



**LISBOA
SCHOOL OF
ECONOMICS &
MANAGEMENT**

MASTER IN FINANCE

THESIS

DISSERTATION

DETERMINANTS OF INTERNATIONALIZATION ON PORTUGUESE START-UPS

CÁTIA SOFIA PEREIRA VIEIRA

OCTOBER – 2014



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PROFESSORA ANA ISABEL ORTEGA VENÂNCIO

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Abstract

The objective of this study is to analyse the most relevant determinants for the internationalization of start-ups from the individual and firm perspective. To address this goal, we use a matched Employer-Employee dataset combined with international trade data, which allow us to evaluate the firm's characteristics and which of the founders' demographic and educational characteristics affect the internationalization strategies for start-ups.

In terms of methodology, we use a Logit analysis to understand the impact of this determinants in exports capacity of new ventures. We can control our regression through the reference year, industry and municipalities.

In our conclusion, we can observe that the size of the new company, the gender and the education affect the internationalization process of start-ups.

Small start-up can have a negative result in the internationalization process and that male founders with ages between 40 and 49 years are the ones who conduct more start-ups for the internationalization.

Our results suggest that smaller start-ups with middle age founders, and with medium qualifications are more likely to exports in the first years of the start-up.

JEL classification: M13, L26

Keywords: Internationalization, Start-ups, International new venture, firm's age, founder's age, founder's qualification; exports, founder.

Resumo

O objetivo desta tese é analisar os fatores mais relevantes para a internacionalização de novas empresas através do desenvolvimento de um estudo empírico.

A partir deste estudo avaliamos a importância da internacionalização nas start-ups, examinando como as características educacionais e demográficas dos fundadores podem afetar o processo de internacionalização.

Em termos da metodologia, iremos recorrer a uma análise Logit, onde controlamos a nossa estimativa através do ano de referência, indústria e municípios. Nesta análise pretendemos entender de que forma a capacidade de exportação das start-ups é afetada pelas características da empresa e do fundador.

Desta forma, podemos observar que o tamanho da nova empresa afecta positivamente e algumas características sócio-demográficas e educacionais do fundador, como o género e a educação, afectam negativamente o processo de internacionalização das start-ups. E que os fundadores masculinos com idades entre os 40 e os 49 anos são os que mais gerem start-ups que se internacionalizam.

Sendo assim, podemos concluir que start-ups pequenas em que o fundador é jovem ou de meia idade têm mais propensão para exportar nos primeiros anos de vida das start-ups.

Classificação do JEL: M13, L26

Palavras-chave: Internacionalização, Start-ups, International new ventures, idade da empresa, idade do fundador, qualificação do fundador, exportações, fundador.

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All remaining errors are my own. Views expressed are those of the author and do not necessarily reflect those of any branch or agency of the Government of Portugal.

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Tables of contents

1. Introduction	8
2. Literature Review	10
2.1. Barriers to internationalization	12
2.2. Types of models of internationalization process	13
3. Theory and Hypotheses.....	14
3.1 Determinants of Start-ups: Empirical evidence	14
3.2. Hypotheses.....	17
4. Data and Descriptive Statistics.....	20
4.1 Data.....	20
4.2 Descriptive statistics	21
5. Empirical Methodology and Results	22
6. Conclusion	24
7. Bibliography	27
8. Tables	29
9. Appendix.....	39

List of Tables

Table 1: Determinants of internationalization process.....	30
Table 2: Incentives for the internationalization of starts.....	33
Table 3: Variables Description.....	34
Table 4: Descriptive Statistics.....	36
Table 5: Determinants for Start-ups Exports- Heckman Model.....	37
Table 6: Determinants for international start-ups- Logit model	38
Table A1: Determinants for internationalization of start-ups: Probit Model.....	40
Table A2: Determinants for internationalization of start-ups: Linear Probability Model.....	41

1. Introduction

Start-ups perceive the internationalization process as an opportunity to create value and grow their business organization across national border (McDougall and Oviatt, 1997). In fact, international new ventures are founded with foreign strategies or, at least with, the intent to engage early in foreign direct investment and export activities that coordinate multiple value-chain activities in many countries.

Advances in technology progress, in transportations system and the deregulation of markets made the international process simple and less risky, pushing new ventures to go abroad (Hitt, Ireland, Camp and Sexton, 2001; Andersson and Gabrielsson, 2004). Factor such as dynamic environment, intense competition and few homeland incentives affect the decision to internationalize.

However, this decision is also affected by internal factors, such as networking, high product technology, prior international experience of founder, dynamic capabilities and strategic planning.

In fact, start-ups do not survive without a supportive network of business associates because of their small size. Therefore a strong international connection helps them to initialize and develop their international activities (McDougall et al., 1995). Moreover, the dynamic capabilities allow start-ups to identify new opportunities and to quickly respond them (Jarvenpaa and Leidner,1998; Sapienza, Autio, George and Zahra, 2006). Prior international experience of managers also helps ventures to find solutions for problems in foreign markets (Eriksson et al., 1997). Moreover, the strategic planning is a crucial factor for internationalization because it helps ventures continually to review

their long-term plans and reduce the uncertainty (Andersson et al., 2004; Conference, Juan, and Rico 2002).

The technology has an important role in start-ups that want to internationalize. Previous literature suggest that high-technology start-ups tend to internationalize more early than others (Oviatt and McDougall, 1995; Bürgel et al., 1998).

