

The funding of new technology-based firms in Brazil

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Abstract

Around 50 percent of Brazilian firms shut down before three years. This ratio can be considered to be high, particularly compared to ratios in developed countries, between 30 percent and 40 percent. Certainly, one of the main cause for this mortality rate is the lack of financing. If even established firms have trouble financing their day-to-day activities, this is even more difficult for new businesses, particularly very innovative ones, with new technology-intensive products or processes, as the risk inherent in these businesses is higher. In this sense, the purpose of this article is to discuss the main forms of financing available for innovation and to analyze some financing choices open to Brazilian entrepreneurs interested in starting up a new technology-based business. To this end, we carried out a literature review of the main forms of financing new businesses domestically and abroad, as well as an empirical survey using the participant observation technique, according to which we visited institutions with the purpose of obtaining financial support to establish a technology-based business.

Key words: financing, innovation, new business

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1. Introduction

Surveys show that around 50 percent of Brazilian firms shut down before three years (SEBRAE, 2004). This ratio can be considered to be high, particularly compared to ratios in developed countries, between 30 percent and 40 percent. According to Romani (1997), one of the main cause for this mortality rate is the lack of financing.

On the other hand, in the current scenario experienced by firms, marked by international competitiveness, for a firm to ensure its long-term survival it must, in addition to being competitive in costs, apply and trade knowledge, innovate, and be acknowledged as a provider of better products and processes.

If even established firms have trouble financing their day-to-day activities, this is even more difficult for new businesses, particularly very innovative ones, with new technology-intensive products or processes, as the risk inherent in these businesses is higher. In this sense, the purpose of this article is to discuss the main forms of financing available for innovation and to analyze some financing choices open to Brazilian entrepreneurs interested in starting up a new technology-based business. To this end, we carried out a literature review of the main forms of financing new businesses domestically and abroad, as well as an empirical survey using the participant observation technique, according to which we visited institutions with the purpose of obtaining financial support to establish a technology-based business.

2. Methodology

This study is predominantly exploratory, performing a preliminary survey of the main practices in terms of innovative business financing found in the literature and in the Brazilian reality. To this end, the study tries to answer the following research question: What are the financing choices available to an entrepreneur interested in starting up a new technology-based business in Brazil?

For the purposes of the paper, we carried out a field survey in which certain institutions were visited to determine whether or not financing was available for starting up an innovative business. In parallel with the empirical survey, we researched secondary data from previously published articles and materials on the addressed issue.

Data collection took place in October 2004, through participant observation and semi-structured interviews. In the case of banking institutions, one researcher would visit the institution and impersonate an entrepreneur in search of financing to assist in the implementation of a new technology-based business. In the case of support institutions, we interviewed practitioners in their employ. We surveyed 2 state-owned banks, 3 private banks and 3 institutions that provide support to enterprise and innovation.

3. Pros and Cons of innovation at small businesses

Since the vast majority of new technology-based businesses start out as small firms based on an entrepreneur's notion, it is important to understand the main advantages and disadvantages of small enterprising firms. The literature shows several authors who point out small firms' contribution to innovation, particularly in its early stages. If R&D spending is concentrated among large businesses, according to Freeman and Soete (1997), the concentration of patents among small firms is relatively high. According to Patel and Pavitt (1995), in the United Kingdom, in the 1970s, the one hundred largest firms in terms of R&D answered for 91 percent of total corporate R&D expenditures, but only 60 percent of patents or innovations. This suggests that it is easier for small firms to invent (and patents are the closest proxy for invention) than to innovate (which demands more investment to introduce new products into the market). Chakrabarti (1991) reinforces this notion by pointing out the significant role played by small firms as dominant sources of innovation in the early stages of a technology, with the locus of innovation shifting towards large firms at mature stages of the technological life cycle, where larger amounts of capital are required.

