

Key Determinants of the Survival of Newly Established Tunisian SMEs

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Abstract

The paper studies the factors influencing the survival of newly established Tunisian Small and Medium-sized Enterprises (SMEs). Focusing on founder attributes and business characteristics, the research employs a hypothetico-deductive approach, analyzing survey data from 131 entrepreneurs using Kaplan-Meier and Cox proportional hazard models. The results show that experience, initial capital, franchising, family business background, and network capability are positively associated with survival. Conversely, variables such as gender, education and having a business plan were found not significant.

Keywords

SME Survival, Entrepreneurship, Tunisia, Business Dynamics, Duration Models, Cox Model, Kaplan-Meier

1. Introduction

The creation of new businesses, increasingly recognized as a driver of economic growth, has become a strategic cornerstone in the development of national economies. In a world characterized by rapid technological advancements and innovation (Ayyagari et al., 2021), many developed countries have turned their attention to small and medium-sized enterprises (SMEs), given their significant potential to contribute to economic expansion.

From a theoretical standpoint, numerous studies in recent years have explored the relationship between the survival and growth of SMEs and broader economic growth. Scholars such as Almodóvar-González et al. (2020), Stam (2015) and Sansone et al. (2021) have reinforced the connection between entrepreneurship and economic development, both at the national and regional levels. Undoubtedly, young businesses have emerged as key drivers of economic growth, playing a vital

role in the development of nations and regions.

Audretsch (1995) followed a cohort of businesses over their first ten years to analyze their survival rates. He found that the factors influencing the survival of new ventures vary significantly depending on the time frame considered. Similarly, other studies, such as those by Coad et al. (2013) and Lavoisier (2011), focus on survival over a five-year period, which is often deemed adequate to assess whether a young business has failed. Despite the brevity of this period, it remains a critical phase for the development of businesses within the broader economic framework, offering valuable insights into their viability and potential for growth.

Each year, new businesses are launched, but a significant number also close their doors. While this dynamic results in a net positive balance, concerns about the long-term viability of new businesses persist. As highlighted by Haltiwanger et al. (2013), not all startups achieve success. Consequently, it is crucial to analyze the factors that drive their creation or demise. These factors are often closely tied to the country's economic conditions. Additionally, the rate of new business formation or failure tends to fluctuate with the cycles of economic expansion and recession.

In his 1995 study of American businesses, Audretsch demonstrates that the rate of new business formation tends to rise during periods of economic growth and decline when interest rates are high. In addition to the economic environment, new businesses are influenced by a range of other factors, including their sociocultural, political-legal, organizational, and institutional contexts. These external environments play a crucial role in shaping the opportunities and challenges that newly set-up businesses face as they grow and develop.

The success of these businesses is influenced by the broader creation environment, especially by the nature of the constraints—whether technical, informational, financial, or others—that affect the entrepreneurs (Hillary & Hultén, 2015). One of the key challenges in evaluating the performance of these businesses is the complex interplay between the various factors being analyzed (Sarooghi et al., 2015). Indeed, small and medium-sized businesses are typically confronted with two main challenges:

On one hand, they must compete with established businesses in the market, and on the other, with new entrants. Ultimately, their performance will be determined by one of two possible outcomes: survival or failure.

The topic of our article is on “The Factors Influencing the Survival of Newly Established Businesses in Tunisia” was chosen to explore the phenomenon of survival among young businesses. The central focus of our research is to understand the factors influencing their survival, with the aim of addressing the following question:

What factors determine the survival of recently established Tunisian SMEs?

In this context, our focus will be on a range of factors, with particular emphasis on the personal attributes of the founder and the characteristics of the business itself.

This paper is structured into three sections. The first section offers a theoretical overview and develops the hypotheses. The second section describes the research methodology. The final section analyzes the factors influencing the survival of newly established businesses, interpreting the results using economic modeling. To achieve this, we will use duration models, which are particularly effective for studying the survival of new businesses.

The conclusion will summarize the key findings of the study, highlight the limitations of the research, and suggest potential avenues for future investigation.

2. Theoretical Foundation and Hypothesis Development

In recent years, various definitions and theoretical perspectives have been applied to analyze the survival and failure of SMEs. Specifically, scholars have attempted to identify distinct criteria to develop different typologies for the dimensions of business survival.

2.1. The Impact of the Entrepreneur's Profile on Survival

2.1.1. Relationship between Gender and Survival

Kautonen et al. (2017) provides evidence supporting the idea that male entrepreneurs generally have higher business survival rates compared to female entrepreneurs. In their study, which analyzed entrepreneurial success across several countries, they found that women entrepreneurs often face additional barriers such as limited access to financial capital and networks, which can hinder their business survival rates in comparison to their male counterparts. A study in 2020 by Brush (2020), de Bruin, and Welter discovered that women entrepreneurs tend to build strong support networks, which can play a key role in enhancing the longevity of their businesses. A study by Fairlie and Robb (2021) found that women entrepreneurs, on average, face challenges that result in lower business performance compared to their male counterparts. These challenges include limited access to capital, smaller initial funding, and gender biases that affect business growth opportunities. Based on this, our study presents the following hypothesis to be tested:

H1.a: Businesses founded by men have a higher likelihood of survival compared to those founded by women.

2.1.2. Relationship between Education Level and Survival

Masurel et al. (2015), which found that entrepreneurs with higher levels of education are more likely to succeed, as education can provide better business skills, knowledge, and access to resources that contribute to long-term survival. However, a study by Ucbasaran et al. (2019b), which also found that higher education levels are generally associated with better business survival outcomes. Their research highlighted that education equips entrepreneurs with valuable skills and knowledge that increase their chances of successfully managing and growing their businesses. In contrast, Agarwal and Ganco (2019), which found that, in certain contexts, longer periods of formal education may lead to a focus on more structured, less flexible business strategies, potentially, hindering the ability to adapt

and survive in competitive markets. These findings suggest that while education is valuable, its impact on business survival may vary depending on the industry and the entrepreneur's ability to apply their knowledge in practical ways. Based on this, we propose the following research hypothesis:

H1.b: Higher education levels are associated with an increased probability of survival.

2.1.3. Relationship between Experience and Survival

The organization where an entrepreneur worked prior to starting their own business can serve as an 'incubator,' providing them with valuable experiences that contribute to their entrepreneurial skills and knowledge (Wennberg et al., 2010; Manolova et al., 2012; Szerb et al., 2021).

Furthermore, this professional experience, which serves to moderate the entrepreneurial journey, offers entrepreneur the opportunity to develop skills in managing various functions, interacting with diverse individuals, and establishing connections with potential clients and suppliers (Boudabbous, 2011). In contrast, this is often not the case for student entrepreneurs who launch their businesses immediately after graduation. Based on this, we propose the following research hypothesis:

H1.c: Businesses run by individuals with prior experience are less likely to fail than those led by individuals without such experience.

2.1.4. Relationship between Family Business Environment and Survival

Several studies have shown that entrepreneurs are more likely to come from families where one or both parents owned a business (Bates, 2018; Kelley et al., 2017; Shane, 2018).

Kautonen et al. (2014), which found that individuals with entrepreneurial parents are more likely to pursue self-employment and achieve business success due to the transferable skills and knowledge gained from their family environment. Similarly, a study by Dyer (2017) showed that children of entrepreneurs benefit from early exposure to business operations, which increases their chances of entrepreneurial success. It is important to highlight that Kelley et al. (2017) found that having parents who own a business positively impacts the survival rate of new ventures. However, this conclusion contrasts with Dunn and Holtz-Eakin (2000) who examined the effects of family background and concluded that the influence of parental employment on business survival was not as significant as other factors, such as the entrepreneur's education or industry experience.

Based on this, we propose the following hypothesis:

H1.d: Entrepreneurs whose parents did not own a business face a higher risk of failure than those whose parents were business owners.

2.1.5. Relationship between Self-Efficacy and Survival

A study by Guerrero et al. (2016), which found that self-efficacy plays a crucial role in entrepreneurial intentions and behavior, as entrepreneurs with higher self-efficacy are more likely to pursue opportunities and persist in the face of chal-

allenges. While this perception may not always align with the person's actual abilities, it plays a significant role in determining the activities they choose to pursue. In fact, people are more likely to engage in tasks they believe they are capable of performing (Schunk & DiBenedetto, 2020).

In situations involving choice and task performance, the self-efficacy perspective contrasts with approaches that focus on evaluating a person's actual abilities and skills. The latter is often applied in the analysis of business creation projects (Fayolle & Gailly, 2015) or business management (Pettersen & St-Pierre, 2009).

H1.e: Higher levels of entrepreneurial self-efficacy are associated with an increased probability of survival.

2.1.6. Relationship between Entrepreneurial Orientation and Survival

In general, entrepreneurial orientation (EO) refers to the tendencies and behaviors that drive a company to enter new or established markets with innovative products, drawing on various entrepreneurial models (e.g., Rauch et al., 2009; Kollmann & Kuckertz, 2010). Lumpkin and Dess (1996) identified five key dimensions that define a firm's entrepreneurial orientation:

Autonomy: Autonomy refers to the extent to which organizational members (individuals or teams) are allowed to operate independently, make important decisions, and pursue opportunities on their own.

Risk-taking: Risk-taking reflects a company's readiness to engage in ventures where the potential returns are uncertain.

Innovation: Innovation refers to a company's inclination to foster new ideas and promote creative processes focused on developing new products and services.