In this study, we evaluate the main determinants of start-ups internationalization process in Portugal, by examining the start-ups and founder's demographic and educational characteristics.

Our research questions are the following: What are the determinants for international start-ups? ;Which are the start-ups profile that tends to internationalize in first years of their life?

In this study we will focus on Portuguese start-ups that have already international activities or that had started their international process 2 or 3 years after they were born.

Our data comes from two databases, the matched employer-employee and the international trade data (INE international trade database). And, our sample is divide in international start-ups and non-international start-ups. Our data covers all private firms in Portugal from 2004 to 2009 and it allows us to have detailed information not only on start-ups' characteristics but also on their founders' socio-demographic and educational characteristics. Our results helps to understand which determinants affect their initial international activities. Respectively, that exports are positively affected by small size of start-up and for founders` characteristics such as the gender, age and the educational levels.

The remaining sections of this study are organized as follows: The following section reviews the literature on international start-ups and it is followed by section III where

we exhibit our theory and hypotheses. In section IV, we describe the dataset and how it was constructed. The empirical methodology and results are described in section V. Finally, we present our conclusions in section VI.

2. Literature Review

In this section we analyze the concept of international entrepreneurship, then, the reasons for internationalization and the main barriers that affect it and we will finalize by analyzing the internationalization models.

Internationalization is defined as the expansion of a firm`s operations in foreign markets (Korsakienė and Tvaronavičienė, 2012).

International entrepreneurship ¹ is the process of creatively, discovering and exploiting opportunities in foreign markets to pursuit competitive advantages (Zahra and George, 2002). So it is a combination of innovative, proactive and risk-seeking behavior (Oviatt and McDougall, 2000).

Start-up age or timing of internationalization is the main factor that defines international entrepreneurship (Wright and Ricks, 1994). Researches refer that the international process start in the initial years of new ventures (Zahra and George 2002), or, until the first year of start-ups (Oviatt and McDougall,1995).

¹ This concept needs to be flexible to accommodate all the conditions that explain the internationalization decision, action and dynamic process (Westhead, and Ucbasaran, 2007). Previous literature has focused on antecedents of international entrepreneurship as socio-cognitive factors, patterns and degrees of internationalization, influencing the outcome of the born global venture (Solheim 2012).

International entrepreneurship is explained by strategic and environmental factors (Zahra et al., 2002; Wright et al., 2007). The strategic factors include competences and generic, functional and entry strategies² (Zahra and George, 2002). Environmental variables include industry characteristics, country institutional features, competitive forces and regulatory environment (Zahra and George, 2002).

An international new venture³ is a new venture that pursues international opportunities at an early stage, within three years from the foundation (Evers, 2011, Kuivalainen, Sundqvist, and Servais 2007; English and Wakkee, 2007). These start-ups create competitive advantages by coordination activities, in terms of international sourcing and resource building in multiple countries (Oviatt et al., 1995; English et al., 2007). Such firms not only respond to the globalizing market conditions but also act proactively upon opportunities to acquire resources and sell outputs in any country (Oviatt et al., 1995)⁴.

Actually, these start-ups, typically, use exports as an initial foreign activity when they want to enter new markets (Andersson 2004; English et al., 2007). Most studies refer that these firms are international when 25% of their turnover comes from international markets or exports (Kuivalainen et al., 2007). However, this is not the only criteria. Others argue that 25% cut-off ratio for exports is arbitrary and particularly low for small

² The researches refer that, in generic strategies, the unique products, differential and intangible product affect positively the internationalization process of new firms such as, in the resource-based theory of the firm, indicating that unique resources can intensify and expedite a firm international expansion. Besides, the R&D activities and networking are also considered important factors in international strategy these firms (Zahra et al., 2002). Functional strategies link the production, distribution and marketing planning with a successful international activity in start-ups (Zahra et al., 2002).

Entry strategies are crucial to initiate international activities. And small firms do not emphasize significantly their entry strategy as large-scale firms do. However, there are different types of alliances that can use appropriated entry modes for international entrepreneurship (Zahra et al., 2002).

³ International new ventures have also been named: global start-ups, born international, innovate exporter and infant international (Andersen 2004; Oviatt et al., 1995)

⁴ This type of start-ups has strong networks and high-technologies that help start their international process in initial of their business (English and Wakkee 2007; Oviatt et al., 1995; Solheim 2012).

countries. So it is not enough to have a global geographic scope⁵ (Knight and Cavusgil, 2004). New ventures in many cases become international when the multinational companies use the outsourcing to expand their foreign activities. These opportunities allow start-ups to become niche players' specialized (Wright et al., 2007)⁶.

2.1. Barriers to internationalization

Barriers to internationalization depend on the level of internationalization and include internal and external impediments (Korsakienė et al., 2012). As internal barriers, we have marketing and functional impediments (Korsakienė et al., 2012), namely those related to human capital, resources and capabilities that restrict the foreign activities (Souza, 2009). Marketing impediments affect start-ups capacity to price, distribute and promote a product or service in a foreign country (Souza 2009). As internal barriers, the lack of resources is seen as one of the main impediment to venture's activities abroad (Korsakienė et al., 2012). New venture have limited financial resources, regarding to financial investments or bank loans, and have higher costs with regular function of start-ups (Lumini, 2009). In fact, the small size and the yearly age of these firms, when they start to internationalize, increase the business risk (Korsakienė et al., 2012). In some way, the limited of management skills and the lack of marketing knowledge are also considered as internal barriers (Korsakienė et al., 2012). On the other hand, the communication issues linked to foreign language and the lower firm experience in international activities increase the difficulties to adapt in foreign countries. External

⁵ One half of small firms have 70 percent or more of total sales derived from exports (Anderson, 2004).

