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Life expectancy and success of entrepreneurship in Costa Rica

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ÍNDICE DE CONTENIDO

Summary

Studying nascent entrepreneurship is highly relevant to modern society. However, it is not helpful for the economy if such entrepreneurship dies fast in the market. For this reason, it is pertinent to analyze the factors that affect the life expectancy of entrepreneurship. This work evaluates the success of entrepreneurships in Costa Rica using data from The Global Entrepreneurship Monitor (GEM) for the following years: 2010, 2012 and 2014.

A Probit model was used for the estimation, which defines the age of the company as a dependent variable, and the characteristics of the entrepreneurs as explanatory variables.

It was found that successful entrepreneurs displayed the following statistically significant characteristics: men of mature age, with fear of failure, whose companies use updated technology, whose clients consider their products as non-novel, and located far from the Central region of the country.

Additionally, the results showed the factors that affect nascent entrepreneurs are not decisive for its success. The above suggests that the entrepreneurship success requires two phases. First, an initial stage, in which the factors of its birth do not ensure its survival. Second, a long-term phase for the entrepreneurship consolidation, in which deeper capacities as technology, clientele, and experience are required.

Introduction

When analyzing entrepreneurship as an economic and social indicator, the emergence of new companies is the central axis to consider. However, it is essential that these startups not only find success and consolidate in the market, they also need to survive long enough to achieve their goal. There are many studies about the success of new entrepreneurships from North America and Europe; nevertheless, Latin America has been unjustifiably ignored (Halabí & Lussier, 2007, p.34). This work contributes to the generation of studies about the success of entrepreneurship in this region, particularly for a relatively open and small economy such as Costa Rica.

Therefore, the analysis of the entrepreneurship's life is highly relevant. For Schumpeter, a pioneering author on this topic, the life of companies starts with a defined idea and a purpose, and ends when both have been reached. However, a company's life can be extinguished before completing its cycle, either by becoming obsolete or by having stopped innovating, due to operational failures, many of these from initial stages (Schumpeter, 1939).

Examining the life expectancy, or average years of life of new companies, represents a preliminary analysis of the entrepreneurship success. This is relevant, particularly for the Costa Rican economy, because despite the fact that by 2014 Costa Rica achieved an entrepreneurial rate over 11%, the business establishment rate was only 3%, for the same year (Adamson & Varela, 2016).

The above reflects the importance of deepening on both perspectives. For one hand, the elements that influence entrepreneurs in the use of business opportunities. For the other hand, the elements that affect the market consolidation of the startups. Otherwise, all the social and economic advantages of entrepreneurship will be limited.

All these factors together add relevance to the need of answering the following question: Why do some enterprises succeed in consolidating and others not?

This document seeks to answer that question through the analysis of the influential factors in the success of entrepreneurships. In order to achieve it, we define successful entrepreneurship as the one which has been established as a business. For GEM, a startup is established business when it has survived the "Valley of Death", or in other words, it has exceeded a period greater than 42 months. Consequently, if the entrepreneurship does not survive 42 months, it is considered as failed or dead. This definition has been used by various exponents on the subject, such as Arenius and Minniti (2005), Levie and Autio (2008), among others.

The article is organized as follows. First, we present the main theoretical aspects about the topic. Next, we describe the data and explain the methodology. Finally, we show the results and present our conclusions.

Theoretical framework

In order to deepen the topic, it is essential to understand and differentiate key concepts, such as innovation, entrepreneur, and entrepreneurship.

In his book about economic cycles, Shumpeter (1939) defines innovation as the creation of a new production function, mainly as a consequence of a new market commodity, a new organization (or a fusion), a new market opening, or a new production inputs combination. An entrepreneur is an individual who creates innovation (Shumpeter, 1939).

Important analyses has been dedicated to the study of entrepreneurs' behavioral factors and subsequently, to the emergence of new enterprises. As a consequence, three trends or explanatory approaches are highlighted:

a) Previous knowledge of the people;

b) Opportunities perception from people and;

c) Environment in which people interact.

Knowledge has been one of the main analysis factors of entrepreneurship. For Hayek (1945), the economic problem is more about the use of the knowledge that people have over the resources assignation. Therefore, every person has an advantage over others, which is a unique knowledge about the use of the information in a determinate moment (Hayek, 1945).

