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14

International Entrepreneurship in an Emerging Economy

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1. Introduction

The economic development of a country depends today on qualified integration into the world economy. In the past, internationalization tended to be restricted to large companies. Today, small and medium enterprises (SMEs) have become involved in the global market in a variety of ways. The growing internationalization of the small and medium size firms has stimulated the creation of a field of studies aimed at understanding this new phenomenon, the so-called "international new ventures", "born global", "global start-ups" or "international entrepreneurship". The internationalization of these firms is based on singular features: their operations and strategies are not the same as the large firms, as they are not the same as the firms that remain on the home market. Internationalization requires small and medium size firms to mobilize different kinds of resources (economic and social) that uniquely impose greater degrees of risks and indeterminacy. In the past, small and medium size firms tended to be seen as victims; at present, they are seen as 'players in the game' (Ruzzier et al., 2006).

International entrepreneurship[1] is not a new phenomenon, yet it is certainly more significant today than it was some decades ago. Factors that have contributed to small and medium size firms involvement in international business are, among others, the increasing use of information and communication technologies (ICTs), growth of knowledge-intensive industries, reduced costs of transportation and logistics[2], trade liberalization and increasing competition, greater awareness of international economic opportunities, the need to share knowledge and costs with partners and the lack of qualified human resources on the home markets.

[1] Entrepreneurship is a controversial concept. For a good review of the concept, see Aldrich, H.E. (2005) "Entrepreneurship", in Smelser, N. J. & Swedberg, R. (eds), The handbook of economic sociology, 2. ed. New Jersey: Princeton University Press. Briefly, for the purposes of this article, international entrepreneurship is considered "the discovery, enactment, evaluation, and exploitation of opportunities—across national borders—to create future goods and services" (Oviatt & McDougall, 2005, p.540).

[2] "…a three-minute telephone call from New York City to London cost $717.70 in 1927 and 84 cents in 1999 (all in 1999 U.S. dollars). Shipping a 150-pound parcel by air from New York City to Hong Kong cost $2,188 in 1960 and $389 in 1999 (in 1999 U.S. dollars)." (Kuemmerle, W. (2005). The entrepreneur's path to global expansion. MIT Sloan Management Review, 46,42–49).

Indeed, as a result of shifts in technology manufacturing and knowledge-intensive services, a worldwide restructuring is taking place. This can be demonstrated by comparing data on world trade for the periods spanning 1980-1993 and 1994-2008. Data show a significant increase in the annual average of global export – from 3.6 percent to 7.8 percent (International Monetary Fund, IMF, as cited in Nonnenberg, 2011) – as well as a change in the kind of goods and services exported: there has been expressive growth of high technological goods and knowledge intensive services while labor intensive goods have suffered a reduction (from 40 percent of the total, in 1980, to approximately 29 percent, in 2008). A shift in the flux of world trade can also be observed, with export of medium and high-tech goods and services increasing at higher rates in the emerging economies (resulting primarily from Chinese and Korean performances) than in the developed economies. The nature of international operations has also changed: in addition to export and/or commercial activities, these operations now include partnerships and contracts with other enterprises for manufacturing or assembling processes, for distribution, maintenance, after-sale support, and for brand transfer and franchises abroad.

These changes can, to a large extent, be seen as a result of the nature of innovation, technology transfer facilitated by multinational corporate investments in R&D, as well as the increasing volume of foreign direct investments in emerging economies (Nonnemberg, 2011)[3] and, last but not least, the spread of science and technological capacity around the world. Indeed, research investments are growing more rapidly outside the centers that previously dominated world R&D – North America, Europe, and Japan (See Figure 1).