⁶ The necessity of bigger firms use the outsourcing when internationalize create the opportunity to SMEs become niche players specialized with a set costumers in a global scale (Wright et al., 2007).

impediments are environment factors out of the control of start-ups (Souza 2009). External impediments are related to the characteristics of foreign country such as: differences in consumer habits and long administrative procedures that increase the bureaucracy and make the business start-ups entrance difficult; the inaccessible market information, the foreign government restrictions (Korsakienė et al., 2012). Apart from these, the intense competition abroad and the higher risk in overseas markets are also viewed as important external impediments (Korsakienė et al., 2012).

2.2. Types of models of internationalization process

In literature there are two types of models to explain the internationalization process: The Uppsala Internationalization Model (U-M) and Innovation-Related Internationalization Model (I-M).

The Uppsala Model focuses on traditional cross-border behavior, where the firm learns and increases its international knowledge over time, mainly through experience (Andersen, 1992; Oviatt et al., 2005). Thus, firms start to export for countries that are physically⁷ and culturally close to home and that require less resources or less investment. Also, firms tend to expand in concentric circles to more distant countries (Edelman and Greene; 2002).

The I-M model sees the internationalization decision as an innovation for new ventures (Andersen, 1993). So, this model explains the internationalization process from an innovation-related perspective. The internationalization process is represented by steps.

⁷ The concept of psychic distance is related to factors preventing or disturbing the flow of information between firms and markets, such as, differences in language, culture political system and level of industrial development.

The level of them is directly related with experience or involvement of start-ups in the internationalization process. Although, the delimitation of steps and sequence of them are ambiguous, the higher levels happen when the firms have more experience. The movement between steps is related to a “pull” mechanism or internal change agent (Andersen, 1993). This model is restricted to manufacturing firms⁸ (Andersen 1993). Although both methods are used to understand the internationalization process, (Mcdougall and Oviatt, 2005), previous literature considers U-M Model the best method because it are more closed of startup reality. This model when applied to start-ups should include a new focus on network relationships involving customers and suppliers (Oviatt et al., 2005).

3. Theory and Hypotheses

3.1 Determinants of Start-up internationalization: Empirical evidence

The internationalization process of start-ups is determined by external and internal factors⁹.

External factors are considered the global vision such as the following examples : transactions costs, industry level, competition and the macroeconomic conditions of foreign market ¹⁰ (Zahra and George 2002). The strategy applied from manager/entrepreneur is influenced by them. The domestic environment factors and the

⁸ The firms are classified into various stages taking into consideration the few characteristics of their international activity.

⁹ These factors may determine the gains of entrepreneur in internationalization process.

¹⁰potential of foreign markets (Zahra and George 2002)

international competition provide spillovers¹¹ that can be leveraged by international new ventures. The start-ups look for internationalization firstly, as a way to reduce the business risk (Korsakienė et al., 2012). In most cases the national markets provide resources to entry the foreign markets mainly if they are geographically fungible.

The internal factors include individual firm's characteristics as the size, age, asset composition, management attitude and the industrial characteristics as seasonality of sales and business risk.

. The knowledge-intensity¹² of global start-ups was referred by Uppsala Model as a way to create competitive advantages in foreign countries, because it used to design new products, improve production methods and expand the efficiency of services delivery(Oviatt et al., 2005).

Another factor that is crucial for internationalization process is the network of a firm. It is a powerful tool for the entrepreneurs¹³ (Dubini & Aldrich, 1991) because it helps the founder of global start-ups to identify international business opportunities (Mcdougall et al., 1995)¹⁴. The network is used as a link with cross national borders to explore where and how quickly the opportunity can be exploited in foreign locations (Korsakienė et al., 2012;Mcdougall et al., 2005) . The extensive personal network among top management of born global is a way of overcoming constrains such as the lack of

¹¹ Spillovers are external activities that affect who is not directly involved.

¹²The management of knowledge is particularly challenging in a cross-national settings where different cultures, corporate governance systems, time zones and languages are involved (Kuemmerle, 2002).

¹³New ventures being resource poor are much more dependent than large mature multinational enterprises on a supportive network of business associate (Oviatt and McDougall ,1995). The authors stated that small groups of entrepreneurs and international new ventures use alliances and network structures as unique resource, providing sustainable advantages that are possible to transfer to a foreign location and to control a bigger percentage of vital assets.

¹⁴ McDougal et al.(1995), refer that network appeared to have more influence on the founder's country choice than psychic distance.

knowledge and the risk aversion (Solheim 2012). The global vision of managers is crucial for the global start-up to become quickly and successfully internationalized (B. M. Oviatt and McDougall 1995). The global start-ups, the founder's proactiveness and vision create the global mindset towards leading and managing their firms in international markets (Evers, 2011). Other factor that affects the internationalization process is the technological level of global start-ups. The technologies advances in transportations, communication and computer allow entrepreneurial actors to form new ventures that internationalize rapidly (Oviatt and McDougall, 2005).