But the knowledge generation has an economic equilibrium issue. It is true that knowledge can be improved by the innovation, but it is also true that knowledge is maximized when it is shared. However, the free access to knowledge disincentives its generation. Therefore, knowledge will not maximize its use if it is not shared. However, there is no incentive to create knowledge for free-sharing.

Clercq and Arenius (2005) found that the likelihood for an individual to participate on an entrepreneurship is related to both their own knowledge and the knowledge acquired from interaction with other entrepreneurs. Meanwhile, Arenius and Minniti (2005) said that skills of each entrepreneur are very important for the entrepreneurship. However, they do not clarify if those skills exist before or after the entrepreneurship.

Shane and Venkataraman (2000) point out the perception of opportunities as a key factor in entrepreneurship. Which depends on two large categories. First, the possession of the previous information necessary to identify an opportunity. And second, the cognitive properties necessary to assess that opportunity. In addition, they emphasize that according to empirical evidence people differ in their ability to identify opportunities.

A third factor to consider is the environment in which the entrepreneurship is generated. According to Amorós, Cristi, and Minniti (2012), there is a volatility of entrepreneurship driven by necessity, and this differs between countries, obeying the quality of the Government. Entrepreneurship is usually the result of situations in which the environment of a country is not driven by entrepreneurial opportunities.

Koellinger (2008) affirms that the capacity for business innovation cannot be explained only by individual specific factors. Consequently, he concludes that business opportunities often have an objective component (information generated in the environment), instead of being a specific product of the creativity of the entrepreneur. He also finds a significant influence of various characteristics at an individual level such as education, employment status, and self-confidence.

In the same line, to answer the question: Why, despite the similarity of conditions, does entrepreneurship flourish in some regions and not in others? Minitti (2004) argues that economic characteristics explain only a part of the variance of the rate of entrepreneurship between regions. Entrepreneurship tends to concentrate geographically partly due to the social environment. When individuals make decisions they follow social cues and are influenced by what others have chosen, especially when they face ambiguous situations.

These three positions reflect the historical debate that has been held over time. The knowledge of the entrepreneur, their abilities to detect opportunities, or the environment in which the entrepreneurship is developed. Which of these is the key factor that determines the success of a new company? Or, is it a combination of the three?

While it is true that the total early-stage entrepreneurial activity (TEA) is relevant, the successful entrepreneurship could be even more important. A successful entrepreneurship can continue competing and generating the socio-economic benefits associated with it.

Analyzing this last idea, Gompers et al. (2008) investigate the probabilities of success in a new business and suggest that those who have already achieved success in the past are more likely (30%) to consolidate a new firm. In contrast, those who start their own business for the first time only have an 18% of chance to survive. Additionally, those who failed previously, now have a probability of success of 20%. This establishes the idea that success leads to more success (indicated as success-success); and the same applies to failure (failure-failure). Gompers et al. (2008) also argue that failed entrepreneurs with administrative deficiencies may not assume their lack of administrative and other skills, and they tend to change sectors. Following the same practices and with the same skill shortages, these failed entrepreneurs tend to continue reproducing failures.

Gompers et al. (2008) used a Probit model with success as the binary dependent variable. However, this is not the only tool used so far. More recently, Halabí and Lussier (2011) proposed an ordered Probit model to distinguish between three types of entrepreneurs in Chile: mediocre (with average success), successful (exceeding the average), and failed (zero success). Their starting point is that measuring the success of entrepreneurship as a dichotomous variable is unrealistic, given that it is understandable to consider different percentages of success (not just the extremes of 0% and 100%). However, this methodology contains a factor of subjectivity. The indicator is derived from a survey question where entrepreneurs, by themselves, must classify their earnings as superior, inferior, or average. These results could reflect how the entrepreneur wishes to be perceived with respect to that definition of success. Their empirical results seem to confirm the important

influence of the social environment (family or friends with entrepreneurships). Also, authors affirm that to achieve success it is crucial to have sufficient working capital and to possess management tools and skills. Once again, the financial element and the managerial capacities are empirically validated as determinants for the success of an emerging entrepreneur.

