

Born Globals from Emerging Economies: Small and Medium Brazilian Technology-Based Firms

Fernanda C. Ferreira Ribeiro
Assistant Professor
Department of Business Administration
Pontifical Catholic University of São Paulo
Visint Scholar
Department of International Business
Indiana University - Kelley School of Business
feribeir@iupui.edu

Moacir de Miranda Oliveira Junior
Associate Professor
Department of Business Administration
University of São Paulo
mirandaoliveira@usp.br

Felipe Mendes Borini¹
Associate Professor
Department of International Business
Escola Superior de Propaganda e Marketing
fborini@espm.br

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Abstract

This paper offers an analysis into the factors influencing the accelerated internationalization of technology-based firms (TBFs) from emerging economies. This type of firm is typically called born global and it has been studied in developed countries, but born globals from emerging economies such as Brazil, China and India are a largely understudied context in international business. A survey was applied to small and medium Brazilian TBFs. At the end of the data collection period, the first database generated gathered 214 responses. Out of those, 85 were obtained from companies that have some kind of business abroad and 54 questionnaires were considered valid to this research. The results show that companies that have an entrepreneur or a group of senior executives with international management skills have more chances to become born globals. In opposition to previous research in the field the results show that TBFs that take more than five years to enter the international market take more advantages of their competence for innovation and the ability in international marketing in their internationalization processes. This paper contributes to the discussion of the internationalization process of small and medium born globals and TBFs. The factors that would make companies from an emerging economy to rapidly enter the international market and the factors that would drive the accelerated internationalization of a new American, European or Japanese high-tech company may indicate significant differences. Thus, this study contributes to a better understanding of the phenomenon and points to new perspectives of studies.

Keywords: technology-based firms, born globals, emerging economies, small and medium firms

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1. Introduction

This paper discusses a phenomenon that shows some significant changes that have been taking place in international business: the recent emergence of small and medium technology-based companies (TBFs) that internationalize at an accelerated rate from their foundation or a few years after their founding. In the last decade, several studies have shown that TBFs are achieving competitive success in their business activities abroad, especially when these companies offer products with high technological content and competence for innovation (Knight & Kim, 2009; Oviatt & McDougall, 1994; Knight & Cavusgil, 2004). The born global phenomenon, as it is called, is not restricted to companies in technology-based sectors, although it is more often found and discussed in these sectors (Rialp et al. 2005; Dominguihos & Simões, 2001).

Most authors have conducted studies using samples from companies in the U.S. context (Knight & Kim, 2009; Oviatt & McDougall, 1994; Knight & Cavusgil, 1995) and European context (Dominguihos & Simões, 2001; Zucchella, 2002; Gabrielsson *et. al.*, 2004). Therefore, the models that emerged so far to explain the phenomenon were based on the reality of developed countries.

In recent years, studies have pointed to the appearance of born global firms in different regions of the world (Mathews & Zander, 2007), mainly in countries with a business and innovation reality very different from developed economies. For example, Latin America studies indicate software born global firms from Costa Rica (Lopez *et. al.*, 2009) and Brazil (Dib, Rocha & Silva, 2010). In Asia, research on Chinese born globals (Zhou *et. al.*, 2007), Indian IT companies (Varma, 2009), Vietnamese companies (Thai & Chong, 2008) and in Oceania, Australian companies (Evangelista, 2005; Rennie, 1993).

This study is in line with the latest research on the born global phenomenon which has been concerned with identifying the characteristics or factors that make these companies go abroad from their outset.

In international studies on born globals, the internal factors of the company and those related to the entrepreneur are more recurrent; however, most studies originate from developed economies. On the role of the internal factors, very little is yet known about the entrepreneur's profile or what executives of TBFs think or do regarding the internal competencies of their companies on the accelerated internationalization of TBFs in developing countries, such as Brazil. Therefore, there is evidence that the born global phenomenon is not limited to specific countries or realities of developed economies and the origin of very different countries leads to questions: *1) What would be the role of the organizational factors and factors related to entrepreneur in the born global phenomenon?* This goal contributes for a better understanding of the phenomenon and can point new perspectives of studies due to the differences in the context of developing economies. This paper consists of five parts, in addition to this introduction. In the following part, we introduce the theoretical background pertaining to the concept and characteristics of born global firms, in addition to the characteristics of the internal factors and factors of the entrepreneur as well as how they can influence the internationalization of these companies. Then, we present the hypotheses of the study. In part four, we discuss the methodological aspects. Finally, we discuss the results and present the general conclusions of the study.

