flexibility and adaptability to respond to external shocks. Having access to debt financing can provide a critical cushion during disruptions, while startups heavily reliant on founder equity should ensure they have access to diverse funding sources. This approach can help mitigate risks and maintain operational continuity during times of crisis.

Additionally, while family and friends' funding can provide valuable support during the early stages, it should be used cautiously. Although the study shows that it reduces the risk of failure, over-reliance on informal financial sources can lead to personal financial risks and potential conflicts. Managers should aim to balance informal funding with formal capital sources, ensuring long-term financial stability and reducing dependency on personal networks.

Lastly, while government support did not show significant impact on startup survival in this study, it still plays a role in certain contexts, especially for startups in sectors that benefit from public funding and incentives. Managers should actively engage with government programs that offer loans, grants, and tax relief, particularly during times of economic downturns or crises. While government support alone may not guarantee survival, it can provide an important supplementary layer of security when combined with other financial strategies.

By diversifying financial resources, leveraging debt strategically, and enhancing human capital, startups can improve their chances of survival and operational effectiveness. Building financial strategies that adapt to external shocks and maintaining a balanced approach to funding will enable startups to navigate difficult circumstances, ensuring their resilience and long-term success.

6.3 Limitations and further research directions

This study has several limitations that should be considered. First, the identification of startups in Vietnam remains qualitative, as there is no official classification of “startup” in business registration documents. Startups were selected for interviews based on data from the Startup Support Network for Students in the Mekong Delta, which may introduce bias, as it may not fully represent all startups, especially those outside this network or in early stages.

Second, obtaining data from startups no longer in operation posed challenges, particularly with recall bias. Respondents had to rely on memory for financial data from previous years, which may have led to inaccuracies. This could be especially problematic for financial figures, as businesses may have experienced significant changes or closures, affecting the reliability of the recalled information.

These limitations suggest caution in generalizing the findings, particularly to startups outside the network or those that have closed. Future studies could benefit from a more formal method of identifying startups and improving data collection from defunct businesses.

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Authors' Contribution

All authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

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