So entrepreneurs have been motivated to take preemptive advantage of technological opportunities in foreign countries because they feared competitors would respond quickly to a new product introduction and prevent them from eventually going international if they initially competed only in their home country¹⁵.

The other fact that is referred by many researchers as an important factor that influences the internationalization process of global start-ups is the physical distance (Korsakienė and Tvaronavičienė 2012; Almor, Lane, and Bd 2002; Solheim 2012) .

International orientation¹⁶ is comprised of dimensions such as psychic distances of foreign markets, proficiency in foreign languages, travel abroad and risk tolerance (Manolova et al. 2002).

The psychical distance concept is determined by culture and geographic distance between countries (Almor, Lane, and Bd 2002). This research refers that the growth of international activities is a result of less perceived psychic distance. In fact, this loss of perception of psychic distance happens because firms gain experience(Oviatt and

¹⁵ See Oviatt & Mcdougall, 1995; Oviatt & Mcdougall 2005;Andersson 2004 et al.

¹⁶ The construct is related to global orientation of managers (Manolova et al. 2002).

McDougall ,2004). This experience will lead to further commitments in more distant markets, including equity investment in offshore manufacturing and sales operations(Almor, Lane, and Bd 2002).

Some scholars see the environment influences and industry conditions as prime factors to determine the internationalization involvement, because it influences the international entrepreneurial behavior (McDougall and Oviatt, 2005). We present more details about the empirical evidence and the descriptions of mains factors that affect the internationalization process of startups in table 1 and 2.

3.2. Hypotheses

Firm size is traditionally the main predictor of international activities (Andersson, 2004; H. Sapienza et al., 2006; Harms and Schiele, 2012). The initiation of internationalization process requires firms` new capabilities, structures and routines¹⁷ (Zahra, 2006). The researchers conclude that most of these new ventures can develop the dynamic capabilities necessarily to internationalize but, the little (or inexistence) reputation and history of excellence can affect negatively the process of entrance in foreign markets (Zahra, 2006). However, the environmental conditions are continuously changing and this fact affects the original structures of firms, as new ventures have more flexible and dynamic structures than older firms, so they can adapt more easily. In new ventures, the costs of developing new dynamic capabilities¹⁸ are low(Zahra 2006). Furthermore, to

¹⁷ For young firms the process is more complicated because they may do dual task of developing new routines and building networks in home and foreign market (Zahra,2006).

¹⁸ The dynamic capabilities viewed, as the Research-based View, focus on knowledge inventories, capabilities and resources as a source of competitive advantages and firm growth(Evers 2011).

internationalize a young firm¹⁹ adopts an entrepreneur orientation that involves the risk taking, proactivity and innovation (Lumpkin and Dess, 1996).

H1. The small size affect, more, the decision to start-ups internationalize.

McDougall and Oviatt (1995) refer that the international new venture looks for countries with strong educational infrastructures because it is crucial for them to have human resources with higher qualifications²⁰. This means that international new ventures invest many resources in their human resources, to get continual innovation from them (Souza ,2009; B. M. Oviatt and McDougall ,1995). This higher skilled professionals and continues training necessary for the internationalization process could be costly. And global start-ups²¹ have a greater financial risk associated to their higher investments in R&D (Lumini 2009). However Zahra and George (2002) refer that the internationalization of activities create opportunities to achieve gains and financial performance for these firms. So the competences of human resources, measured by the educational level of professionals, affect the capacities of global start-ups to internationalize.

H2. The high qualification of human resources influences more, the decision to internationalize for new ventures.

Andersson et al. (2006) referred, on knowledge based, that strategic choices and performance levels of organization can be viewed as a reflection of values and cognitive bases of managers/CEOs of company. So the importance of CEO's characteristics for international activities of new ventures is definitely a reality

¹⁹ For this type of companies, the small size create a difficult to access on resources and capabilities necessarily to enables economies of scale and scope (Coeurderoy and Tywoniak 2008).

²⁰ The unique knowledge is referred as intangible assets that allow this new ventures to get competitive advantages(Oviatt and McDougall 1995).

²¹ Lumini (2009) find evidences that this companies have difficulty to access of future return on investment (ROI).

McDougall and Oviatt (1995) explained the importance of a successful internationalization process, a global vision of managers and communication so that organizations can create a commitment of employees. Furthermore, the networking and the managers` experience are considered for many researchers as an essential tool for the successful global process(B. M. Oviatt and McDougall 1995)(Solheim 2012).

The international new venture, as any other type of start-ups are covered by pro-active managers that can use their ideas and personal network to go abroad (Wictor 2003, Andersson et al., 2004). However, this pro-active and innovative capacity is common in young generations of entrepreneurs that in mostly cases, don` t have the necessary life and professional experience to have a strong personal network.

H3. The young age of manager/CEO affects, positively, the process of internationalize in start-ups.

4. Data and Descriptive Statistics

4.1 Data

The data for our empirical study combined a matched employer-employee dataset (Quadro Pessoal-QP) with the international trade data (ITD).

QP are a mandatory survey submitted annually to the Portuguese Ministry of Employment and Social Security by firms with at least one employee. The dataset collects information from an average of 220,000 firms and two million individuals per year and virtually covers all employees and firms in the Portuguese private sector

between 1986 and 2009. The database have comprehensive information at the individual and firm level. At a firm level the database contains the following information: year of creation, size, industry and location. Some information about founders are also available such as: age, education, level of qualification, number of hours worked and professional activity. These data allow us to identify start-ups and their founders.

