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Entrepreneurial Behavior of Mature Firms in Internationalization: Evidence from a High-tech Industry

Comportamento Empreendedor de Empresas Maduras na Internacionalização: Evidências de um Setor de Alta Tecnologia

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Abstract: The study investigates the international trajectories of leading entrepreneurial firms in the Brazilian software industry using an international entrepreneurship perspective. The following research question guided the study: How does a mature entrepreneurial firm's international expansion evolve and how does it differ from a typical international new venture's path? The research adopts the case study method of investigation. The study analyzes three cases of leading high-tech Brazilian firms in the software development industry, whose internationalization processes occurred at least ten years after inception. The analysis uses a cross-case comparison, followed by a pattern-matching analysis with the extant literature on international new ventures and born globals. The results show that the late internationalization of the mature entrepreneurial firms examined in this study differs markedly from that of INVs or BGs on the following aspects: risk taking, competitive strategies, international vision since inception and entrepreneur´s previous international experience. Nevertheless, the two types of firm have in common innovativeness, proactiveness and networking capabilities.

Keywords: International entrepreneurship, Internationalization, Software, Mature Firms.

Resumo: O estudo investiga as trajetórias internacionais de empresas empreendedoras líderes na indústria brasileira de software, sob a perspectiva do empreendedorismo internacional. A seguinte pergunta de pesquisa guiou o estudo: Como ocorre a expansão internacional de uma empresa empreendedora madura e como se diferencia de uma típica trajetória de novos empreendimentos internacionais (INVs)? A pesquisa adota como método de investigação o estudo de caso. São analisados três casos de empresas líderes de alta tecnologia brasileiras no setor de desenvolvimento de software, cuja internacionalização ocorre pelo menos dez anos após sua fundação. A análise utiliza a comparação entre casos seguida pela comparação com os padrões apresentados na literatura sobre novos empreendimentos internacionais e *born globals*. Os resultados mostram que a internacionalização tardia das firmas empreendedoras maduras, examinadas no presente estudo, difere substancialmente das INVs e BGs nos seguintes aspectos: aceitação de riscos, estratégias competitivas, visão internacional desde a fundação e experiência internacional do fundador. No entanto, os dois tipos de empresas têm em comum a inovatividade, a atitude proativa e o uso de redes na internacionalização.

Palavras-chave: Empreendedorismo internacional, Internacionalização, Software, Empresas Maduras.

Introduction

Theories and empirical work developed and carried out in the 1970s and 1980s on how a firm internationalizes suggest that gradual internationalization is the typical trajectory of a firm that decides to go abroad (Johanson & Vahlne, 1977). The patterns of gradual internationalization, as described in the original Uppsala internationalization model, include the process of going step-by-step following a sequence of markets and entry modes. However, changes resulting from globalization have challenged gradual internationalization theories (Knight & Cavusgil, 1996; Oviatt & McDougall, 1994, 1995, 1997; Wright & Dana, 2003), giving rise to a new research stream – international entrepreneurship (IE).

Oviatt and McDougall (2000) defined IE as proactive, innovative, risk-seeking behavior that crosses national borders and is intended to create value in organizations. Despite the fact that these two authors' definition applies to any entrepreneurial firm regardless of age or time of internationalization, most of the IE literature focuses on international new ventures – INVs – with few studies looking at entrepreneurial firms that internationalize later in their lifecycle. Since its recognition as a separate field of research, IE has focused mainly on the process by which new ventures are created to operate in an international environment (Dimitratos & Plakoyiannaki , 2003; Jones & Coviello, 2005). In spite of this, Oviatt and McDougall (2005) proposed a broader definition for the new field to encompass other entrepreneurial firms in addition to INVs.

Accordingly, in an IE literature review, Jones, Coviello, and Tang (2011) suggested that further efforts are needed to understand the differences between early- and late-internationalizing entrepreneurial firms. Also, Coviello, McDougall, and Oviatt (2011, p.628) indicate that "the entrepreneurial behavior of large firms is another important and under-developed aspect of IE research," a position shared by Covin and Miller (2013). Naldi, Achtenhagen, and Davidsson (2015, p.780-781) adopt a similar position with respect to SMEs, stating that "the pursuit of international opportunities by established small and medium-sized enterprises (SMEs) lacks theoretical understanding and empirical investigation through an entrepreneurship lens." In addition, a recent literature review covering the intersection of international marketing and entrepreneurship research claims that there is "a shortage of studies conducted in developing countries, especially those with large domestic markets, as in Brazil, Russia, India and China" (Yang & Gabrielsson, 2018, p.33). These authors suggest a need to compare established international firms with entrepreneurial SMEs, along the same lines as the present study.

The contribution of this study, therefore, relates to the theoretical and empirical gap in IE concerning mature entrepreneurial firms from an emerging economy that internationalize during a more advanced phase of their lifecycle. The study uses the case study method and adopts the IE perspective to investigate the international trajectories of mature

entrepreneurial firms in the Brazilian software industry. The following research question guided the study: *How does a mature entrepreneurial firm's international expansion evolve and how does it differ from a typical INV's path?*

The relevance of the study comes from three aspects. First, few IE studies investigate how mature entrepreneurial firms engage in international activities. Thus, there is a call in the literature for more research on older, established firms using the IE perspective (Coviello et al., 2011; Covin & Miller, 2013; Naldi et al., 2015; Yang & Gabrielsson, 2018).