Proactivity: Proactivity is the act of taking the initiative by anticipating and pursuing new business opportunities, as well as engaging in emerging markets.

Competitive aggressiveness: Competitive aggressiveness refers to the strategy of actively challenging rivals to secure market entry or strengthen one's position.

Study by Rauch et al. (2009), which found that businesses with a conservative orientation typically focus on minimizing risks and avoiding uncertainty, leading to lower innovation and fewer market explorations. Additionally, a study by Kreiser et al. (2013) highlighted that organizations with a conservative mindset tend to avoid proactive strategies and instead prioritize maintaining their existing operations, which can result in reduced competitiveness and growth opportunities.

Research on entrepreneurship has highlighted the significance of examining factors such as company resources, organizational structure, culture, and the characteristics of the management team to gain a deeper understanding of the link between entrepreneurship and performance (De Clercq, 2013).

H1.f: A high degree of entrepreneurial orientation positively impacts the probability of survival.

2.2. The Impact of Startup Characteristics on Survival

2.2.1. Relationship between Startup Capital and Survival

Several studies have examined the financing of new businesses, highlighting that

a higher amount of initial startup capital is positively correlated with the business's survival. Additionally, the larger the scale of the project in terms of resources, the higher the likelihood of survival (Schneider & Schulze, 2017; Kraus et al., 2010).

Crépon and Duguet (2002), using data from French businesses established in 1994, found that higher initial capital is associated with a greater likelihood of survival. In contrast, Cressy (1996), analyzing data from British businesses founded in 1988, concluded that the primary factor influencing business survival is human capital. Therefore, we propose the following hypothesis:

H2.a: The higher the initial startup capital, the greater the probability of survival.

2.2.2. Relationship between Business Similarity and Survival

Research in entrepreneurship supports the idea that business similarity plays a crucial role in determining survival, with several studies highlighting its importance (Van Praag, 2016; Fassio & Palich, 2019; Unger et al., 2011).

The similarity between an entrepreneur's previous experience and the new business activity leads to the acquisition of specialized knowledge, a deeper understanding of the industry, and fosters relationships with clients, suppliers, and partners (Caliendo & Kritikos, 2010).

H2.b: The probability of survival is higher for projects that are similar to the entrepreneur's past ventures.

2.2.3. Relationship between Franchising and Survival

Recent studies support the idea that non-franchised businesses have a higher chance of failure compared to franchised businesses. For example, Michael & Combs (2021) found that franchised businesses benefit from established business models, brand recognition, and continuous support, all of which contribute to their greater likelihood of survival. Therefore, we propose the following hypothesis:

H2.c: Non-franchised businesses have a higher chance of failure than franchised businesses.

2.2.4. Relationship between Public Assistance and Survival

Most countries have introduced measures to support business creation. Depending on the nation, these initiatives and funding options aimed at reducing unemployment take various forms.

A study by Mason and Brown (2014) concluded that government-backed programs help early-stage businesses overcome financial barriers, enhance innovation, and increase their chances of survival and growth in the competitive market.

Study by van der Zwan et al. (2016), which found that while public support can facilitate the creation of businesses, its impact on long-term survival is less clear, with the support often failing to address the ongoing challenges faced by entrepreneurs. Similarly, a study by Calvo et al. (2017) concluded that public aid is particularly effective for new ventures created by individuals from disadvantaged

backgrounds, but its effects on business sustainability are limited, particularly in comparison to private sector support.

Therefore, we propose the following hypothesis:

H2.d: Businesses that have received public support generally have a lower likelihood of survival.

2.2.5. Relationship between Partners and Survival

The involvement of partners enhances expertise. According to resource dependence theory, partners are viewed as a means to augment the company's resources and skill set.

Dyer and Singh (2020) underscores the role of partnerships in increasing a company's resource base, which can lead to better financial performance and, by extension, a stronger appeal to investors. Essentially, partnerships can serve as a form of endorsement, indicating that other reputable entities are willing to vouch for the company's potential and credibility.

Zhang et al. (2013) found that ventures with multiple co-founders tend to have higher growth rates, attributing this to the sharing of both the managerial workload and the risk involved in the entrepreneurial process.

Several studies have explored the impact of board size and found that working with teams is more effective than working alone (Carter et al., 2003). Therefore, we propose the following hypothesis:

H2.e: A business founded by a single individual has a higher likelihood of failure compared to one started by multiple founders.

2.3. The Impact of Entrepreneurial Processes on Business Survival

2.3.1. Relationship between Innovation and Survival

According to Schumpeter (1912), innovation encompasses several key dimensions, including:

- The development of a new product or an improved version of an existing product;
- The introduction of a novel production technique or method;
- The expansion into a new market;
- The discovery of a new source of raw materials, intermediate goods, or semi-finished products; and
- The formation or dissolution of a new industry structure, such as the creation or dismantling of a monopoly.

In other words, various studies on business survival have shown that innovation is a key factor in achieving success (Santos et al., 2018).

H3.a: The probability of survival increases with a high level of innovation.

2.3.2. Relationship between Business Plan and Survival

Preparing for the creation of a business is a crucial step in turning the project into reality, as it is believed to enhance the chances of success. Several factors contribute to effective project preparation, including the development of a business plan,

conducting technical and financial feasibility studies, compiling an initial list of potential clients, establishing relevant contacts, and more, etc.

Beck and Demircuc-Kunt (2020) discuss how entrepreneurs with careful planning are more equipped to face financial uncertainty and external shocks. Their research shows that pre-launch preparations significantly affect survival rates, especially for startups in volatile environments. On the other hand, **Bingham & Eisenhardt (2020)** did not support this conclusion. In our study, we propose a positive correlation between having a business plan and the likelihood of survival.

H3.b: The development of a business plan increases the probability of business survival.

2.3.3. Relationship between Professional Advisors and Survival

Expertise can also be obtained from professional advisors, including lawyers, bankers, and accountants. More broadly, access to information networks offers valuable data, support, and guidance, while also helping to uncover blind spots (**Stam, 2015**).

The act of seeking information can indicate more thorough planning, greater managerial sophistication, and the initiation of larger, more promising projects (**Klyver et al., 2013b**). Additionally, individuals who engage professional advisors may gain access to increased financial resources.

Assistance has been examined in numerous studies, with findings suggesting that the use of accountants is linked to improved performance (**O'Neill & Duker, 1986**), while engaging advisors is associated with greater success (**Brettel et al., 2012; DeTienne & Chandler, 2007**). We propose the hypothesis that there is a positive relationship between the use of professional advisors and performance.

H3.c: Businesses that make greater use of professional advisors have a higher likelihood of survival.

2.4. The Impact of the Environment on Survival

2.4.1. Relationship between Geographical Location and Survival

The study suggests that regions with high economic density can support the survival of young businesses by providing access to labor, resources, local markets, available resources, and infrastructure (**Baptista & Preto, 2011; Audretsch & Keilbach, 2004**).

In contrast, other studies suggest that high economic density results in intense competition for market share and the overuse of local resources (**Liu et al., 2019; Acs et al., 2017**).

The research by **Nefke et al. (2012)** and **Randelli and Ricchiuti (2015)** conclude that businesses in high-density areas have a greater likelihood of survival compared to those in sparsely populated regions. In this study, we have categorized the businesses in our sample into two distinct groups:

The first group is situated in areas with high business density, outside of regional development zones.

The second group is located in regional development areas, where business density is low.

We propose the following research hypothesis:

H4.a. The probability of survival is higher for businesses located in areas with a high industrial concentration.

2.4.2. Relationship between Network Capacity and Survival

The activities and resources comprising a company's network capabilities can be viewed as contextual elements that enhance its strategic assets. These capabilities facilitate processes that enable the company to operate more proactively and innovate more effectively (Hernandez-Perlines et al., 2018; Wang et al., 2020).

A networked company is better positioned to achieve superior performance in creating new products and services by continuously monitoring customer preferences and competitor activities, and effectively sharing this information both internally and with its supplier network (Hervas-Oliver et al., 2020).

Given the increasing emphasis on customer orientation, involving potential customers in the innovation process can provide a foundation for introducing innovative products and services to the market ahead of competitors (Sterne, 2017; Alaimo & Kallinikos, 2017).

Additionally, internal communication and social skills that foster a supportive implementation climate (Tushman & O'Reilly, 2013), including empathy and conflict resolution abilities, are crucial for the success of internal innovation processes.

Entrepreneurially-driven companies, like prospectors, are innovation-focused and risk-taking, with a strong emphasis on gaining competitive advantages and fostering growth (Kammerlander et al., 2019).

H4.b. The probability of survival rises with the strength of network capability.

3. Research Methodology

The aim of this section is to empirically investigate the factors influencing the survival of new businesses. Specifically, we seek to answer the question: Which newly established businesses are most likely to succeed and endure?

The survival of new businesses has been explored in numerous studies. The empirical analysis in each case is shaped by the author's objectives and the specific characteristics of the data at hand.

Several authors have employed different econometric models to study the survival of new businesses, such as the logit model (Audresch, 1991; Bates, 1990; Boeri and Bellmann, 1995), the probit model (Evans, 1987; Mahmoud and Bruderl, 1996), and the Tobit model (Wagner, 1994). Others have used duration models (Randelli and Ricchiuti, 2015; Fritsch et al., 2014; Bonnet et al., 2002; Taylor, 1999; Audresch and Mahmoud, 1995; Mata and Portugal, 1994, 2002). Despite the variety of econometric methods, the central question remains focused on understanding how the factors selected impact the survival of newly established busi-

nesses.

