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Relevance of the Mann Whitney Wilcoxon test in the survival analysis of newly established companies in Tunisia (Case of the sfax region)

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Abstract

This research focuses on the factors of survival and growth of new enterprises in Tunisia. Based on previous research, we hypothesize that three factors influence the survival and growth of these firms: factors related to the entrepreneur, factors related to organizational characteristics and characteristics of the environment from start-up. We test these assumptions on a sample of 60 companies. The results show that human capital and the experience of the entrepreneur have a relatively small impact on the survival of newly created firms. Similarly, the intensity of preparation for creation by accompanying structures is not generally a key factor for survival. On the other hand, organizational characteristics (the amount of capital invested at start-up or customer structure) are strongly linked to the survival of the latter.

Keywords: Survival, Newly created companies, Growth factors, Mann-Whitney Test

Introduction

This study analyzes the efficiency and impact of incubators on the survival rate of firms that employ them. The study also identifies whether other factors such as degree of business innovation, firm size, sector, and export activity affect firm survival.

Backgrounds

The interest in business creation is now more intense than at any point in the last 20 years. Business incubators seek to boost regional development by fostering business and employment creation (Furdas, M. and K. Kohn ([2011a]). In this study, 60 entrepreneurs were interviewed. The criteria for the section was that the must have worked An attempt was made to interview 60 entrepreneurs who had lived with their companies for more than three years and reached the first five years. Only companies that are in a start-up situation and who have not exceeded their fifth birthday and meet the criteria for novelty and small size will be affected by the study. The selection of cases was also carried out in terms of internal diversity as a heterogeneous group composed of different sectors (Bertaux et al., [2006], p.28, Pirès, [1997]). The sample studied then included 60 entrepreneurs from Sfax different academic backgrounds who created micro- or small enterprises, located in urban areas of the Sfax region.We have intervewd the Tunisian banks , how they

accord credits and does the carecteristics of campany sector as crafts and Tunisian pastry, the technology sector (software implementation for example), the catering sector and the services influence the acceptance of the credit report.We studied the legal files of new companies that have not exceeded the first 5 years of creation. Those who are located in the region of Sfax with Tunisian accounting experts, their financial statements (balance sheets and statements of results)

Methods

Empirical Analysis

Research Methodology

This exploratory and interpretative study is based on a qualitative approach based on a longitudinal case study. This research method is based on the work of Yin (1990) who defined the case study as: "an empirical investigation that studies a contemporary phenomenon in its real context, when the boundaries between the phenomenon and the context are not clearly obvious, and in which multiple sources of evidence are used. " Yin (1990) also points out that any phenomenon observed through a single case study can be general in scope.

The research was based on an in-depth analysis of data collected at different times over a period of perception of new companies created since 2010. After a distant perception of the field and a theoretical deepening on the studied phenomenon. It was decided to observe the consequence of the creation of these new companies established in the Region of Sfax. An attempt was made to interview 57 entrepreneurs who lived with their businesses for more than three years and reached the mark of the first five years.

Preliminary exploration

The purpose of the preliminary exploration is to highlight aspects of the phenomenon studied from the study of the variety of positions. To do this, we have endeavored to respect the principle of external or intergroup diversification advocated by Bertaux et al., 2006, (p.28) and Pirès (1997). Each actor has his own representations, perceptions, beliefs and ideas. The representations of each other overlap, favoring the emergence of a representation that is close to "objective reality" (Bertaux et al., 2006: 28).

In order to respect this principle, we interviewed in a very open manner three categories of actors: specialized researchers, privileged witnesses and actors who are the new promoters of the companies concerned by the study (Quivy and Van Campenhoudt, 2006: 59). The category of interlocutors is composed by privileged witnesses. "They are people who, by their position, their actions or their responsibilities, have a good knowledge of the problem" (Quivy and Van Campenhoudt, 2006, p.60) and whose professional activity puts them in direct contact with creators of companies in survival situation. For this type of interlocutor, we interviewed support-managers of support structures such as the Sfax business center, the bankers of the International Union of Banks UIB-credit managers, accountants-consultants. We explored the role of entrepreneurial relational degree and social capital in providing financial support to Tunisian funding agencies or support mechanisms.

Deepening of the phenomenon

The second stage of qualitative exploration aims to deepen our understanding of the phenomenon, but only within a small and homogeneous group. Only companies in a

start-up situation that have not exceeded their fifth birthday and who meet the "new business" criteria will be affected by the study. Case selection has also been reasoned in terms of internal or intra-group diversity (Bertaux et al., 2006, p.28, Pirès, 1997). The sample studied then includes 57 entrepreneurs from different university programs, having created micro- or small enterprises, located in urban areas of the Sfax region, operating in the sector of commerce, crafts or services.

In addition to the principles of homogenization and internal diversification, the constitution of the field of study was also based on the criteria of theoretical relevance, intrinsic quality of cases, exemplarity and accessibility (Pirès, 1997).

After a first selection, we selected entrepreneurs who had various experiences of failure including cases of disappearance, ie cases of entrepreneurs who had been forced to abandon their business plan, who have changed the design of their old businesses. Others who have had bad experience in their jobs for the benefit of a leader.