Second, the research locus is an emerging economy, Brazil, which has not been the object of studies from IE scholars. In fact, three outstanding literature reviews on the field of IE (Kiss, Danis, & Cavusgil, 2012; Peiris, Akoorie, & Sinha, 2012; Yang & Gabrielsson, 2018) have suggested the urgent need for more IE studies in Brazil. Moreover, it is quite limited the number of Brazilian scholars that adopted the IE perspective (exceptions are works such as Leite & Moraes, 2014; Sarmento, Carvalho, & Dib, 2016) and none of the Brazilian studies published addresses the internationalization of mature firms from an IE perspective. In addition, there is a new body of literature on emerging market multinational enterprises (EMNEs) developed mainly in the last two decades, which also suggests the need to investigate firms from emerging markets other than China. For example, Cuervo-Cazurra (2019) recommends looking in more depth into multilatinas and a 2017 literature review on outward foreign direct investment by EMNEs (Paul & Benito, 2017) found no studies that specifically addressed Brazil, although five studies addressed the BRIC countries together.

Third, IE researchers have studied the software industry in the belief that high-tech industries in general are well represented in INVs, but they have not approached the industry from the perspective of mature entrepreneurial firms. Moreover, a survey-based study conducted in Brazil concerning the characteristics of born globals (a type of INV) versus traditionally internationalizing firms in the software industry (Dib et al., 2010) suggests that differences between the two groups are not as striking as might be expected. It seems therefore that an in#depth look into leading Brazilian entrepreneurial software firms that internationalized later in their lifecycle might provide insights vis-à-vis rapidly internationalizing new ventures.

Literature Review

The study of entrepreneurship is scattered among several fields such as management, economics, psychology, and sociology. Several, and often conflicting, conceptualizations have tried to explain the phenomenon. The Schumpeterian view sees the entrepreneur as an engine of economic development and the entrepreneurial process as "destructive creation," while the Kirznerian perspective views entrepreneurship as a process of

opportunity discovery. Some studies equate entrepreneurial firms with small or medium-sized enterprises, or even with start-ups.

Entrepreneurship research in the field of management has inherited many of the frustrations and challenges of other fields. Research has followed two main directions: individual entrepreneurship and corporate (or organizational) entrepreneurship. Corporate entrepreneurship has been applied mainly to the study of multinational enterprises (MNEs) (e.g. Birkinshaw, 1997; Sharma & Chrisman, 1999) and to small and medium-sized businesses (e.g. Cucculelli & Bettinelli, 2015; Naldi et al., 2015). In fact, the large, mature, entrepreneurial firm has not attracted much researcher interest.

The literature on corporate entrepreneurship

Corporate entrepreneurship has been looked at mainly in the field of entrepreneurship and strategy. Although many studies have looked specifically at types of corporate entrepreneurship, recent work has examined internationalization as a type of corporate entrepreneurial behavior.

Types of corporate entrepreneurship

Guth and Ginsberg (1990) stressed three relevant dimensions of corporate entrepreneurship: innovativeness, new venturing, and strategic renewal, a typology that has been often followed by other researchers (Bierwerth, Schwens, Isidor, & Kabst, 2015). However, other authors work with different categories. For example, while Klammer, Gueldenberg, Kraus, and O'Dwyer (2017) suggest that strategic renewal includes downsizing, outsourcing, corporate venturing, restructuring, and rejuvenation, Schmitt, Raisch, and Volberda (2018, p.85) hold that the concepts of corporate venturing and strategic renewal "clearly differ." In addition, while some authors look at entrepreneurial attitudes, others look at entrepreneurial activities (Covin & Miller, 2013).

Kuratko, Hornsby, and Hayton (2015) suggest that corporate entrepreneurship comprises two sets of activities: corporate venturing and strategic entrepreneurship. Corporate venturing deals with the internal creation, or the acquisition, of new ventures. Strategic entrepreneurship refers to "a broad array of significant entrepreneurial activities or innovations that are adopted in the firm's pursuit of competitive advantage which usually do not result in new businesses for the corporation" (Kuratko et al., 2015, p. 248), and comprises several types of innovation: strategic renewal, sustained regeneration, domain redefinition, organizational rejuvenation, and business model redesign. Sustained regeneration (new product in an existing category) and domain reconfiguration (reconfiguration of products/categories) are two forms of product diversification. Strategy renewal has been defined as "the firm's ability to integrate, build and reconfigure internal and

external competences" (Teece, Pisano, & Shuen, 1997, p.516). Schmitt et al. (2018, p.81), in a literature review on strategic renewal, present a similar definition, defining it as "the process that allows organizations to alter their path dependence by transforming their strategic intent and capabilities." Organizational rejuvenation refers to "the alteration of internal structures, processes and capabilities" (Adenfelt & Lagerström, 2006, p. 94), and business model redesign consists of creating a "fundamentally different business model in an existing business" (Markides, 2006, p.21).

