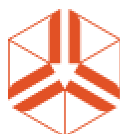

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Drivers of Brazilian foreign investments – technology seeking and technology exploiting as determinants of emerging FDI

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Drivers of Brazilian foreign investments – technology seeking and technology exploiting as determinants of emerging FDI[*]

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Abstract

The paper uses data from a recent survey on Brazilian firms to investigate the role of technology in the internationalization of firms, and whether if affects the destination of foreign investments. Emerging markets FDI is a much-debated topic these days, and their technology-seeking purpose is a strong driver for the internationalization, as firms are searching for assets in order to compete. We apply a logit model to seek for the influence of determinants and some firms' competitive advantages on the choice for developed countries as a destination for Brazilian FDI. We also test which modes of entry are preferred when investing in a developed destination. Our results point out the importance of a skilled labor force on the decisions to invest in developed destinations. We found out that technology is an asset used as a competitive resource, and that Brazilian firms do not undertake technology-seeking investments in developed countries, and that acquisitions and Greenfield investments are the main modes of entry.

Keywords: foreign direct investments, emerging markets, technology, innovation, competitive advantages, multinational corporations.

JEL Classification: F21, F23, O33

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1. INTRODUCTION

The internationalization of firms from emerging markets has recently become a widely-studied topic, with several important publications giving special emphasis on this subject, as the special issues of the Journal of International Business Studies 2007, Journal of International Management (13), 2007; International Journal of Technology and Globalization (4), 2008) including recent books, such as Matthews (2002), Goldstein (2007) Sauvant (2008) and Ramamurti (2008). Many of these studies focus on firms emerging from Asian countries – with China by and large being the most studied case.

The reason for such a rise of interest in the subject is the growing dimension of the phenomenon of emerging FDI, which has increased from US$ 144 billion to US$ 2,288 billion in the period 1990-2007 (UNCTAD, 2008). The speed with which firms from emerging economies are spreading worldwide is unprecedented, and unpredicted by any of the early theories of internationalization. They are expanding to different and distant markets, partnering with local producers (Embraer has a joint venture to produce airplanes in China; Sadia sells poultry in a similar arrangement with a Russian partner), and making bold acquisitions of established brands (such as IBM by Taiwanese Lenovo and Jaguar Land Rover by Indian Tata Motors) or key assets (Vale acquired Canadian Inco and now holds nickel reserves) (Goldstein, 2007; van Agtmael, 2008).

An interesting aspect that has caught the attention of scholars in the study of emerging countries outward investments (OFDI) is the growing role of strategic asset-seeking investments as a key determinant for the internationalization of firms from these countries (Makino *et al.*, 2002; Child and Rodrigues, 2005; Luo and Tung, 2007). For instance, firms from newly industrializing countries from Asia (Korea and Taiwan in a first moment, followed by India and China) have based their internationalization strategies on the search for competitive assets not yet possessed or fully leveraged (Dunning *et al.*, 1997; Matthews, 2002).

This specific feature has changed completely the traditional (or expected) timing for firms to become multinationals, as some of them started their internationalization without possessing the pre-

assumed necessary assets to venture overseas markets. This has prompted some scholars to claim the need for a new strand of theory to explain emerging FDI (Matthews, 2002, 2006; Child and Rodrigues, 2005). In special, this new dynamics of emerging investments has brought about the rise of multinationals at earlier stages of economic development of their respective countries of origin (see chapter 1 for a discussion of outward FDI and development). Even though having not yet accumulated strong Ownership advantages as envisioned by the eclectic paradigm (Dunning and Lundan, 2008), firms from emerging markets are internationalizing – and this early movement has led several authors to suggest that emerging multinationals follow a unique rationale, having their specific combination of resources and competences that demand a special attention in order to be fully understood (Luo and Tung, 2007; Matthews, 2002, 2006; Child and Rodrigues, 2005; Goldstein, 2007).

Having in mind the recent context of foreign direct investments from emerging markets, we take an in-depth look on the determinants of Brazilian foreign investments, focusing on technology and firms capabilities as drivers of the internationalization strategies of Brazilian firms. The main question is to understand if on one side, technology and innovation related capabilities are a key asset for the foreign competitiveness of Brazilian firms, and, on the other, whether technological assets are sought after in international ventures, in special to developed countries. In other words, we want to investigate whether Brazilian investments have followed the same assumptions taken to the emerging markets investments – and hence Brazilian firms are going abroad in search of technological strength rather than relying on them as an advantage.