A possible explanation to this advantage small firms enjoy lies in the fact that they are less bureaucratic than large ones (Rothwell & Dodgson, 1994), which makes the decision-making process much faster. This affords much greater flexibility in response to market changes, enabling small firms to dominate specific niches. In addition, the fact that the innovation structure is simpler at small firms leads to much lower innovation costs. Furthermore, small firms benefit from the presence of a governmental framework in support of small businesses, which subjects them to less regulatory hurdles than large ones face. Yet another beneficial factor lies in their ability to learn much faster as a result of their simpler structures.

Oakey (2003) also notes that large firms generally tend to take a portfolio approach to technological progress in which one or two 'winner' projects may emerge from a R&D portfolio of inventions and innovations. Small firms, in turn, are often restricted to a single new product development on which the fortunes of the firms concerned solely depend, and can therefore turn their efforts to a single direction. The merits of the small firm's R&D operating environment are perhaps best testified to by the tendency for large firms to imitate this approach through 'intrapreneurship', corporate venturing or the establishment of wholly owned separate subsidiary small firms (Oakey, 2003).

The main disadvantage of small firms as compared to large ones is their inability to obtain financing, in addition to difficulty controlling and entering into advantageous partnerships with suppliers, which is quite ordinary for large ones. Levratto (1994) points out certain factors that affect small firms in the financial area: lack of own funds, focus on the short term, and the excessively high rates they face when they take loans from outside sources.

Tourigny and Le (2004) analyzed the main obstacles faced by Canadian manufacturing firms in connection with innovation, based on a sample of over 5,000 firms. According to this study, 90 percent of these firms claimed to face hurdles, including:

- (i) Inability to devote staff on an on-going basis due to production requirements (58%)
- (ii) High cost of development (55%)
- (iii) Lack of skilled personnel (39%)

(iv) Lack of financing (27%), and

(v) Organizational rigidities in the firm (20%).

4. Main forms of financing for new technology-based businesses

Financing forms for innovative businesses vary widely, depending on the stage where the business is. According to Oakey (2003), while funding can be provided by the public sector if very early technical developments are conducted in, for example, a university or a public institute, later private sector innovation phases must be funded through a range of private capital sources, such as personal savings, business angels, banks and venture capital organizations.

However, forms of financing must abide by a certain rationality. The proven relationship between small firms and jobs generation leads to the establishment – particularly in developed countries – of several new business-oriented programs. However, for these programs to bear fruit, McMullan and Vésper (1987) claim that simply injecting money is not enough: it is also important to develop objective assessment mechanisms consistent with the peculiar traits of these programs. According to the authors, this is due to the fact that four reasons exist for not indiscriminately supporting new businesses: the expectation of deflecting high potential contributors from more important work elsewhere; the expectation that high rates of business failure will quickly eat up any contributions generated; the belief that early-stage entrepreneurs neither want nor need such support; the belief that we don't know how to effectively and efficiently support early-stage venture development.

4.1. Own Resources

One of the alternatives entrepreneurs use most often to start a business lies in their own resources, from savings, sale of an asset the entrepreneur may have or loans from friends and relatives. There is a joke that says the main source of founding for startup entrepreneurs lies with the 3 Fs: Family, Friends and Fools.

However, due to characteristics of technology-based businesses, own funds are usually not enough to start out on this kind of activity. For Oakey (2003), all stages of the innovation process in new technology-based firms (i.e. ranging from R&D, through production, to final marketing) are consistently costly and are often incurred well before any return on such investment is received from product sales. Zider (1998) also points out that many entrepreneurs also recognize the risks in starting their own businesses, so they shy away from using their own money. As a result, it is important to create specific financing mechanisms intended for technology-based businesses.

4.2. Partnerships with large firms

An efficient and not very costly way to finance innovation is by means of partnership with large firms in mutual-interest projects where the small firm provides the technological effort needed and the large one bears with the brunt of financial resources. One Brazilian example of such partnerships can be found at the Volkswagen plant in Resende, where small auto parts makers set up inside the Volkswagen unit to achieve better interaction among partner firms.