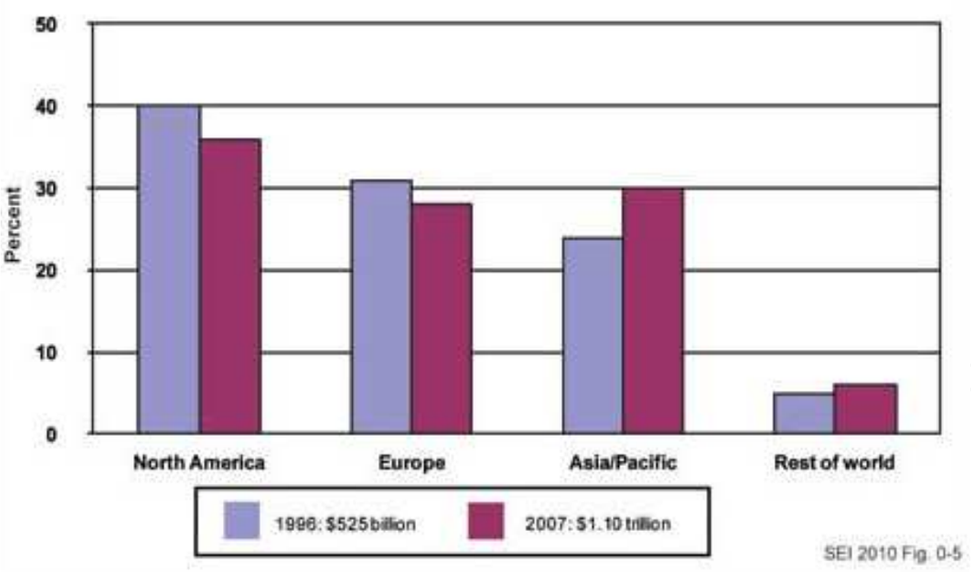


Fig. 1. Location of Estimed Worldwide R&D Expenditures: 1996 and 2007[4]

[3] In developed countries, high-tech goods and services underwent a 53 percent to 66 percent increase during the 1980-2008 period; in emergent countries, there was a 16 to 50 percent increase over the same period (Nonnemberg, 2011).

[4] Source: Globalization of Science and Engineering, Science and Engineering Indicators, 2010. National Science Board, Arlington, Virginia, US (accessed on 05.09.2011: http://www.nsf.gov/nsb)

The growth of knowledge intensive entrepreneurship in emerging economies may be associated with worldwide decentralization of R&D, made possible to a great extent by ICTs5. Data from the Science and Engineering Indicators, 2010, of the National Science Board (NSB), USA, reveal a new map of R&D (see Figure 1): in 2007, North America and European Union were responsible for 63 percent of the world's US$ 1,10 trillion invested in this area, as compared to 71 percent in 1996. The Asian Pacific's (mainly China, Japan and Korea) contribution rose from 24 percent to 31 percent. Latin America remained a minor player with a mere 2.6 percent of the total. Despite the region's low performance, Brazil emerges as its leader in R&D, demonstrating growth that has repercussions for innovation and high tech-entrepreneurship.

Since the end of the 1990s, successive Brazilian administrations have made significant efforts to stimulate the internationalization of the Brazilian firms, through a range of incentives which have included SMEs. The Productive Development Policy, issued in 2008, aimed at increasing private investments in R&D in order to create conditions for the country's qualified integration (including SMEs) into global trade.

Recently (August, 3rd, 2011), the Brazilian Research and Innovation Enterprise (Embrapii) was created, in partnership with the German Institute Fraunhofer. It aims at promoting innovation in industrial and service sectors, based on the principles of the successful Brazilian Enterprise of Agricultural Research (EMBRAPA), which operates 90 research centers throughout the country. In the speech he gave, current Minister of Science, Technology and Innovation Aluízio Mercadante asserted that EMBRAPII seeks to "expand the system of innovation primarily within small and medium enterprises" (Minister of S,T&I speech, See http://www.anpei.org.br/imprensa/noticias/cni-e-governo-criam-empresa-para-inovação).

Why is internationalization important? Internationalization is a general concept that includes a variety of activities, such as exportation of goods and services or establishment of joint ventures and subsidiaries abroad, aimed at setting up contracts and partnerships among enterprises for the development of R&D activities. In this article, we use the concept "internationalization" in its general sense, that is, the move to carry economic and productive activities beyond borders; in other words, activities that are not restricted to commercial operation. Internationalization is always considered here with a focus on technological innovation.

There is some consensus in the literature that internationalization has a positive impact on firm performance. Internationalization implies greater transaction costs than would be incurred within home markets, thus requiring the enhancement of firm performance. Thus a process of reciprocal influence is set off: internationalization favors the development of a firm's technological capacity which, in turn, benefits its competitiveness. Firms may also benefit from exchanges that are set up with international research centers, some of which are

[5] This transformation, which the ICTs made easier, enables us to question the thesis asserting the inevitably peripheral position of developing countries - as exporters of commodities and bearers of a technologically-dependent industrialization - within the international division of labor (Arora & Gambardella, 2004; Ariffin & Figueredo, 2006).

known for their excellence. Furthermore, the possibility of establishing partnerships with other firms for joint developments of goods and services, aimed at accessing new markets, is opened.

Nonnemberg (2011) refers to several recent studies that demonstrate the existence of strong correlation between exportation, innovation (presence of R&D) and increase in productivity. That correlation would be especially true when considering SMEs in emerging countries, which benefit from the interaction with foreign enterprises through the transfer of technological, managerial and market knowledge. There is also evidence that shows a positive correlation between exporting firms and improved human resources management (for instance, higher wages and investment in training). Firms that rely primarily on exporting what they produce have 3.6 times more probability of producing radical innovation than firms relying on local or regional markets; firms that participate in cooperative arrangements with other organizations for the development of innovation have 4 times more chances of producing radical innovation than firms that are not involved in cooperation with other organizations (Tironi & Cruz, 2008).