For the collection of data, we first favored the use of non-directive interviews that were later consolidated by semi-directive interviews. The first interviewees are led by closed questions. The second interviews are led by open questions and follow a purely chronological line. To return to points that require more explanation, the second interviews are more directed.We have used a questionnaires with likert echelle 5 point skills.

The emergence of a new generation of entrepreneurs to alleviate unemployment in Tunisia is an economic priority in the face of a public sector with a low capacity for job creation and a weakening private sector. One way to fight unemployment is to promote entrepreneurship. Moreover, the State has tried to promote entrepreneurship through the provision of support structures and support for the creation of companies (e.g., Agarwal et al. 2007). However, the average 4-years mortality rate of new Tunisian firms is 40% (e.g., Khelil et al. 2011). For this, Tunisia needs today a new generation of entrepreneurs, giving new impetus to the national economy and changing the rules of the game in the private sector. We should seek today to promote a new entrepreneur who invests in high value-added sectors, which will have a favorable political and economic environment in order to ensure the survival and success of the newly created company (e.g., Mejri and Ramadan, 2016). Nevertheless, given that the entrepreneur's journey is risky and full of uncertainty, the latter risks abandoning his journey halfway. Therefore, it is not only a question of increasing the number of entrepreneurs in the country; but rather to study the sustainability of these jobs, as well as the sectors in which they are created. This research questions for this study are: How does the entrepreneur achieve a successful business? Why do some companies succeed and others fail? In addition, what are the factors that favor the survival of the newly created company?

These are questions that we are tempted to provide answers. Our aims are to analyze the determinants of the success and survival of the newly created company.

From this research, we will explore the criteria for the survival of the new company (Section 1). Then, in the second section, the key factors of survival of the new company are reached and the hypotheses of our research are advanced (Section 2). We will identify the research methodology and how we will be able to validate or invalidate the assumptions of the survival of the young company. We used the Mann-Whitney Wilcoxon test. This is a method of analyzing ordinal qualitative data (Section 3). Finally, in the fourth section, we discuss the results of our research (Section 4).

Review of the literature

Survival analysis

Organizational development theorists have studied the early years of a new company extensively. It seen as a preliminary step leading to growth and leading to success and success (e.g., Verstraete and Saporta 2006). Indeed, the start-up period is mainly criticized for the fragility of the created entity, it would be its youth that would represent the major risk and which would generate the problems to be solved (e.g., Verstraete & Saporta 2006). Therefore, it is from the entry of companies in the start-up phase that sometimes precedes the creation process and its legal creation (e.g., Sammut 2001) that it is possible to identify those companies that were created. Some authors describe this phase as a stage of survival (e.g., Churchill and Lewis 1983) at the "valley of death" (e.g., Sweeney 1982). Indeed, it is the period when the failure rate is highest (e.g., Lorrain and Dussault 1988; Cressy 2006). So the survival of the young firm is the minimum criterion, the first step, the necessary element in the access to the success of a company (e.g., Tamàssy 2006; Littunen et al. 1998). Entrepreneurship research focuses on survival as a period ranging from 1 to 3 years (e.g., Teurlai 2004), which ultimately corresponds to the presumed duration of the start-up phase (e.g., Sammut 1998). Our field of study is limited to companies that are at the end of the start-up phase and have not exceeded the first 5 years of their existence (e.g., Gartner et al. 1992) in the pre-organization phase (e.g., Katz and Gartner 1988), or in the downstream phase of growth and expansion.

The duration of a project's survival refers to the period between the date of its actual creation and/or its commencement and the date of its closure or cessation of its activity. We take as the original event the start date of the activity of the companies created and as the last date, that of the cessation of activity.

Key factors in the survival of newly created companies

University studies and OECD research identify a list of factors that influence the survival rate of firms. While macroeconomic conditions, industrial cycles and existing market discriminations have an impact on the survival of firms. In addition to the factors related to the characteristics of the manager and his newly created enterprise (e.g., Irastorza and Pena 2014; Schoof 2006; OECD 2008; Kautonen 2013).

Assumptions related to the manager

The age of the entrepreneur: Older people are more likely to have work experience, so firms run by older people have higher survival rates (e.g., Furdas and Kohn 2011a, b). However, at the same level of experience, a young entrepreneur has a better chance of survival (e.g., Sapienza and Grimm 1997; van Praag 1996).

Education: when the entrepreneur's level of education is high, the better the company's performance and the better the survival rate (e.g., Schiller and Crewson 1997). In addition, the diploma of the project bearer gives chances of survival and passes the course of the third year of activity. In addition, a qualified entrepreneur is more likely to have a perennial business than an inexperienced entrepreneur is.

Experience: Relevant past experiences (self-employed or self-employed activities in the same sector or occupation) are likely to increase the chances of survival

(e.g., Brüderl and Preisendörfer 1998; Luk 1996; Cooper et al. 1994). Data suggests that this factor has no impact (e.g., van Praag 2003).

Similarly, the experience of an entrepreneur has a stronger impact on female creators. The perennial firm rate by experienced women is higher than those run by experienced men. This experience must be longer than 3 years; otherwise, experience does not influence sustainability (OECD 2012a, b). On the contrary, Langowitz and Minniti (2007) explain that women have less self-confidence than men in making decisions business development. This is why businesses by men survive compared to those by women. The survival rate is higher by creators formerly employed by the same sector or business owner than those who were unemployed or students (Court of Auditors 2012).