2. Theoretical Background

2.1 The born global firms and Organizational and Entrepreneur factors

Studies on the born global phenomenon are relatively recent, dating back just over a decade (Knight & Kim, 2009; Rialp *et. al.*, 2005; Oviatt & Mcdougall, 1994). In the literature, different denominations of companies with accelerated internationalization appear as variations of the same phenomenon (Rialp *et. al.*, 2005), such as: international new ventures (Oviatt & Mcdougall, 1994), born globals (Knight & Cavusgil, 1996), global start-ups (Oviatt & Mcdougall, 1995; Madsen & Servais, 1995), and global high-tech companies (Roberts & Senturia, 1996), *High technology start-ups* and *technology-based new firms* (Autio 1999), among others.

More than a decade after the pioneering study by Oviatt and Mcdougall (1994), much has been discussed about the phenomenon, but there are no general definitions of the concept yet. Usually, the born globals are presented as companies that establish activities abroad since their foundation or a few years after their creation. These are companies that can take on business in the

international market, sometimes with no experience in the domestic market, simultaneously with the establishment of the domestic business activities or shortly after the domestic operations are established.

Despite the reasonable meaning of a born global, the same can not be concluded on the empirical operationalization of this concept (Dib *et. al.*, 2010). There is still a lot of controversy because different criteria have been somewhat arbitrarily chosen by the authors, thus making any attempt of comparison extremely challenging. The most recurrent criteria (Rialp *et. al.*, 2005; Dib *et. al.*, 2010) are: founding date (most authors believe that born global firms emerged after 1990); beginning of international activities after the foundation (varies from 02 up to 15 years); percentage of revenues arising from foreign operations (ranging from 5% up to 75% for firms with small domestic markets); range of markets (one or few international markets, in the same or in different regions around the world). An observation of these variables suggests that the adoption of a definition is contingent on the type of the company's country of origin and the characteristics of its business environment (Dib *et. al.*, 2010).

Dominguinhos and Simões (2004) emphasize that this type of company is more common in high-tech industries, such as those involving software, electronics, biotechnology, aerospace and medical instruments, however, it is not restricted to these sectors. The authors report the case of a born global company in the footwear industry of Portugal. However, the focus of this paper is lined up with more notable studies in the area of accelerated internationalization of sectors of more technological density. The TBFs play a critical role in the processes of innovation and technological development in the countries. The TBFs commercialize an increasing number of products and processes, in which conception and development are results of academic studies and are important parts of processes of innovation in the companies (Autio *et al.*, 2000). Therefore, the phenomenon *born global* is believed to be well documented in the emerging economies reality by studying small and medium TBFs.

Several studies, such as Zahra and George (2002); Mathews and Zander (2007); Dominguinhos and Simões (2001), Dib *et. al.* (2010), Oviatt and McDougall (1994), Knight and Kim (2009), Gabrielsson *et. al.* (2008), among others, have developed theoretical approaches based on the identification and analysis of the company's internal and external factors that could explain what would lead a company to be able to go abroad since its foundation or a few years after it. However, Rialp *et. al.* (2005), Zahra and George (2002) and Dib *et. al.* (2010) point to the fact

that most authors who conduct empirical surveys on born globals elaborate their own list of factors for operation of these companies abroad. Internal factors of the company and factors related to the entrepreneur are most frequent in the studies on born globals.

Several studies shows that the ability of born globals to succeed in international markets is no doubt largely a function of their specific skills and resources (Knight & Cavusgil, 2004; Knight & Kim, 2009) because these companies tend not to have the same profile of traditional internationalization of multinational corporations that have substantial financial and tangible resources. The born globals, in general, have much less tangible resources such as facilities, goods and equipment, human and financial resources, which generally favor the internationalization of multinational corporations. Despite the shortcomings of various tangible resources, both financial and human, and often having little or no experience in their home markets, the born globals enter the international market and in many cases can survive and succeed in their business. These companies generally have a high degree of product knowledge and expertise and require constant innovation (Knight & Cavusgil, 2004).

Despite the evidence that internal company factors are essential for accelerated internationalization, the available literature does not have convergence in relation to which specific factors are more important to encourage early entry of the company abroad.

The studies of accelerated internationalization address the issue of the internal factors of the company and recover part of the discussion of the emergence of the so-called resource-based view. The resource-based view (RBV) has played an important role in initiating the discussion of international entrepreneurship and the emergence of *born global* companies like solving a key question: How do some young and small businesses with several limited domestic resources quickly succeed abroad without going through different phases suggested by the model of internationalization in stages? (Peng, 2001).