The internationalization process of Brazilian firms is an interesting object of investigation. Brazil led the first movement of outward FDI from the emerging world in the 1980s, when such flows had less significance in comparison to total levels of FDI. Over time, the level of outward stocks of investments from Brazil has stagnated to around 3% of the world total levels since 1990. Since then, the world has witnessed rare outstanding performances of Brazilian outward investments, as in 2006, when huge acquisitions abroad by domestic firms have raised the outward FDI flows to US$ 28.2 billions, way above

the inward flows) (UNCTAD, 2007). Currently, Brazil has outward flows of FDI that amount to US$ 7,067 million and its level of outward investment stocks has reached US$ 129,840 millions (UNCTAD, 2008). Comparatively, in the same year Mexico had outflows of US$ 8,256, China of US$ 22,469 and India US$ 13,649. Their outward FDI stocks in 2007 were, respectively, US$ 44.7, US$ 95.8 and US$ 29.4 billions.

Studies of the foreign investments of Brazilian firms are still scarce; in special using firm level data such as the Global Players survey that is applied in our study. A larger firm-level study can contribute to the information already accumulated on individual Brazilian firms, given by case studies. We believe that a survey comprehending a wide range of sectors will provide a better understanding of the determinants and main characteristics of Brazilian investments, leading to a clearer portrait of the country's pattern of outward investments.

The reminder of the paper is divided in four sections. Next section places the debate on emerging FDI and the role of technology and technology-seeking investments in the development process of firms from emerging countries; section three brings up the conceptual framework and hypotheses of the research. Section 4 describes the data, hypotheses and empirical method; section 5 brings the results. A final session presents the main conclusions.

2. DETERMINANTS OF FOREIGN DIRECT INVESTMENTS AND THE EMERGING MARKETS

The international business research has an extensive account of both theoretical and empirical works on the determinants of foreign production of firms. Dunning's eclectic theorem discusses the key drivers of a firm towards internationalization; those are summarized by the ownership of some valuable assets, that can be tangible and intangible (O),by the advantages presented by certain locations (L), and the advantages of internalizing (I) the company's activities rather than transferring it to third parties.

Having this set of advantages, firms pursue internationalization according to a range of objectives: market-seeking, natural resource-seeking, asset-seeking or efficiency-seeking (Dunning and Lundan, 2008).

The possession of technological advantages, as a key ownership advantage, has always been considered a key determinant for the growth of the firm, and is also the main asset sustaining its foreign expansion. Technology has become more and more a crucial component of a successful venture, both domestically and international, as we move further and deeper towards a knowledge and information intensive era , when knowledge is not anymore an asset restricted to high-tech sectors, but plays an important role even in traditional industries (Narula and Dunning, 2000). In fact, the most successful firms, who accomplished to become large and competitive in worldwide markets, were those who attained a significant level of technological capabilities and innovativeness. Technological assets are the key assets that multinational firms resort to in order to be successfully competitive. Traditional multinationals (those originated from the most developed countries, such as USA, Japan and Europe) base their foreign activities on the exploitation of their ownership advantage, in special, technological asset ownership.

Recently, however, firms from less developed economies have started their internationalization with, apparently, less (or very specific) technological capabilities as competitive assets. This has brought back the discussion of the main objectives of such investments. Instead of relying on solid asset ownership, firms from emerging countries would internationalize with a technology-seeking motivation. The debate brings to date the role of internationalization in the process of technological catching up of firms from emerging countries[1].

In fact, several countries from East Asia have taken advantage of the imitative industrialization as a source of fast paced catching up (Matthews, 2006). The Japanese industrialization in the after-war is a good example of a late industrialized country that succeeded to take advantage of the backwardness as a

[1] Emerging markets, or countries, is the term we chose to designate those also called late industrializing countries, new industrialized countries, or developing countries. Though not a homogeneous group, they are often mentioned as such in the economic and international business literature.

way to leap forward (Kojima, 1960; Ozawa, 1975). The same occurred with South Korea, whose firms invested in developed markets with the deliberate intent to source advanced technologies not available at their home markets (Sachwald, 2001). Recently, other East Asian countries, such as China, Taiwan and India are following the same trend (Matthews, 2002; Athreye and Goldwin, 2008). Firms from those countries target their investments to more developed destinations, with a clear strategic asset-seeking purpose, reaffirming the role of advanced economies as source of capability building for firms from less developed locations (Makino *et al.*, 2002).

Backwardness can therefore be seen as a driver rather than a deterrent of investing abroad, which gained strength as a catching-up strategy of firms from emerging markets. As posed by Dunning and Narula (1996: 17), "precisely this insufficiency of O-advantages needed to become global competitors in medium to high-technology intensive industries form another motivation to invest in economically advanced regions". In this sense, foreign investments from emerging economies are the strategic response of these firms to the evolution of globalized capitalism.