International corporate entrepreneurship

The idea that internationalization is a special case of corporate entrepreneurship is not new. In fact, internationalization has been seen in the international business literature not only as a form of geographic diversification and expansion to new markets, but also as an innovation (e.g. Lim, Sharkey, & Kim, 1991; Samiee, Walters, & Dubois, 1993). Internationalization is a form of entrepreneurial behavior by established firms because these firms internationalize in the pursuit of opportunities not available in the domestic market, and opportunity recognition is "at the heart of contemporary research in entrepreneurship" (Naldi et al., 2015, p.781). These authors define international corporate entrepreneurship as "an international firm's expansion into new foreign markets or into existing foreign markets by providing new products/ services to existing customers." (p.783). They add that this sort of corporate entrepreneurship often requires innovative, proactive and risk-taking approaches by management.

The international entrepreneurship and born globals literature

IE is positioned at the intersection of the fields of entrepreneurship and international business (Oviatt & McDougall, 2000). As such, it combines concepts from both fields. Therefore, in order to gain insight into the internationalization process of mature entrepreneurial firms, we examine the main issues that characterize INVs (and BGs).

Innovativeness seems to be positively associated with early firm internationalization (e.g. Autio, Sapienza, & Almeida, 2000; Dimitratos & Plakoyiannaki, 2003; Kraus, Brem, Schuessler, Schuessler, Niemand, 2017; Knight & Cavusgil, 2004; Zheng & Khavul, 2005). Internationalization is, in and of itself, innovation. Also, internationalization may engender more innovation as a result of knowledge acquisition when a firm crosses borders (Riviere & Suder, 2016), or of the development of dynamic capabilities as the firm strives to reconfigure its resource base (Capron & Mitchell, 2009). Innovativeness is thus both an antecedent and a consequence of internationalization (Zahra, Hayton, Marcel, & O ′Neill, 2001). In addition, these firms show proactiveness (e.g. Dimitratos, Plakoyiannaki, Pitsoulaki, & Tüselmann,

2010; Efrat, Gilboa, & Yonatany, 2017; Gabrielsson, Gabrielsson, & Dimitratos, 2014) and risk-taking behavior (e.g. Harveston, Kedia, & Davis, 2000; Knight & Cavusgil, 1996; Madsen & Servais, 1997; Mort & Weerawardena, 2006), and their internationalization process is strongly connected to the use of social capital (networks and partnerships) (e.g. Arenius, 2005; Chetty & Agndal, 2007; Felzensztein, Ciravegna, Robson, & Amorós, 2015; Gabrielsson, 2005; Ngasri & Freeman, 2018; Schwens & Kabst, 2009).

Researchers have also noticed that born globals – BGs (considered a type of INV) – are more market- or customer-oriented than firms that internationalize later or gradually (e.g. Brettel, Engelen, & Heinemann, 2009; Kim, Basu, Naidu, & Cavusgil, 2011; Knight, Madsen, & Servais, 2004), although one study did not find significant results for this variable (Wong & Merrilees, 2012). BGs also tend to deploy niche or focus strategies (e.g. Baronchelli & Cassia, 2014; Chetty & Campbell-Hunt, 2004; Gabrielsson et al., 2004; Moen, 2002; Zuchella, Palamara, & Denicolai, 2007) and differentiation strategies (e.g. Bloodgood, Sapienza, & Almeida, 1996; Evangelista, 2005; Knight et al., 2004; Pla-Barber & Escribá-Esteve, 2006).

Furthermore, the extant literature consistently shows that a number of entrepreneur characteristics (such as an international vision at inception and international experience prior to the firm's founding) seem to correlate strongly with early internationalization, although a study done in China indicated a different pattern (Naudé & Rossouw, 2010). Several authors uncover that international experience supports rapid internationalization (e.g. Bloodgood et al., 1996; Harveston et al., 2000; McDougall & Oviatt, 1996; Schwens & Kabst, 2009). Nordman and Melén (2008) found differences among born globals in terms of prior international experience of the founder/manager. An international vision seems to be behind the ability to inspire and lead the firm into new international markets, as well as to devise strategies that can take the firm into unexplored terrain (e.g. Harveston et al., 2000; Kundu & Renko, 2005; Mort & Weerawardena, 2006; Oviatt & McDougall, 1995). New opportunities are created or discovered due to external factors that trigger a "vision" and the subsequent pursuit of a way to implement it. The way by which the entrepreneur recognizes the opportunity and deploys resources can either enhance or constrain subsequent steps in international markets (Mathews & Zander, 2007). Table 1 presents selected characteristics of INVs and BGs found in the literature.