In this context, intangible resources that are relatively unique, confer competitive benefits and enable the company to produce higher added value in its offerings for international markets. In the traditional internationalization approach (Johanson & Vahlne, 1977), entering the international market requires a long learning process. In order to establish operations in an international market, the company needs to have sufficient resources and the organizational capacity to negotiate in a language other than the country of origin, be able to operate in a different legal environment, learning to meet the consumer taste of the target country, relate with

partners in this country, among other issues. This learning process and accumulation of knowledge is difficult and often become an obstacle to the internationalization of a company. This is because the company learned to operate in its domestic market, established routines and accumulated knowledge about this market and for many companies it is hard to search for new experiences and overcome the logic operation in the domestic market (PENG, 2001).

The explanation of RBV for companies of accelerated internationalization is indeed the difficulty to learn and obtain a great knowledge about internationalization. When a new business achieves this knowledge, it quickly provides it a competitive advantage to operate in foreign markets. Based on the resource-based view, Rialp and Rialp (2007) studied how specific intangible assets of the company supported the emergence of born globals in Europe. The study comprised 1102 Spanish companies and revealed that human capital and organizational resources have a greater influence on the speed of internationalization in comparison with tangible resources (Rialp & Rialp, 2007).

In the logic of RBV, new and small companies that indicate several gaps of financial and human resources, with little or no experience in the domestic market can outperform their competitors and internationalize more easily, as they managed to obtain “unique” factors to operate in the foreign market (Simões & Dominginhos, 2001). In other words, unlike the disadvantages of the internationalization of new companies suggested by the Internationalization Stages Theory (Johanson & Vahlne, 1977), there may be “inherent advantages” of being small and new when it comes to accelerated internationalization. Large and established companies would need to first unlearn their domestic routines to then be able to operate successfully in the international markets (Knight & Cavusgil, 2004). In small and new businesses, there is no administrative heritage rooted as there is in the business established for a long time in the domestic market and, therefore, for these small and new companies, it may be easier to enter the international market (Rialp & Rialp, 2007).

2.2 Born Global firms and Innovation in Emerging Economies

The term emerging markets was created by economists at the International Finance Corporation (IFC) in 1981, when the group was promoting the first mutual fund investments in developing countries (Kanna & Palepu, 2010). Since then, references to emerging markets have become

present in the media, foreign policy and investment fund prospectuses and multinationals' annual reports, but definitions of the term vary widely (Kanna & Palepu, 2010). Overall, an emerging country or market is defined as the one that is in a rapid process of structural reforms and globalization, that is, it is opening its borders to the flow of international trade and investments (Hoskisson et. al., 2000, Kanna & Palepu, 2010).

The opportunities for born global firms in the next 10-15 years will grow for all countries but may grow exponentially in emerging markets. The most important emerging markets such as China, India, Mexico, Brazil, Turkey will be poised to capture most of that growth because they have done the difficult and, at times controversial, economic structural changes and reforms in order to take advantage of the global marketplace (Persinger et. al, 2007).

There is still a shortage of studies on born globals from emerging countries and the comparison is highly challenging, since the factors chosen for analysis are very diverse. However, it is interesting to note that several studies have showed some trends that differ from the main studies on born globals carried out in the contexts of developed economies (Kiss et. al., 2012; Lopez *et. al.*, 2009; Dib *et. al.*, 2010; Zhou *et. al.*, 2007; Varma, 2009). When it comes to the accelerated internationalization of technology-based companies in developing economies, the differences of the competitive and institutional context of developed economies make these companies have a singular behavior.

TBFs are characterized by the significant technological effort, but in the context of small and medium enterprises in developing countries, such initiative can be held in formats other than the R&D aggregated to the company's structure. Thus, the concept of TBF should not be restricted to the classic criteria of intense R&D, but it also should cover some less formalized arrangements and the direct articulation with research institutions and universities. The predominance of unstructured R&D is related to the small size of most TBFs (Autio & Sapienza, 2000).

In terms of international performance, a characteristic of TBFs from emerging economies is the fact that their technological and market strategies are, in most cases, guided by imitation, which can lead to difficulties in setting up their markets and face more structured and larger foreign competitors that provide the same product or a similar product in foreign markets (George & Prabhu, 2003).

In general, TBFs from emerging countries are companies that operate in niche markets in their own country, and in the foreign market in the case of the few internationalized TBFs. The opportunities for the operation of TBFs take place mainly in markets where demand in their country is too small to justify the internalization of the foreign competitors' operation or in markets that even in developed countries do not indicate an interest extensive enough for the operation of more structured and bigger companies. In these niches, there is potential for success for the TBFs from emerging economies.