The QP-database lack international trade information; therefore, we supplement QP data with international trade database (ITD) from Instituto Nacional de Estatística (INE). This latter database are a mandatory survey that captures all the international firm transactions at product level, on a monthly basis, since the year 1990, when their volume of exports and imports are above a certain threshold²²(Kuivalainen, Sundqvist, and Servais 2007). These data allow us to gather comprehensive information about the international activity of start-ups.

We select all start-ups established between 2004 and 2009²³, and them identifying the founders and their career history. We restrict the founders with ages between 20 and 60. Then, exclude start-ups where we could not identify at least one founder. We ended up with a sample of 19318 portugueses new firms founded by 30528 entrepreneurs.

4.2 Descriptive statistics

A detail definition of the variables presented in our study is presented on table 3 (see page 34). In our study, we define an international start-up, a venture which exports

²² Threshold is 27,6% of total sales of firm (INE, 2002).

²³ In this period, the volume of new firms born, in Portugal, increase 18,6% (INE, 2012)

within their first three years. This definition is consistent with previous literature. In table 4 (see page 36) it is summarized the descriptive statistics of our sample.

We divide our data in international and non-international start-ups. In international start-ups are usually small and employ on average 4 employees and 2 founders. On average, 87% of international start-ups survive of their first three years. They export are, on average, 140,624.5 Euros between 2004 and 2009. The founders are mostly men (68 percent) and middle (with 37 years). Also, 97 percent have Portuguese nationality and the remaining 3 percent are foreign. Regarding to educational level only 19 percent have high education, 26 percent have medium education, 43 percent have low education and the remaining 13 percent have a very low education. Regarding the field of education, 24 percent of founders are from business and administration areas, 20 percent from engineering and 12 percent are from healthcare.

Non-international start-ups are distinguish of international new ventures in export activities, when in first three years of your life, the exports activities are, on average, 3315,6 euros. In survive, when 91% of them survive in first three years of their life. In gender, when 75% of founders are male. Regarding to educational level 21 percent have high education and 38 percent have low education, the other educational levels follow the international start-ups. Finally only 30% of founder are Portuguese in non-international start-ups that survive in their first three years of their life.

5. Empirical Methodology and Results

In order, to evaluate the determinants of start-ups to internationalize, we have used four different models: the Logit model, the Probit model and the Linear Probability model

and Heckman model, controlled for some variables such as the firm, the founder characteristics and the industry and municipally as fixed effects.

$$\text{International Startup}_{jf} = a_i + \theta_y + \gamma_m + \beta_2 X_{jf} + \varepsilon_{iy} \quad (1)$$

Where f denotes founder of start-ups, j refers to a start-up firm, y refers to entry year, m refers to municipally and i refers to industry.

The dependent variable international start-up is a dummy variable, equalling 1 if start-up exports in your first two years and 0 in otherwise. The model includes the vector X_j to control the firm's and founder's characteristics. The vector X_j include the size (logarithm of initial number of employees). The founder's gender (measured by 0 for male and 1 for female), the founder's age divided into four categories (*Age 20-29* is coded one for individuals with age between 20 and 29 years; *Age 30-39* is coded one for individuals with age between 30 and 39 years; *Age 40-49* is coded one for individuals with age between 40 and 49 years; *Age 50-60* is coded one for individuals with age between 50 and 60 years), foreign measured with dummy variable measured by one if the founder is Portuguese and zero otherwise); education is evaluated by four categorical variables: *verylowereducation* (dummy variable when one refers to individuals who have never attended or completed the elementary school), *loweducation* (dummy variable equaling for individuals that attended junior high school), *mediumeducation* (dummy variable, which is one for individuals recording a high school diploma or vocational school degree) and *higheducation* (dummy variable equals to one for founders with bachelors, masters or doctoral degrees). We also include the entry year dummies (θ_y) to control for entry year of start-up because we only want the new ventures that born after 2004; industry dummy variable(a_i), defined with fifty one

categorical variables for CAE in 2013 to 2 digit dummies to control the activities of this new ventures; municipally dummies (γ_m) to control for different opportunities at municipally level; ε_{iy} is the error term.

As the dependent variables is dummy variable, we use the logit model. Table 5 presents the marginal effects using a logit model.

With this table we can see that size negatively affects the decision to export. So, start-ups with large size tend to not internationalize n first three years of life. Hence this not reject our hypothesis 1. Regarding to the founder's demographic and education characteristics, the male, young aged (20-29) with medium education are more likely to start exports.

Hence, this reject our hypothesis 2, that refer high qualification as important determinant in founder's that decide to internationalize their new ventures. And not reject our hypothesis 3 that refer the young age of founder as important factor that affect the internationalization process of start-ups.

Founder's nationality is not statistically significant.

Table A.1.and A.2. in Appendix presents the estimated coefficient of the determinants of start-ups. Exports using probit and linear probability models. The main results not change except for founder's age. In both of models the age between 40 and 49 years old are statistically significate.

Next, we evaluate the amount of exports that a new venture decides pursue. To do so, we use the equation (1) but in this case the dependent variable is exports and it is measure the omitted variables bias that affect our model.

Table 5 presents the estimated coefficients for this specification using a Heckman Selection model. This model are used to reduce the bias of our regression and to

understand the variables that have meaning in our model. In this case the conclusions are the same when we use the logit model. However, in education of founders we see that, besides of high education, low education are statistically significant in our regression. This conclusion not reject our hypothesis 2 because the high education are more relevant.