Furthermore, Dunning and Narula (1996) posit that the nature of motivations leading to strategic asset-seeking FDI is changing as the world economy evolves. In addition the search for accessing knowledge-intensive assets, firms are also engage in FDI in order to enhance their learning experiences, which involve a better knowledge of foreign markets and their consumer specificities better (Dunning, 1998).

The existence of technological spillovers – learning externalities that originate from the exchange of information, voluntary or not, between agents (firms in this case) in a close location, due to the characteristic of public good that information has to some extent - is also a driver for technology-seeking investments. In contact to technologies and technological capabilities, firms have stronger opportunities to learn and absorb the knowledge available in the foreign environment (Blomstrom and Kokko, 1993; Carvalho, 2005). The boom of investments in the Silicon Valley in the last decade is a strong example of the attractiveness of a technological intensive location due to the existence of

technological spillovers. Technological spillovers are a good opportunity for firms from emerging markets that are locating in more developed destinations. The interaction with established agents – companies that have accumulated a great deal of knowledge and technologies - enhances the learning possibilities, hence turning developed countries into attractive destinations for setting up facilities when looking for increased knowledge and fast absorption.

Firms from emerging markets that succeeded in internationalization have relied on different kinds of innovation – new organizational and managerial ways of thinking, innovative ways to provide services, etc. This is the case of Chinese Lenovo, Brazilian Embraer and Mexican Cemex (Matthews, 2002; van Agtmael, 2007; Goldstein, 2007).

The Brazilian aircraft manufacturer Embraer became worldly famous due to its innovative organizational structure that improved the company's performance and profitability, and also due to how they decided to outsource to reliable suppliers key components and the company's own R&D activities, thereby reducing costs and risks (Goldstein, 2008). Moreover, Embraer achieved its success by focusing in a market share that was neglected by the top players in the industry, and used this opportunity to become number one in the market of regional jets (van Agtmael, 2007; Goldstein, 2008).

In the same line, Mexican cement company CEMEX became the leading firm in its sector by developing a simple strategy to build plants in strategic locations, mostly through the acquisition of existing but slacking companies, and therefore be as close as possible to clients, while also expanding its exporting range. As a result, the company's businesses are so widespread that no country has more than one third of total revenues – a clear strategy of 'not having all his eggs in one basket' (van Agtmael, 2007).

This highlights the fact that firms with already embedded technological efforts, those that have accumulated a significant set of capabilities, have stronger chances to succeed, both locally or internationally (Barnard, 2008). The previous accumulation of capabilities is also crucial to make technological and learning spillovers more effective - absorptive capacities and complementary

capabilities have proved to be determinants in successful catching up processes, being explored in several studies in the field (Cohen and Levinthal, 1990; Kinoshita, 2001).

There are two distinct moments in the history of FDI from emerging economies: a first flourish of investments in the early 1980s and a more recent acceleration of the process in the late 1990s and early 2000s. However still recent, these two moments present quite distinctive features and have been assessed and debated by scholars for some time (Lall, 1983; Wells, 1983; Tolentino, 1993; Dunning *et. al.*, 1996; Narula, 1996; Dunning, 2008).

In the first moment, FDI from emerging countries had specific features that remounted to the specifics of the economic development and industrialization characteristics of such countries, which had an effect on the competitiveness of firms and in the patterns of their innovative efforts. The multinational firms that rose in that first moment had their success linked to their capacity to attend to the needs of emerging markets, and for this reason usually restricted their scope to close and culturally similar locations (Wells, 1983; Tolentino, 1993).

The second and more recent phase of emerging investments has as its main feature an increasing speed with which firms are internationalizing, at earlier stages than their developed countries counterparts did. The intensification of the globalization process and the facilitation of communication trans-frontiers prompted by new technologies are the main reasons. There are less restrains to the mobility of firms, and more and stronger motivations. "In a world without borders, only global competitiveness is good enough", and internationalization becomes less of an option and more of a necessity (van Agtmael, 2007: 35). When firms are faced with the absence of key competitive (especially technological) assets, they internationalize with the purpose of acquiring such.