3. Research hypotheses

3.1 Internal Factors

The born globals, in general, have less tangible resources, such as facilities, financial and human resources and, very often, they have little or no experience in their markets. Still, these companies enter the international market and often survive and manage to obtain positive returns in their business. This fact is attributed to the possession of products that imply a high degree of knowledge and expertise that require constant innovation (Knight & Cavusgil, 2004). The articulation of unique products and the capacity for constant innovation enable born globals to outperform their competitors and internationalize more rapidly (Dib et. al., 2010; Simões & Dominginhos, 2001). Other studies also discuss the ability of a company to innovate (Knight & Cavusgil, 2004) and the constant search for differentiating their products which demand constant innovations as a source of competitive advantage (Bloodgood, Sapienza, Almeida, 1996) or technological advantage (Moen, 2002). Usually, these companies belong to industries where the life cycles of the products are short and require innovation and specialized resources, difficult to copy. In fact, these are companies that sell exclusive products or specialized services as the only way to survive in the foreign market (Oviatt & Mcdougall, 1995; Dominginhos & Simões, 2004).

H2a: The accelerated entry of born global TBFs in the foreign market is positively associated with the innovation capacity of the company.

According to the research of Knight and Kim (2009) conducted with 354 new and small American companies, the orientation to the international market is one of the most important constructs to rapidly enter the foreign market. In addition to the innovation capacity, the born

globals stand out due to their orientation to the international market, that is, due to their international activities guided to meet specifically the international clients' demands, understand the competitors' action in the foreign market, and be able to coordinate the international operations among the functional areas of the company (Knight & Kim, 2009).

The positive effect of the orientation to the market on the performance of the company is registered in domestic business environments (Calantone, Kim, Schmidt, Cavusgil, 2006). However, the profile of foreign clients and competitors are significantly different from the domestic market, and born globals that have the ability of properly using market intelligence to understand and serve clients abroad usually achieve greater performance. In general, in order to meet the demands of a certain market niche, born globals have strategies of product customization and orientation to the clients' needs (Knight & Cavusgil, 2004), and it comes from their orientation to the international market.

H2b: The accelerated entry of born global TBFs in the foreign market is positively associated with the orientation to the international market.

The study of Knight and Cavusgil (2004) showed that when born globals enter the foreign market, they need to develop and apply the marketing abilities. Activities such as advertising, direct sales and promotional techniques are crucial for the company to be able to rapidly enter the international market. Luostarinen and Gabrielsson (2006) studied the strategies of prices, distribution and advertising of products.

Knight and Kim (2009) reinforced that the abilities in international marketing refer to the capacity of the company to create value to foreign clients through market segmentation and orientation. Value can be created also with the integration of international marketing activities of planning, controlling and assessment to meet the preferences of international clients and differentiate their offers from competitor's offers. Issues such as means of distribution and sale, product price, adequacy to local customer, company's image etc. can present an important difference in relation to domestic market. (Calantone *et al.*, 2006).

H2c: The accelerated entry of born global TBFs is positively associated with the ability in the international marketing.

3.2 Entrepreneur Factors

In international literature, the evidence that the entrepreneurs profile and their actions constitute recurrent and essential elements in the characterization of the accelerated internationalization phenomenon prevails (Dominguinhos & Simoes, 2001).

Holtbrugge and Wessely (2009) discuss about the concept of international management skills of the entrepreneur in studies of born globals. The authors highlight the dimensions directed related to the entrepreneur's profile, such as their technical and management background, their experiences accumulated over their professional and academic career, language knowledge etc (Dominguinhos & Simoes, 2001). Among the dimensions related to the entrepreneur's actions are: their ability to identify foreign opportunities (Mathews & Zander, 2007; Andersson, 2000); the mobilization and management of resources to exploit these opportunities (Mathews & Zander, 2007); and inclination to take financial and market risks internationally (Andersson, 2000).

(Dominguinhos & Simoes, 2001) argue that one of the main obstacles for the internationalization of TBFs is the fact that many of them are managed by their own founders who, in general, are researchers or inventors, and, in most cases, have no entrepreneurial profile and have little or no management background.

H3a: The accelerated entry of born global TBFs in the foreign market is positively associated with the international management skill of the entrepreneur.

Simões and Dominguinhos (2004) and Oviatt and McDougall (1994) point out that in companies of accelerated internationalization, the entrepreneurs have, in general, international professional experience, whether from previous works in multinational companies (in international or export departments) or from experiences abroad as expatriate employees or some other type of professional experience in the foreign market. The authors even mention experiences during the education of these professionals, such as MBA programs abroad.