The main problem with partnerships of this kind is that the small firm will only develop innovations that meet the large one's interests. For Cieply (2001), when SMEs have close relationships with large firms, these ties can provide significant sources of financing which tend to reduce the apparent capital shortage of SMEs. However, this financial transfer between large firms and SMEs tends to reduce the independence of small firms.

4.3. Banks

According to Cieply (2001), the financial systems of most industrial nations underwent deep changes with the advent of market globalization. However, not all bank-based systems react in the same way. In Germany, only the large firms' financial model has been affected by the liberalization process and in such a way that the German tradition of shareholders' long-term involvement remains undiminished. By contrast, the financing of SMEs is still based on high external bank financing and close relationships with banks.

As regards France, Cieply (2001) reports a completely different situation, where the small firms' financial model has been deeply affected by the financial reforms. With financial deregulation, French banks have to cope with heightened competition both outside and within the banking sector – securities, foreign-owned banks, insurance companies, mutual funds. To protect their market shares from new competitors, French banks had to grant firms low prices for credit, so that the spreads between bank lending rates and market rates were favorable terms. As fixed costs are heavy in the banking sector, this tariff policy led to very low margins and very low rates of return and confronted banks with a difficult problem concerning the financing of SMEs, which constitutes a high-risk customer class.

For Zider (1998), getting a bank loan is a difficult proposition for small firms even in the United States. According to this author, usury laws limit the interest banks can charge on loans – and the risks inherent in start-ups usually justify higher rates than allowed by law. Thus bankers will only finance a new business to the extent that there are hard assets against which to secure the debt. And in the today's information based economy, many start-ups have few hard assets.

In Brazil, the main problem is the low availability of money for financing. According to data from the São Paulo State Industries Federation (2001), the Brazilian credit-to-GDP ratio is at around 28 percent, while in the UK, for example, the same ratio reaches 220%. The scarcity of credit in Brazil is reflected on the high interest rates charged by financial institutions, which, in addition to charging much higher interest rates than those in other countries, also demand heavy collateral on loans given.

For the purposes of this study, five major Brazilian banks were visited, 2 state-owned and 3 private. Out of these banks, only one – a state-owned bank – even offered any kind of financing for entrepreneurs at the start-up stage. This bank has a facility with funds from the Laborer Support Fund (“*Fundo de Amparo ao Trabalhador*”), for investment projects intended to generate and maintain employment and income. The facility is intended for micro and small enterprises with gross annual sales of up to US\$ 2 million. Entrepreneurs may finance up to 80 percent of the total investment, with a US\$ 140 thousand ceiling and repayment in up to 60 months, including a 12-month grace period.

The other state-owned bank visited only extends credit to firms in operation for at least one year because the main item in its credit analysis is the firm's repayment capacity, which requires an operations history of at least one year.

As for private banks, two informed that the possibilities for loans to a small business entrepreneur are limited to Individual Loans at amounts no higher than US\$ 4,000. The remaining bank only extends credit to firms that have been in operation for at least one year.

4.4. Venture Capital

Venture capital, as an atypical form of financing, offers an excellent opportunity for small firms to avoid the collateral or high interest rates that prevail in the regular financial trade. There is, however, the problem that not all fields of activity are consistent with venture capital practices. Industries with very long return periods or that require much capital will seldom find venture capital financing.

According to Avilla (2004), the earliest venture capital activities took place in the United States, particularly after the promulgation of the *Small Business Investment Act* in 1958, which authorized the establishment of *Small Business Investment Companies – SBICs*. In 1982, the promulgation of the *Bay-Dole Act* in the United States provided additional incentive to venture capital investment initiatives, as it created safety measures to foster industrial innovation and the establishment of technology firms. As a result, public research centers and universities began to file for patents, assuring exclusive exploitation thereof by private firms.

According to Zider (1998), contrary to popular perception, venture capital plays only a minor role in funding basic innovation. Where venture money plays an important role is in the next stage of the innovation life cycle – the period in a company's life when it begins to commercialize innovation. We estimate that more than 80% of the money invested by venture capital goes into building the infrastructure required to grow the business – in expense investments (manufacturing, marketing and sales) and the balance sheet (providing fixed assets and working capital).