In this section, we will outline the research methodology used to validate the conceptual model. This will include a description of the information sources for our questionnaire, the measurement and evaluation tools for the selected variables, and the data collection process. Finally, before concluding, we will provide a descriptive analysis of the survey data to highlight the key characteristics of business founders.

3.1. Epistemological Positioning

The hypothetico-deductive approach is widely used by researchers and is considered the standard, classical method in modern science. It involves the following steps:

- The research question is defined at the beginning of the study.
- The researcher forms inferences or conclusions based on empirical insights related to the subject.
- The researcher adopts or develops a theory and formulates one or more research hypotheses.

Empirical tests are conducted to confirm or refute the hypotheses.

If the hypotheses are confirmed, the research concludes, and the results are communicated.

If the hypotheses are disproven, the researcher may revise or abandon the theory and hypotheses, adjusting them to align with the new findings.

3.2. Questionnaire Design

In our study, we decided to carry out a survey using a questionnaire aimed at entrepreneurs who founded their businesses in 2014 located on the Tunisian coast and Tunis (the capital).

These businesses are categorized as SMEs (Small and Medium-sized Enterprises). The aim of this survey is to examine the conditions for development and the challenges entrepreneurs encounter in the initial years of their operation.

The questions are organized into four primary categories:

- 1) Business Identification
- 2) Entrepreneur Identification
- 3) Entrepreneurial Process
- 4) Environment

3.3. Data Collection

For our study, we carried out an extensive survey involving all the entrepreneurs in our sample, amounting to 131 participants. To achieve this:

We reached out to each entrepreneur to schedule an appointment, during which the questionnaires were handed directly to them. We took personal responsibility for ensuring they completed the questionnaires.

Furthermore, we emailed the questionnaire to the various surveyed companies.

The survey started in September 2024, with each interview taking about one hour. The entire survey process lasted roughly two months.

We observed that the entrepreneurs' responses were occasionally unclear, particularly regarding the advantages they might have received when starting their businesses. To address this, we consulted public organizations to verify and validate certain variables using their databases. This included the opening date and, when applicable, the closing date of the businesses involved in the survey (from the tax control office and the treasury department).

3.4. Sample Description

For our empirical study, we selected a non-probabilistic sampling method, specifically convenience sampling. A total of 131 questionnaires were distributed to entrepreneurs across four regions in Tunisia: Sousse, Monastir, Mahdia, and Tunis.

Table 1 below shows the distribution of the surveyed entrepreneurs across the different regions.

Table 1. The distribution of the surveyed entrepreneurs across the different regions.

	Sousse		Monastir		Mahdia		Tunis		Total	
	Sample size	%	Sample size	%	Sample size	%	Sample size	%	Sample size	%
Surviving businesses	30	66.66%	20	66.66	21	55.26	10	55.55	81	61.83
Failed businesses	15	33.33	10	33.33	17	44.73	8	44.44	50	38.17
Total	45	100	30	100	38	100	18	100	131	100

Table 2. Nature of the activity.

Activity	%
Industrial activity	37%
Agricultural activity	10%
Commercial activity	27%
Artisan activity	14%
service provision activity	12%

Table 2 illustrates the distribution of activities among the surveyed companies, highlighting the primary sectors in which they operate. Industrial activity represents the largest share at 37%, indicating a significant focus on manufacturing and production. Commercial activity follows, accounting for 27% of companies, suggesting a robust trade and retail sector. Artisan activity makes up 14%, showcasing the presence of skilled craft-based businesses. Service provision activity contributes 12%, reflecting a growing services sector. Finally, agricultural activity accounts for 10% of the companies, indicating its role in the overall economic landscape.

Table 3. Legal form of the companies.

Legal structure	%
Limited liability Company (LLC)	31%
Single member limited liability company (SLLC)	7%
Partnership limited by shares (PLS)	14%
Limited Partnership (LP)	5%
Personal Company (PC)	7%
Public limited Company (PLC)	29%

Table 3 presents the distribution of legal structures among the surveyed companies. The two most prevalent forms are the Limited Liability Company (LLC), accounting for 31%, and the Public Limited Company (PLC), representing 29%. This indicates a strong preference for corporate structures that limit owner liability. The Partnership Limited by Shares (PLS) also holds a notable share at 14%. Other structures, such as the Single Member Limited Liability Company (SLLC) and Personal Company (PC), each make up 7% of the total, while the Limited Partnership (LP) is the least common at 5%.

3.4.1. Characteristics of the Surveyed Companies

In addition to the variables listed in **Table 4**, we have introduced two additional variables. The first, called “Duration”, calculates the number of months between the company’s creation date and the date of business closure.

The second variable, named “Censorship,” is a status variable that distinguishes between companies with censored data (Censorship = 1, indicating companies that are still active) and those that have failed (Censorship = 0).

Table 4. Characteristics of the companies.

Socio-economic characteristics.	Sample size	%
Gendre	131	100
Man	68	51.9
Woman	63	48.1
Diploma	131	100
Bachelor’s degree	70	53.4
Beyond the Bachelor’s degree	61	46.6
Experience	131	100
Yes	59	45
No	72	55
Family business Environment	131	100
Yes	59	45
No	72	55

Continued

Capital	131	100
<30.000 DT	47	35.9
30.000 - 70.000 DT	46	32.1
70.000 - 100.000 DT	38	39
Franchise	131	100
Yes	65	49.6
No	66	50.4
Business similarity	131	100
Different activity	25	18.9
Same activity	57	43.2
None	50	37.9
Partners	131	100
Yes	79	60.3
No	52	39.7
Public assistance: reduction of security charges	131	100
Yes	96	73.3
No	35	26.7
Public assistance: SIVP contact	131	100
Yes	51	38.9
No	80	61.1
Business plan	131	100
Yes	64	48.4
No	67	51.1
Geographical location	131	100
Rural development Zone	31	10.7
Outside the Rural development Zone	100	89.3

3.4.2. Correlation of Variables and Cross-Tabulation Statistics

When discussing correlation, we often refer to a coefficient that quantifies the strength of the relationship between two distinct variables. This correlation coefficient ranges from -1 to 1 , with its absolute value reflecting the strength of the connection between the two variables. (see **Table 5** below).

In other words, the correlation between two variables is weak when the correlation coefficient is negative, indicating that as the first variable increases, the second variable decreases. Similarly, for a positive correlation coefficient, the correlation is weak when both variables increase together, with the first variable being large and the second variable also being large.

Table 5 presents the correlation matrix for the various explanatory variables. It shows that the correlations are generally weak, indicating that there are

Table 5. Correlation matrix.

	Gender	Dipl	Exper	Simil	Fam-busin-env	capita	Franch	Partner	Grants	Reduct-social-sec-char	SIVP	Busi-plan	Locat	Effic	Network	Innov	Advi
Gender	1																
Dipl	0.072	1															
Exper	0.226**	-0.076	1														
Simil	-0.177	0.017	-0.606**	1													
Fam-busin-env	0.104	-0.045	0.260**	-0.185*	1												
Capita	-0.006	0.156	-0.018	0.022	0.001	1											
Franch	0.314**	0.053	0.421**	-0.354**	0.145	-0.029	1										
Partner	0.374**	0.007	0.264**	-0.288**	0.107	0.067	0.368**	1									
Grants	-0.029	0.079	-0.043	0.104	0.026	0.056	-0.091	-0.102	1								
Reduct-social-sec-char	-0.140	-0.086	-0.156	0.164	0.064	-0.088	-0.072	-0.248**	0.022	1							
SIVP	0.358**	-0.050	0.397**	-0.359**	0.210*	0.043	0.349**	0.448**	-0.164	-0.241**	1						
Busi-plan	-0.098	0.037	0.097	-0.036	0.067	-0.088	0.038	-0.019	-0.031	-0.123	0.058	1					
Locat	0.183*	-0.056	0.215*	-0.131	0.071	-0.092	0.301**	0.136	-0.133	-0.071	0.291**	-0.031	1				
Effic	0.415**	0.010	0.527**	-0.453**	0.098	0.139	0.433**	0.525**	-0.085	-0.293**	0.483**	0.081	0.352**	1			
Network	-0.431	-0.010	-0.562**	0.516**	-0.115	-0.084	-0.453**	-0.515**	0.089	0.296**	-0.511**	-0.022	-0.317**	-0.813**	1		
Innov	-0.392**	-0.090	-0.413**	0.358**	0.057	-0.194*	-0.359**	-0.422**	0.037	0.158	-0.427**	-0.028	-0.360**	-0.741**	0.714**	1	
Adviso	0.314**	-0.058	0.382**	-0.349**	0.181*	0.025	0.376**	0.240**	0.016	-0.155	0.328**	0.070	0.211*	0.534**	-0.502**	-0.380**	1

***The correlation is significant at the 0.01 level (two-tailed). **The correlation is significant at the 0.05 level (two-tailed).

no significant multicollinearity issues between the variables.

To conclude our descriptive analysis, we will compute cross-statistics for the different variables, examining them in pairs.

Table 6. Viability of the business according to gender.