The entrepreneurs of TBFs are, in general, researchers from universities who started their own business or have a close relation to the academic sector. It is very common for researchers who are seeking scientific knowledge in their area of expertise to obtain this know-how abroad, conducting part of their studies in another country or even attending congresses abroad (Fernandes & Seifert, 2007).

H3b: The accelerated entry of born global TBFs in the foreign market is positively associated with the international experience of the entrepreneur.

4. METHODOLOGY

4.1 Population and sample

The population of this study consists of technology-based firms (small and medium sized) that have economic activity of high technological intensity. According to the classification from the Organization for Economic Cooperation and Development (OECD, 2003), high technology sectors are: Aeronautics and aerospace, pharmaceuticals, computer, electronics and telecommunications, and optical and precision medical devices. The high technology was selected because the born global phenomenon is more recurrent in sectors of high technological density, although not exclusive.

There is a difficulty to consolidate a statistically representative sample of TBFs due to the inexistence of census or complete rolls of this type of companies and few studies of national scope which characterize this population in Brazil. Thus, several sources were consulted to build the sample:

- (1) Lists of associated technological parks and incubators of the National Association of Entities Promoting Advanced Technology Ventures (ANPROTEC) which are known for having companies of high technology sectors, such as aeronautical equipment (São José dos Campos – State of São Paulo); electronics (Santa Rita de Sapucaí – State of Minas Gerais) and biotechnology (Belo Horizonte – State of Minas Gerais); Porto Digital (Recife - State of Pernambuco); Unicamp Park (Campinas – State of São Paulo), Parks of São Carlos (São Carlos - State of São Paulo), among others;
- (2) Lists of government programs of Brazilian Trade and Investment Promotion Agency (APEX) of incentive to internationalization of high technology sectors.
- (3) The study of Pinho (2005) on the results of an extensive research about the activities, arrangements of cooperation, technological training, among others, of TBFs in Brazil. And also the study of Dib et. al. (2010), the only quantitative study about born globals in Brazil. Dib et. al. (2010) focused on the Brazilian software sector and identified 35 companies of accelerated internationalization in this sector.

Therefore, due to the uncertainty of the population number, the nature of the sample in this study did not aim to meet the criteria for statistical representativeness of the population and constitutes a non-probabilistic and intentional sample (Hair, Black, Babin, Anderson, Tatham, 2005). Although, in principle, the ideal would be to have a probabilistic sample, the inexistence of lists and complete census of TBFs of high technology sectors and previous studies of national scope that characterize this population makes it impossible to build a sample under this level of accuracy. Thus, the objective of this study was to constitute an extensive sample regarding the coverage (1) of sectors in which activities of high technology TBFs are normally developed and (2) the main regions in Brazil where there are previous indications of the existence of this type of company.

The questionnaire was developed with five-point Likert scales. Each one of the operational variables proposed is related to at least three interval-level questions. The questionnaire was analyzed for validation by a group of international business experts. Right after the validation by the experts, pre-tests were conducted. Then, after some adjustments, the questionnaire was sent to the founder (entrepreneur) or a manager who works direct to international operations of each TBF to answer the questionnaire. The questionnaire was available in the Internet in the months of June and July 2011.

At the end of the period of data collection, the companies with majority foreign capital were excluded and, as the study was focused on small and medium companies according to IBGE (Brazilian Geography and Statistics Institute), companies with more than 249 employees were also excluded.

The first database generated had 214 answers. Out of these 214, 114 questionnaires were from companies whose business runs only in Brazil and 85 were from companies which had some kind of foreign business, 39.7%. However, 31 out of these 85 questionnaires had a large number of missing values. We decided to eliminate the questionnaires with missing values from the analysis (Hair *et. al.*, 2005). Therefore, 54 valid questionnaires were considered.

4.2 Construction of variables

The dependent variable of the accelerated entry abroad analysis model will be considered in terms of **Time** from the foundation to the first foreign operation. Several authors worked with the same time variable, that is, the beginning of international operations after the foundation. In

the studies, the period from the company's foundation and the first foreign operation varies from 02 to 15 years. Two years (Moen 2002, Moen & Servais, 2002). Three years (Knight & Cavusgil, 1996; Kinight and Kim, 2009; Knight, Madsen and Servais, 2004). Five years (Zucchella, 2002). Six (Zahra, Ireland and Hitt, 2000). Eight (McDougall, Shane & Oviatt, 1994). Fifteen years, in this case counting with 50% of the sales in another continent (Gabrielsson, Sasi and Darling, 2004). In this study, we used the operational concept of born globals established by Dib et. al. (2010) because it is the only quantitative study about this type of company in Brazil. The definition is in line with the main international studies about this concept. Thus, the company is considered a born global when, within a time horizon of up to five years from its foundation, it has already done business in at least one international market (Dib et. al. 2010). There was no restriction regarding both the percentage of revenues from foreign operation and the market or countries coverage, which could be one or several markets/countries (Dib et. al., 2010).