The financial resources of the entrepreneur: the more a small independent firm has its own financial capital available to the firm (the self-financing of the entrepreneur), the more likely it is to succeed (e.g., Brüderl and Preisendörfer 1998; Cooper et al. 1994). However, small firms are less likely than large firms to have access to sufficient capital are. As for the entrepreneur's capital, many researchers emphasize the importance of initial capital to ensure the survival and success of the business. However, Wagner (1994) found that the higher the capital intensity, the greater the chance of its survival. Other researchers such as Berryman (1983); Keasey and Watson (1991); Cressy (1994) choose a financial approach and specify the importance of a solid financial basis for the survival of newly created societies.

Assumptions related to the characteristics of the newly created company

The first step of the creation of the enterprise, it can be called birth at its start. In survival and growth, it transforms and modifies its structure, thus organizing its maturity (e.g., B. De Montmorillon, 1997). First, early survival studies focused on two characteristics of the company, the age and the size. Evans (1987) was one of the first to demonstrate that age and size increase the likelihood of survival of a firm. However, more recent studies suggest that the rate of change in firm size would be more influential the survival of the company (e.g., Agarwal and Rao, 1996; Cefis and Marsili, 2005). The analysis carried out by INSEE on the three and 5-years survival of companies created in the form of Ex Nihilo of the 2006 generations show that a company created by partners is the more likely to be perennial than the individual business.

In addition, we have the age of the company: Small and new businesses often have more limited resources and capacity than the large firms. This is why newly created small firms have higher death rates than the large firms (e.g., Mata and Portugal, 1994, Audretsch and Keilbach 2008, Sharma and Kesner 1996, Cook et al. 2012). However, if the company seeks to develop, it must seek a competitive advantage to position itself on the market. The survival and development opportunities offered to each company also depend on its competitive position: relevance of the market segmentation, relative quality of supply, level of competitiveness. There is also the Innovation capacity: entrepreneurs whose activities are based on new products, services or technologies face a greater risk of rejection of their products by markets than those who market already accepted products, services or technologies.

Therefore, innovation capacity is associated with a higher death rate (e.g., Furdas and Kohn 2011a, b). Baum et al. (2000) demonstrates that firms increase their chances of

life by making innovation research alliances. Indeed, the degree of centrality on the research network affects the performance of the firm. Startups would benefit from making alliances to have access to information and skills that allow for better performance. Furthermore, collaboration with public partners such as universities, high schools and schools is more likely to survive (George et al. 2002).

The role of employees and product development Capacity: Business development theories assume that the business grows through the acquisition of new productive assets and/or the hiring of personnel under the direct disposal of the company. Therefore, it is to acquire "raw" production capacities to adapt them to the specific needs of the company (it is an internal learning of new resources that tend to make these new capacities specific to the needs of the company business). Product development is an important aspect of the development of new enterprises. To this end, Shoonoven et al. (1990) argue that developing a portfolio of new products is necessary for new firms to put in a quick cash inflow, gain external visibility and legitimate rapid trade from where Increase in the probability of survival as concerning cosmetics, human health and pharmacy.

H1

The characteristics of the newly created company have a positive influence on the survival of the new company.

Assumptions centered on the company environment

The choice of location: For Jacob (2001), opening up to a local market results in growth that develops according to a proximity strategy and which operates essentially in a market where uncertainty is low and where needs are not sophisticated which leads to a lower degree of innovation and less widespread use of business practices. On the other hand, the firm that opens up to an international market is more innovation-oriented, giving more importance to the development of new products as well as to the improvement of existing production methods (e.g., Audretsch, 1998). Aimed at a well-developed organizational structure in order to satisfy the requirements of importers. Similarly, De Toni and Nassimbeni (2001) point out that the environment in which the young firm is located can promote growth. Such as the case of a young company sheltered by a nursery. The latter provides support logistics, assistance and linkage with a network of technical and commercial partners (Starbuck, 1965). Therefore, it is considered a stimulating growth location. Similarly, companies in a dense and resource-rich environment (notably cognitive), which can generate significant savings and, above all, have a positive influence on the growth of young companies.

Flexibility to competition: The inverse and taking into account this positive effect of the territory, the intensity of competition associated with a high local density of establishment of the sector of the young enterprise could tend to penalize its growth (L. Pouquet et al. 2004). The measure of survival is the subject of a wide-ranging debate and depends on different estimates of the evolution of variables such as profit, assets, fixed assets, value added, employment, sales or (St-Pierre et al. 2005). It can be measured by the increase in turnover, without necessarily Employment and vice versa. Similarly, there may be growth in turnover and deterioration in value added (e.g., Wiklund 1999). Thus, the phenomenon of survival is multifactorial as there is not a single causal factor but a conjunction of

favorable factors (e.g., Boissin et al., 2008, Pouquet et al. 2004) note that the need for survival has two dimensions. The first is the need to ensure competitiveness, or simply the survival of the company. This "objective" need for growth is particularly marked when the company suffers from a dimension that is less than the optimal minimum size of its sector and is thus penalized in terms of costs vis-à-vis its competitors (e.g., Audretsch 1995).

H2

The characteristics of the environment of the newly created company have a positive influence on the survival of the company.