Among the characteristics observed from the recent profile of foreign investments from emerging markets' firms is the pursuit of strategic assets as a central motivation. Strategic asset-seeking investments are by no means new and had a special importance for late industrializing countries in their catching up process (Dunning *et al.*, 1997; Kim, 1997). The search for strategic assets has been addressed

as one of the main drivers of the internationalization of firms in general (Dunning, 1993 and 1998; Narula, 1996; Li, 2007; UNCTAD, 2005), and the most outstanding characteristic of this motivation in present days - and specifically in FDI from emerging economies - is the growing importance of this specific determinant of FDI for emerging multinationals, that undertake this type of investment earlier than theories of the growth of the firm and of sequential internationalization had predicted (Tolentino, 1993; Dunning and Narula, 1996; Narula, 1996).

The increasing number of multinational firms from emerging countries means that those firms are starting to invest at much earlier stages of development of their home countries, therefore with less or weaker ownership (O) advantages. Asset-seeking investments reshape the O-advantages of emerging multinationals, originally a result of home country characteristics. The search for strategic assets is an important determinant of outward investments from China, for instance (Child and Rodrigues, 2005). Child and Rodrigues (2005) reviewed the determinants of recent Chinese foreign investments, highlighting their central motivation to become global players in international markets. The relative *disadvantages* of Chinese firms are precisely the propellers of FDI, seen as an effective mean to equip firms with the competitive strength that they lack. In the case of Chinese FDI it is worth noticing the importance of acquisition as a route towards international markets. Along with joint ventures and other types of partnerships, these are a fast access to markets, technology, R&D skills and international brands.

The growing importance of asset-seeking investments suggests that developed countries have grown importance as destination for emerging markets' firms, given that more advanced economies would have more to offer in terms of technologies, capabilities and managerial skills (Dunning *et al.*, 1996). Some previous studies have dealt with this issue, revealing the relationship between strategic asset seeking investments and developed countries destinations. Makino *et al.* (2002) tested this relationship for Taiwanese firms and found that asset seeking investments tend to locate in more developed destinations, provided that investing firms possessed some capabilities that enabled them to compete in such

destinations. The conclusion of the study corroborated the importance of accumulated skills and absorptive capacity so that firms can benefit from being in a more advanced location.

Other studies highlight the role played by mergers and acquisitions on the internationalization patterns of emerging economies. Their share in total M&A flows climbed from slightly more than US$ 40 billions in 1990 to US$140 billions in 2006 (The Economist, 2008). Some of these acquisitions have gained international attention, such as the purchase of the IBM PC line by Chinese Lenovo, of Land Rover by Tata Motors, of RMC by Mexican cement company Cemex, and of Inco by Brazilian mining company Vale.

Brazil is an interesting case among the emerging world's foreign investments. As mentioned earlier in the chapter, Brazilian firms started their internationalization already in the late 1970s and had since early had an inclination to invest in developed markets, especially the USA (Villela, 1983; UNCTAD, 2006). Apart from the geographic proximity to this country relative to other destinations, the determinants of the locational choice of Brazilian firms have never been deeply investigated.

Acquisitions by Brazilian firms have also gained momentum in the past years. Brazilian firms have profited from the Brazilian currency valuation and took over several firms from strategic markets. Among these operations are: the acquisition of Chaparral Steel and Qanex by Gerdau, Swift by JBS-Friboi, US Zinc by Votorantim – all in 2007 (FDC, 2008).

We believe that Brazilian firms have their very own features that evoke the country's specific past - just as so many other emerging countries that have proved to require a whole new approach to FDI and international business in order to be properly understood (Child & Rodrigues, 2005; Matthews, 2006). Brazilian firms are driven to certain destinations according to their specific motivations, and the determinants of their internationalization varies a lot in time and through the sectors. While a few of these firms are worldly famous (Petrobras, Embraer, Vale), many other interesting cases are are not yet broadly know.

Sabó is an autoparts company that started its internationalization process already in the early 1990s, following its customers. The company also took the opportunity of being in foreign markets to establish partnerships with local firms in order to learn and absorb new technologies and better production processes. The company was the only Brazilian firm in the autoparts industry to survive the boom of acquisitions by foreign firms in the late 1990s (some other successful but smaller companies, less studied internationally, are Weg, Artecola, Marfrig, Tigre, Localiza, Bematech, Politec; SOBEET, 2007; Ramsey and Almeida, 2009). Each case highlights the main competitive assets, their drivers, and other specifics of the internationalization of firms. However, we still lack more comprehensive studies that attempt to draw a general portrait of Brazilian FDI, placing it somewhere in the recent boom of emerging investments.

Specific case studies of some well-known cases of Brazilian multinationals have stressed the role of technology in their internationalization process, such as the role of the accumulation of technological capabilities in the successful international insertion of Petrobras (Carvalho and Goldstein, 2009), as well as the innovative global business model of Embraer (Goldstein, 2008). However, no broader study has taken the role of technology and its influence on the destination of Brazilian investments into further consideration. We hence raise this as the main question addressed in this chapter, and in the next sections we try to bring some light to this issue.