6. Conclusion

The aim of our study was to evaluate the determinants on the internationalization process of start-ups within the first three years and the level of exports. We use a sample of Portuguese´s start-ups between 2004 and 2009.

Our finding has demonstrated that the small size of new ventures affect positively the choice of start-ups to internationalize. As Zahra (2006) refer, the small size of firms are more capable to develop dynamic capabilities that helps in international process.

So in this way, the small size of start-up has impact when new ventures choose to go abroad.

Regarding the characteristics of founders we can conclude that the founder´s age is also an important variable in our model. This variable has a positive impact on international sales, mainly for ages between 40 and 49. This is explained by middle aged founders that are more proactive to internationalize because they tend to have more experience and network than the younger ones, having also more predisposition and resilience than the older ones (Andersson et al., 2004).

The founder's gender tends to have a specific behavior according to our expectations. With our model we can conclude that the Portuguese start-ups that tend to go abroad are generally led for men.

The founder's education level appears to be statistically relevant for start-ups internationalization.

Bearing in mind all the models that we have analyzed, and take in consideration our hypothesis we can conclude, that in Portugal, the startups' founders that tend to decide for internationalization have age between 40 and 49 years old and can have a low or a medium education level.

Comparing our results to relevant literature about international process of start-ups, we find that our results agree that small size of companies are more receptive to international opportunities to develop your business. Regarding to founders characteristics, we see that our results agree with literature about founder's age and importance of founder's qualifications, in decision and beginning of international process for start-ups.

Data limitation confines us to the values between 2004 and 2009, when export values had an exponential growth starting 2010. This period was choose because we only have the exact match between matched Employer- Employee and International Trade Data for the period between 2004 and 2009. Previous empirical studies used questionnaires to retrieve variables that could explain the internationalization process of new ventures. Despite all the stated limitations, our study can provide founders and policy makers's practical guidelines. Firms and founders can project our internationalization, taking into account, the internal requirements that make this process more efficient and secure.

Policy makers can use this study to summarize the determinants of internationalization of new ventures and promote new incentives program to internationalization.

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8. Tables

Table 1: Determinants of internationalization process

Factors	Empirical support	Designation
International experience of Entrepreneurs	Manolova et al.2002, Sapienza et al. 2006, B. M. Oviatt & McDougall 1995, Benjamin M Oviatt & McDougall 2004,Solheim 2012,Andersson, Gabrielsson, & Wictor 2004	The international experience contributes to international development, because it can inject new inputs and ideas that can help the firm to create new routines in foreign markets.
Social networking	Englis & Wakkee 2007, (Lumini 2009), (Voudouris, Dimitratos, and Salavou 2011), (Benjamin M Oviatt and Mcdougall 2005),(Solheim 2012), (Evers 2011), (B. M. Oviatt and McDougall 1995), (Korsakienė and Tvaronavičienė 2012)	The network is used as a link with cross national holders to explore where or how quickly the opportunity can be exploited in foreign location. It used to identify the resources, the information, the capabilities and the access of exchange partners that enable a fast internationalization.The networks are established to allow a rapid and efficient internationalization (Korsakienė and Tvaronavičienė 2012).
International Orientation	B. M. Oviatt & McDougall 1995, Manolova, Brush, Edelman & Greene 2002, (Coeurderoy and Tywoniak 2008)	International orientation is comprised of dimensions such as psychic distances of foreign markets, proficiency in foreign languages, trips abroad and risk tolerance. The international orientation gives entrepreneurs a strong connection between international strategies and firms' outcomes .

Determinants of internationalization on Portuguese Start-ups

Size and Age	(Andersson 2004), (Almor, Lane, and Bd 2002)	Firm size and age have traditionally been used as the main predictors of firms' international activities.
Global Vision	(B. M. Oviatt and McDougall 1995), (Zahra and George 2002), (Evers 2011)	Global Vision is probably the most important characteristic found in entrepreneurs in international new ventures (B. M. Oviatt & McDougall, 1995).
Competitive Strategies (technological choices)	(B. M. Oviatt and McDougall 1995), (Zahra and George 2002),(Benjamin M Oviatt and Mcdougall 2005)	The technologies advances open the untapped foreign markets for new ventures (Benjamin M Oviatt and Mcdougall 2005). Technologies advances allow entrepreneurs to form new ventures that internationalize rapidly (Oviatt & Mcdougall, 2005). The technological progress establishes opportunities for entrepreneurs to create competitive advantages in foreign markets.
Financial Strength	(Zahra and George 2002)	The successful past organizational performance creates the slack resources needed to support international expansion. The financial position is a good reason for some new ventures to expand internationally to achieve a variety strategic goals.
Alliances and cooperative strategies	(Andersson 2004), (Zahra and George 2002), (Oviatt & Mcdougall, 2005)	The alliances in foreign markets can be an effective strategy to overcome the deficiencies of start-ups Face in resources and capabilities of expand their activities abroad (Andersson 2004).