Indeed, the need to reach "critical size" can also arise from the importance of R & D or communication investments that the company must make to stay in the race. The second dimension of the need for growth is a more psychological one. It refers to the place of growth in the objectives of the manager and his company environment (e.g., Cuervo 2005).

Social capital: It is increasingly accepted by the scientific community that entrepreneurial activity integrates the social relationships of entrepreneurial networks that allow them to access the resources they need more easily by being in a way or 'Another better connected these days (e.g., Stam, 2013). The literature clearly indicates that social capital, or the resources that entrepreneurs can access through their personal network, enable the entrepreneur to identify opportunities (e.g., Bhagavatula et al. 2010), mobilize resources and Build the legitimacy of their enterprises (e.g., Elfring and Hulsink 2003; Zimmerman & Zeitz, 2002). It is also known that social networks influence economic performance (e.g., Court of auditors 2012). A network is a social structure composed of individuals (or organizations) called nodes that are connected by one or more types of interdependencies (e.g., professional, friendship, kinship). Social networks influence the flow and quality of information because actors prefer to trust people they know. Trust, defined by Granovetter (1985, 2005) as the certainty "that others will do things well" develops within the networks. Individuals need confidence.

Granovetter (1985) argues that social networks allow the development of social capital, access to information, the discovery of opportunities, etc. They are made up of weak links and strong ties. While weak links provide access to wider information, strong personal relationship-based relationships improve co-operation between structures or individuals and problem solving (e.g., Bøllingtoft and Ulhøi, 2005).

The amount of capital invested at start-up: According to Aparicio et al. (2016) firms with high capital at start-up have a higher probability of surviving than those with low financial resources. For Starbuck (1965) survival is not a spontaneous or random phenomenon, but rather a result of a combination of factors linked in particular to the characteristics of the company, its strategic positioning, but also to the financial structure And its operating constraints. This is the consequence of a decision, such as creating employment for the decision maker and increasing production in response to a stronger demand or in order to stimulate demand (e.g., Verstraete et al. 2011). We find also, Carpenter and Petersen (2002), Trovato and Becchetti (2002) show that the lack of capital limits the probability of survival as well as the rate of growth. In this regard, Becchetti and Trovato (2002); Riding and Haynes, (1998) show that the availability of capital through debt and bank lending and by the contribution of equity were very important factors in promoting the survival and growth of the firm (e.g., Aparicio et al. 2016).

Table 1 Variables and items

The newly created company factor	The environmental factor	The Business Resource Factor
Company Age	Choice of location	Age of the entrepreneur
Company size	Intensity of competition	experience
Activity area	Accompanying structures	Self-financing
Role of employees	Bank support	Family Support
Innovation capacity	Role of suppliers	Network of friends
Product quality /Price	Role of clients	Social Capital: Business and Information Network
Franchise of brand		

H3

The resource characteristics of the entrepreneur of the newly created enterprise has a positive influence on the survival of the company.

Research methodology and sample

Research model

Choice of the research model: We identify the effect of factors related to the entrepreneur, the company and the environment that influence survival is studied (Table 1).

$$Y \text{ (The survival of the newly created firm)}$$
$$= \beta 0 + \beta 1 \text{ (Business characteristics)} + \beta 2 \text{ (Environmental effect)}$$
$$+ \beta 3 \text{ (Entrepreneurial resource characteristics} + \mu t$$

Participants

In this study, 60 entrepreneurs were interviewed. The criteria for the section was that the must have worked. An attempt was made to interview 60 entrepreneurs who had lived with their companies for more than 3 years and reached the first 5 years. Only companies that are in a start-up situation and who have not exceeded their fifth birthday and meet the criteria for novelty and small size will be affected by the study. The selection of cases was also carried out in terms of internal diversity as a heterogeneous group composed of different sectors (Bertaux 2006; Pirès 1997).

The sample studied then included 60 entrepreneurs from different academic backgrounds who created micro- or small enterprises, located in urban areas of the Sfax region. Tunisian crafts and Tunisian pastry, the technology sector (software implementation for example), the catering sector and the services.

We used a questionnaire with a 5 point-Likert scale *(1 = disagree to 5 = agree)*. The variable of the company is measured by 7 items and the variable of the environment is measured by 6 items. There is also the variable of the business resources of the entrepreneur is measured by 6 items. Finally we controlled the company survival and his continuous by the five new year's, it is measured by two items that are the age and size of the firm.

Materials and procedure

First, we used the "SPSS20" software to explain the results obtained using the data collected. First, a major component analysis will be performed. Then, we study the

reliability of the scales will be verified through the Cronbach alpha coefficient. Therefore, we will test the assumptions of our model and finally we will present the descriptive analyzes to describe the characteristics of the company and the entrepreneur.

Second, the correlation that represents the link between the variables is used: the endogenous variable which is the survival of the newly created firm and the exogenous variables are the characteristics of the firm, the motivation of the entrepreneur and the Resources available.

The correlation is measured by a linear correlation coefficient. The value of this coefficient is between (– 1) and (1). If the value of this coefficient tends to (– 1), then the variables are strongly correlated and vary in the same direction.

Third, regression analysis has been used. Indeed, this statistical method based on the study of the correlation between the variables. In the simplest cases, we are interested in studying.

We are looking for the linear relation between an independent variable and the dependent variable. In addition, linear regression analysis describes the variations in the variable to be explained associated with variations in the explanatory variables.