3. CONCEPTUAL FRAMEWORK AND HYPOTHESES

Having in mind the traditional approaches to the determinants of foreign direct investments, in special the OLI paradigm, and the new debate about emerging FDI, we will test what are the main drivers of FDI by Brazilian firms. Moreover, we will test if Brazilian direct investments fit into the new wave of FDI from emerging economies and therefore are driven by technology-seeking motivations. We also test the hypothesis that acquisition is a preferred mode of entry for an emerging market firm in a developed country. Our hypotheses were built having in mind the basic assumptions of an extensive theoretical debate on the subject of emerging multinationals.

The debate on emerging multinationals evolved from the original discussion of the then called 'third-world multinationals' (Tolentino, 1993; Lall, 1984; Lecraw, 1983). Even though those can still be considered one group, in terms of the differences in their strengths and weaknesses vis-à-vis firms from developed countries, they present an essential distinction: the group of emerging market multinationals seem to rely on FDI as a strategy to access the required assets to compete more effectively and hence overcome the constraints of their home markets (Luo and Tung, 2007). In other words, their strategy is to go abroad in order to grow and become competitive, and this is the central distinction brought in by the recent debate (Matthews, 1006; Dunning *et al.*, 2008).

Therefore, in order to assimilate superior technological knowledge, it is reasonable to expect that technology-seeking investments aim at more developed economies - those with an advanced technological base that can offer the foreign investing firms numerous learning and assimilating opportunities (Narula, 1996; Narula and Dunning, 2000; Lee and Slater, 2007; Goldstein, 2007). From this we draw the following hypothesis:

Hypothesis 1a: Firms from emerging economies are more likely to invest in developed countries when their main motivation is to **seek** for strategic assets (e.g. **technology**) in the host country

Firms undertake market seeking investments for a variety of reasons: to comply with the company's growth aspirations, to fulfill an unsatisfactory domestic demand, to establish in competitor's markets, to have lower logistics costs, among others. In Brazil, it seems reasonable to assume that a low growing market in some moments of the economic history have driven firms to invest abroad (Carvalho *et al.*, 2010). At a first glance, Brazilian investors would have incentives to invest both in developing and developed countries for market seeking reasons. The following hypothesis tries to clarify whether they favor developed markets.

Hypothesis 1b: Firms are more likely to invest in developed countries when their purpose is to gain **markets.**

The premises of foreign direct investment consider that a minimum of competitive assets and capabilities are required to circumvent the 'liability of foreignness'; according to the OLI paradigm these are the "O", referring to ownership advantages, many in the form of technological capabilities, brands, managerial and marketing expertise (Dunning and Lundan, 2008). It is therefore expected that firms undertaking foreign direct investments, whatever are their main determinants, already rely on a minimal set capabilities required to successfully compete abroad, capabilities that are also required in order to absorb external knowledge.

In order to test their influence on the propensity of firms to locate in developed markets, we named two important competitive advantages, or capabilities: first, the existence of a skilled labor force, (LABORCAP); second, the existence of a certain set of technological, managerial and organizational advantages - asset ownership advantages required to compete in foreign markets (TECHNOLOGY) (Dunning and Lundan, 2008). We therefore put together some determinants of investments and capabilities in the same hypotheses:

Hypothesis 2a: Firms are more likely to invest in developed countries when they possess **skilled labor** resources

Hypothesis 2b: Firms are more likely to invest in developed countries when they possess a set of **technological** assets

Hypothesis 2c: Firms are more likely to invest in developed countries when they possess previous **experience** in operating in foreign markets

We also raise the hypothesis that similar or less developed countries are chosen as the destination for Brazilian firms' FDI when their purpose is to explore the availability of cheap labour and/or natural resources. It is also in those countries where, according to the early theories of emerging FDI, firms would be able to exploit to the fullest their technological advantages (Lecraw, 1977; Wells, 1983). Hence:

Hypothesis 3a: Firms are more likely to invest in developing countries when their main motivation is to have access to **resources** and low cost labor.

Hypothesis 3b: Firms from emerging economies are more likely to invest developing countries when their purpose is to **exploit** their specific **technological** advantages.

Investments with market seeking purposes have a great range of motivators. Market size and growth are important ones, but firms also follow suppliers and customers (and many times competitors), have product adaptation needs (Dunning and Lundan, 2008). Similar emerging countries would be, in thesis, less attractive for market-seeking purposes due to their smaller purchase power and lower market dynamism. Obviously, this is not true for the entire group, as some emerging markets have the most dynamic market growth of the past decade Firms could also target emerging markets in order to benefit from similar consumer preferences. Hypothesis 1b will therefore test what is the case for our sample of Brazilian firms.