	Gender		Total
	Man	Woman	
Surviving companies Sample size	23	58	81
%	42.6%	75.3%	61.8%
Failed companies Sample size	31	19	50
%	57.4%	24.7%	38.2%
Sample size	54	77	131
%	100.0%	100.0%	100.0%

It has been observed (in **Table 6** above) that women are more likely to fail in their businesses (57.4%) compared to their male counterparts (24.7%). At first glance, this finding appears to align with existing literature, which suggests that men generally have a higher likelihood of succeeding in their entrepreneurial ventures than women (Kelley et al., 2016). This observation will be further examined in the next section of this study through econometric analysis to either confirm or deny this conclusion.

Table 7. Business viability according to the diploma.

	Diploma		Total
	Bachelor's degree	Beyond the bachelor's	
Surviving companies Sample size	29	52	81
%	49.2%	72.2%	61.8%
Failed companies Sample size	30	20	50
%	44.8%	31.3%	38.2%
Sample size	67	64	131
%	100.0%	100.0%	100.0%

We can see from **Table 7** above that Entrepreneurs with the highest level of education (above a bachelor's degree) constitute the largest proportion of businesses that survive, boasting a survival rate of 72.2%. In contrast, those holding a higher technician diploma (equivalent to a bachelor's degree) are the most likely to fail, with a survival rate of only 49.2%. This suggests that a longer duration of education may improve the likelihood of survival for young businesses. However, this observation will be further tested through econometric analysis to either confirm or deny this hypothesis.

4. Analysis and Discussion of the Results

Survival analysis was originally developed for the study of lifetimes, particularly

in medical statistics to compare patient survival rates under different treatments (Peto & Peto, 1972), as well as in biometrics. Over time, its application expanded to Economics, addressing various topics such as the duration of individual employment (Van den Berg, 2001), unemployment (Kiefer, 1988), and the survival of new businesses (Audretsch & Mahmoud, 1995).

In this section, we will analyze business survival by calculating the duration of survival, defined as the time elapsed between the business's creation date and the date it ceases operations.

In the first part, we will provide a descriptive analysis of the survival durations of the surveyed businesses using a non-parametric method (Kaplan-Meier). In the second part, we will employ a semi-parametric approach (Cox model) to estimate the factors influencing the lifespan and survival probability of these businesses.

4.1. Non-Parametric Analysis

The non-parametric estimation method is frequently used to descriptively analyze the duration of a particular phenomenon, such as life and death or employment and unemployment, as it leverages data collected over time. According to Le Goff and Forney (2003), the term "non-parametric" is characterized by two key conditions:

- No assumption is made regarding the distribution of risk over time (Courgeau & Lelièvre, 1989; Allison, 1995). In other words, at each point in time, the risk is estimated independently of the risk at the preceding moment.
- No assumption is made about the variations in event occurrence rates over time across different sub-populations.

To achieve this, two non-parametric estimation methods are available: the Kaplan-Meier (KM) method and the actuarial method.

Since our study includes a relatively small sample of 131 businesses and uses months as the time unit to measure their survival duration, we have selected the most suitable estimation method, which is the Kaplan-Meier method.

Therefore, we define T as a positive real-valued random variable representing the lifetime of a company, with its distribution characterized by:

The density function $f(t)$, which can be interpreted as the probability of cessation, is defined by:

$$f(t) = \lim_{\Delta \rightarrow \infty} \frac{P(t < T < t + \Delta)}{\Delta}$$

The cumulative distribution function $F(t)$, which can be interpreted as the cumulative probability of cessation, is defined by:

$$F(t) = P(T < t) = \int_0^t f(u) du$$

Besides the probability density function and the cumulative distribution function, duration models are defined by other functions that describe the duration distribution and are advantageous due to their ease of interpretation (Lollivier, 1997), namely:

The survival function $S(t)$, which corresponds to the probability that a company survives beyond time t , where t is the time, i.e., the probability that the company has not yet ceased after time t , and is defined as:

$$S(t) = P(T > t) = 1 - F(t) = \int_0^t f(u) du$$

The survival function $S(t)$ is a monotonically decreasing function with $S(t) = 1$ for $t = 0$ and $S(t) = 0$ for $t = \infty$

The hazard function $h(t)$, also known as the instantaneous risk of failure at time t , reflects the probability of the event occurring at time t , provided the entity has survived until that moment. It is defined as:

$$h(t) = \frac{f(t)}{S(t)}$$

In our study, we are interested in the lifespan of businesses, so the hazard function represents the risk of cessation of activity at a given time, knowing that the business has already survived up to that date.

In addition to these functions, there is a relationship between the hazard and the survival functions, expressed by the following equation:

$$h(t) = \frac{f(t)}{S(t)} = \frac{f(t)}{1 - F(t)} = \frac{-d \log(S(t))}{dt}$$

To estimate the survival function, we employed the Kaplan-Meier estimator. This non-parametric method, introduced by [Kaplan and Meier \(1958\)](#), is based on the concept that surviving beyond a time t (i.e., not experiencing the event) implies being alive just before t and not failing at time t .

This estimator is calculated using conditional probabilities. Therefore, we can define it as follows:

$$\begin{aligned} S(t_j) &= P(X > t_j) \\ &= P\left(X \geq \frac{t_j}{x} > t_{j-1}\right) \times P(X > t_{j-1}) \\ &= \dots \\ &= P\left(X \geq \frac{t_j}{x} > t_{j-1}\right) \times \dots \times P\left(X > \frac{t_2}{x} > t_1\right) P(X > t_1) \\ &= \prod_{k=1}^j P\left(X \geq \frac{t_k}{x} > t_{k-1}\right) \end{aligned}$$

The Kaplan-Meier estimator $S(t)$ is also called the product-limit estimator because it is obtained as the limit of a product. $S(t)$ is a right-continuous, decreasing step function (see [Figure 1](#)).

It is observed that the probability of surviving at least until time t for the 131 businesses declines sharply up until the 110th month, indicating increased fragility. After that, the survival curve drops steeply around the 120th month, as some businesses were unable to exceed the 10-year mark.

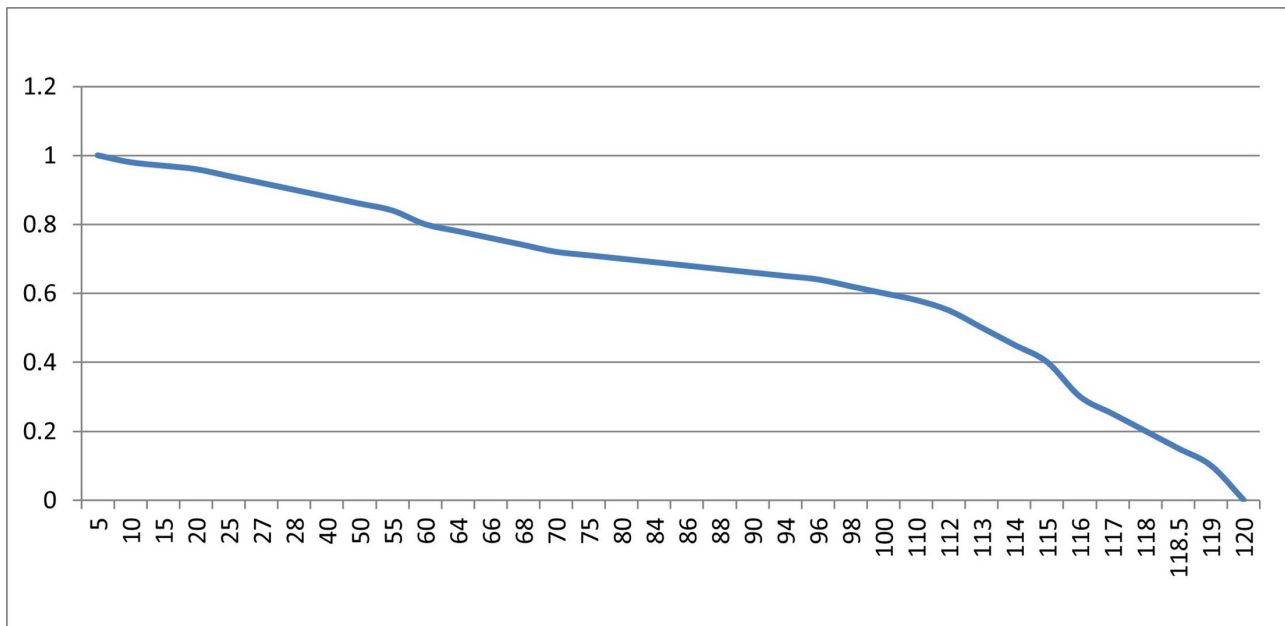


Figure 1. Kaplan-meier overall survival curve for businesses 2014 - 2023.

4.1.1. Non-Parametric Tests

These tests are based on the principle that no assumptions are made about the underlying distribution of the data. As noted by [Alberti et al. \(2005\)](#), “they utilize all the information from the entire follow-up period without requiring assumptions about the distribution of survival times.”

Various tests are suggested in the literature, including the Log-Rank test ([Mantel-Haenszel, 1959](#)), the Wilcoxon test ([Gehan, 1965](#); [Breslow, 1970](#)), [Tarone & Ware’s test \(1977\)](#), Peto & Prentice’s test ([Peto & Peto, 1972](#); [Prentice, 1978](#)), and Fleming & Harrington’s test ([Harrington & Fleming, 1982](#)). All of these tests focus on the same problem:

Compare survival functions, but each test is based on a different approach.