Table 1.
Selected characteristics of INVs and BGs

Selected Characteristic	Description
Innovativeness	Attitude favorable for innovation
Proactiveness	Attitude favorable for acting in advance to exploit opportunities
Risk-taking	Attitude that regards risk as unavoidable
Networking	Access to international networks or local networks with international contacts
Use of niche/focus strategies	Selling to one or only a few segments of the market
Use of differentiation strategy	Uniqueness of company offer compared to competitors
Entrepreneur's international vision at inception	Entrepreneur's view of the world as one single market; ability to see international opportunities
Entrepreneur's prior international experience	Experience acquired while living, studying or working abroad

Few IE studies have looked at the characteristics of more mature entrepreneurial firms that internationalize. A mature firm may still be led by the original entrepreneur many years later, or may have created an entrepreneurial culture (Dimitratos, Johnson, Plakoyiannaki, & Young, 2016; Leal-Rodriguez, Albort-Morant, & Martelo-Landroguez, 2017). Gabrielsson et al. (2014) approached the issue of whether an entrepreneurial culture remains intact as an INV ages. They found that entrepreneurial nature and intentions change over time, and certain characteristics that appear in earlier phases are not as important in later stages of the lifecycle.

Why do mature firms already established in the domestic market internationalize? There is no single answer for this question in the literature. The entry into a foreign market by a mature firm can often be associated with the entry of foreign competitors into the domestic market (Oviatt & McDougall, 1995) — either a defensive or a preemptive move. Bell, McNaughton, and Young (2001) note that some firms seem to abruptly start their internationalization process without any discernible motive whatsoever even after having been well established in the domestic market. Sometimes, firms decide to internationalize to increase their participation in already-established networks (Schweizer, Vahlne, & Johanson, 2010). In other cases, firms with strong entrepreneurial characteristics choose to internationalize gradually, during a later stage of their lifecycle (McDonald, Krause, Schmengler, & Tuselmann, 2003). Comparing early- and late-internationalizing firms, Schwens and Kabst (2009) found that late-internationalizing firms have different motives, compared to early internationalizers; mature firms seem to be more motivated by market-seeking and competitor-following than do INVs.

Mature firms combine previous domestic experience with new international experience, and they also tend to use trial-and-error strategies and replicate strategies that proved to be successful in the domestic market. Their international development often culminates in

wholly-owned subsidiaries in foreign markets (Schwens & Kabst, 2009). The replication of domestic solutions in foreign markets is seen as an attempt to reduce risks (Zahra et al., 2001). Nevertheless, other studies have found that established firms that internationalize later show behavior that is similar to that of INVs, such as innovativeness, proactiveness and risk-taking (Schueffel, Baldegger, & Amann, 2014).

Research Methodology

The research adopted the case study method of investigation, which is deemed more appropriate for obtaining a longitudinal and in-depth view of firms' internationalization processes (Nummela & Welch, 2006; Wright & Dana, 2003).

Case selection

The software industry was selected because of its dominance in INV and BG research. Three cases were selected based on the following criteria: (i) firms must be large-sized; (ii) their CEOs must be the founding entrepreneurs; (iii) their inception must have been prior to 1990; (iv) they must have started their internationalization at least ten years after inception (thus distinguishing them from BGs); and (iv) they must have reached a leading position in the Brazilian software industry. Three cases were identified (Table 2) that complied with these criteria: Stefanini, Totvs, and Politec. The last case was studied only until 2011, when the company was sold to a multinational firm.

Table 2.
Firms studied

Firm Characteristic	Stefanini	Totvs	Politec
Year of inception	1987	1983	1970
Year starting national expansion	1995	1996	1990
Total sales	R$2.6 billion (2016)	R2.2 billion (2016)	R$414 million (2011*)
Main Product Line	BPO (Business Process Outsourcing), Consulting	ERP (Enterprise Resource Planning)	BPO, Total Enterprise Security

* Until the company was acquired by a Spanish IT multinational

Stefanini IT Solutions was founded in São Paulo in 1987 by entrepreneur Marco Stefanini to train IT personnel. By 1990, however, the firm started to develop business software and to offer outsourcing services. National expansion began in 1995, with the opening of local offices in three large Brazilian cities. International expansion began in 1996. The firm adopted a path of organic growth until 2008, followed by acquisitions of several domestic and foreign companies. In 2016,

Stefanini had sales of 2.6 billion reais and around 21,000 employees worldwide (12,000 in Brazil). It remained privately-owned.

Totvs was founded in 1983 by Laércio Cosentino and Ernesto Haberkorn to develop software programs for microcomputers. From its headquarters in São Paulo, the company expanded nationally, setting up local offices in major urban areas, and it franchised operations in smaller regional markets. The first international move was in 1997. In 1998, a venture capital fund acquired a 25% stake in Totvs, enabling the acquisition of the Mexican software developer Sipros. In 2005, the venture capital arm of the Brazilian National Economic and Social Development Bank (BNDES) acquired a 16.7% stake in the firm. In 2006, Totvs went public. Between 2006 and 2013, the company also benefitted from subsidized loans and an investment in debentures (convertible to common stock) from BNDES. By 2016, Totvs had sales of 2.2 billion reais and around 5,500 employees (500 outside Brazil), and another 6,000 people working in franchises.

The study uses Politec as a counterfactual case, since the company failed and was acquired by a Spanish IT multinational at the end of 2011. Politec was founded in 1970 by the entrepreneur Carlos Alberto de Barros. With headquarters in Brasilia, the capital of Brazil, the firm offered software solutions for business and government. The Brazilian government soon became Politec's largest customer. National expansion started in 1990 and initial attempts to sell abroad began in the mid-1990s. Sales estimates for 2011 were around 400 million reais, and the company had close to 5,000 employees.