Knowledge-based firms tend to employ more complex processes in designing a new product, an improved production method or more efficient service delivery. For instance, in the Bio-technological sector, a firm may develop processes that involve some type of manipulation of human genes. These firms may enjoy the possibility of internationalizing insofar as they tend to hold a competitive sustainable advantage which may be in demand in other countries (Oviatt & McDougall, 1994).

A study of technology, export and employment which considers Brazilian firms has concluded that "The innovative internationalized firms pay better wages, employ qualified people expend proportionally more resources in training, which improves the workers' qualification." (Arbix et al., 2005 as cited in De Negri e Salerno, 2005).

In the present article, our major goal is to describe the findings of research based on five cases. These cases were selected from a survey that our team carried out at 81 knowledge-based SMEs, located in incubators or in technological parks situated on five different university campuses. Among the 81 firms where interviews were conducted, there were only 19 that declared involvement in international activities, and in most cases, this was more occasional than regular; furthermore, for most of them, this involvement had taken place in the past. The five cases we selected were among the small and medium size firms that could be identified as minimally successful.

Our research main objective was to inquire into how entrepreneurs discover, evaluate, and exploit international opportunities, considering the relationship between environment, industry conditions and entrepreneurial actors. Based on that objective, some issues were raised, as follows:

How does a Brazilian start-up expand beyond borders? Can patterns of internationalization be observed among high-performing ventures or do they all tend to follow different paths?

How have an outward-oriented culture and strategic actions developed, in light of the fact that neither are part of the country's entrepreneurial culture and that the size of the domestic market could be considered an incentive to remain at home?

2. Brazil and internationalization

New features of economic development marked by knowledge-based industries, internationalization and innovation represent a significant challenge for an emerging economy like Brazil. The Brazilian industrialization process was based on an import-substitution model, geared toward the home market and favored by strong state protectionism. This worked to prevent the emergence of a culture of innovation, insofar as the reigning concern became the production of goods that had previously been imported. Yet over the last two decades, confronted by new economic dynamics, Brazil has been made a tremendous effort to overcome the lacunas that were the legacy of the "old culture". Since the end of the 1990s, the country has been implementing policies aiming at stimulating innovation, aided by private investment in R&D and seeking to put the country on the map as a relevant player in the international innovation scenario. Incentives also target micro and small high-tech companies.

Notwithstanding government incentives, innovative small and medium size companies in Brazil show low performance in export activities. Moreover, this is particularly true with regard to the leading sectors of the "new economy" - ICTs and the Life Sciences sector. Findings of research carried out in 2008 (Biominas, 2009) which looked at 252 private firms in the Life Sciences field showed that only 11.2 percent of the respondents declared recurrent export activity, while 22.4 percent reported that they exported occasionally. Nonetheless, 30.7 percent of these firms declared an intention to take part in the world market within the next two years. Efforts are being made to overcome low performance: in the area of Biotechnology, BrBiotec, a Technical Network in Biotechnology and Health, was recently created, for the purpose of strengthening the identity and performance of Brazilian firms on a world scale.

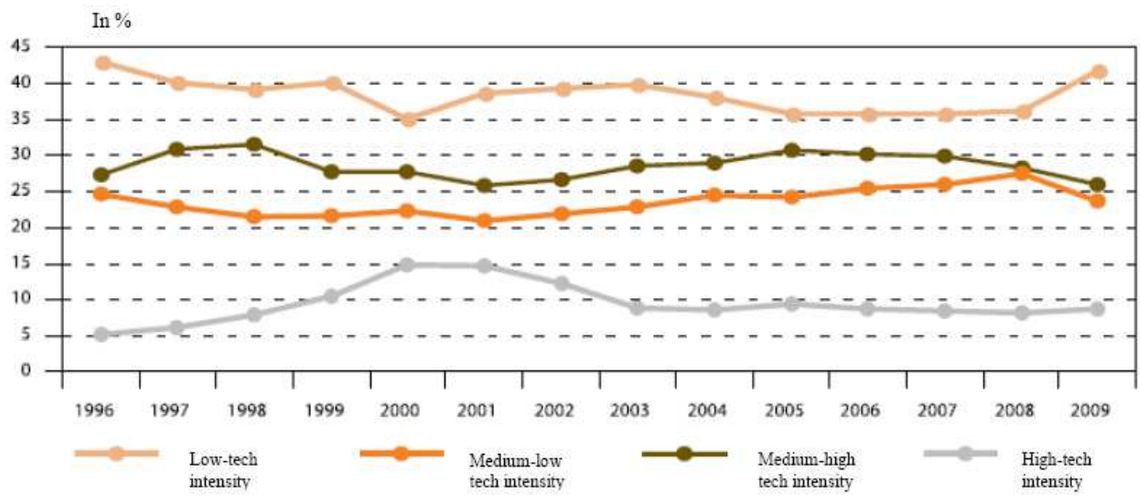


Chart 1. Export of manufacturing goods, by technological intensity (1996-2009)[6]