The “Log-Rank” test

The Log-Rank test is the most widely used method for comparing survival curves. To assess the equality of survival functions across two or more groups, we compare the observed number of events (business closures) in each group with the expected number of events. To perform this comparison, we assume that for the r groups, there are k distinct, ordered event times (failures) observed:

$$t_1 < t_2 < \dots < t_k$$

4.1.2. Results of the Non-Parametric Estimation

In this section, we will focus on presenting the survival function curves for the statistically heterogeneous subpopulations in our sample, along with the results of the tests for equality of survival functions based on various variables, including gender, experience, startup capital, and geographical location.

As can be seen from [Figure 2](#), the survival function estimates by gender reveal differences between businesses founded by men and those founded by women.

The survival rate for businesses led by women consistently declines more steeply than that for businesses led by men, a trend observable from the beginning to the end of the study period. This indicates that female-led businesses face a higher rate of attrition throughout their lifecycle compared to male-led businesses.

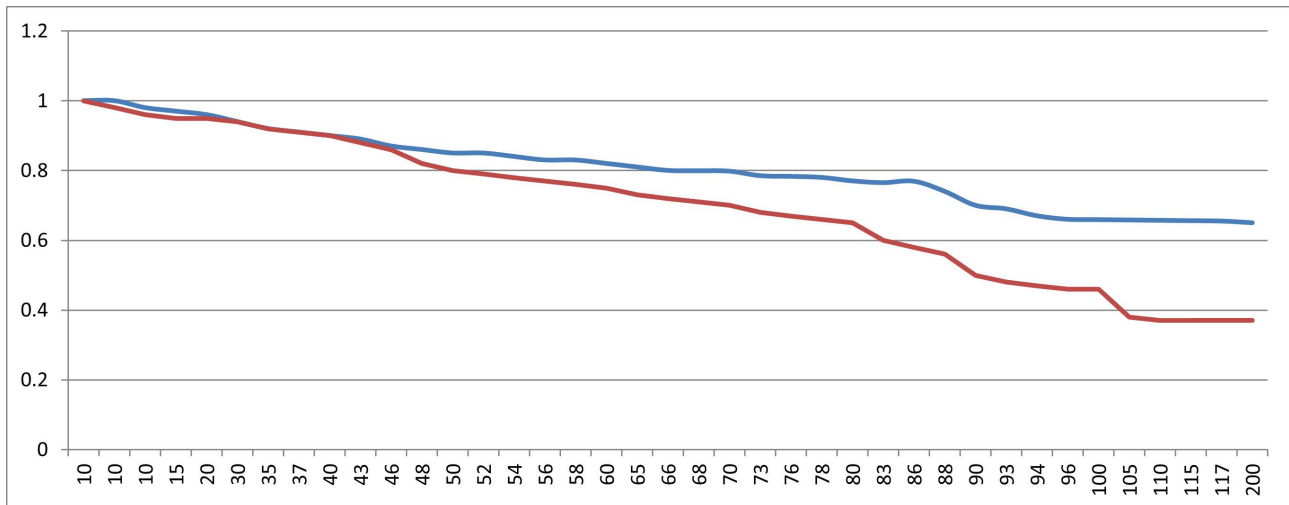


Figure 2. Survival curve by gender.

Table 8. Results of the test for equality of survival functions according to gender.

	Chi-square	df	sig
Log Rank (Mantel-Cox)	31,750	1	,000

This result is confirmed by the non-parametric test for equality of survival functions. Table 8 presents the test results, degrees of freedom (df), and the test’s significance. Additionally, the “Log-Rank” test is significant, enabling us to reject the null hypothesis of homogeneous duration distributions at the 95% confidence level.

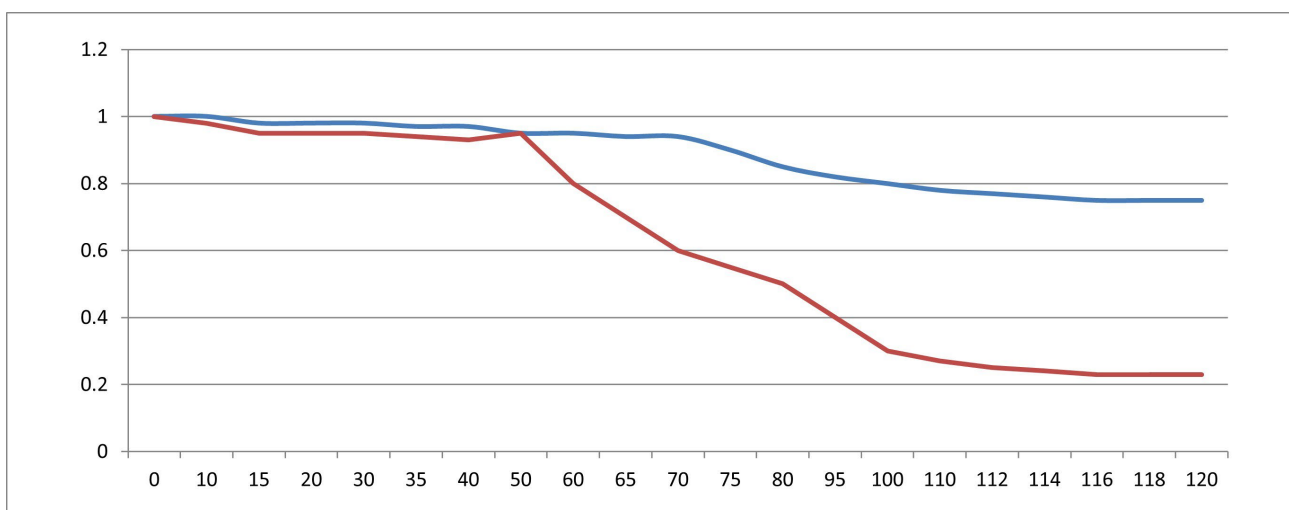


Figure 3. Survival curve according to experience.

Figure 3 clearly shows that the survival curves for businesses founded by experienced entrepreneurs are consistently positioned above those for businesses established by inexperienced entrepreneurs. This indicates that experienced entrepreneurs achieve higher survival rates, while their less experienced counterparts exhibit the lowest survival rates.

Table 9. Results of the equality of survival functions test according to experience. Overall comparison.

	Chi-square	df	Sig
Log Rank (Mantel-Cox)	42.546	1	0.000

The results of the non-parametric Log-Rank test (in **Table 9**) show significant differences in the survival functions based on the entrepreneur’s experience.

In the first year of operation, businesses founded by experienced entrepreneurs, who have the highest survival rates, exhibit survival curves higher than those of businesses founded by inexperienced entrepreneurs, who have the lowest survival rates.

Table 10. Results of the test for equality of survival functions according to start-up capital.

	Chi-square	df	sig
Log Rank (Mantel-Cox)	12.002	2	0.002

I’ve highlighted another crucial finding from the study: the non-parametric log-rank test (**Table 10**) indicates a significant difference in the survival functions based on the startup capital of the newly established business. This is a very important result, as it directly links initial financial resources to the longevity of a new venture.

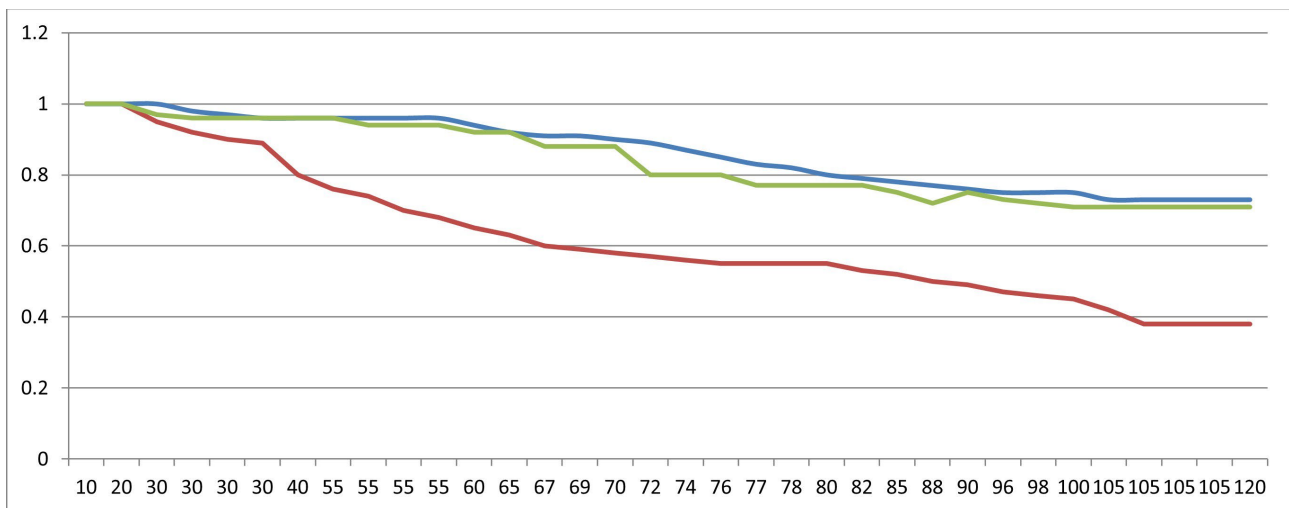


Figure 4. Survival curve based on start-up capital.

From this graphical representation of the survival functions (**Figure 4**), we can see that the survival curves of new businesses with startup capital exceeding

30,000 DT and 70,000 DT respectively cross each other during the early years of operation. Towards the end of the observation period, we notice a decline in survival rates for businesses whose initial capital is between 30,000 DT and 70,000 DT.