<p>External Environment factors</p>	<p>(Zahra and George 2002),(Korsakienė&Tvaronavičienė,2012), (Andersson,2004)</p>	<p>The external factors include the transaction costs, the competitive and industry environment. The external environment has an impact on a firm's strategic choices (Zahra & George 2002,Korsakienė &Tvaronavičienė 2012) . The characteristics of the industry may significantly moderate the relationship between international entrepreneurships and the financial gains .</p>
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Table 2: Incentives for the internationalization of starts

<p>(COMPETE I²⁴)</p> <p>Objective : Giving financial help for international investments of start-ups. Increase the financial sustainability of new ventures in order to grow their productivity and competitiveness in the global market</p> <ul style="list-style-type: none"> · The projects can be individual or in group · Projects can only be accepted with minimum eligible costs of 25.000 Euros and maximum of 400.000 Euros (in case of individual projects) and 18.000 Euros x number of enterprises (in case of projects of enterprises associations); · This program covers 45% of eligible costs and: <ol style="list-style-type: none"> 1. 75% of costs with participation in international fairs: 2. 50% of costs with strategic projects of micro and small companies (except costs with fixed assets, intangible assets and technical employees' contracts 3. 80% of costs in professional education of their employees · The indivisible costs (publicity costs ,evaluation and dissemination of results) cannot spend more than 25 % of eligible costs nor more than 5% with human resources' costs · Life time 2007-2013 <p>For more information see:</p> <ul style="list-style-type: none"> ·Decree-Law nr.287/2007, 7th that approves the National System Framework of Encouragement for Investment. First change to Decree-Law .nr.65/2009, 20th March
<p>Portugal 2020</p> <p>Competitividade and Inovação program integrated in the Portugal 2020 program ,started in 2015 and will end in 2020. This program aims to increase the competitiveness of economy with intensive activities in knowledge, to invest in products and services to internationalize and develop the qualification and the export capacity of SMEs (and start-ups). This operational program has 6 priority axis and a budget of 6,2 Millions of Euros, focus on invest in technologies area, quality of employee and promotion of sustainability. This program was created taking into considerations the Horizon 2020.</p>

Think Global

· Think Global[2]: Create by SIAC- Support System Class Actions . Propose: Internationalization of start-ups. This project gives information and tools for help young entrepreneurs that wants internationalize to create their international network . The informational component of this program was complemented by a strategic role in the networking and international cooperation level.

Tabela 3: Variables Description

Variables	Description
Panel A: Firm Characteristics	
Exports	Exports activities of new venture between 2004 and 2009.
International Start-up	Dummy variable equaling 1 if a firm exports within their first 3 years.
Survival	Dummy variable equalling 1 if a firm survives the first three years, and 0 otherwise
Initial Size	Initial number of employees
Panel B: Founder's Characteristics	
Founder's Gender	Dummy variable, equalling 1 for men and 0 for women

24 Compete- Competitiveness Factors Operational Program - aims to sustainably improve the competitiveness of the economy as part of a European and global challenge. This program was integrated in QREN;

Quadro de Referência Estratégica Nacional (QREN)- provides the framework for implementing the Community's economic and social cohesion in Portugal in the period 2007-2013.

<p>Age Founder years of age at the establishing of the start-ups .With variable we construct four dummy variables.</p>	<p><u>Age 20-29</u> equals one for individuals with ages between 20 and 29 years; <u>Age 30-39</u> equals one for individuals with ages between 30 and 39 years; <u>Age 40-49</u> equals one for individuals with ages between 40 and 49 years; <u>Age 50-60</u> equals one for individuals with ages between 50 and 60 years</p>
<p>Education Founder education at the stablishing of the start-up. With variable we construct four dummy variables.</p>	<p><u>Higheducation</u> is a dummy variable (one for founders with bachelors, masters or doctoral degrees);</p> <p><u>Mediumeducation</u> is a dummy variable(one for individuals reporting a high school diploma or vocational school degree);</p> <p><u>Loweducation</u> is a dummy variable (one for individuals that attended junior high school);</p> <p><u>Veryloweducation</u> is a dummy variable (one for individuals who never attended or completed the elementary school)</p>
<p>Nationality</p>	<p>Dummy variable equals 1 for Portuguese's founders and 0 for foreigner's founders</p>

Tabela 4: Descriptive Statistics

	International Start-ups			Non-International start-ups		
	Obs	Mean	Std Dev.	Obs	Mean	Std Dev.
Firms Characteristics						
Exports (thousands euros)	19318	140624	904913	402	0	0
Size	19318	3,55	0,9	402	4,02	4,31
Number of founders	19318	1,58	0,75	402	1,68	0,85
Survival	19318	0,87	0,35	402	0,91	0,29
Founder´s Characteristics						
Age	Obs	Mean	Std Dev.	Obs	Mean	Std Dev.
20-29	19318	0,23	0,42	402	0,21	0,41
30-39	19318	0,4	0,50	402	0,43	0,50
40-49	19318	0,25	0,43	402	0,23	0,42
50-60	19318	0,11	0,32	402	0,13	0,34
Gender	Obs	Mean	Std Dev.	Obs	Mean	Std Dev.
Man	19318	0,69	0,46	402	0,75	0,43
Educational Level	Obs	Mean	Std Dev.	Obs	Mean	Std Dev.
Very low education	19318	0,13	0,34	402	0,12	0,33
Low Education	19318	0,43	0,49	402	0,38	0,49
Medium Education	19318	0,26	0,44	402	0,28	0,45
High Education	19318	0,19	0,39	402	0,21	0,41
Nationality	Obs	Mean	Std Dev.	Obs	Mean	Std Dev.
Portugal	19318	0,69	0,43	402	0,3	0,19

Note: This table reports descriptive statistics of start-ups created between 2004 and 2009, for international and non-international start-ups. All data were retrieved from the database *Quadro de Pessoal and international data*.