Despite low performance in the export of high-tech goods and services, Brazil's export structure has undergone change. Chart 1 here maps Brazilian export performance over the 1996-2009 period, by degree of technological intensity for product groups. In the case of goods

[6] Source: IPEA, 2010, P. 497.

produced with lower levels of technology (textiles, leather, shoes, wood, paper and cellulose), a decrease from 43 percent, in 1996, to 36 percent, in 2007, can be observed; however, this was followed by a later increase that brought the group up again to previous rates, reaching 42 percent in 2009. Products requiring medium-high and medium-low technological intensity maintained a largely balanced pattern, with some minor fluctuation, over the period. The world crisis explains drops in the medium-high group (cars and capital goods, refined oil and other fuels) and the medium-low group (rubber, plastic products, refined oil and other fuels; other mineral products) in 2008-2009. The high-tech group (airplanes and aerospace equipment/services, pharmaceuticals, information and communication technologies, medical and optical equipment) has increased its participation from 5 percent, in 1996, to 15 percent, in 2000, due to airplanes and cellular phone export. From 2003 on, exports in this group have fallen to 9 percent, primarily due to the drop in cell phone exports; nonetheless, when compared to 1996, a significant increase becomes evident (Instituto de Pesquisa Econômica Aplicada [IPEA], 2010, p.497).

3. International entrepreneurship

The literature on SME firm internationalization, although highly diversified, tends to focus primarily on Europe and the United States. There is a tendency to generalize firms' internationalization trajectory as a continuum that moves from local to worldwide, with regional presence as an intermediate stage. This tendency runs on the assumption that the lower the level of cultural differences and geographical distance, the faster and more successful the route to internationalization (Kuemmere, 2005). Yet the validity of this assumption may be questioned, since in the era of easy communication, a firm's trajectory is likely to be related to the economic dynamism of a region or market, regardless of geographical or cultural distances (an argument that we will be develop later on).

In examining the internationalization of small and medium-size firms, current literature tends to highlight the so-called structural aspects or enabling forces: faster and lower cost transportation that have enabled people and goods (the containerization of freight) to move easily among countries (Oviatt & McDougall, 1999) and improved communication (on line communication through digital technology and/or facilities for overseas travel). However, it is also acknowledged that in order for structural factors to be effective, motivating forces must be set into motion. Concerning the internationalization of small firms, several aspects may be identified as motivating drives: reduction of tariffs in target countries; incentives provided by the home country government; the influence of international-minded management; sharing of knowledge and research costs through strategic alliances and collaboration; favorable sales and profit opportunities in foreign markets; new markets; voluntary orders from foreign buyers; foreign expertise to improve domestic competitiveness; feasible ways to ship to foreign markets; unused productive capacity; adverse domestic market conditions; looser product regulations in target countries; favorable currency exchange values; foreign competitors' entrance into the domestic market and access to human and financial resources.

Beyond objective and enabling factors, some analysts also emphasize the ability of certain individuals to perceive valuable opportunities, which they call "opportunity recognition". This is considered to be a central characteristic of entrepreneurial behavior, the underlying subjective aspect of the phenomenon: how entrepreneurial actors interpret or mediate the opportunities that are created by enabling and motivating forces. The way in which an

entrepreneur observes and interprets opportunities to enable internationalization is considered to be contingent, to large extent, on personal experiences and characteristics (e.g. prior international experiences) and psychological traits (e.g., risk-taking propensity) (Oviatt, Shrader, & McDougall, 2004; Oviatt, & McDougall, 2005, p.542).

Other analysts challenge the subjective perspective by asserting that opportunities can only be recognized by individuals with certain capabilities (Shane & Venkataraman, 2000, as cited in Aldrich, 2005). Indeed, the perception of opportunities requires a diversity of information. The importance of the networks and their diversification, as well as learning acquired from earlier jobs or other professional experiences are all salient elements. Research findings highlight the absolute relevance of such factors. Nonetheless, they may be considered a necessary but not sufficient condition, since among many people in similar personal and cultural situations, only a few choose to found a firm.