The independent variable company's internal factors was built in accordance with the models of Knight and Kim, (2009); Gabrielsson *et al.* (2004); Knight and Cavusgil (2004) and consisted of the following factors:

Capacity for innovation (Alpha of Cronbach 0.856). Variable based on the study of Knight and Cavusgil (2004) and Knight and Kim (2009) that define innovation as the capacity of a company to develop and introduce new products, services, management processes or ideas for international market. The questions verify these several faces of the innovation and its role in the accelerated internationalization: Our company is at the technological forefront of our industry in the international markets; We developed great part of the technology of our product; We hired some of the most qualified experts in industry to elaborate the design and manufacture our product; We are known in the international market for products with superior technology; Comparing to local competitors, very often we are the first to introduce product innovation or new operation approaches in international markets; We formally invest in R&D of new products.

Orientation to the international market (Alpha of Cronbach 0.803). Variable based on study of Knight and Kim (2009). It is the capacity of the company to understand the action of competitors, and be able to coordinate international actions among functional areas in the company. It is mediated by international activities oriented to meet specifically the international client's demands. The questions verify this ability in the accelerated internationalization: The

strengths and weaknesses of our main international competitor; If a competitor launches an intensive campaign oriented to our international clients, we will implement an immediate answer; Integrated business operations (commercialization/sales, finances, production etc.) to meet the needs of international market; If the strategy of the company is based on the international clients' needs; If the satisfaction of international clients with the products or services is systematically measured.

International marketing skills (Alpha of Cronbach 0.903): It is also based on study of Knight and Kim (2009). It is defined as the ability of the company in creating value for international clients through an effective segmentation and assessing as marketing tools are organized to differentiate its offers from the competitors' offers. Thus, the construct is composed of six variables: The process of international marketing planning; Ability to segment and identify foreign market niches; Ability to use marketing tools to make the product stand out (design, price, publicity); Develop and fit the product in the international market; Press image; Worldwide recognition of the product / service.

The independent variable of entrepreneur factors is based on models of Simões and Dominginhos (2004) and Oviatt and McDougall (1994) and it was built on the following factors:

Entrepreneur's international management skills (Alpha of Cronbach 0.813). This variable is adapted from Holtbrugge and Wessely (2009) who consider the international management skills a result of the profile (technical and management training, years of experience in the career, language skills) and the actions of the entrepreneurs: (ability to identify foreign opportunities, the mobilization and management of resources to exploit these opportunities, and inclination to take financial and market risks, internationally. Manager's view about the international market; The entrepreneur's orientation when deciding to enter in foreign markets; The entrepreneur's management training when entering in the foreign market; Manager's language skills; Selection process to hire candidates with skills to perform in international markets; Skills of company staff to work with people from other countries, with different cultures; Staff adaptation to other countries and cultures; Manager's skill to identify business opportunities in foreign markets.

International professional experience (Alpha de Cronbach 0.625). Variable based on Dominginhos and Simões (2001). The International professional experience is defined as a previous work in multinational companies (in international or export departments) or from

experience abroad as expatriate employees, or some type of professional experience in foreign markets, such as experiences during the training of these businessmen in MBA programs abroad etc. The questions verify: The entrepreneur's previous work in multinational companies in Brazil (in international or export departments); The entrepreneur's previous experience abroad as an expatriate employee in companies based in Brazil; Educational experience abroad (MBA, Master's degree, professional courses); The entrepreneur's personal relations abroad; The entrepreneur's family background.

4.3 Statistical techniques

In this study, the model of logistic regression was estimated to assess whether and at which level each of the independent variables contributes for a rapid entry of the TBF in the foreign market. The significance of the independent variables coefficient of external factors was tested by using Wald test, and it was considered a valid coefficient for the model when the level of statistical significance was $p < 0.05$ (Hair et al, 2006). The significance of the final model can be observed in the Hosmer and Lemeshow measure of general adjustment, whose focus is not to reject H_0 : there is no significant difference between the classifications observed and predicted.

3. Results

In total 49 TBFs were considered, of which 18, i.e. 37% are not internationalized born globals (internationalize their business after five years of experience in the domestic market). Of the total, 31 companies, 63% are born global internationalization TBFs.