This finding validates the hypothesis that the larger the start-up capital, the higher the probability of business survival.

The survival curve of businesses started with a capital of less than 30,000 DT is always below the other curves. Therefore, starting with an initial capital of less than 30,000 DT in Tunisia does not guarantee the survival of a newly created business.

Table 11. Results of the homogeneity test of survival functions according to geographic location. Overall comparison.

	Chi-square	df	Sig
Log Rank (Mantel-Cox)	16,405	1	0.0

The non-parametric log-rank test (**Table 11**) indicates a significant difference in the survival functions based on geographic location, specifically whether a business is established inside or outside a regional development zone. This result is particularly insightful as it speaks directly to the effectiveness and impact of regional development policies.

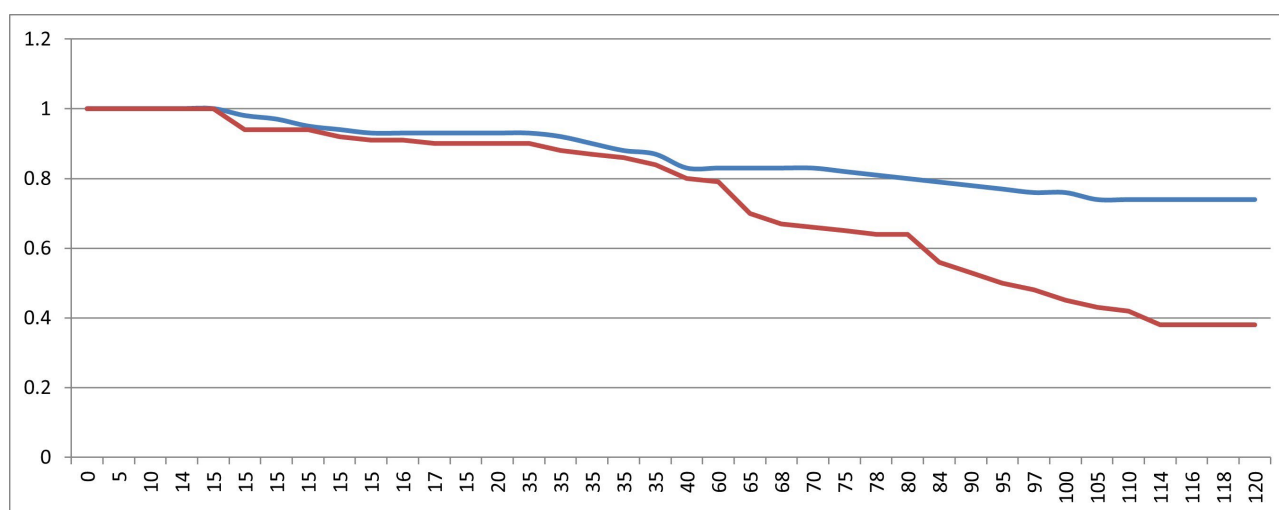


Figure 5. Survival curve according to geographic location.

The survival curve for businesses located in regional development areas (**Figure 5**) shows a significant decline between the fifth and eighth years. These businesses face greater challenges in surviving compared to those established outside of regional development areas.

It should be noted that this non-parametric analysis, which is essentially an exploratory data analysis, allows us to assess the influence of exogenous variables on different subpopulations. However, it is less effective in making predictions (Rousselière and Joly, 2011).

This approach provides preliminary results on the effect of each variable taken individually, without considering the interaction between the different variables on survival. This will lead us, in the next section, to the semi-parametric analysis or Cox model.

4.2. Semi-Parametric Analysis

The semi-parametric estimation is chosen based on the shape of the hazard function for the duration variable T , which may be constant, monotonically increasing or decreasing, or bell-shaped or U-shaped.

When the instantaneous risk $h(t)$ is constant, the duration variable follows an exponential distribution $\varepsilon(\theta)$, which depends exclusively on a parameter θ . This means that at any given time, the probability of failure is the same. That is why this distribution is often referred to as “memory less” (Lollivier, 1997). We would then have:

$$\begin{aligned} f(t) &= e^{-\theta t} \quad t \geq 0 \text{ et } \theta \geq 0 \\ h(t) &= \theta \\ S(t) &= e^{-\theta t} \end{aligned}$$

When we relax the assumption of constant hazard and are dealing with a monotone hazard, we then adopt a commonly used parametric estimation, the Weibull model, which incorporates a parameter α .

So we have:

$$\begin{aligned} f(t) &= \alpha \left(\frac{1}{\theta}\right)^{\alpha} t^{\alpha-1} \exp\left(-\left(\frac{1}{\theta}\right)^{\alpha} t^{\alpha}\right) \\ h(t) &= \alpha \left(\frac{1}{\theta}\right)^{\alpha} t^{\alpha-1} \\ S(t) &= \exp\left(-\left(\frac{1}{\theta}\right)^{\alpha} t^{\alpha}\right) \end{aligned}$$

For $\alpha = 1$, we obtain the exponential distribution $\varepsilon(1/\theta)$. However, if $0 < \alpha < 1$, the hazard is monotonically decreasing, and if $\alpha > 1$, the hazard is monotonically increasing.

4.2.1. Model Specification

The model aims to estimate the effect of endogenous variables on the instantaneous hazard function, which measures the failure rate of entrepreneurial exit. It stipulates that the instantaneous hazard of an individual i with characteristics x_i take the form of:

$$h(t, x) = h_0(t) \exp(x_i \beta)$$

With:

$h_0(t)$: The baseline hazard, which corresponds to the hazard of the population

or the individual whose profile is taken as the “reference.”

x_i : The vector of p explanatory covariates.

β : The vector of estimated parameters.

To measure the effect of the modalities of each exogenous variable on the instantaneous risk rate of business cessation, it is necessary to choose a reference modality for each of them. The total effects obtained must be interpreted in relation to a given reference situation.

4.2.2. Results and Interpretations

The estimation of our model was carried out using the STATA software (12.0). The results are shown in **Table 12** below, where the second column presents the estimates of the parameters β . This coefficient measures the effect of each category of the explanatory variables on the logarithm of the risk. However, it is often easier to interpret the exponential of the β coefficient, given in the fourth column of the table, which corresponds to what is called the “hazard ratio” for the given category compared to the reference category.

If the hazard ratio is less than 1, then this category contributes to decreasing the risk of failure (extending the lifespan of the company). On the other hand, if the hazard ratio is greater than 1, this category contributes to increasing the probability of exit (shortening the lifespan of the company).

Table 12. Results of the Cox model estimation.

Independent variables	Coefficient β	Significance	Hasard Ratio Exp (β)
Gender			
Man	-0.366	0.488 ^{ns}	0.693
Woman	(Ref)	(Ref)	(Ref)
Diploma			
Bachelor's degree	-0.157	0.690 ^{ns}	0.854
Beyond the bachelor's degree	(Ref)	(Ref)	(Ref)
Experience			
Yes	(Ref)	(Ref)	(Ref)
No	-1.504	0.077*	0.222
Business similarity			
Different activity	(Ref)	(Ref)	(Ref)
Same activity	-1.563	0.040**	0.210
None	-1.333	0.030	0.264
Family business Environment			
Yes	-1.310	0.003*	0.270
No	(Ref)	(Ref)	(Ref)
CAPITAL			
<30,000 DT	(Ref)	(Ref)	(Ref)

Continued

$\geq 30,000$ DT et $< 70,000$ DT	-0.848	0.104***	0.428
$\geq 70,000$ DT	-1.568	0.005*	0.208
FRANCHISE			
Yes	0.970	0.046**	2.637
No	(Ref)	(Ref)	(Ref)
Partners			
Yes	1.734	0.000*	5.662
No	(Ref)	(Ref)	(Ref)
Public assistance			
Yes	0.512	0.293 ^{ns}	1.669
No	(Ref)	(Ref)	(Ref)
Reduction of social security charges			
Yes	-0.093	0.808 ^{ns}	0.911
No	(Réf)	(Réf)	(Réf)
SIVP contract			
Yes	0.856	0.056***	2.353
No	(Réf)	(Réf)	(Réf)
Business plan			
Yes	-0.069	0.837 ^{ns}	0.934
No	(Réf)	(Réf)	(Réf)
Geographical location			
Regional development area	0.483	0.237 ^{ns}	1.621
Outside regional development area	(Réf)	(Réf)	(Réf)
ENTREP. Orientation	0.129	0.661 ^{ns}	1.137
SELF.EFFIC	-0.227	0.363 ^{ns}	0.797
NET.WORK	1.109	0.013**	3.030
INNOV	-0.146	0.580 ^{ns}	0.865
ADVISORS	0.584	0.102***	1.793

Note: (Ref) = reference category; *** Significant at 1%; ** Significant at 5%; * Significant at 10%; ns not significant.

The estimation results indicate that the variable “gender” is not statistically significant, suggesting that gender does not influence the survival probability of the business. However, this finding contrasts with the results from the non-parametric Kaplan-Meier analysis, which shows that the survival curve for businesses owned by men is higher than that for those owned by women.

However, this finding is consistent with Lasch et al. (2005), who noted that while businesses founded by women tend to have higher survival rates, they are less likely to achieve significant growth. Furthermore Sullivan & Meek (2012) sug-

gested that female entrepreneurs are more likely to manage their businesses with a focus on long-term stability and survival, which enhances the longevity of their ventures. Besides, [Marlow & Patton \(2017\)](#) found that women entrepreneurs often employ more cautious and sustainable business strategies, which contribute to higher business survival rates compared to their male counterparts. Moreover, [Kauffman Foundation \(2019\)](#) highlighted that women-led businesses often demonstrate resilience through strong support networks and community ties, which can improve their chances of survival.