Zider (1998) claims that the venture capital industry includes four players: The venture capital industry has four players: entrepreneurs who need funding, investors who want high returns (pension funds, financial firms, insurance companies and university endowments), investment bankers who need companies to sell and the venture capitalists who make money for themselves by making a market for the other three. Venture capitalists expect yearly returns between 25% to 35%. Figure 1, ahead, depicts the industry's main players.

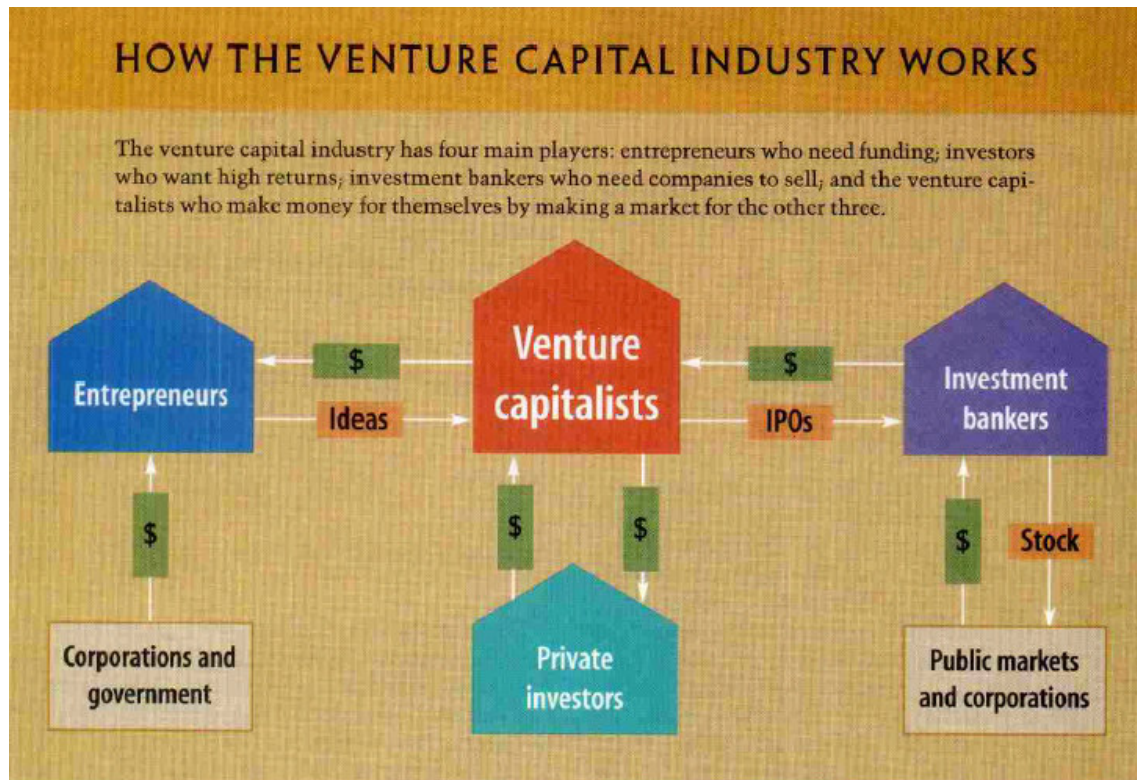


Figure 1: How the venture capital industry works. Source: Zider (1998)

For Porter (1998), one explanation for the United States' extreme competitiveness in the software or biotechnology industries lies in high venture capital figures. To illustrate the vigorous growth venture capital has experienced in the U.S. (Sebrae, 2004), simply compare annual investment flows in the 1970s, when they were no higher than US\$ 100 million, with today's over US\$ 50 billion, a 500-fold increase in a mere three decades. American venture capital investment funds concentrate in California and Massachusetts, in a total of over 500 firms operating in the segment.