Table 1 shows the means, standard deviations and the results of the correlation made with the independent variables of the model. The ability to construct international management averaged over four, showing the importance of entrepreneurial skills in the internationalization of such company. Overall, the average is three, regarding the capacity of the constructs of innovation, market orientation and international marketing skills. Only the support of international experience of the entrepreneur is below three, showing the lack of this construct in general for TBFs.

The correlations presented in Table 1 are considered low, although in some cases are significant at 5% and 1%. This suggests there is little possibility of multicollinearity among the constructs

presented. The variables International Management and International Experience of the entrepreneur have significant average correlations with the variables for the international market orientation and international marketing.

The variable Capacity for Innovation is correlated with Guidance for the International Market and International Management Ability. In general, to meet the demands of any given external market, TBFs have product customization strategies and are oriented to customers' needs. Thus the greater capacity for innovation is more likely to get TBF meet overseas clients, understanding the actions of competitors in foreign markets, and to coordinate international efforts between the functional areas of business.

Insert table 1 here

Table 2 presents the logistic regression model are shown in which the coefficients of the logistic function to the internal factors. Results for the regression model had high explanatory power of 60%. This shows that the factors of external environment have reasonable predictive power to explain the strategic behavior of TBFs.

Insert table 2 here

According to table 2, three of the five independent variables of the internal factors showed significance ($p < 0,05$) for the internationalization process of TBCs, and capacity for innovation, international marketing ability and skills of international management. Per contra, the capacity for innovation and international marketing ability present a negative coefficient B, which contradicts the theoretical model. The analysis of the coefficient sign of these variables reveals that, other than that provided in the theoretical model, the more the company delays to internationalize, the more the company is able to develop and take advantage of its capacity for innovation and marketing skills to enter the international markets.

The ability of the entrepreneur in international management brings as a result, according to Table 2, significance to the process of internationalization ($p = 0.032$, $p < 0.05$) of TBFs. The analysis of the sign of the coefficient of the variable international management skills (positive) also reveals that, as predicted in the theoretical model, the more skills and resourcefulness of the

international management TBF entrepreneur has, the greater the likelihood that the company follows a process of *born global* internationalization.

Among the factors related to internal factors that accelerate the introduction of the company abroad, the results obtained demonstrate empirical support for a construct, allowing to conclude that: the TBFs that have entrepreneurs with international management skills tend to follow more of a *born global* internationalization.

Insert figure 1 here

The result of the logistic regression analysis related to international management skills of the entrepreneurs supports the literature of born globals in the sense that it is a factor that accelerates the entry of the company abroad (Madsen & Servais, 2002; Dominguihos & Simões, 2001; Andersson , 2000). The international management skill of the entrepreneur refers to the dimensions directly related to the entrepreneur's profile (such as their technical and management skills, their experiences accumulated over their professional and academic career), and the dimensions regarding the entrepreneur's actions (their ability to identify opportunities abroad, the mobilization and management of resources to exploit these opportunities, the inclination to take financial and market risks internationally).

Regarding the internal factors, there is another interesting result in this study: two of five, tested hypotheses for the internal factors were proven reversed. Therefore, it can be stated that these two factors have influence on the internationalization process of TBFs, but are not important factors for TBFs to become born globals. Which means that the more experience the TBF has in the domestic market, the more it can develop and benefit in favor of its process of internationalization, of innovation and international marketing skills.

The literature on the born global phenomenon is still very early and controversial. However, this result seems to demonstrate a difference in what is shown in the main studies. In the literature, a company with greater capacity for innovation than their competitors tends to follow a most likely born global path, as the results of Dib et. al. (2010) who studied the Brazilian software industry. This is in line with what has been proposed by various international authors, Knight, Kim (2009), Autio et. al. (2000), Knight and Cavusgil (2004); Gabrielsson (2005), Mort and

Weerawardena (2006) , among many others. The same factors for the international market orientation and international marketing skills (Knight & Kim, 2009; Knight & Cavusgil, 2004). The hypothesis of international experience has not received empirical support. The literature on born globals is also controversial concerning this factor. For some studies the international experience of the entrepreneur is a necessary condition for an international expansion of a company, but mainly creates the motivation and ambition to make the company become a born global, among other factors, because it changes the perception of distance from other countries (Oviatt & McDougall, 1994; Madsen & Servais, 2002; Dominginhos & simões, 2004; andersson, 2000). In the study of Dib et. *al.* (2010) the Brazilian born globals in the software industry, the issue of international experience and education of entrepreneurs abroad, united in the same hypothesis, did not receive empirical support.

4. Conclusion

The confirmation of the results suggests that, by considering the Brazilian technology-based firms, the born globals are most likely to be the ones that: Have an entrepreneur or a group of senior executives with international management skills.