Data sources

The case studies were based on personal interviews with top executives, questionnaires applied to managers, and extensive secondary research (Table 3). Part of the material was available in a research center (including transcriptions of past interviews with firm executives) and part was collected for the study. The amount of data available for this study permitted triangulation. Triangulation was especially useful for constructing the case description. The interviews provided a general guide for reconstructing the events that characterized the international trajectory of each firm. The other materials helped to check inconsistencies and fill in the gaps.

Table 3.
Sources utilized in the study

Types of Sources	Stefanini	Totvs	Politec
Interviews and questionnaires	1	4	1
Books	1	1	1(*)
Thesis, dissertations and/or monographs	3	4	2
Company websites	1	1	1(**)
Articles in the press	65	83	33
Academic articles	1	7	1
Case studies	-	1	1

Book chapter; (**) Politec's website (pre-2011) is no longer available, since the company was acquired; however, the research center kept data from this website.

Data analysis

The first analytical step after the data were gathered included preparation of comprehensive case reports. The data were then organized into categories based on the literature. Each category was subdivided to serve as a guide for data organization and analysis (Table 4). Some sub-categories used in the analysis emerged from the field; industry recognition (a sub-category of innovation) and the three types of proactiveness (market seeking, preemptive move and follow the customer. The next step was cross-case analysis. Finally, pattern-matching was used to compare the findings with those in the literature.

Table 4.
Categories used in the analysis

Categories	Sub-categories
Innovation/ Innovativeness	Sustained regeneration (new product in an existing category)
	Domain reconfiguration (reconfiguration of product categories)
	Industry recognition
International corporate venturing	Acquisition of firms in other countries
	Greenfield investments in other countries
Proactiveness	Market seeking
	Preemptive move
	Follow the customer
Risk taking	Risk aversion
	Risk as inevitable
Competitive Strategy	Price (cost leadership)
	Differentiation
	Focus
Networking	Firm's social capital
	Entrepreneur's social capital
Entrepreneur´s Characteristics	International vision
	International experience

Cross-Case Analysis

The Brazilian software industry emerged in the 1970s under the military rule. However, it only started to prosper under the Information Technology (IT) Law of 1984, which established a market reserve for domestic IT producers. And although software was not directly included under the shield of government protection, it did benefit from this favorable domestic environment. After protection of the domestic market ended in 1992, most hardware manufacturers disappeared. Nevertheless, in the software industry, several firms not only survived but showed substantial growth, such as the three firms selected for this study (Stefanini, Totvs and Politec), which were small at the time of market protection for Brazilian IT firms, and remained so until 1992, when the IT law was abolished. Politec was the largest of the three firms until 2007, when it was surpassed by Totvs, and later (2008) by Stefanini.

Strategies and growth in the domestic market

The three firms followed different strategies in the domestic market. Stefanini focused on large clients, particularly in the financial sector, providing outsourcing and consulting services. In the beginning, taking advantage of Brazil's competence in IT for the financial sector (due to years of high inflation rates, which required the development of sophisticated software programs), the firm's main clients had been banks and other financial institutions. Later, the company started to serve other sectors such as retail and manufacturing. Expansion became necessary in order to better serve large clients: first nationally, and shortly thereafter internationally. The mode of entry into other markets, both domestic and foreign, was the opening of firm offices or acquisitions. Markets were selected according to where the clients had their operations.

Totvs followed a very different strategy. During the 1990s, the firm specialized in ERP systems to serve the small and medium-sized segment, which had basically been ignored by large multinationals such as Oracle and SAP. As these smaller firms grew, Totvs soon began to serve large firms, accounting for around 20% of its sales. Nonetheless, its focus remained on the small and medium-sized firm segment, both in the domestic and the international market. Because of the size of its target clients, management believed it did not make sense to open other offices, except in a few locations; franchising to local high-tech entrepreneurs was seen as the best strategy because these entrepreneurs had local market knowledge and access to local firms using their networks.

By contrast, Politec emphasized large government contracts. This strategic choice was consistent with the company's headquarters being in the capital of Brazil. Indeed, a cluster of software firms flourished in Brasilia, driven by the proximity with government agencies. Politec soon became the largest player, and a preferred supplier to government agencies and state companies. However, the over-reliance on government contracts eventually paved the way for bribery. And, as federal investigations became public, it threatened the continuity of business with other Brazilian government agencies, state companies, and the U.S.

State Department. Such circumstances made sale of the firm virtually mandatory.

Firm internationalization

The internationalization of the three firms was markedly different, although their first significant international moves occurred around the same time. Table 5 presents selected characteristics of the firms' internationalization processes.

Table 5.