Moreover, for the threshold of acceptance of the Cronbach coefficient, as specified in the previous section, for the exploratory nature of the research, we retain the value of 0.55 as the minimum threshold of significance. It should be noted that this coefficient is used in metric, proportional, or interval scales. However, some scales of ordinal type or Likert, as is the case in this research, are the most often considered as metric scales.

Results

Measurement of the continuity and survival of newly created enterprises

For the study of the scale "Continuity and survival of the companies" we mobilized 8 items. A first coefficient of Cronbach gives us a satisfactory result that is 0.970. We have continued the factor analysis. The ACP, initially procured, required a rotation of the axes. We then obtained the results presented below. As can be seen, we have only 71.09% of the total variance explained (Table 2).

The analysis carried out in this research was basing on two parts. The first is to check the change in the degree of continuity and survival of the newly created enterprises in the Sfax region according to the characteristics of the newly created company factor, the

Table 2 Total of variance explained: the newly created company factor

The new company factor	Contribution F.1
The role of employees	0.970
The product (Quality / Price)	0.859
The Market share	0.833
Size	0.832
Activity area	0.818
Business Franchise	0.840
Innovation Capacity	0.799
Age	0.705
	% of variance explained 71.09%

environmental factor and the financial resources of the entrepreneur factor. Nonparametric tests are applied (inequality of variances and non-normality). At this level, we have chosen to adopt an analysis of the nonparametric variance factor, and ordinal variables, guided us towards the implementation of non-parametric tests (the Mann-Whitney Wilcoxon).

The rank of these values obtained by a classification (or even an inter-classification) of the set of observed values. The question then is whether the differences observed in the sub-samples bear with a sufficiently low risk of error (risk of first species).

H0 corresponds to the hypothesis of homogeneity, or if, conversely, they contradict it (H1).

Then, the non- parametric tests will be applicate. The aim is to study the quality of the causal relationships between the variable to be explained and the explanatory variables formulated in the research hypotheses.

As a first step, we will focus on verifying assumptions about changes in business continuity and survival based on business characteristics (industry, product/service quality, and team of employees).

The impact of businesses characteristics on the continuity and survival of newly created company

To test the hypothesis concerning the variability of the continuity and survival of businesses by force or not the industry, we operationalized the Mann-Whitney Wilcoxon two sample groups *(1 = life Of a force in the sector of activity, 0 = absence of a force in the sector of activity)*. The goal is to determine the extent to which the survival of firms changes according to the strength of the industry. The rank test by industry shows that the mean score for the sample of the presence of force in the industry is 28.14, while that of the absence sample of sector strength of activity is 24.58. The result of the Mann-Whitney Wilcoxon equal scores is significant at the 10% level ($p < 0.088$). This reflecting the continuity and survival of businesses change depending on the strength of the industry. We only conclude the sector of activity with significant assessments on the continuity and survival of the newly created companies.

To test the variability of the continuity and the survival of the companies according to the strength of the quality of the product / service, we mobilized a test on the ranks of the scores. The result of the latter reveals an average rank score of 26.29 for the group of companies with a strength of their product / service quality and 26.89 for the sample of companies not having a strength of their product / service quality. The

Table 3 The results of Mann-Whitney Wilcoxon Test: the characteristics of the enterprise factor

	Number of observation		Sum of scores		Average scores		Mann-Whitney Test	
	N1	N2	SC1	SC2	M1	M2	Z[b]	*p*-value
Company area	28	24	788	590	28,14	24.58	3.836[b]	0.088
Quality/Price	34	18	894	484	26.29	26.89	−0.138 Ns	0.891
Role of employees	17	34	492	834	28.94	14.53	4.022[a]	0.027

N1: number of observations for companies that attach great importance to the sector of activity, quality of product/service, and team of employees
N2: number of observations for companies that do not attach importance to the sector of activity, product/service quality, and team of employees
[a]Significant coefficient at the threshold of 5%
[b]Significant coefficient at 10% threshold (Ns) non-significant coefficient

difference in mean score between these two samples is not significant ($p < 0.891$). Consequently, the quality of the product/service has no appreciation for the continuity and survival of the companies. The result of the Mann-Whitney Wilcoxon equal scores obtained showed that two staff team groups vary in terms of the continuity and survival of businesses.The probability of being wrong in rejecting the hypothesis Nil is below the threshold of 0.05% ($p < 0.027$). We conclude that the team of employees with significant assessments on the continuity and survival of newly created companies (Table 3).

The impact of conditions linked to the business environment on the continuity and survival of newly created companies

The second step we wanted to verify logically is the hypothesis that the continuity and survival of firms can change according to environmental conditions and values (local location, regional location, export, number of customers, suppliers, and Agreement with public enterprises).

To test the variability of the newly created firms' survival according to each environmental condition, we used a test on the ranks of the scores on the two groups of the sample *(1 = favorable environmental condition) (0 = unfavorable environmental condition).* The test of rank scores on the local implantation confirms the rejection of the null hypothesis. This hypothesis is confirmed for the exact test ($p < 0.092$) at the risk of 10%. Indeed, there is a significant relationship between the local presence and the continuity of the newly created companies. We have using the same test on the variability of the survival of firms according to export shows that there is a significant difference between the two opinions (favorable/unfavorable) in terms of export. The Wilcoxon test indicates a value of 6.81 ($p < 0.02$). We can conclude that exporting significantly affects business continuity and survival. As for suppliers, the Mann-Whitney Wilcoxon test is significant, and therefore the assumption that suppliers affect the continuity and survival of newly created companies is verified. Finally, the test on rank scores, provided on the basis of the agreement with public enterprises is significant at the 1% threshold ($p < 0.004$). The continuity and survival of firms change according to the agreement or not with the public companies (Table 4).