We also test the possibility of existing preferred modes of entry according to the destination. Studies on other emerging countries FDI have suggested that many firms prefer acquisitions or associative modes of entry when their destination is a developed country (Matthews, 2002; Barnard, 2008). By acquiring assets, it also buys some of the expertise of the firm and its employees. Associations with local partners, *via* joint ventures or mergers are also a 'shortcut' used by emerging investors in order to diminish their uncertainties regarding that new market, and hence neutralizing some of their 'liability of foreignness'. Acquisitions and partnerships are also good ways to leverage the local knowledge and facilitate the learning process (Matthews, 2002). Model 5 tests how different modes of entry relate to the choice of a developed destination.

Hypothesis 4: Firms from emerging markets prefer to enter developed countries *via* **acquisitions** of local firms

Based on these hypotheses, next section will apply data from a survey about the internationalization of Brazilian firms. It is the first time that firm-level, primary data is applied in order to study the general trends in investments from Brazilian firms of a broad range of firms in this country. The novelty of the information is its major richness, and is by drawing, with firm level data, a portrait of the general state of Brazilian FDI that we aim to make our biggest contribution to the literature in the field.

4. DATA AND METHODOLOGY

Sample

The data used in the chapter is from the Global Players survey on the internationalization of Brazilian firms, carried out in Brazil in 2007. The survey was submitted to the 1.000 largest Brazilian

firms in terms of total revenues. A small response rate was already expected due to the fact that not many Brazilian firms are engaged in foreign activities, and hence would not be interested in joining the survey. From the total target firms, 93 provided valid responses to the questionnaire. Of these, 73 firms reported to have some kind of international operation. Their total revenues amount to over 2.4 billion Brazilian Reais (around US$ 1.3 billions). The majority of firms from sample, 92%, are composed of firms with more than 500 employees. Most firms from the sample operate in foreign markets *via* export activities, but manufacturing and higher end activities abroad are also present in some sectors. Firms in the sample are predominantly from intermediate goods (31%) and services sectors (30%). The sectoral distribution of firms from the sample is presented on Table 1.

(TABLE 1 AROUND HERE)

Brazilian investments have a wide geographic dispersion. Developed destinations, represented by Europe and North America, respond for 37 percent of all investments. South and Central America (exc. Brazil) hosts 23 percent of investments, Africa holds 10 percent, and Asia 13 percent ; Oceania hosts a small share of 2.5 percent of Brazilian investments.

(PICTURE 1 AROUND HERE)

As described on the previous chapter, productive investments (manufacturing and R&D activities) concentrate in two regions: first, South America; then, developed countries as a whole (EU and USA).

Variables and Models

The variables of the models were constructed based on the survey's questionnaire. The questions aimed to capture the perception of the respondent (mostly firms' top management) on the referring subject, for which a Likert scale was applied to measure the agreement level. A scale of six was used in order to avoid central tendency bias. We then build dummy variables for the following aspects: main motivation to internationalize; main competitive advantage of the firm; and investment location.

The dependent variable is the location of foreign investments, where developed destinations assume the value 1 and less developed destinations are given 0. Firms were asked about the location of their foreign activities and the option given comprised eight regions: North America, European Union, Eastern Europe and Russia, Middle East, South and Central America, Asia, Africa and Oceania. The first two regions are the ones that we considered as developed destinations.

As independent variables we use two sets of variables: motivation related and capability related. We create five sets of investment motivations, based on the respondents grade for each investment determinant; dummies are created based on the average of such responses, where one is a positive result. Among the set of motivation variables are: strategic asset seeking (TECSEEK), market seeking (MKTSEEK), technology exploiting (TECHEX), efficiency seeking (EFISEEK) and resource-seeking investments (RESEEK). With information on the perceived competitive strengths of the firm *vis-à-vis* their international competitors we built three variables related to firm's capabilities. These are: the presence of skilled human resources (LABORCAP); the reliance on innovation, new technologies, modern equipment usage and responsiveness to international customers demand, which we label as innovative advantages (INNOVATION). As a measure of firm size we use the logarithm of the number of employees (LNEMPLOY) and also EXPERIENCE, measured by the logarithm of the number of years that the company has been established overseas. A correlation matrix between the variables is used as a tool for checking colinearity between variables.

We apply a logit model to test the possible influence of firm's motivations and capabilities on the location choice for foreign investments.