Internationalization Process	Stefanini	Totvs	Politec
First international operation	1996	1997	1998
First country w/ foreign operations	Argentina	Argentina	US
Number of countries with physical presence	39 (2016)	8 (2016)	4 (2010)
% of sales from foreign countries (est.)	50% (2016)	4% (2016)	5% (2010)

Selected aspects of the firms' internationalization processes

Politec started with the acquisition of a small software firm in the US, with sales of around four million dollars. Until then, the firm had tried unsuccessfully to get contracts in the US. The acquisition legitimized Politec as a US firm. A partnership with Iridian Technologies gave access to the US State Department, and soon the firm had several contracts to develop iris recognition software for American consulates around the world. The international expansion after this promising start was, however, quite modest. In fact, the US operation was not as successful as expected. Acquired in 1998, the company had not yet reached breakeven by 2003. Other foreign initiatives included partnerships with Chinese and Indian firms, but they did not result in the establishment of facilities in those firms' countries. In 2008, Mitsubishi acquired a minority stake in Politec and the partnership was followed by a joint-venture in Japan. In 2009, the company announced a merger agreement with a Chilean firm, but the agreement later fell through. Although the reasons were not revealed, Politec was at the time under federal investigation because of charges of bribery in government contracts.

On the other hand, both Stefanini and Totvs showed a steady and rapid increase of the scope of their international operations, but Stefanini was more successful in achieving depth. In 2016, Stefanini had sales of 2.6 billion reais, around 50% of that amount from foreign countries, and had 88 offices in 39 countries (seven in the US). In contrast, in 2016, Totvs had operations (owned or franchises) in 41 Latin American countries, the US, Portugal and Angola. The company also had facilities in foreign countries: development centers in the US, Russia, China and Taiwan, and offices in six countries (Argentina, Mexico, China, Colombia, Portugal, and the US) besides Brazil. International sales accounted for 4% of total sales.

Innovation/Innovativeness – All three companies were recognized as highly innovative and had earned several awards and nominations throughout their history from domestic and international organizations,

both profit and non-profit. In addition to industry recognition, the three firms had developed software of their own that was competitive with similar offerings by international firms. They had expanded their product portfolio as they advanced to national and international markets, not only by adding new software, but also by entering new market segments with products designed to serve them. They thus achieved both sustained regeneration and domain reconfiguration (Kuratko et al., 2015).

International Corporate Venturing – The three firms acquired other firms as a way to enter new markets, while at the same time accelerating domestic growth and/or acquiring new competencies. Politec acquired Synergy Imaging Systems to gain access to US clients. Stefanini made a series of acquisitions, the most important being the American software firm TechTeam, a large-sized company with 2,300 employees and 16 subsidiaries in several countries. Stefanini also acquired two other companies in the US, two in Colombia and one in Uruguay. According to Stefanini's founder and CEO, the acquisitions in and outside Brazil had two different purposes: in Brazil, the goal was to add competencies; outside, in contrast, the purpose was to increase the company's volume by acquiring firms with similar products and services. Totvs's acquisitions were focused more in Brazil: its most important acquisition was Datasul, its largest domestic competitor. However, Totvs also acquired a Mexican firm (Sipros), and its domestic acquisitions resulted in a subsidiary in Portugal (from RM Sistemas), as well as franchised operations in other countries (from Datasul). After 2012, Totvs acquired a minority stake in the US firm Good Data Corporation. Table 6 presents the foreign acquisitions of each firm by year and by foreign country.

Table 6.
Corporate foreign acquisitions

Stefanini	Totvs	Politec
2010 - TechTeam (US) 2011 - CXI (US); Informatica & Tecnologia (Colombia) 2012 -Top Systems (Uruguay) 2013 - RCG Staffing (US) 2016 - Sysma (Colombia)	2003 - Sipros (Mexico) 2006 - RM Sistemas (Brazil and Portugal) 2008 - Datasul (Brazil and franchises in several foreign countries) 2013 - Good Data Corp (US - minority stake)	1998 - Synergy Imaging Systems (US)

Proactiveness – The three firms showed proactive internationalization. All the founders considered internationalization a strategic move. Politec's management saw internationalization as both a preemptive move and an opportunity for growth. Stefanini claimed that while the idea of going abroad came quite early in the firm's history, the main triggers were the perception that foreign competitors were entering the Brazilian market and going abroad was thus necessary in order to compete effectively. There was also a need to follow large Brazilian firms that were internationalizing. In addition, the firm had partnerships with other global software firms, such as SAP and Oracle, which also demanded services in other parts of the world. Totvs displayed all three types of

proactive attitudes, as reflected in top management's compiled statements (Table 7).

Table 7.
Examples of interview extracts concerning proactiveness

Proactiveness	Stefanini	Totvs	Politec
Market seeking	"The American or European IT market is still more than ten times larger than the Brazilian. [The crisis could be] synonymous with opportunity for those who can see beyond the crowd."	"When we speak of Brazil in terms of broadening our market share, I won't say it's impossible; but it is an extremely arduous task, since our share of the market is over 50% . . ."	"The U.S. market is unable to meet its own needs. And this demand is being met largely by those who already have one foot there, companies from India, Pakistan, Russia, Ireland."
Preemptive move		"We started talking with the international competitors that were coming. As this came to no avail, we decided to adopt a line of attack . . ." "No use staying here, because the competition was going to increase from there on out."	"With globalization, companies of our size can't just wait for things to happen. In the long run, that spells death."
Follow the customer	". . . go where the customers are." "This led us to partner with large multinational companies that have a high global sales volume yet don't have their own local team to implement all requests."	"Internationalization is not easy . . . but it is necessary. Brazilian companies are growing and internationalizing, and if you don't follow them, you're out of the game."	