Djankov, Qian, Roland, and Zhuravskaya (2007) use the years of survival in the market as a gradual measure of success for entrepreneurships. Using data extracted from their own survey (Brazil), they analyze the influence of certain characteristics of entrepreneur's family nucleus. They conclude that the temporary success of business is found in people with a higher cognitive level, with greater aversion to risk, and whose parents or friends hold management positions. A curious detail about this research is that the authors use their own definition of intelligence and risk aversion.

More recently, Klucznik-Törö (2014) found that within the particularities of entrepreneurs' successful are personal characteristics such as creativity, imagination, risk aversion, alertness to possible changes, motivation, innovation, and efficiency. The author also points to objective characteristics such as formal education and work experience. His results are consistent with other previous studies.

Halabí & Lussier (2007) make a relevant effort to systematize the literature on success and failure of entrepreneurships. They review a wide variety of studies, focusing on 15 factors or variables: working capital, financial control and transaction records, industry experience, management experience, planning, professional advice, formal education, personal ("staff"), timing of correct entry to the industry, economic activity, age, partners, type of parents, minority membership, and marketing effort. The authors indicate that there is no list of accepted variables to distinguish success from failure (Halabí & Lussier, 2007). Some variables are significant in some studies and not in others. However, the planning variable seems to achieve a greater consensus regarding its influence on the success of the entrepreneurships.

In the case of Costa Rica, previous research has focused on the determinants of the nascent entrepreneurship. It was found that cognitive factors such as fear of failure, self-perception of specific skills, and perception of opportunities are not only statistically significant, but also very influential (marginal contribution) for the conception of entrepreneurships (Adamson et al., 2017). However, the relevant components in the consolidation process of such entrepreneurships have not been investigated.

With this paper we try to reduce the lack of research about the life expectancy of entrepreneurships in Cosa Rica. First, by determining which factors influence the successful of entrepreneurships, and which factors affect the death of companies. And second, by making a comparative analysis between the factors that are relevant in the entrepreneurship emergence and those factors relevant for its consolidation.

Data and methodology

The data used come from the Global Entrepreneurship Monitor (GEM) , a dual initiative between the London Business School and the Babson College. GEM conducts surveys in different countries, in order to determine the conditions of current startups, as well as the conditions and opportunities to launch an entrepreneurship in the short term.

GEM surveys select the sample from two differentiated populations. On the one hand, they make a random selection of adult population for a minimum of 2000 people per country; these surveys are called APS (Adult Population Survey). On the other hand, GEM selects experts in the field of entrepreneurship; in this case, 36 as a minimum, these surveys are called NES (National Expert Survey).

Since this work seeks to analyze the life expectancy of startups, we only use adult population surveys. APS measures competitiveness through questions such as the percentage of customers located outside the country (export capacity), the level of innovation in the product or service offered, the existence of companies that offer the same product or service, and the age of the technology used in the production process (innovation). In addition, it includes personal information of the respondents, such as sex, age, academic degree, among others.

We use APS data from the years 2010, 2012, and 2014. The final sample contains 1,233 individuals from 2010; 1,597 individuals from 2012; and 1,396 individuals from 2014; for a total amount of 4176 individuals.

A Probit model is used to run the model. The age of the company represents the depending variable. Therefore, a company is classified as successful (consolidated in the market) if its age exceeds 42 months of life. Reciprocally, if the company dies before reaching that threshold, it is considered as an unsuccessful entrepreneurship. The explanatory variables correspond to characteristics of the entrepreneurs, coming from the data compiled in the APS, as mentioned above.

It should be noted that using the 42-month threshold as the definition of success outlines some limitations. For example, specific cases can exist in which a company achieves its success before the threshold. In addition, a company can fail after having exceeded that threshold. This situation can be found in many different studies, such as economic growth studies. There may be cases of countries that reach high growth rates in an isolated period, contrary to their normal behavior. Meanwhile, other countries with promising growth show lower parameters because, at the time of the study, they faced a particular situation or still did not reach their potential growth.

The main reason why this threshold of 42 months is used is because of the importance that it has received in existing literature, demonstrating it as the period in which most of the entrepreneurships perish, for this reason it has received the name of "Death Valley" .

A relevant finding of this research is that endogenous variables of the entrepreneur are not relevant for the entrepreneurship consolidation (they are not statistically significant at a level of 5%). This contrasts completely

with what was found in the study of the emergence of companies in Costa Rica (Adamson et al., 2017), where the cognitive factors were highly important in new entrepreneurships.