TABLE CORRELATIONS HERE

5. RESULTS

In order to test hypotheses 1 to 3, we run 4 logit models that relate investment determinants and firm competitive advantages to the destination of FDI. In each of these models, we controlled for the technological intensity of the industry sectors: low tech in model 1, average low tech in model 2, average high in model 3 and high tech in model 4[2]. To test Hypotheses 4 we run a logit model using modes of entry and location of FDI. The results are presented on Tables 2 and 3.

The results have shown that, contrary to what has become a trend among emerging markets firms, Brazilian firms do not invest in developed countries with technology-seeking motivations. In fact, very few firms have identified technology-seeking as a significant factor for internationalization. On the contrary, we found a positive and significant result for technology-exploiting investments into developed countries – a determinant that was the strongest among all respondent firms (see chapter 2). Therefore, we cannot accept hypothesis 1a. This leads us to believe that firms rely on their existing specific capabilities in order to establish abroad.

Little can be said about market seeking investments. Though this was the second strong motivation pointed by respondents, the results in the models were negative though not significant for developed countries. Whereas this leads us to reject hypothesis 1b, it does not mean that market seeking investments would prefer non developed location. We may assume that market seeking investments have

[2] We applied the concept of technological intensity based on a categorization that took into account the R&D expenditures of firms in the Brazilian market. See Furtado and Carvalho, 2005).

a certain balance between locations, which seems reasonable since all markets have their specific market attractiveness.

Regarding firms capabilities tested by hypotheses 2a, 2b and 2c, LABORCAP has shown the strongest positive effect over the investment location. Technology, on the other hand, showed a negative sign, though not statistically significant. The years of experience in foreign markets, as well as the size of the firm did not have effect over location choice. As a result, we accept hypothesis 2a, and reject hypotheses 2b and 2c.

Investments to developing countries – the 'zero' result for our dependent variable - we can argue that, though results are not statistically significant, efficiency and resource-seeking investments are more inclined to go to those countries, rather than locate in developed ones. That leads us to accept hypothesis 3a. On the other hand, as mentioned before, technology-exploiting investments were positive to developed countries, which leads us to reject hypothesis 3b.

We also tested the moderating effects of the possession of technological capabilities, and experience in foreign markets, on technology seeking motivations. The interaction variable between technology and technology-seeking investments showed collinearity, which means that the possession of previous technological capabilities is correlated to technology seeking investments. Similarly, we tested the moderating effects of skilled labor and technological capabilities on market seeking investments, but the results were negative and not significant.

Based on such results, we can say that, for those Brazilian firms in our survey, the quality of their labor force is their main competitive asset, and that they might perceive their technological skills as embedded in their personnel.

The interaction variables did not present any significant results, meaning that the capability variable in question does not influence the determinant of market seeking investments. The interaction

between innovation and technology exploiting investment also did not present neither positive nor significant results.

With regard to modes of entry, Model 5 results reveal that acquisition has a strong, positive relation to developed destinations, as does Greenfield investments (Table 3). That leads us to accept hypothesis 4a and reject hypothesis 4b. This result goes in line with the noticeable boom of acquisitions, from Brazilian firms, of firms located in developed markets[3]. The preference for Greenfield investments, *vis-à-vis* partnerships with local firms might be linked not only to the traditional preference for majority ownership, but also due to the fact that firms are deploying their own technological skills in foreign locations.

In resume, the sample of Brazilian firms studied in this chapter proved to be another 'one of a kind' set of emerging multinationals. Brazilian firms have characteristics that evolve from the country's past, and also from recent political and economic realities. It reinforces the belief that there is no such an homogeneous group as those of emerging multinationals, but rather several groups of firms from diverse origins with very particular ways to do business and internationalize.

[3] For a list of recent acquisitions of foreign firms, see the previous chapter, Table 1, and CEPAL (2008) and Almeida (2009).