Risk Taking – The firms tended to proceed more carefully than their INV or BG counterparts. Politec initially acquired a small firm and used it as a basis for US operations. The investment was not substantial, and the risk of failure was small. Also, the follow-the-client strategy posed low risk to Stefanini to expand internationally. Totvs' expansion, based on franchise contracts, was also a low-risk strategy.

Market Strategies – None of the three firms adopted a focus strategy in their internationalization, although Totvs tended to emphasize the small and medium-sized segment of the ERP market. As for differentiation, all firms had developed their own software and were considered innovative, but none used differentiation strategies; they competed on price. They were also customer-oriented. Interestingly, the three companies essentially followed the same strategy in the domestic and international markets, but later Stefanini began operations in India with a different

purpose, that is, to have access to the qualified and cheaper human resources available in that country.

Networking – All three showed a strong reliance on the firm's and the entrepreneur's social capital. This is not surprising, since, in their survey of the Brazilian software industry, Dib, Da Rocha and Da Silva (2010) found no significant difference in terms of use of social capital between early- and late-internationalizing firms, with substantial use of social capital by both groups. The authors explained that in Brazil "relationships are systematically used in order to foster business with other firms and individuals and are critical to operate successfully..." (p. 246).

Founders' Vision and International Experience – Despite the lack of an international vision at the firm's inception, the understanding that internationalization was critical for their firms' growth came in a later phase of their development. At some point in the firm's trajectory, Stefanini's founder decided to transform the firm into a global enterprise. In a similar way, Cosentino, the CEO and founder of Totvs, came to believe that international expansion was an imperative for the firm. Such understanding was the result of the dominant market position of Totvs in the small and medium-sized firm segment of the Brazilian market. As for international experience, none of the founders had work experience or education abroad, nor had they lived abroad.

Discussion

The results showed that the trajectories of the late-internationalizing entrepreneurial firms studied diverged substantially from those expected for INVs and BGs. Not only they internationalized later in their lifecycle, but also their internationalization processes, once started, proceeded slowly, with cautious steps, as predicted by Uppsala scholars (Johanson & Vahlne, 1977). Additionally, as explained by Oviatt and McDougall (1995), domestic firms that did not choose to internationalize tend to be limited by their organizational history, culture, and, most of all, by their routines, which were established to serve the domestic market. The argument can be applied to late internationalizers; they have to overcome these same obstacles in their international expansion. In addition, the entrepreneurs of the mature firms studied had no international vision at the time of their firms' inception but developed it later. In fact, although operating in a high-technology industry, these entrepreneurs were the product of pre-globalization times. Why then did these firms decide to internationalize? The study suggests that critical changes in the competitive and regulatory environment in Brazil were strongly behind firms' decision to go abroad. Such changes not only attracted strong multinational competitors to the Brazilian market, but also stimulated domestic firms to go international.

Their entrepreneurial nature also presented some different patterns compared to INVs and BGs. Despite being entrepreneurial and showing innovativeness and proactiveness, they were not risk-seekers (McDonald et al., 2003). Their risk aversion is probably associated to the fact that

they had much to risk at the time they went cross-borders: reputation, domestic market position, and resources. Comparatively, it is easier for young BGs to take considerable risks, because they do not have as much to lose.

The three firms used networking, but this characteristic does not seem to distinguish different types of firms in Brazil (Dib et al., 2010). Moreover, they had to build international linkages they did not have in their early years. The fact that older firms did not have previous international ties is due to the restrictions to importing and barriers to foreign direct investment in Brazil and to the entrepreneurs' lack of previous significant international experience or education abroad. In fact, the lack of international knowledge has been found to negatively relate to the speed of internationalization (e.g. Hagen & Zuchella, 2014; Love, Roper, & Zhou, 2016). In addition, the way these mature firms use social capital differs from INVs and BGs. Because the latter suffer from resource scarcity, they use networks to have access to the partners' resources and capabilities in order to complement their own (e.g. Gabrielsson & Kirpalani, 2004), while the mature firms studied use international linkages to replicate their domestic strategies in foreign markets. Also, mature firms made use of acquisitions, both in the domestic and international markets – a strategy also identified in a study of Israeli mature, high-technology BGs (Almor, Tarba, & Margalit, 2014) – to get access to foreign networks and acquire legitimacy in foreign markets.

Although innovative, the firms studied did not use differentiation strategies or focus/niche strategies, which are often adopted by BGs (e.g. Chetty & Campbell-Hunt, 2004; Knight et al., 2004), but competed mainly on price. The most salient aspect that emanated from the study, however, was the relationship between the domestic and the international strategies employed by the firms. The mature firms studied replicated their domestic strategies in foreign markets, as suggested by Zahra et al. (2001) and Schwens and Kabst (2009). The outcomes of the firms' internationalization processes (scope and depth) were the result of path-dependent trajectories, that is, they were directly linked to each firm's earlier strategic choices: segments served (larger versus smaller firms, government versus for-profit) and mode of operation (offices vs. franchises).