In short, some approaches emphasize the entrepreneur's ability to perceive opportunities and make decisions based on his/her values and attitudes; others highlight the role of institutions and the general socio-economic conditions favoring or constraining actors' decisions and decision-making. To isolate only one of these perspectives would lead to too simplistic a position; as Thornton asserts, entrepreneurship is a dynamic phenomenon, changing according to social-economic and technological transformations. Individual or socio-economic or cultural factors may be responsible for the emergence of the phenomenon in one period yet not in another, since the nature of entrepreneurship and the requirements for starting a business also change. Thornton proposes a multilevel approach which integrates analyses of "the effects of individual-level traits, organizational and market-level variables, and population-level characteristics…" (Thornton, 1999, p. 36). This seems to be a more adequate approach for analyzing international entrepreneurship as well, since small firms' internationalization results from a combination of factors created by institutions, environment, the nature of the industry and actors' capabilities.

4. Our findings

The firms we researched were created over the last 10-12 years. Their products and services are knowledge-intensive: telecommunications equipment; software and biotech products. In four companies, at least one of the founders was connected to academic life. Some of them are still active as academic faculty. All firms except one began their activities as an incubator firm or within a technological park on a university campus; all of them are currently engaged in research projects with academic participation.

Different firms have taken different paths towards internationalization, thus limiting possibilities for generalization. This in turn poses some problems for perspectives that assume firms move, gradually, from shorter to longer distances, whether in geographical and/or cultural terms. The trajectories of the firms we researched portray other scenarios, as we suggest below:

1. Following the client – this is the case of firm A, created in the 1990s and specializing in development of software for the shoe industry (in southern Brazil). It was founded by an academic who abandoned academic activities due to the difficulties he had in combining them with business. These difficulties were heightened by internationalization itself, with its concomitant commitment to travel and long stays abroad.

In this case, the internationalization process began in 2004, following in the wake of a client - a Brazilian shoe company which had initiated production operations in China. Around 80 percent of the firm income is generated from export (a previous 90 percent). As we see here, the process of internationalization resulted from an indirect factor: the main client moved production to China, in an attempt to face the challenge of Chinese competition. In fact, this is not an unusual form of internationalization; it has occurred within the leather industry with some companies moving to Spain and China. Although "following a client" may seem like an easier way to internationalize – since apparently, the groundbreaking work has been carried out by the client - in reality the process demands significant changes for the software supplier. Support and maintenance services, require considerable adjustment, such as employees' intensive training; this has included building skills in oral and written communication in English, not often required for Brazilian employees, not even in the software industry. The need for frequent travel to distant places is cited by employees as another problem, demanding the ability to adjust to different or unusual situations.

The firm employs 30 people, of whom 70 percent hold undergraduate and graduate degrees. The remaining 30 percent are currently attending undergraduate courses. The company's founder expressed concern over the present situation: according to him, since 2004, computer professionals' wages have increased 80 percent, while the business' income was reduced by half due to the de-valuation of US currency exchanges rate. He also complained about high staff turn over – an indication of scarcity of personnel – which, he sees, jeopardizes firm investments in training.

The firm sustains a close relationship with the university, through joint development of research projects with academics, as well as providing training for students.

2. Strategic alliances with international partners – this is the case of firm B - one of the most innovative small firms in the field of Biotechnology in Brazil. It is a typical knowledge -intensive firm, investing 60 percent of its annual income in research activities. Its founder is a perfect example of "scientist-entrepreneur", preserving the qualities of a real scientist which he fuses with the practical view of an entrepreneur.

The founder holds a PhD degree in Medicine, from Alberta University in Canada. There, he was exposed to another sort of experience: his academic training was accompanied by technical training within a biotech firm located within the university technological park. This experience gave him expertise in technical aspects of the field. In contrast to what occurs in Brazil, the generation of knowledge was conceived of there as a potential tradable commodity.

His return to Brazil, in 1999, coincided with the government policy that created a system of support for Science, Technology and Innovation, guaranteeing finance resources for R&D aimed at the development of research and innovation in the private sector as well – something that had been previously almost inexistent.

Growth strategies involve investment in relevant innovation, in order to produce new knowledge at the global level, rather than simply adding improvements to a product already existing abroad. This kind of innovation adds considerable value to the product. As the entrepreneur argues: "(The firm) grows and makes money not by simply exploiting the firm's resources, but by adding value to the products."

This company has partners in Canada, Germany and Brazil, through trade agreements (distribution and representation), joint ventures (through mutual technology transfer) and

through contracting. The cooperation agreement signed with a Canadian firm, from Toronto, seeks to develop a vaccine for prostate cancer. The Brazilian firm is preparing to go to public offerings (IPO), at the Toronto Stock Exchange.