The perception of having specific skills (required by the entrepreneurship) and the fact that the economy presents favorable opportunities were not statistically significant variables for the entrepreneurship consolidation. Appendix 1 presents the detail of the model results.

In the same way, the perception of market competition was not statistically significant. This seems to reflect that, during Death Valley, entrepreneurs are more concerned about their own development than about competition (Appendix 1).

The fear of failure was significant in both studies, however, in opposite directions. According to the new entrepreneurship study (Adamson et al., 2017), being afraid of failure decreases the probability of starting an entrepreneurship. In this case, being afraid increases the probability of success or consolidation. This may reflect that to consolidate an entrepreneurship, much more prudence is required than to gestate them.

The specific year variable was not significant. In that case, it seems to suggest that entrepreneurship consolidation factors do not depend on specific economy condition in a particular year, but it is a long-term process.

Results also shows that another endogenous variable such as income - which did turn out to be statistically significant in the determination of the nascent entrepreneurships (Adamson et al., 2017) - does not significantly influence the success or consolidation of entrepreneurships. Formal education, as in the case of nascent entrepreneurship, does not show statistical significance, so it does not seem to influence the level of success or consolidation of the entrepreneurships. In addition, experiments were conducted seeking to identify some non-linear education relationship, which also did not show any statistical significance.

Having relatively new technology (from 1 to 5 years old) and customers' perception of the product as not technologic resulted statistically significant for entrepreneurship consolidation (Appendix 1). These results are not necessarily contradictory for two reasons. First, the technology used in the production is not always reflected in the final product. Second, the result of such production does not necessarily reach the market as a novelty, since the product or service can solve simple needs or also needs already covered by others. In other words, a new or cutting-edge technology not necessarily implies a novel product. On the other hand, customers can catalog a product as non-novel only because they know of its existence from before.

Exporting the product is not significantly relevant for the consolidation of entrepreneurships in Costa Rica. This seems to indicate that entrepreneurships are focused on serving local market needs. Also, entrepreneurships could be targeting niche markets mainly related to non-tradable goods or services, at least in the non-exportable sector. This could suggest that micro or small businesses do not achieve a production level large enough to

generate economies of scale. Therefore, their production costs are not lower than international export prices, or their efficiency levels do not allow them to compete and subsist in the international export market.

The above would imply that despite the Costa Rican governments' effort to accentuate the trade liberalization in the last decades; entrepreneurs, in a majority, may not be able to compete in other countries' markets.

It was found that the geographical location of the enterprise affects its success (Appendix 1). The results show that being outside the Central region favors the consolidation of firms. This can be explained considering that the Central region of the country contains a more competitive market and, therefore more complete, with fewer spaces for the survival of new companies. It is in this market, where the presence of imported goods, as well as the national consumption, is more intensely concentrated.

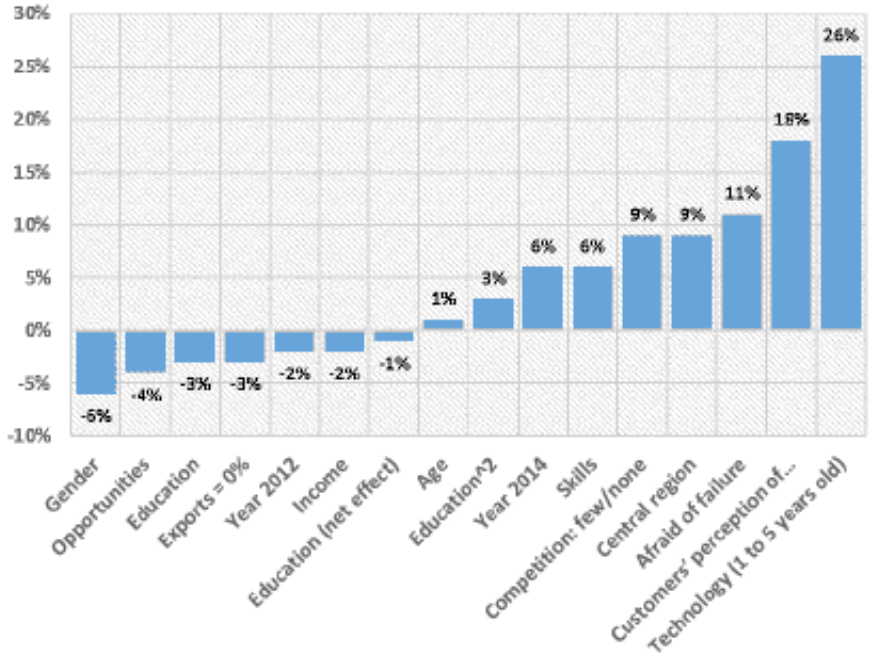
This result is contrary to what was stated by Minitti (2004), who argues that entrepreneurship tends to concentrate geographically, partly due to the social environment. According to Minitti, individuals consider social cues when make decisions, they also are influenced by what others have chosen, especially when faced with ambiguous situations. This difference of arguments can be explained considering that the explanatory variables of entrepreneurship consolidation differ to the explanatory variables of entrepreneurship birth.