Romani (1997) also points out the importance of venture capital in the development of basic technology firms, usually operating from incubators or technology malls. These firms are characterized by incorporating scientific and technological knowledge as their main input and by intense relationships with universities or research institutes. The businesses located in the Silicon Valley are a classic example of basic technology firms who use the knowledge generated by the Universities of Stanford and Massachusetts and the abundance of skilled and available workers, the result of the major crisis the area's large firms faced in the 1970s – including IBM, HP, Texas Instruments, Hughes and others.

Table 1, ahead, show venture capital investment in selected countries.

Total Private Equity / Venture Capital Investment

| | USD (million) | | | | |
|----------------|---------------|--------|--------|--------|--------|
| | 1995 | 1996 | 1997 | 1998 | 1999 |
| OECD | 13,705 | 19,280 | 25,814 | 36,500 | 87,041 |
| European Union | 7,029 | 8,303 | 10,681 | 15,724 | 25,988 |
| Europe | 7,250 | 8,570 | 10,942 | 16,174 | 26,764 |
| United Kingdom | 3,442 | 3,773 | 5,018 | 7,947 | 12,256 |
| USA | 5,457 | 11,178 | 17,406 | 21,687 | 59,531 |
| Netherlands | 611 | 753 | 861 | 1,184 | 1,823 |
| Sweden | 112 | 533 | 398 | 227 | 1,361 |
| Canada | 487 | 802 | 1,316 | 1,116 | 1,831 |
| Japan | 803 | 1,511 | 1,067 | 800 | --- |
| France | 1,112 | 1,077 | 1,414 | 1,988 | 3,002 |
| Germany | 870 | 908 | 1,502 | 2,179 | 3,366 |
| Korea | 742 | 1,195 | 1,307 | 523 | --- |
| Portugal | 72 | 43 | 71 | 55 | 126 |
| Spain | 212 | 245 | 297 | 406 | 770 |
| Greece | 11 | 41 | 18 | 22 | 76 |

Source: STI working paper <http://www.venturecapital.com.br>

It is worth noting, based on Table 1, that the development of venture capital in France does not keep pace with other similarly sized countries, such as England and Germany. In fact, according to Cieply (2001), the involvement of venture capital organizations appeared to be restricted in France by several elements. Primarily, there are fixed charges for screening and monitoring the firms estimated at approximately 45k euros for the first 3 years of the relation between the venture capital organizations and the firms. Secondly, several arguments put a ceiling on the investment of these funds including the capitalization level of the organization, its risk diversification policy, and investment guidelines defined in the charter of the venture capital organization. In addition, Cieply (2001) also states that international and national venture capital organizations remained concentrated in very large cities and they invested only in high potential projects that call for larger amounts of capital and offer great opportunities for profit.

One explanation for the U.S. lead in the venture capital industry lies in the fact that the American culture itself favors risk. As mentioned by Zider (1998), the United States is unique in its willingness to embrace risk-taking and entrepreneurship. Unlike many Far Eastern and European cultures, the culture of the United States attaches little, if any, stigma to trying and failing in a new enterprise. Leaving and returning to a corporation is often rewarded.

According to Bueno (2004), the Brazilian venture capital market is still incipient, at around R\$ 500 million distributed among 20 to 30 funds. This is a direct consequence of Brazilian institutional and economic problems, which have been largely solved since the mid-1990s, including rampant inflation, volatile monetary policies and the frailty of the domestic stock market system. Still, two factors can be identified as significant hurdles to the development of venture capital in Brazil:

a) interest rates: the market's high interest rates inhibit investing in real businesses, such as firms, by diverting money to financial applications, with much lower risk than venture capital investment and with attractive returns.

b) cultural aspects: there are countless explanations for investors' reluctance to invest in emerging and start-up firms in Brazil, from fear of default and corruption to demanding very high rates of return to make up for the high risk of investment, the result of sovereign risk, industry risk and internal firm risk. This culture of risk aversion and, even, fear of investing in new businesses, is the fruit of the Brazilian economy's history of crises and of the few government incentives to the creation of new business.