3. "Born global" – Firm C started in 2003, exporting electronic games (for family entertainment centers), first, to Spain, through the help of a reseller. The firm was able to expand to other European markets: in its current (2011) eight years of existence, it has exported to more than 30 countries in Europe, Asia, Africa and Middle East and has distribution contracts with 17 international firms. At the beginning, markets were opened through the help of personal social networks. Expansion to other markets was largely carried out through the firm's presence in fairs and through contacts via Internet. Until recently, it exported up to 60 percent of its production. In 2010, exports dropped to 20 percent, due to the fall of international demand and the simultaneous growth of the home market, primarily as a result of upcoming international events such as World Cup and Olympic Games, which will require electronic equipment produced by the firm (electronic panels and stadium access cards). The firm also produces voting machines used in several state parliaments in Brazil. The firm's entrepreneur considers exports very important primarily because of the value of feedback from abroad- which he sees as contributing with new ideas that help to improve the products- and to tax breaks, considered a way of compensating for the high taxation of the home market. The firm's target goal is to export 50 percent of its total production. One of its founders, currently the minor partner, is a university researcher in Computer Science. The major partner has a background as a staff member at a firm which made games. The combination of both kinds of know-how has allowed them to become very successful, through innovation in electronic equipment and games. The firm's R&D has about 30 employees (one third of the total number of employees).

The major part of firm C investments come from its own resources, although it has recently taken a loan from a public bank in order to build new installations. Despite the ease with which credit (at lower rates) can be obtained (especially since the firm was awarded a prize for its innovative performance), the owner is very cautious about taking loans; he fears unpredictable shifts in the market.

4. Sub-contracting in China - Firm D chose to subcontract out to China in order to benefit from lower labor costs in producing the cabinet for one item in its telecom equipment. However, it kept its innovative research sector at home. Producing in China is also a way to deal with Chinese competition. It involves a process of technology transfer from the Brazilian firm to the producers in that country, in order to guarantee compliance with quality standards and application of tests to assure the quality standards required. Furthermore, the pieces produced in China undergo thorough testing for compliance with standards at home. The firm has 90 employees, one third of whom work in R&D. The firm also contracts out R&D services and maintains a partnership with an university to carry out two research projects. In the past, these funds came from the firm's own resources. At present, part of this money comes from a government endowment: the firm and a university have received resources to develop research projects jointly. The focus on R&D is also related to the firm's concern for increasing its product portfolio in order to reduce market vulnerability.
5. Export on demand –Firm E is a small firm which focuses on R&D. It was created in 2001 by a group of researchers from two well known universities in the South of Brazil who

were motivated by a call from a government program to finance knowledge- intensive firms. Its current owners are three persons holding PhDs in Biotechnology, two of whom work in the academic area and a third, devoted to management activities. The goods and services the firm offers are based on modern Biotechnology and Bio information.

Firm activities are concentrated on R&D, focusing on biopharmaceutical research. They do engage in commercial activities but rely on resellers for packing and selling the products to other firms. Firm E employs 22 skilled staff members (among whom five hold PhD degrees and four, Master's Degrees). For approximately four years, firm income was generated by the supply of biopharmaceuticals to larger domestic firms. These firms, however, were bought by other larger companies – a consolidation process characteristic of what goes on in the industry worldwide. Previously-signed contracts were broken, generating penalties that allowed Firm E to continue in the business. At the moment of our research (2010), the biotech firm relied heavily on government financing. To complement its budget, the firm carries out services for larger firms. Its income is totally exhausted on running the business and owners are not currently receiving payment; their income comes from their academic work at the university.

This firm illustrates of the main features of the new paradigm quite well, that is, the close relationship between academic life and business. Its internationalization began through a foreign order resulting from an academic paper written by one of its founders which was accessed on line. The American subsidiary of a German multinational expressed interest in a potential product and asked the company whether it would be interested in producing and exporting it. The American firm then helped the Brazilian firm with the procedures to get the export process going – a very cumbersome process indeed, since they are dealing with biological material that requires strict certification rules. The relationship between the firms worked very well, until the 2008 economic crisis which reduced and eventually terminated demand.

5. The internationalization process

Knowledge -intensive firms have a variety of characteristics: some products and services such as the ones related to life sciences and Biotechnology are more complex and more difficult to work with than others. Biotechnology – one of the key sectors in the "new economy" - attracts billions of dollars in capital on a worldwide scale, but must cope with extreme risk and uncertainty. Innovation in Biotechnology demands a long process and depends on time-intensive R&D work. Nonetheless, the life sciences and Biotechnology industry in Brazil is growing, particularly in health biotechnology (primarily in the areas of vaccines and diagnostics). The country has acquired a strong technical position in a number of crucial enabling areas, such as stem cell research, genomic studies, plant Biotechnology and vaccines. Around 75 percent of the sector is made up by small firms (Biominas, 2009, p. 9). Notwithstanding the important governmental role in supporting R&D within life sciences companies, targeting internationalization (64.1% of the total amount of US$ 95.8 million invested in 2008), the sector's international achievement still remains very low.