Table 4 Results of Mann-Whitney Wilcoxon-Test: the business environment factor

	Number of observation		Sum of scores		Average scores		Mann-Whitney-test	
	N1	N2	SC1	SC2	M1	M2	Z[c]	*p*-value
Local	37	15	925	453	25.00	30.2	2.145[c]	0.092
Regional	27	24	700	626	25.93	26.08	−0.039	0.943
Exports	7	44	173	1153	14.71	26.2	6.81[b]	0.02
Number of clients	22	29	598	728	27.18	25.1	−	0.613
suppliers	16	35	474.5	851.5	29.66	14.33	5.215[b]	0.034
Public Conventions	17	35	423	955	24.88	17.29	7.548[b]	0.004
Business franchise	16	35	418.5	907.5	26.16	25.93	−0.052	0.959

Ns not significant coefficient
[a]Significant coefficient at threshold of 1%
[b]Significant coefficient at the threshold of 5%
[c]Significant coefficient at the threshold of 10%

The impact of the financial and material resources of the entrepreneur on the continuity and survival of the newly created company

The test of the scores of the ranks on the three indicators of the assembly of the financial file (structures of support and financing like the bank credits, the subsidies and the BTS). Besides, financing the equipment of the new company; the material means and the layout of the new enterprise during the first years of the life of the company. Thus, the results of our research confirm the rejection of the null hypothesis. Indeed, the Wilcoxon test has a value of 4478 at the 5% threshold ($p < 0.043$).

In other words, there is a significant effect of support structures on the continuity and survival of new firms. Then, to check the variability of continuity and survival of firms according to the importance or not of the financial capital at the start. That is to say that self-financing of the entrepreneur and his responsibility towards third parties during the first years of the life of the company. The result of the latter shows a ranking score of 29.11 for the sample of companies that attach great importance to the financial capital of the entrepreneur and 14.42 if they do not attach importance to the financial capital of the founder. The difference test on average score between these two business samples, taking into account the variable "financial capital at start-up", and significant at the 1% threshold. The same test of the importance of the social capital of the entrepreneur, that is to say the relational network that favors the life of the company. Indeed, some banks provide credit to entrepreneurs because of close relationships. This test indicates a significant mean score difference in terms of continuity and survival of the newly created firms, the Wilcoxon test has a value of 3.56 ($p < 0.069$).

These results show that the assumption that continuity and Survival of newly created companies change according to the importance given to the financial and material setup is fully valid (Table 5).

Measurement of the model with multiple regressions

In order to test factors influencing business continuity and survival, we used multiple regression tests at three levels:

The dependence intensity of each factor (enterprise characteristic, environmental condition, and the entrepreneur's financial arrangement) on the survival of firms, which is calculated using the correlation coefficient R.

Table 5 Results of Mann-Whitney Wilcoxon-Test: the financial and material factor

	Number of observation		Sum scores per ranks		Means of scores		Mann-Whitney	
	N1	N2	SC1	SC2	M1	M2	Z^c	Plus-value
Support structures	31	25	855	741	27.58	29.64	4.478[b]	0.043
Financial support	42	13	317.5	1222.5	29.11	14.42	7.398[a]	0.001
Social capital	43	13	1304.5	291.5	30.34	22.42	3.56[c]	0.069

N1: number of observations for companies that attach great importance to the financial and material arrangement of the entrepreneur

N2: number of observations for companies that do not attach any importance to the financing and material of the contractor

Ns non-significant coefficient

[a]Significant coefficient at threshold of 1%

[b]Significant coefficient at the threshold of 5%

[c]Significant coefficient at the threshold of 10%

The significance of the link and the quality of the fit of the model, which is assessed through the coefficient **R2**, as well as the Fischer test **F**.

Residue testing to reflect the accuracy of the model.

However, the interpretation of **R-2** must also take into account the number of explanatory variables and observations assimilated by the model. For this purpose, the adjusted **R-2** allows a more realistic appreciation of the results of the model. The multiple regression test, in this regard provided a significant result. Indeed, the value **F** is 8.849 with a probability p-value = 0.0041. It makes it possible to decide on the quality of the value between the two variables. At this stage, we verified three main relationships: the company characteristic, the environmental condition, and the financial and material arrangement of the contractor at the start.

The first review of the relationship between industry and business survival reveals a significant test. Indeed, the test shows a coefficient of the order of 0.756 at the risk of 10% ($p < 0.053$).

The results also reveal a significant relationship between the team of employees and the survival of firms. The multiple regression test shows a significant coefficient at the 5% threshold and allows us to conclude the acceptance (H1) proposing that the characteristics of the company significantly influence their survival and in particular increase the continuity and survival of newly created projects.