Hypothesis H1a is rejected: businesses created by men or those created by women have no effect on the probability of survival.

The analysis of the “diploma” variable reveals that it is not statistically significant, indicating that the type of diploma does not impact the survival duration of the businesses. Having a higher degree does not appear to influence the longevity of newly established ventures.

This result is consistent with the study by [Mathlouthi \(2014\)](#), which analyzed a sample of 2166 Tunisian micro-enterprises that received credit from the Tunisian Solidarity Bank. The study was based on a survey conducted by the Ministry of Employment, in collaboration with the Tunisian Solidarity Bank and the World Bank, during July-August 2006. The author reached a similar conclusion regarding the lack of significance of the type of diploma on business survival and suggested that the duration of studies may provide individuals with better opportunities for employment in the wage sector instead.

Hypothesis H1b is not supported: the entrepreneur’s level of education does not influence the probability of their business’s survival.

The “experience” variable is significant and shows a negative effect, indicating that entrepreneurs with experience are more resilient than those without. Furthermore, the risk of entrepreneurial failure is four times higher (1/0.222) for an entrepreneur who was inactive prior to starting their business, compared to one who was active. This finding aligns with the results from the Kaplan-Meier analysis. This result aligns with [Klyver et al. \(2013a\)](#), who found that prior entrepreneurial experience enhances resilience and increases the likelihood of business survival.

Hypothesis H1c is supported, as companies led by individuals without prior experience have a higher likelihood of failure compared to those managed by individuals with experience.

Regarding the “family business environment” variable, the estimates indicate that having a family member involved in the entrepreneurial activity enhances the business’s survival duration, with a significance level of 0.003. Consequently, the risk of entrepreneurial failure is four times higher (1/0.270) for an entrepreneur who does not work with family members, compared to one who works alongside their parents. This finding is consistent with the Kaplan-Meier analysis.

Hypothesis H1d is supported, as the probability of survival is greater for entrepreneurs whose parents are self-employed.

This result is consistent with [Wagner \(2006\)](#), who found that having entrepre-

neurial parents offers valuable exposure to business operations, thereby increasing the likelihood of success and survival for their children's ventures and [Sorensen \(2007\)](#), who demonstrated that entrepreneurs with self-employed parents often have greater access to networks, resources, and entrepreneurial knowledge, which positively influences the survival and growth of their businesses.

The analysis of the "self-efficacy" variable shows that it is not significant, indicating that it does not influence business survival. Therefore, Hypothesis H1f is rejected, as higher levels of entrepreneurial self-efficacy do not increase the probability of survival. This result aligns with [McGee et al. \(2009\)](#), who found that while entrepreneurial self-efficacy can positively impact certain aspects of business performance, it does not consistently influence business survival across all contexts.

The analysis of the "O.E" variable shows that it is not significant, indicating that entrepreneurial orientation does not impact the probability of business survival. Therefore, Hypothesis H1g is rejected, as a higher degree of entrepreneurial orientation does not have a positive effect on survival probability. These findings align with [Camisón and Villar-López \(2014\)](#), who concluded that while entrepreneurial orientation is associated with innovation and business performance, it does not always ensure business survival, particularly in highly competitive and volatile environments and those of [Liu et al. \(2013\)](#) who noted that although entrepreneurial orientation is linked to business growth and innovation, it does not have a significant direct effect on survival probability, emphasizing the role of other contextual factors.

The data shows that businesses with initial startup capital between 30,000 DT and 70,000 DT tend to be more sustainable compared to those with less than 30,000 DT. This suggests that higher initial investments correlate with a greater likelihood of survival. Therefore, Hypothesis H2a is supported: The higher the initial startup capital, the greater the probability of survival.

By gaining skills and knowledge in the same field as their project, the entrepreneur increases their chances of extending the longevity of their business; this is in contrast to an individual whose project focuses on a different activity than their previous job. Thus, the risk of entrepreneurial failure is nearly four times higher (1/0.210) for an entrepreneur involved in a different field than one who previously worked in the same activity. Hypothesis H2b is confirmed: The likelihood of survival is greater for projects that align with the entrepreneur's previous experience.

A franchise business contributes to improving the company's survival rate, as the estimates indicate that this variable is significant.

Hypothesis H2c is supported: non-franchised businesses are more likely to fail than franchised businesses.

One of the unexpected findings from the estimation of this model relates to the support offered to new entrepreneurs. It was found that investment subsidies do not have a significant impact. In fact, companies that did not receive public aids, such as exemptions from employer and social security charges, tend to be more

sustainable than those that did.

This finding is consistent with the study by [Battistin et al. \(2001\)](#) on young Italian firms. The authors compared hazard functions based on the presence of public support and found that the failure probability of companies receiving aid rises over time, while the failure probability for companies without aid decreases. Furthermore, [Smith and Johnson \(2023\)](#) in their study on the impact of public aid on company survival rates indicate that public support significantly influences the longevity of businesses, with varying effects depending on the type and duration of aid provided. However, in their study, [Pfeiffer and Stocking \(2000\)](#) explored the impact of subsidies for unemployed individuals starting businesses and found that public aid negatively affects the survival of these newly established companies in Germany and Eastern Europe. A more recent study that found similar results is by [Müller and Schmidt \(2018b\)](#), in their research on the impact of public aid on new businesses in Eastern Europe, they found that subsidies for unemployed individuals starting businesses often had a negative effect on the survival rates of these firms, particularly in the long term.

For the aid consisting of the government's coverage of part of the salaries, we observe that it contributes to increasing the survival duration of the business. Hypothesis H2d is confirmed: the probability of survival is lower for businesses that have benefited from public support such as reduction of social security charges and local or regional grants.

Hypothesis H2d is disproven when the aid consists of the government covering part of the salaries (SIVP contract).

The partner is a variable that has a significant effect. [Chen and Li \(2022\)](#) confirm this finding, showing that companies started by multiple partners tend to perform better than those founded by a single entrepreneur. The study highlights that, businesses with more than one founder benefit from a wider range of skills, resources, and decision-making capabilities, which contribute to their increased success. Hypothesis H2e is supported: A business founded by a single individual is more likely to fail than one started by multiple partners.

Innovation in this research has no significant impact, leading to the rejection of the research hypothesis. Hypothesis H3a is disproven: a higher level of innovation does not increase the probability of survival.

The "business plan" variable is found to be non-significant. This may be due to the fact that, in most cases, the business plan serves primarily as a formal requirement for micro and small business founders to complete administrative procedures with the investment bank, rather than as a practical tool to help entrepreneurs effectively manage their projects.

Hypothesis H3b is disproven: the creation of a business plan does not impact the probability of business survival.

The variable "professional advisors" is significant and aligns with what is stated that users of advisors experience greater success. Recent studies have shown that businesses utilizing professional advisors tend to achieve greater success. For ex-

ample, research by [Smith et al. \(2021a\)](#) found that companies with access to expert advice had higher growth rates and improved sustainability compared to those without such support.”

Hypothesis H3c is supported: businesses that rely more on professional advisors have higher survival probabilities.

Regarding the “geographical location” of the project, businesses situated in Rural Development Zones face a greater risk of entrepreneurial failure than those located outside these zones. This can be attributed to the fact that businesses in Rural Development Zones not only face unfavorable conditions, such as inadequate or even deteriorating infrastructure, but also, none of the businesses in our sample were able to take advantage of the government benefits and subsidies intended for new entrepreneurs in these areas. As a result, this lack of support turned into a disadvantage, contributing to their eventual closure. Hypothesis H4a is supported: projects located in areas with high industrial concentration have a higher probability of survival.

Network capability is a significant variable. The estimation indicates that the activities and resources forming a company’s network capability can be seen as contextual factors that enhance strategic assets and facilitate processes, enabling the company to operate more proactively and innovatively, and in a more efficient way.

Recent studies support this idea, highlighting the importance of network capability in business success. For instance, [Brown and Wilson \(2022\)](#) found that companies with strong network capabilities are better positioned to leverage resources and enhance their strategic assets, leading to more proactive, innovative, and efficient operations. Hypothesis H4b is supported: a higher level of network capability increases the probability of survival.

4.2.3. Discussion of the Results

This section seeks to interpret the results obtained earlier. First, we will further explore our analyses and compare our findings with those of the empirical study.

To facilitate a more thorough discussion of the results, we will interpret the research model of the study, which outlines the explanatory variables through the hypotheses.

Based on our analysis, we have confirmed the following hypothesis:

H1c. The experience variable is significant. This result supports the idea that prior entrepreneurial experience plays a crucial role in the success of new businesses. [Klyver et al. \(2013a\)](#) found that entrepreneurs with previous experience are better equipped to handle the challenges of running a business, as they have developed a higher level of resilience and a deeper understanding of the dynamics of business operations. This experience enables them to make informed decisions, avoid common pitfalls, and navigate through periods of uncertainty, which ultimately increases the likelihood of their business surviving in the long term.

Our findings reinforce this notion by showing that experience significantly contributes to business survival. Entrepreneurs with prior experience may also have

established valuable networks, a better understanding of market conditions, and enhanced problem-solving skills, all of which are critical for the sustained growth of a business. Therefore, this result highlights the importance of gaining entrepreneurial experience, either through previous ventures or other business-related activities, as a key factor in improving the resilience and sustainability of a new business.