In the electronics industry, where competition is harsh and products have a short life, internationalization is seen as a form of surviving, not only through export but also by establishing strategic alliances and subcontracting. In general terms, internationalization was seen by our interviewees as a way of enhancing company competitiveness, since in the global era - where access to the markets is supposedly easier - goods and services must have international quality and prices, regardless of whether produced for home or foreign markets.

Despite sectorial differences and the distinct paths to internationalization that characterize the cases we have researched, all of our interviewees claimed to have been benefited by ease in communications, particularly electronic communication. In some cases, it has been absolutely crucial for business emergence and expansion. Reliance on electronic communication is particularly true in the case of Brazil, where labor laws make it practically impossible for a small firm to maintain employees abroad. Internet was considered a formidable tool for obtaining information of different kinds related to firm performance. Access to fairs and exhibits was also seen as a very important opportunity to engage in international business.

Our respondents identified internationalization experience as having a positive impact on firm performance. Interviewees felt they could characterize relationships with foreign partners as horizontal rather than dependant. Constraints stemming from requirements and certifications which are sometimes quite strict were regarded as an opportunity to learn and to improve the quality of the products and services.

Constraints were identified as emerging primarily from domestic problems. A common complaint was related to the lack of skilled personnel needed to deal with innovative research linked to market demands. It was noted that people holding university degrees are prepared for the academic world but not for producing innovation. The lack of skilled staff generates heavy competition over human resources within knowledge-intensive firms. Other problems that entrepreneurs pointed to were the excess of bureaucratic procedures imposed by Brazilian institutions and currency exchange rates that devaluate the US dollar vis-à-vis other national currencies, thus favoring imports over exports.

The world economic crisis was seen as a problem acting to reduce demand. Nonetheless, the country's economic growth and favorable market conditions guarantee the expansion of the home market, without the uncertainties and difficulties of trading across borders. Therefore, small start ups which have been involved only sporadically within the world market become less motivated to internationalize.

The firms we researched have had different trajectories, performance outcomes and path dependence, demonstrating the risks of generalizations about innovative knowledge-intensive entrepreneurship. Their affinities can be identified as a shared focus on innovation. The two firms that come closest to what could be called "radical innovation" are in the Biotechnology field. One of them (Firm E) is still very dependent on government support while the other one (Firm B) relied heavily on government support in the past. It was able to consolidate its trajectory through strategic international alliances and it is now preparing to go to IPO, in Canada. The two other firms which are currently undergoing processes of expansion (Firms C and D) rely mainly on their own funds and can be seen as based on incremental innovation. At present, they are redirecting the major part of their production to the home market, due to conjunctural conditions. Firm A, focused on software development, was also the one which reported to have been most harshly affected by the negative impact of the present currency exchange situation.

6. Final considerations

At the macro-level, the so-called knowledge economy and globalization stimulated by ICT feasibility have tended to favor economic decentralization of production and of R, D &I,

which may facilitate discovery of promising market niches and business opportunities. The availability of a national/regional system of innovation, however incipient, tends to favor the expansion of high-tech entrepreneurship in emergent economies. In the Brazilian case, notwithstanding unfavorable cultural and institutional features, government legislation since the end of the 1990s has been a strong factor in stimulating entrepreneurship.

At the micro level, it has been shown that entrepreneurs have a particular view of the potentialities of some market conditions, contributing to the pursuit of their goals, even against the grain of predominant social and cultural conceptions. In that sense, their individualist perspective seems to play a role. At this level of analysis, empirical data suggest that individual differences in social status did not correspond to differences in the "opportunity recognition" – an ability that depends to a large extent on information but also on an ability to make good use of it through generating knowledge.

Individual exposure to multiple social and cultural influences (whether on the job, in school or through other means of information, locally or abroad) is vital in supporting the decision to be an entrepreneur, particularly when this does not seem to constitute a rational choice.

The dependence of successful entrepreneurial efforts and economic activities on embedded and densely connected network of social actors was demonstrated, as well as the importance of network diversification allowing firms to identify and access novel information and the resources needed for sustained development and improved performance. In the case in point – emergent societies – the articulation of educational and scientific institutions, students, professors, government, other enterprises, among others social actors, reveal relationships that are not properly embedded within social contexts but rather learned from an ad hoc situation. To cope with difficulties, firms have to extend their networks beyond the closed scientific circle, in order to reach different external partners: the finance industry and leading investors, administrative consultants in areas related to law, taxes and marketing, local authorities, customers, foreign partners and competitors.