The second relationship we studied concerns the influence of environmental conditions on the continuity and survival of firms (H2). However, the relationship between linkage and absorption capacity indicates a significant test, the test reveals a positive and significant coefficient of dependence of 1.33 for the export variable, respectively, and a positive and significant coefficient of 0.918 for the variable "agreement with public enterprises".

On the other hand, the results show that the two variables conceived on the side of the "local implantation" and the "suppliers" have insignificant effects on the continuity and the survival of the companies. In this regard, we conclude that the hypothesis (H2) is partially validated.

Table 6 The robustness test. Independent variable: The survival of newly created company

	Coefficients	t-stat	p-value
Area company	0.756[c]	2.331	0.053
Role of employees	1.12[b]	2.437	0.045
Local implementation	0.303 ns	1.382	0.209
Exports	1.331[b]	2.55	0.038
Suppliers	0.29 ns	1.018	0.342
Agreement with public campanies	0.918[c]	2.151	0.069
Support structure	−0.286 ns	−1.539	0.168
Financial capital at start-up/self-financing	0.598[b]	2.859	0.024
Social network	0.97	3.401	0.011
Constant	−3.28 ns	−1.35	0.217
Fisher	8.849		
Adjusted R^2	51%		

Ns non-significant coefficient
[a]Significant coefficient at threshold of 1%
[b]Significant coefficient at the threshold of 5%
[c]Significant coefficient at the threshold of 10%

The last relationship we wanted to verify logically returns to the hypothesis (H3) relative to the influence that can have the financial arrangement of the entrepreneur on the continuity and the survival of the company. The multiple regression test provided a significant result. The results show that the two variables "financial capital at start-up" and "social capital" positively and significantly affect the survival of newly created firms at the 5% threshold. However, these results are frustrated by a non-significant effect on the part of the support structure on the survival of enterprises. Thus the hypothesis (H3) which postulates that the survival of newly created firms depends on the financial and material arrangement of the entrepreneur is partially validated (Table 6).

Discussion

This paper takes stock of the accumulated research on the newly created companies since the early work on new companies contributions to society emerged in the late 1970s and 1980s (Acs and Audretsch, 1987; Birch, 1979; Phillips and Kirchhoff 1989). A pivotal reason for the lack of consensus on the reasons, sources, and patterns of the continuity of companies is to found in the endogenous nature of the survival and other performance variables such as profitability and survival. To guide our analysis, we adopted an evolutionary perspective to explain the role of the characteristics of the new company for firm growth and survival. In the face of uncertainty, entrepreneurs use their financial resources to learn about their productivity and as the environment resource for investing in survival and growth. Our theorizing suggested that survival and growth depend on industry specific competition, the role of employees and the company area. Specifically, industries' innovation intensity was expected to be an important contingency of the relationship between competition and new firm survival, growth, and profitability. Our finding of the negative direct relationship between growth and subsequent survival is important as growth generally is seen as reflecting good fit with in evolutionary models and previous studies have found positive relationships (e.g. Phillips and Kirchhoff 1989). Additionally, growth is often times equated with positive new firm performance and in fact sales contribute to the growth and is the most measure of new company performance (e.g., Shepherd and Wiklund 2009; Short et al. 2009).

Our findings about the financial factor conclude that people starting with their own capital are as successful as those who start with debt capital (e.g., Holtz-Eakin et al. 1994a). Although banks select small business founders whom they grant with a loan very carefully, they have not succeeded in making this selected group more successful than the group of entrepreneurs starting with their own business capital. These results confirm the research of Holtz-Eakin et al. 1994b. The environment factor emphasis on the importance of the nature of clients, their number, and their location (Koschatzky Seger et al., 1997). It thus becomes clear that starting with individual customers is a factor of failure, while starting with other companies as customers is a factor of success. In the same vein, a too small or a very large number of customers is a strong failure factor. In the case of successful companies, these customers are located in national markets. Conversely, in the case of failing companies, customers giving more attention to international products than local.

Finally, the choice criteria for location are a factor in the success or failure of technological start-ups: choosing an implementation based on these economic criteria

leads to greater chances of survival than choosing to locate on more personal criteria. This result confirms all the research that shows the importance of externalities for activities based on innovation and technology (location and agglomeration effects), as well as the role of the regional context as a source of specific knowledge and expertise. (Audretsch 1998; Lasch et al., 2005), a too rapid internationalization being linked to high risks.

Conclusion

The aim of this work was to explore the survival factors of newly created firms. To do this we have mobilized the survival theories of the newly created company while taking into account theories that analyze the success and failure of newly created companies. In this paper, we studied the concepts around the new company. We based on theories that deal with the life cycle of the company, by which we talked about the survival of the newly created company that is a spiral between success and failure (e.g., Khelil et al., 2010).

We have used the factors related to the characteristics of the new firm and the characteristics of the entrepreneur in the theory of population ecology (of a deterministic nature), the theory of resources (of a voluntarist nature) and the theory of entrepreneurial motivation (of emotional nature). These theories offer a broad vision to relativize the dominant conception of success centered on the entrepreneurial context and the social capital of the entrepreneur. While taking into account the financial dimension of this theory, the factor of financial resources is used (Bruyat 1993, Bruno and Leidecker, 1988, Everett and Watson 1998, Smida and Khelil 2010). This phenomenon is multidimensional because it is appreciable from several obvious variables. It is multifactorial in the sense that entrepreneurial failure is not the exclusive consequence of a single causal factor, but the result of a conjunction of several explanatory variables which according to our theoretical framework, revolve around three dimensions: environmental context, own resources of the company and motivation of the entrepreneur (Khelil et al. 2012).