In relation to the physical characteristics of the entrepreneur, the age was found to be highly significant (1%) for entrepreneurship consolidation (see Appendix 1); unlike the case of nascent entrepreneurships where it was not significant. Thus, evidence supports the highly relevant of the experience in the business consolidation.

Also, gender is significant at 10% (Appendix 1); However, contrary to the case of nascent entrepreneurship, the empirical evidence shows that entrepreneurships promoted by women have a lower probability of survival (they reduce the probability of consolidation by 6%, see Graph 1). If these results are compared with those obtained by Arenius and Minitti (2005) in their nascent entrepreneurship research, it is observed that they coincide with sex, but not with age, since the authors found that entrepreneurship is fundamentally a game of young men.

While it is enlightening to determine what variables are statistically significant in the entrepreneurship consolidation probability; it is also important to determine or isolate the size or contribution of those variables (marginal) in said probability. Graph 1 shows variables marginal contributions, in percentage points. Details of the estimation of this graph are presented in Appendix 2.

GRAPH 1.
MARGINAL EFFECTS (MARGINAL CHANGE IN PROBABILITY, %) OF THE VARIABLES IN THE PROBIT MODEL OF SUCCESS OF THE ENTREPRENEURSHIP IN COSTA RICA



Source: Own elaboration with information from GEM database (Appendix 2).

When analyzing the marginal contributions in the entrepreneurship successful probability, it was found that the presence of technology (with five or less years old) is the factor that most positively affects the results. The fact that an enterprise passes from not disposing to dispose of technology remarkably increases its probability of survival to the Death Valley by 26 percentage points. So, technology does matter in terms of survival of the ventures in the market.

In the same way, the probability of success increases by 18 percentage points if the client does not consider the product as novel. In addition, the probability increases by 11 percentage points if the entrepreneur behaves with fear of failure. Finally, the probability increases 1 percentage point for each year of age added by the entrepreneur.

Between the negative effects highlights the geographical location. If the entrepreneurship is located outside the Central region, the probability of success increases by 9 percentage points.

This increase of almost 10% in the likelihood suggests that, outside the Central region, entrepreneurships face favorable economic conditions (labor, inputs, markets niches, etc.) that allows them to consolidate with a greater probability. Finally, another factor that reduces the probability of entrepreneurship consolidation is the female gender condition, by 6 perceptual points, which may suggest unequal conditions between genders.

We found that a startup is more likely to be successful if its entrepreneur meets the following characteristics: men of mature age, afraid of failure, with updated technology, whose clients do not consider them novel, and located far away from the Central region of the country.

Conclusions

We demonstrated that the key elements in the gestation process of a new company in Costa Rica differ from the determinants of the entrepreneurship consolidation. In the first case, the factors of perceptions about abilities and opportunities are highly significant, as well as other exogenous factors, such as the time window in which it develops. However, in the case of the entrepreneurship consolidation, the availability of relatively new technology exerts a high contribution in the probability of success. Even the fact that the product is not novel, which could reflect some type of knowledge / loyalty to the brand of the product. Everything indicates that survival depends more on technology than on perceptions of skill and market opportunity.