Private equity funds are looking for opportunities of business in Brazil, because this market has not many players and the Brazilian culture is famous for the innovation, modernization and creativity. On the other hand, the flows of investments in Private Equity in Brazil are not constant because the real market competes with the financial market, that used to be more attractive as a result of the high interest rates.

The main current initiative in venture capital investments in Brazil are those fostered by BNDES through BNDESPAR, which operates in basic technology firm-support, and, more recently, by Sebrae jointly with FINEP (*"Financiadora de Estudos e Projetos"*) with its INOVAR PROJECT.

The purpose of FINEP, a government-owned agency under the Ministry of Science and Technology, is to promote technological development and innovation in Brazil. Its role is to foster support to companies and institutions investing in new products and processes, continuously striving for technological innovation and leadership. INOVAR PROJECT was launched in May 2000 as a strategic action of FINEP and its aim is to promote the development of small and medium-size businesses based on technology by designing instruments for their financing, especially venture capital.

The development of small and medium-size technology-based companies depends on a technologically active environment that offers technical and human resources and providing room for business enterprise, promotes the entrepreneurial spirit and creates synergies to set up new companies. On the other hand, a financing system is also required to further the development of these companies.

INOVAR PROJECT began from the perception that small and medium-size companies based on the concept of "technological innovation" and consisting of "customers-base-finep", do not find suitable mechanisms in the traditional credit system to finance their growth. Venture capital is one of the most suitable instruments for financing technology-based companies.

Although Brazil has pre-conditions to develop venture capital, this emerging market in the country lacks a comprehensive institutional structure that can bring the various interested agents together, combining their efforts for one common purpose. Acting in partnership with agencies such as IDB/MIF, CNPq, SEBRAE, PETROS, ANPROTEC, SOFTEX and IEL, FINEP, through the INOVAR PROJECT, has been seeking to build an institutional framework – a bridge between the companies and investors – which fosters the venture capital investment culture in incipient and emerging technology-based companies, helping to complete the cycle of technological innovation from research to the market.

Moreover, through the INOVAR PROJECT, FINEP has been creating mechanisms that contribute towards the rise and development of technology-based projects based on achievements in Brazilian scientific research. New actions have been adopted in an endeavor to organize the allocation of non-reimbursable resources from FINEP and its partners in transforming innovation projects into technologies that can be taken to the market. The effort is to combine partnerships and instruments that fully support the innovation process: from the laboratory bench to transfer of technologies that can translate the enormous effort of the Brazilian population in economic value and social development in order to be part of the global scientific and technological scenario.

Therefore, INOVAR PROJECT intends to build an institutional environment that helps nurture the activity of venture capital in the country in order to fortify the incipient and emerging Brazilian technology-based companies, contributing, ultimately, to the national technological progress and for to generate jobs and income.

Fórum Brasil Capital de Risco is INOVAR PROJECT's main initiative, promoting a series of events where entrepreneurs present business plans to investors interested in venture capital applications. So far, more ten editions have been held, where over 100 new enterprises were presented and resulting in around R\$ 100 million invested in nineteen startup technology-based enterprises (Projeto Inovar, 2004).

For Rezende and Nogueira (2003), the evidence found in studies of the Brazilian market better reflect state-supported operations — BNDES, FINEP, etc. — than an architecture of a growing industry based on the private sector's wealth and risk-taking.

4.5. Angel Funding

According to Zider (1998), angels are wealthy individuals who typically contribute seed capital, advice and support for businesses in which they themselves are experienced. Turning to angels may be an excellent strategy, particularly for businesses in industries that are not currently in favor among the venture community. But for angels, these investments are a sideline, not a primary business.