This conclusion is in agreement with the literature on born globals, which shows the international management skills of the entrepreneurs as essential for a rapid entry and expansion in the international market, mainly in the coordination of globally dispersed resources. Therefore, TBFs with the greatest chances to rapidly enter the foreign market are the ones that have executives with an entrepreneurial profile for international operations.

However, some results of this study seem to differ from the trend presented by the main studies of born globals, showing that companies from emerging countries have a different behavior than the companies in developed countries. In this study it was possible to verify different behaviors of the TBFs in relation to internationalization. Different from the born global TBFs, the TBFs that take more than five years to enter the international market take more advantage of their capacity for innovation and the ability in international marketing in their internationalization processes.

These results show the essential role of the internal factors, such as innovation and international marketing skills, for TBFs with longer period of operation in the domestic market before entering the foreign market.

Some internal factors tested here seem to be in disagreement with the trend pointed by the studies about born globals. Often in the international literature, the orientation to the foreign market did not present relevance in the internationalization process of the Brazilian TBFs studied here. Thus, the comparison of the factors that would make companies from an emerging economy to rapidly enter the international market seem to indicate significant differences in relation to the factors that would drive the accelerated internationalization of a new American, European or Japanese high-tech company.

This research used a survey with Brazilian technology-based companies to collect data. The method is extremely valuable to draw a general picture of the internationalization process of these companies (whether or not an accelerated one). In Brazil, the only study that used a survey to understand born globals was that of Dib et. *al.* (2010), and even in the international literature such methodology has not been extensively used. Therefore, the limitations of the study must be recognized.

Firstly, we used a non-probabilistic sample, which prevents the researcher from calculating a statistically liable sample. There is no official census on the number of Brazilian TBFs. The objective of this study was to constitute an extensive sample regarding the coverage (1) of sectors in which activities of high technology TBFs are normally developed and (2) the main regions in Brazil where there are previous indications of the existence of this type of company.

The number of TBFs in Brazil presents a growth trend and the internationalization studies have indicated an inclination to have a greater commitment of these companies abroad. Over the past ten years, there has been an increasing support for innovation in general in Brazilian companies as well as the specific creation of technology-based companies. The increase in the number of this type of company has been possible due to a series of recent initiatives: valuation of entrepreneurship as a career; increasing support from incubators; promotion of innovation projects organized by the government and entities promoting entrepreneurship. However, it is necessary to point out the reduced number of Brazilian TBFs that have some type of business abroad.

Secondly, most data collected in this study was based on the perceptions of the respondents. Studies that collect data from the institutional environment and test them with the phenomenon of born global TBFs are welcome.

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TABLES AND FIGURES

Table 1: Correlation of independent variables of the model.

	Mean	Std Dev	1	2	3	4	5
1 INNOV	3.87	0,735	1				
2 MINT	3.13	0,819	358.	1			
3 MKT	3.00	0,725	0.18	0,279	1		
4 MGT	4.10	0,630	346.	.404**	.409**	1	
5 EXP	2.53	0,750	0,147	.429**	.425**	0,252	1

*p< 0,05
n = 49 **p<0,01

Source: The authors

Table 2: Logistic regression - the internal environment factors

	B	S.E.	Wald	df	Sig.	Exp(B)	95% EXP(B) Lower	C.I.for Upper
INOV	-2,819	1,12	6,335	1	0,01	0,06	0,007	0,536 1,839
MINT	-0,65	0,642	1,024	1	0,31	0,522	0,148	0,770
MKT	-1,9	0,836	5,164	1	0,02	0,15	0,029	0
GER	5,585	1,793	9,699	1	0,00	266,434	7,927	8955 3,360
EXP	-0,069	0,654	0,011	1	0,92	0,933	0,259	0
Constant	-2,826	2,945	0,921	1	0,34	0,059		

R
Nagelkerke 0,601
Hosmer = 4.285
(p>0.05)
% correct classifications =
81.6%

Source: The authors.

Figure 1. Summary of the testing of hypotheses related to external factors

Internal factors	Results
H1a: The capacity for innovation accelerates the entry of TBFs abroad	Supported, but Inverted
H1b: The orientation for the international market accelerates the entry of TBFs abroad	Not supported
H1c: The ability in international marketing accelerates the entry of TBFs abroad.	Supported, but Inverted
Factors of the Entrepreneur	
H2a: The international managerial ability of the entrepreneur accelerates the entry of TBFs abroad.	Supported
H2b: The international experience of the entrepreneur accelerates the entry of TBFs abroad.	Not supported

Source: The authors.