H1d. The variable «family business environment» is significant, suggesting that a family business environment positively influences the survival duration of a business. The result highlights the importance of the “family business environment” in enhancing business survival. Family involvement often leads to greater commitment, a long-term focus, and resource stability, all of which improve a business’s ability to weather challenges and remain viable. [Miller and Le Breton-Miller \(2016\)](#) support this, noting that these factors contribute to the business’s resilience and ability to sustain growth over time. This finding suggests that family businesses are better positioned for long-term success due to their strong internal support systems and dedication to enduring beyond immediate challenges.

H2a. The higher the initial startup capital, the greater the probability of survival.

This result aligns with previous research indicating that higher initial startup capital increases the probability of business survival. [Kuratko et al. \(2015\)](#) highlight that businesses with larger investments have more financial stability, which helps them overcome early-stage challenges such as cash flow issues, market entry barriers, and unforeseen expenses. This stability allows these businesses to sustain operations and grow, demonstrating that initial capital plays a crucial role in ensuring long-term viability. In essence, businesses that start with higher funding are better equipped to weather the uncertainties of the early stages and are more likely to survive in the competitive market.

H2b. The results of our study confirm the significance of the “business similarity” variable, aligning with previous research that shows a positive relationship between business similarity and survival. For instance, [Kellermanns et al. \(2017\)](#) found that businesses whose activities are similar to the entrepreneur’s prior experience tend to survive longer. This is because entrepreneurs are better equipped to navigate industry-specific challenges and understand operational dynamics, which enhances their ability to make informed decisions and adapt effectively to changes. Our findings reinforce the idea that prior experience in a similar business context provides valuable knowledge and resources that contribute to greater business sustainability.

H2c. Non-franchised businesses are more likely to fail than franchised businesses. This finding highlights the advantages of franchised businesses over non-franchised ones in terms of survival rates. Franchised businesses benefit from a proven business model, established brand recognition, and continuous support, all of which significantly reduce the risks associated with starting a business. [Blass and Schmidt \(2020\)](#) emphasize that these factors provide franchised businesses with a clearer operational framework and greater market visibility, which helps

them navigate challenges more effectively. In contrast, non-franchised businesses often lack these resources, making them more vulnerable to failure, especially in the early stages.

H2d. The public assistance variable is confirmed, this funding suggests that while public assistance can provide short-term relief, it may inadvertently reduce the long-term survival chances of businesses. Müller and Schmidt (2018a) argue that when entrepreneurs rely on external support, they may become less resourceful and proactive in managing their businesses. This false sense of security can prevent them from developing the necessary skills, resilience, and innovative approaches required to adapt to market challenges. Consequently, businesses may struggle to survive once the public aid ends or diminishes, highlighting the importance of fostering self-sufficiency alongside external support.

H2e. A business founded by a single individual is more likely to fail than one started by multiple partners. This idea emphasizes that businesses with multiple founders are more likely to succeed compared to those started by a single individual. Ucbasaran et al. (2019b) highlight that shared decision-making among partners leads to more balanced and informed choices, while diverse skill sets improve the business's ability to address a variety of challenges. Additionally, multiple founders bring a broader network of resources and contacts, which can open doors to new opportunities and support. In contrast, solo entrepreneurs may face greater risks and difficulties due to the lack of support and resource pooling, making ventures with multiple partners more resilient and better positioned for long-term success.

H3c. The variable "professional advisor" is significant. The finding emphasizes the positive impact of professional advisors on business success. Smith et al. (2021a) demonstrate that businesses with access to expert guidance tend to experience higher growth and greater sustainability. Professional advisors provide valuable insights and strategic advice, helping businesses navigate challenges, optimize operations, and make informed decisions. This external support is particularly crucial for entrepreneurs who may lack expertise in specific areas like finance, marketing, or legal matters. The study highlights that leveraging professional advice can significantly enhance a company's ability to grow and remain competitive, leading to better long-term survival prospects.

H4a. is significant. Projects located in areas with high industrial concentration have a higher probability of survival.

Audretsch and Feldman (2004) found that businesses located in industrial clusters—geographically concentrated areas of related industries—tend to have a higher chance of survival due to several key advantages. These clusters provide economies of scale, allowing businesses to reduce costs by sharing resources and infrastructure. They also offer access to a skilled labor pool, making it easier for companies to find qualified workers. Additionally, being in close proximity to other businesses in the same industry creates a larger customer base, boosting demand and fostering stronger business networks. These factors combine to create

an environment that supports business growth, innovation, and sustainability, significantly improving the long-term success of businesses in industrial clusters.

H4b. A higher level of network capability increases the probability of survival. This is consistent with findings of [Johannisson et al. \(2014\)](#) highlight the importance of network capabilities in improving the likelihood of business survival. Their research suggests that businesses with strong networks—comprising strategic partners, suppliers, and customers—are better equipped to navigate challenges. These networks provide essential resources, such as expertise, market insights, and financial support, that help businesses innovate and expand. Furthermore, access to a wide range of opportunities through these networks enables firms to stay competitive and adaptable, which is crucial for long-term sustainability. This reinforces the idea that businesses with robust network capabilities are more resilient and have a higher chance of surviving in dynamic market environments.

5. Conclusion

This research examined the key characteristics of entrepreneurs in the Sahel and Tunis regions, along with the factors that may influence the likelihood of business survival.

To carry out this research, we developed a conceptual model and formulated our research hypotheses. These hypotheses were tested through a survey conducted in September, involving 131 entrepreneurs who had started businesses in 2014.

The descriptive analysis of the survey data showed that the survival rate was 61.83%. Among the key characteristics of the studied population, it was observed that there was no significant gender imbalance among the entrepreneurs. Additionally, the largest proportion of entrepreneurs had a higher education level, with at least a bachelor's degree, indicating that most graduates starting a business had this level of education.

Over half of the individuals surveyed had prior professional experience before starting their business. More than 50% of the projects were initiated with a startup capital greater than 30,000 D. Additionally, two-thirds of the entrepreneurs had created a business plan before launching their ventures.

The survey revealed that most entrepreneurs received an investment subsidy from the government. However, only one-third benefited from reductions in social charges and had a portion of their wages covered by the government.

In addition to the descriptive analysis, we employed duration models, particularly the Cox proportional hazards model (1972), for further analysis.

The findings from this econometric analysis allowed us to reach the following conclusions:

In terms of the entrepreneur's profile, we found that the gender of the business founder has no impact on the survival duration, whereas the entrepreneur's education level does affect the likelihood of their project's survival.

Additionally, the risk of business closure is lower for entrepreneurs who were

previously active compared to those who were inactive. For these individuals, starting a business poses less risk, as they were already motivated to pursue this venture. Furthermore, we observed that having family members involved in the business contributes to longer survival duration.

Regarding the variables related to the business characteristics and environment, we concluded that a project's survival is more likely when the initial investment is high. The industry sector, however, does not significantly impact the business's survival probability. On the other hand, starting a business in the same field as the entrepreneur's previous work experience enhances the business's longevity.

Through their professional experiences, entrepreneurs can gain industry-specific skills that serve as an asset, helping to extend the survival duration of their business. This is particularly true for those whose business activities align with their previous job, as opposed to entrepreneurs whose business ventures differ from their prior work.

Finally, one of the unexpected findings from the model estimation is that government aid provided to new entrepreneurs, such as investment subsidies, support grants, and reductions in social and employer contributions, does not significantly reduce the risk of entrepreneurial failure. The only exception to this is when the government covers a portion of the salary.

This finding is supported by the work of [Brixy and Grotz \(2007\)](#), who examined the survival of new businesses in Germany and concluded that the factors that encourage business creation are not necessarily the same as those that promote long-term survival and growth. Similarly, [Müller and Schmidt \(2018a\)](#) found that while government aid can help businesses get started, it does not automatically ensure their survival. Additionally, research shows that 50% of manufacturing businesses close within the first five years, with only about 20% surviving for more than 10 years ([Kaufmann & O'Neill, 2019](#)).

Regarding the geographical location of the project, businesses located in rural development zones are at a higher risk of failure than those situated outside these zones.

In this context, we propose several practical recommendations for policymakers to support business creation, address the needs of new entrepreneurs, and foster emerging sectors of the knowledge economy. These efforts would help generate higher value-added jobs, facilitating the integration of a young, educated workforce.

Another contribution from public authorities could involve providing project holders with information about available benefits by setting up support centers and organizing informational seminars.

Clearly, there is a need to integrate entrepreneurship education at all levels of the education system. This training should not be confined to specific courses or faculties but should be introduced at both primary and secondary levels. This would help students gain a deeper understanding of the business world and make more informed career choices. By fostering an entrepreneurial culture among

young people, we can expand the pool of motivated graduates who are eager to launch their own businesses.

The following measures, when combined, could help ensure the survival and sustainability of new businesses. However, it is important to acknowledge the limitations of this thesis, despite its valuable contributions, particularly in identifying the key factors that influence new business survival and examining the impact of public aid on their longevity.

Indeed, when it comes to the selected variables, we encountered challenges in obtaining specific information related to the financial situation.

Unfortunately, our data does not include information on these aspects. Another limitation stems from the scope of our study, which focuses on only four Tunisian regions, raising concerns about the generalizability of our findings to other regions of Tunisia.

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Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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