For Lipper and Sommer (2002), business angels have been playing a vital role in the US economy for decades. The capital and know-how that business angels contribute to start-up entrepreneurial ventures is unparalleled. Historically, US business angels have provided the largest amount of capital in more rounds and financed more than ten times the number of firms as their venture capital counterparts. Due to the large size of venture capitalist funds, they are investing less and less in the smaller initial, seed stages of this investment process.

The lack of venture capitalists participation in these initial rounds of entrepreneurial venture financing is providing a growing fissure in the funding stream that encourages the creation of entrepreneurial activity. Filling this gap are the approximate 400 000 business angels scattered around the US. These angels tend to organize unspecified groups that are informally networked together. These investors groups invest in approximately US\$30 – 40 billion a year in 50 000 early stage ventures. The role business angels play in the US economy is clear. However, researchers and investors will agree that the private investor market is still largely misunderstood, inefficient and under-studied (Lipper and Sommer, 2002).

A number of significant changes in the current angel investment market can be identified, according to Lipper and Sommer, (2002):

- The frequency of formation of angel organizations across the country is increasing;
- Angels are more willing to be visible and less inclined to operate in secrecy to protect themselves from lunatic inventors;
- More investors are joining angel groups;
- Early stage angel investment leads to larger, later stage venture capital investment (which leads to wealth creation and economic development);
- Institutional venture capital is moving downstream to larger, later stage deals causing an ever-widening gap in the equity financing available to truly meritorious entrepreneurs.

In Brazil, angel investor presence is timid, according to Rezende and Nogueira (2003). These authors point out the rare presence — and even absence — of angels willing to leverage the early days of Brazilian startups. Using the case of Canadaⁱ as a reference, one may see how the presence of such actors in the Brazilian economy might serve as a catalyst for the development process.

4.5 - Stock Exchange / Stock Issuance

Another possible source of funding for innovations is to issue stock. This avenue, however, is unavailable to most emerging enterprises inasmuch as it is regulated by several practices intended to protect public investors, which implies that firms must show significant sales volumes, assets and a history of profitability to be post in a stock exchange.

Although some countries, such as France, are taking a series of steps to strengthen the stock market and enable small firms to go public, this is still an incipient trend in Brazil, and the market remains strictly limited to large corporations. Even in France, where commissions and fees for financial markets were deregulated and the ‘*Second Marche*’, a stock market specifically dedicated to SMEs, was introduced in 1983, small-firm participation is still limited, as the requirements and costs involved are still too high for them, as (2001) mentions.

5. Public support

Public support may be of two types – direct investment in innovation, and indirect activities, such as grants, incentives and subsidies to foster innovation. Cieply (2001), on making a retrospective analysis of innovation financing in France, states that in the 1970s the financial system existing to promote innovation was essentially based on grants and rebate rates. This system was brought into question in the beginning of the 1980s. At that time, the French State introduced the direct supply of long-term loans to SMEs by the *Credit d’Equipement des PME* (CEPME).

Oakey (2003) argues that there must always be a proportion of new businesses that are never eligible for external public or private investment capital support, due to their lack of medium-term growth (or even survival) potential. These enterprises, called ‘clearly un-fundable’ may be 50% (or more) of any given total firm population. Moreover, a smaller percentage of new business ideas are immediately fundable by the private sector on the basis of the obvious commercial potential of the new idea (often contained in a business plan). Such businesses are approximately 10 percent of the total. Thirty percent of the total of firms are considered ‘probably un-fundable’ for a variety of reasons often related to problems with management

competencies, project viability, market potential, and/or other factors. Finally, the remaining 10 percent are those that are 'probably fundable'. According to the author, government agencies should focus their attention on these 'probably fundable' firms and develop them to a point where they would attract private sector venture capital or other forms of investment support.

Given the limited resources available, it is important to have a combination of public and private funds. For Oakey (2003), public sector funding might be appropriate where the private sector is unable (or unwilling) to become involved in extending support into risky areas of pre- and post-formation enterprise. Private sector support may be the best option in developing the market potential of products initiated under the public sector. The public and private sectors can be seen as complimenting each other and should not be viewed, in ideological terms, as 'oil and water' that cannot be allowed to mix. The key to success in this context is to practically plan in advance for public-private collaboration, since the efficient integration of these two types of funding is likely to be most effective if it is premeditated, and not the result of random events.