High-tech firms are able to build different strategies that allow them to face competition from competitors who are better- positioned in economical and technological terms. A key difference between firms was identified: a) those producing incremental innovations (improvements in already-existing products – new to the national and to the Latin American markets), relied on their R&D departments, on relevant information usually sought abroad ,and on imported equipment; b) those firms whose innovation can be characterized as radical innovation or something similar to it, (that is, new to the world market) reveal a higher degree in founders' level of scientific training. This may be crucial factor in explaining the difference we have identified.

The internationalized knowledge-based firms we have researched here focus on R&D activities, since innovation is the main strategy they employ to compete in the global market. All the firms we studied had their own R&D department, which usually accounted for one third of total staff. This feature indicates a new trend among firms, since in Brazil – a lasting consequence of the import-substitution model of industrialization- even large companies tend to have little interest in maintaining a R&D department.

Some of the innovative firms we studied tended to privilege the R in detriment of D. In some cases, firms follow the organizational principles of the new division of labor, which

tends to separate R&D from production, which, in turn, is outsourced. Two firms in our research fell in that category.

The focus on R&D has created incentives for the development of relationships between firms and universities. The firms we studied all mentioned some kind of relationship with the universities. The two firms in the Biotechnology sector have a closer relationship to academic life although both have their own R, D &I departments. However, innovation – the creation of goods and services aiming at the market – was accomplished at the firm itself while universities contributed with knowledge creation and the training of skilled personnel. The university role has not been a relevant source of innovation for the firms, but maintains a secondary role, primarily related to personnel recruitment, consultancy and research partnerships. One case of joint development of research projects was observed, revealing a closer relationship between the firm and academics in which the academics were also the owners of the company.

To foster internationalization, innovation must be accompanied by market prospects and knowledge of communication channels. Information technologies are an invaluable contribution in easing the burdens of communication that have, in the past, posed restrictions on the SME internationalization. For our respondents, another crucial strategy refers to maintaining attendance at exhibitions and fairs, in order to become aware of novelties, identify the routes that large firms are paving and search for international buyers and partnerships.

As we have mentioned, the cases we studied did not confirm the thesis that one of the major incentives for firms to engage in international business is related to so-called "psychic distance", that is, the better knowledge they have about business opportunities in their immediate surroundings, enabling the process of internationalization to follow a gradual path from regional to global. Our findings, to the contrary, show that the decisive factor regarding choice of a business destiny is not related to "psychic distance", but to economic dynamism. If a dynamic economy is found in a distant rather than local region, cultural and geographical distance may not be determinant. Among the firms we studied, international networks were not based in Latin America. It seems that easier forms of communication such as those provided by the Internet, as well as the greater familiarity of foreign cultures and feasibility of covering long distances, have contributed to make cultural and geographical distances less important than they used to be.

These conditions confirm the importance of what some analysts call social capital[7] - access to privileged information through connections (network) provided prior to any economic transaction. There is a marked need for the founder to be embedded not only in a scientific network (formed by senior researchers) but also within a network already oriented toward conceiving generation of knowledge as a possible tradable commercial commodity. In that sense, we also highlight the relevance of cross-organizational networks and entrepreneurs' ability to transfer experience obtained abroad in leveraging the performance of their ventures.

[7] "Social capital" is a metaphor that indicates a set of social resources available to individuals who are part of network involving connections and interactions.

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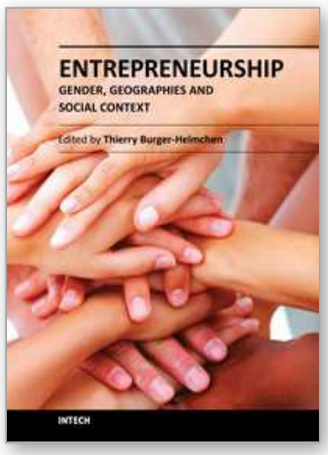
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Entrepreneurship is a main driver of economic growth and of social dynamics. However, some basic characteristics like the gender of the entrepreneur, the geographical location, or the social context may have a tremendous impact on the possibility to become an entrepreneur, to create a firm and to prosper. This book is a collection of papers written by an array of international authors interested in the question of entrepreneurship from a gender point of view (male vs female entrepreneurship), a geographical point of view (Africa, Europe, America and Latin America, Asia...) or a specific social context point of view (agricultural economy, farming or family business, etc.).

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