Table 5: Determinants for Start-ups Exports- Heckman Model

Variables	(1) Exports
Size	0.0205*** (0.00226)
Age 20-29	0.138*** (0.0415)
Age 30-39	0.146 (0.0461)
Age 40-49	0.245 (0.0575)
Gender:Male	0.203*** (0.0354)
Low Education	0.0975* (0.0529)
Medium Education	0.263*** (0.0560)
Hgh Education	0.242*** (0.0589)
Nationality	0.0277 (0.0331)

Note: The table reports the interactions between the dependent and independent variables using the Heckman model for Equation (1). "Size" is the natural logarithm of the initial numbers of employees. The Age 20-29, Age 30-39, Age 40-49 are dummy variables, equalling to one for individuals that have this ages and zero for otherwise. Gender-Male is a dummy variable equal to one if the founder is male and zero for otherwise. Low Education, Medium education and High Education are dummy variables. For each variable, one report to level of education that founder have and zero for otherwise. Finally, Nationality is a dummy variable equals to one for Portuguese's founders and zero for otherwise. In Reporting, the estimated coefficients, our omitted categories one individual age 50-59 with very low education. Industry and county fixed effect are included but not reported. Robust standard errors are in parentheses. ***denotes statistical significance at 1%, **significance at 5%, *significance at 10%.

Table 6: Determinants for international start-ups- Logit model

VARIABLES	(1) Exports
Size	-0.000427** (0.000196)
Age 20-29	0.00591* (0.00350)
Age 30-39	0.00239 (0.00360)
Age 40-39	0.00718** (0.00332)
Gender: Male	0.00959*** (0.00208)
Low Education	0.00921*** (0.00337)
Medium Education	0.0109*** (0.00321)
High Education	0.00485 (0.00315)
Nationality	-0.19745 (0.26992)

Note: The table reports the marginal effects using the logit model for Equation (1). “Size” is the natural logarithm of the initial numbers of employees. The Age 20-29, Age 30-39, Age 40-49 are dummy variables, equalling to one for individuals that have this ages and zero for otherwise. Gender-Male is a dummy variable equal to one if the founder is male and zero for otherwise. Low Education,Medium education and High Education are dummy variables. For each variable, one report to level of education that founder have, and zero for otherwise. Finally, Nationality is a dummy variable equals to one for Portuguese´s founders and zero for otherwise. In Reporting, the estimated coefficients, our omitted categories one individual age 50-59 with very low education..Industry and county fixed effect are included but not reported. Robust standard errors are in parentheses. ***denotes statistical significance at 1%, **significance at 5%, *significance at 10%.

9. Appendix

A1- Determinants for internationalization of start-ups: Probit Model

VARIABLES	(1) Exports
Size	-0.000427** (0.000196)
Age 20-29	0.00591* (0.00350)
Age 30-39	0.00239 (0.00360)
Age 40-49	0.00718** (0.00332)
Gender: Male	0.00959*** (0.00208)
Low Education	0.00921*** (0.00337)
Medium Education	0.0109*** (0.00321)
High Education	0.00485 (0.00315)
Nationality	-0.09604 (0.1167)

Note: The table reports the marginal effects using the Probit model for Equation (1). “Size” is the natural logarithm of the initial numbers of employees. The Age 20-29, Age 30-39, Age 40-49 are dummy variables, equalling to one for individuals that have this ages and zero for otherwise. Gender-Male is a dummy variable equal to one if the founder is male and zero for otherwise. Low Education, Medium education and High Education are dummy variables. For each variable, one report to level of education that founder have, and zero for otherwise. Finally, Nationality is a dummy variable equals to one for Portuguese’s founders and zero for otherwise. In Reporting, the estimated coefficients, our omitted categories one individual age 50-59 with very low education.. Industry and county fixed effect are included but not reported. Robust standard errors are in parentheses. ***denotes statistical significance at 1%, **significance at 5%, *significance at 10%.

A.2- Determinants for internationalization of start-ups: Linear Probability Model

VARIABLES	(1) Exports
Size	-0.000670** (0.000273)
Age 20-29	0.00941** (0.00476)
Age 30-39	0.00415 (0.00458)
Age 40-49	0.00917** (0.00456)
Gender: Male	0.0116*** (0.00250)
Low Education	0.0182*** (0.00474)
Medium Education	0.0185*** (0.00373)
High Education	0.00903** (0.00404)
Nationality	-(0.004919) 0.006193

Note: The table reports the marginal effects using the LP model for Equation (1). “Size” is the natural logarithm of the initial numbers of employees. The Age 20-29, Age 30-39, Age 40-49 are dummy variables, equalling to one for individuals that have this ages and zero for otherwise. Gender-Male is a dummy variable equal to one if the founder is male and zero for otherwise. Low Education, Medium education and High Education are dummy variables. For each variable, one report to level of education that founder have, and zero for otherwise. Finally, Nationality is a dummy variable equals to one for Portuguese’s founders and zero for otherwise. In Reporting, the estimated coefficients, our omitted categories one individual age 50-59 with very low education..Industry and county fixed effect are included but not reported. Robust standard errors are in parentheses. ***denotes statistical significance at 1%, **significance at 5%, *significance at 10%.