According to Cieply (2001), France has adopted, since the mid-1990s, a system in support of innovative businesses that combines several public and private actions. First, the intervention of regional councils has been reinforced in order to promote the development of average growth firms whose contribution to local development is significant. The number of non-profit regional venture capital organizations significantly increased between 1995 and 1999 and they are now funded more by both Regional councils and the CDC (the *Caisse des Dépôts et Consignation*). Some initiatives have been taken to enlarge the market-based system to encompass small innovative firms. This concerns both the creation of the *Nouveau Marche*, a market dedicated to high growth firms, and the stimulation of the venture capital industry whose investments must be reallocated in favor of high-tech-based firms, especially for start-ups. Other initiatives are being taken to increase the capacity of banks to finance innovations, such as the creation of a new Development Bank for SMEs (BDPME), which provides some new financial mechanisms dedicated to intangible assets.

Oakey (2003) also mentions some successful examples in the U.S. and England. In the USA, the Small Business Investment Company (SBIC) program performs the role of putting together investment funds, which subsequently leverage federal funds in the support of financing new technology-based firms. This model, despite some criticism on their effectiveness, is generating some renewed success. Similarly, in Scotland, the recently privatized Scottish Equity Partnership (SEP) has shown, in the past, how a public-private venture capital initiative, in which the European Investment Fund guarantees private sector investments, can be successful. The value of these approaches is that longer term funding can be provided by public and private sector agencies sharing the risk of such external support, to the benefit of the recipient firms and all concerned.

In Brazil, the majority of public funds for innovation have always been targeted at Universities and Research Centers, and almost never to enterprises. Except for Programa Rhae, which also provided scholarships for researchers deployed at firms, very little was intended for businesses. The mid-1990s, however, saw the creation of programs to foster innovation at firms, such as Industry Funds ("*Fundos Setoriais*"), some specific credit facilities, FINEP's previously discussed Projeto Inovar, SEBRAE's Programa PATME, and Fapesp's Program PIPE.

It is important to explain in more details the focus of these Programs mentioned above. The PATME – Program that Support Micro and Small Companies – is an initiative of Sebrae and FINEP that intends to offer more access, for the micro and small companies in Brazil, of knowledge. As consequence of the Program PATME, many companies has receiving specialized consulting and orientation of Sebrae with the aim of improve productivity, quality of products and services, new technologies and earns. The Program PIPE is also an incentive to the micro and small companies to focus their efforts in studies, researches and developing in innovation, science and technology, offering scholarship in universities.

6. Conclusions and closing considerations

The article discusses some forms of innovation financing, with emphasis on technology-based businesses. Concerning the Brazilian reality, we saw that entrepreneurs have great trouble getting financing for their businesses. While developed nations set up mechanisms to foster innovation according to each country's peculiar traits – venture capital in the United States, the banking system in Germany, public support in France –, in Brazil innovation financing is still restricted to specific programs that fail to reach most of the entrepreneurs.

This may be one reason for the enormous mortality rate of small firms face in Brazil, at close to 50% in the first three years of operations, although this ratio is believed to be much higher given the number of firms that fail to formalize their shut-downs because of red-tape. Furthermore, the difficulty small firms have to invest in innovation all but eliminates the competitiveness of their products and their ability to compete in international markets or against the economies of scale large firms can attain.

Note that any attempt to generalize these results must be cautious, given the project's exploratory nature. However, we believe that it may be an interesting and initial contribution to more in-depth studies, both quantitative, with broader and more representative samples, and qualitative. To sum up, small firms' contribution to employment levels must be borne in mind and, given the scarcity of financing that prevails in Brazil, setting up mechanisms to foster entrepreneur credit is a necessary condition to be met if we truly want to assure Brazil's stability in the social field.

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