These marked differences between the factors that influence the creation and permanence in the market of companies is an important finding. Conditions such as open economy and competition are crucial for nascent entrepreneurships, but not for their consolidation. This reflects the need to analyze and attack these two issues in a differentiated way. Because, it is possible that a variable explains very well the appearance of new entrepreneurs, however, it will not necessarily explain their performance.

In short, consolidating a business in Costa Rica requires much more than having specific skills, knowing how to take advantage of opportunities, and even being a risk lover can be counterproductive. Prevailing in the market seems to obey more to factors of productive and market type, highlighting the technological strengths. In other words, to survive in the Costa Rican market and achieve a longer life expectancy require more than intentions and decisions. Everything points to the need to generate real technological skills, to have the experience to cross, though with great prudence, the dreaded Death Valley.

It is important to review if the structures and ecosystem for entrepreneurship are stimulating more of the masculine entrepreneurship, or if the results are reflecting a greater burden on household responsibilities left to women, and/or less possibility of access to training opportunities and other aspects. This is a very significant aspect to investigate since it would indicate important barriers for the consolidation of entrepreneurships led by women.

It is highly recommended -as future lines of research- deepen even more in the analysis of success. Although it is true, the entrepreneurship consolidation variable (more than 42 months) has been widely used as an indicator of success, it is important to extend the concept of success and at the same time focus more on the failure variable. Detailing in the reason of the exit from the market (lack of profitability or other) would allow a sharper vision about what is happening.

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Appendix

APPENDIX 1
RESULT OF THE PROBIT MODEL OF ENTREPRENEURSHIP SUCCESS IN COSTA RICA

METHOD	PROBIT	
Dependent variable	**Established (binary)**	
Constant	**-0,663**	
	(0,225)	
Skills	**-0,183**	
	(0,299)	
Afraid of failure	**0,333**	**
	0,025	
Opportunities	**0,140**	
	(0,282)	
Gender: female	**-0,222**	*
	(0,089)	
Age	**0,019**	***
	(0,001)	
Income	**-0,061**	
	0,156	
Education	**-0,107**	
	(0,506)	
Education^2	**0,010**	
	0,497	
Central Region	**-0,287**	**
	(0,040)	

Year 2012	**-0,075** (0,711)	
Year 2014	**0,183** (0,382)	
Technology (1 to 5 years old)	**0,706** (0,009)	***
Customers' perception of the product as not technologic	**0,510** (0,018)	**
Exports = 0%	**-0,098** (0,656)	
Competition: few/none	**0,275** (0,193)	
Model adjustment	13%	
Prob (likelihood ratio)	0,00	
Sample size	491	

Notes: Significance levels are presented as follows: *** (1%), ** (5%), * (10%). The p-value of each coefficient is indicated in parentheses. The model adjustment corresponds to McFadden's R^2.

Source: Own elaboration with information from GEM database.

APPENDIX 2
SUCCESS OF THE ENTREPRENEURSHIP IN COSTA RICA, MARGINAL EFFECTS OF THE PROBIT MODEL

VARIABLE	AVERAGE INDIVIDUAL	NEW VARIABLE VALUE	EXPECTED PROB.	PROB. AFTER Δ	MARGINAL EFFECT IN P.P.
Constant	N/A	N/A	22,56%	22,56%	0,00%
Skills	1	0	22,56%	28,44%	5,88%
Afraid of failure	0	1	22,56%	33,73%	11,17%
Opportunities	1	0	22,56%	18,57%	-3,99%
Gender: female	Male	Female	22,56%	16,48%	**-6,08%**
Age	40	41	22,56%	23,14%	0,58%
Income	4	5	22,56%	20,78%	-1,78%
Education	4	5	22,56%	19,47%	-3,09%
Education^2	16	25	22,56%	25,30%	2,74%
Education (net effect)	4	5	22,56%	21,99%	-0,57%
Central Region	1	0	22,56%	32,06%	9,50%
Year 2012	0	1	22,56%	20,39%	-2,17%
Year 2014	0	1	22,56%	28,41%	5,85%
Technology (1 to 5 years old)	0	1	22,56%	48,12%	25,56%
Customers' perception of the product as not technologic	0	1	22,56%	40,38%	17,82%
Exports = 0%	0	1	22,56%	19,72%	-2,84%
Competition: few/none	0	1	22,56%	31,62%	9,06%