Indeed, the SMOCS model of Smida has treated the life cycle of the company well. However, Smida has studied failure, success, and survival in most of his articles and at different times. As an indication, Smida (1992), (pp. 59–62) originally designed the SMOCS model to delimit and study the different combinations of futures. This research led us to conclude that this literature refer to the success by citing often combines the success factors of the company which are resulted after the survival of the company. This eliminates the explanation of the entrepreneur's figure and focuses on what ends up. So, this research is part of the analysis of the facts of the entrepreneur, his actions to lead his business life.

The survival of the company can be well explained by the links established by the entrepreneurs between them and distant markets and the analysis of the role of export agents. Moreover, intense competition marks horizontal relationships between new firms, which is all the stronger as barriers to entry are low. However, the latter can be achieved in areas such as the technical training services sector or in the case of large companies benefiting from capacity subcontracting. These include the benefits of market access and skilled labor, the use of advanced technologies and the desire to benefit other less developed counterparts, and intensive inter-firm cooperation.

Concerning the strategy of companies, especially small businesses are strongly conditioned by the motivation of the entrepreneur, as Julien and Marchesnay (1996) have shown that perceptions and decisions are influenced by entrepreneurs' economic preferences and social references. As demonstrated, for example, Bertrand in his thesis (1996). Despite its structural weaknesses, the new company has the highest growth rate dynamism that can be assessed in terms of job investment. Besides, cheap labor is of quality.

From a methodological point of view, we used the Mann Whitney Wilcoxon test as a method of analysis because of our qualitative data and nonparametric tests should be applicate. Our data analysis method is the SPSS 20. Thus, our research can be described as both qualitative and exploratory. The data analysis method helped us by correlation matrix tool and multiple regression. That's why we found relevant results regarding the acceptance (H1) proposing that the characteristics of the company significantly influence their survival and in particular increase the continuity and survival of newly created projects. Then, we concluded that the hypothesis (H2) is partially validated.

There is also the hypothesis (H3) which postulates that the survival of newly created firms depends on the financial and material arrangement of the entrepreneur, this hypothesis is not validate because the incubators of the new companies do not want to finance there for a long time. Also, the banks don't accept to finance a new company's, they haven't a trust and safeguards of solvability. Therefore, our results which are based on the multiple regression include that the characteristics of the new company as the characteristics of the entrepreneur and his self-financing influence her continuity for a long term such as the innovation and the role of the employees.

Research perspectives

The work carried out in this paper has important methodological, theoretical and technical limitations. First of all in terms of methodology, our bias towards the qualitative approach suffers from the recurring criticisms addressed to this method and even more so when it is integrated into techniques very little accepted in the community such as the Mann-Whitney test Wilcoxon. This is why we are looking for a more adequate method of data analysis. In the same vein, our choice of semantic analysis and comprehensive interpretation based on the interpretative paradigm suffers from similar reservations. On the other hand, our posture of the transversal disciplinary combining various social and human sciences and it is reprehensible from superficiality. This is a part of the risks incurred and assumed in the exploratory phase of research, the apprentice-researcher who wants to discover the scientific home in all the latitudes.

Moreover, the specific legal and financial status of new firms reduces comparative protocols for large enterprises. Finally, to a lesser extent, the quantitative and qualitative shortcomings of the available data as well as the sample may undermine the credibility of the approach as well as the results of the research.

On the theoretical level, since the study of the determinants of the success of the company is linked to failure, a whole field of study remains to be explored in the field of space science. In addition, analyzing the firm's praxeology in the temporal dynamics requires other methodological orientations, such as extending the sample to other entrepreneurs in various branches of activity, as well as involving other territorial players

and different stakeholders directly involved (e.g., Gérard and Dokou 2001). With regard to certain studies on the available resources of new enterprises, some appear, and at times confirm, sometimes nuance the results of our life stories. Our interpretations lead us to approach the theory of resources to the theory of organizational development. However, non-economic factors such as the concept of social capital. It is defined as "the non-financial part of the company's assets", the desire to succeed, for example. On the empirical level, an important work of deepening should be carried out within a multidisciplinary team, with the help of mixed software in order to analyze the quantitative and qualitative analysis data.

Additional files

Additional file 1: Supplementary material. (PDF 47 kb)

Additional file 2: Questionnaire about the survival factors of newly created companies in Tunisia (Case of the Sfax Region). (DOCX 16 kb)

Availability of data and materials

Data and supporting materials for this research are attached as Additional files 1 and 2. More information shall be provided in the Additional file 1.

Authors' contributions

Our contribution in this paper is to encourage entrepreneur to build companies with success. This study has may create opportunities for future researchers in entrepreneurship. For instance, the study only addresses a particular type of business incubation center as the banks within the Region of Sfax Future research could examine, and even compare, different business incubation centers in different geographies. Therefore, after testing the propositions with the data collected by the new entrepreneurs. We see how the effort of the entrepreneur to survival his company. The aim in this research is to use the test of Mann-Whitney Wilcoxon in the qualitative analysis. It is a good method to help researchers to finding the relation between the causal conditions. Both authors read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

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