Path dependency has been studied in several contexts, and at both industry and firm level. Researchers have noted that choices made by a firm during its development phase may later have a significant impact on its trajectory: "Its current position is often shaped by the path it has traveled" (Teece et al., 1997, p.522). In addition, there is a tendency to replicate behaviors that were successful earlier (Booth, 2003). The results of the study show that earlier domestic trajectories did in fact shape international trajectories and future positions, as indicated by Schwens and Kabst (2009). This situation differs from that of a newly-born firm, which is more flexible and not locked into a given organizational design or a given strategic path.

Consider the Politec case. It can be argued that the priority given to government contracts made internationalization less interesting to Politec than to its counterparts. In fact, social capital might often be a hindrance to international expansion (Chetty & Agndal, 2007), as illustrated by this case. Because of a powerful network of domestic relationships within government agencies, state companies, government contractors, and other firms serving the Brazilian government, the company did not fear losing government projects to foreign firms. The network provided solid opportunities, not comparable with the difficulties in its US venture. Therefore, the firm's engagement with the Brazilian government influenced the strategic choices that culminated in a modest international position and, at the end, in its acquisition by a foreign multinational.

Both Stefanini and Totvs replicated their domestic strategies internationally. Stefanini's internationalization process was the result of an explicit decision made by the founder. On the one hand, internationalization was facilitated by serving clients from Brazil in other countries where these clients already had operations. Stefanini opened several offices on four continents to offer better services to these clients, a successful strategy that the firm had already employed in its domestic expansion. On the other hand, Stefanini also went abroad in a more independent manner.

For good reasons, Totvs followed basically the same strategy in the domestic and the international markets. The firm competed with powerful global multinationals in the ERP segment of the IT market and specialized in serving the small and middle-sized firm segment, where large competitors were not active. Accordingly, most of its foreign business came from acquiring new clients in the same segment. The choice of the smaller-sized firm segment was, from the beginning, associated with the decision to utilize franchises, a less expensive entry mode using local partners that had market and technical knowledge. Thus, Totvs followed a path-dependent strategy in international markets that was the result of several choices made during the firm's development in the domestic market. These choices led to slower growth in the international market (both in depth and scope) than that of Stefanini. Nevertheless, the firm recognized that internationalization needed to go at a faster pace and implemented changes in its internationalization strategy, which suggests a departure from its path-dependent strategy. A first step in this direction was the establishment of a company lab in Silicon Valley (US) in 2012, aiming at developing market and technical knowledge and building an international image.

It thus appears that two of the firms studied are moving from a path-dependent to a more strategically-oriented internationalization process. To some extent, this is a continued manifestation of a gradual internationalization path, where learning from trial and error (Schwens and Kabst, 2009) promotes forward progress.

Conclusion

The present study has shown that the internationalization of the three mature entrepreneurial firms studied differed markedly from that of INVs or BGs. This is not surprising since mature firms already have a history and have developed specific resources and capabilities, which tend to shape their future trajectories. INVs, on the other hand, start from almost nothing and are therefore free to follow any path that appeals to the entrepreneurs.

The profiles of the entrepreneurs from INVs and mature firms also tend to differ. In a high-tech industry such as software, in which entrepreneurs tend to be young at the time of the firm's inception, the entrepreneur's profile tends to resemble that of its cohort. Typically, the older generation of high-tech entrepreneurs has less foreign experience and education than younger entrepreneurs.

The results of this study suggest that when mature firms internationalize, previous domestic experience may be at least as important as early international experience. The reason is that a large domestic firm has already accumulated a substantial inventory of knowledge, which is incorporated and deployed in the various routines and structures. Accordingly, the firm attempts to replicate its domestic experience in foreign markets (Zahra et al., 2001), a strategy that can be potentially successful when the markets are similar (such as other Latin American countries) or when the same client base is served abroad.

We would argue, therefore, that the historical choices made by the three firms in the domestic market shaped their international trajectories and engendered their future positions. To some extent, these findings support the gradual internationalization hypothesis, as well as Eriksson, Majkgard, and Sharma's (2000) claim that the infrastructure of relationships determines the rate and direction of future international paths. In fact, our study shows that the rate and direction of internationalization in the cases studied resulted directly from the nature of each firm's network of domestic relationships. The study has also shown that once two of these firms started their internationalization processes, they proceeded at a swift pace in terms of number of markets served; moreover, one of the firms showed a fairly rapid increase in the depth of its internationalization.

This research contributes to the international entrepreneurship field, by examining how mature high-tech entrepreneurial firms internationalize, analyzing their trajectory vis-à-vis INVs and BGS, using variables emanating from the IE literature. The findings, therefore, support the concept of gradual, path-dependent internationalization. Nevertheless, the study suffers from several limitations. Only three cases were examined, and they were from the same industry and country. There is no guarantee that the situations studied are not unique or differ markedly from other cases of mature entrepreneurial firms. In spite of this we believe that this study's results help to shed new light on the internationalization process of mature entrepreneurial firms.

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