Table 2: Results of the Logistics Regression

Dependent Variable: LOCATION (DC=1; LDC=0)				
VARIABLES	**Model 1**	**Model 2**	**Model 3**	**Model 4**
tecseek	-0.654	-0.599	-0.373	-0.525
	(1.191)	(1.223)	(1.249)	(1.178)
techex	2.050**	1.755**	2.169**	1.822**
	(0.930)	(0.873)	(0.894)	(0.861)
reseek	-1.656	-1.524	-1.282	-1.905
	(1.579)	(1.598)	(1.678)	(1.541)
mktseek	-0.361	-0.362	-0.174	-0.482
	(0.877)	(0.870)	(0.875)	(0.907)
efiseek	0.0302	0.0625	-0.262	0.170
	(1.409)	(1.384)	(1.493)	(1.351)
laborcap	1.906***	1.868**	2.399***	1.855**
	(0.739)	(0.734)	(0.824)	(0.735)
technology	-0.243	-0.117	-0.554	-0.0863
	(0.770)	(0.755)	(0.840)	(0.760)
exper	0.475	0.371	0.127	0.347
	(0.441)	(0.440)	(0.453)	(0.419)
lnemploy	-0.00736	-0.0445	0.00123	-0.0333
	(0.145)	(0.139)	(0.148)	(0.141)
low	-0.671			
	(0.715)			
avglo		0.178		
		(0.961)		
high				1.603
				-1.917
Constant	-2.001	-1.959	-1.896	-1.933
	-1.423	-1.518	-1.529	-1.419
N	61	61	56	61
Prob> Chi 2	0.0457	0.0597	0.0112	0.0466
Pseudo Chi2	0.220	0.2117	0.2754	0.2213

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1
*** p<0.01, ** p<0.05, * p<0.1
^The variable **avghigh** was dropped for predicting success perfectly.

Table 3: results from Model 5

Dependent Variable: LOCATION (DC=1; LDC =0)	
VARIABLES	Model 5
Acquisition	**3.124*****
	(0.975)
JV	0.708
	(1.045)
Franchising	-1.812
	(2.144)
Licensing	-1.652
	(1.292)
Greenfield	**1.695***
	(0.924)
Alliance	0.0443
	(0.887)
Merger	0.122
	(2.384)
Constant	-1.559*
	(0.922)
N	53
Prob > Chi2	0.0209
Pseudo Chi2	0.2464

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

6. CONCLUDING REMARKS

The main purpose of this chapter was to investigate the relationship between the choice of a developed country as a destination for FDI from a Brazilian firm and its competitive advantages, as perceived by the investor himself. We also wanted to test if Brazilian investments had a technology-seeking drive, a condition present in the investments of several emerging market firms. The main underlying question was to understand the role of technology as a determinant to internationalization, either as an ownership asset or as a strategy-sought asset.

Our main finding, regarding the role of technology in the internationalization of Brazilian firms, was that this is an important competitive advantage driving firms to diverse markets, and that Brazilian firms do rely on such advantages to compete even in more developed countries. This leads us, once more,

to highlight the influence of the country's industrial structure and industrialization process, which shaped the firms that are today national winners (see chapter 1). It is not a surprise that few multinationals from Brazil are in technological intensive sectors, as those were dominated mostly by foreign capital (Moreira, 1999). This does not mean to say that Brazilian firms lack technological capabilities; the do possess significant technological advantages in several fields, for example oil & drilling, pulp & paper, auto-parts, aircrafts, and many others. These firms, rather still few, are important examples of companies with a successful trajectory towards foreign markets.

Another important characteristic highlighted in our models is the role of skilled labour as a competitive asset for internationalization. Whereas technology did not outstand as an advantage, firms have identified their main asset in their human resources. This means that much of the technological advantages of these firms are intangible, and personified in their human resources.

We had already pointed out the growing importance of developed countries as recipients for Brazilian investments, and that higher value-added activities have a preference for locating there. The importance of acquisitions as a mode of entry in those markets was also corroborated by our model, in accordance to what we had stated earlier in the thesis (Chapter 2, Box 1).

It is clear, by all means, that Brazilian firms are intensifying their internationalization strategies and trying to gain markets outside the country – everywhere and anywhere that they can foresee a possibility of profiting and growing. Recent investments show that Brazilian firms are moving towards more advanced markets and sectors. As a result, even though Brazilian investments did not maintain its leading position among emerging investors, firms are on the way to make an upward shift of outward investments.

Regardless the small size of our sample, it is relatively significant given the number of Brazilian firms that actually have direct investments overseas, still very limited. Moreover, we have some of the most prominent examples of Brazilian investors within our sample. Nevertheless, the sample size has posed some challenges in the econometric tests and made difficult some further analyses.

In summary, the Brazilian firms analyzed in this paper presented a different pattern from that followed by investing firms from East Asian countries, which, to a large extent, target developed markets in order to access technologies, brands and successful business models (Narula and Dunning, 2000; Makino *et al.*, 2002; Child and Rodrigues, 2005). That, obviously, does not mean that there are not cases of firms in Brazil that are expanding in order to increase their technological capabilities, but hints that they are not solely or specially driven by the search of assets.

Regarding the specificity of emerging investments, the case of Brazilian firms prove that, indeed, they have (as is the case of most emerging countries) a very peculiar range of characteristics that differ a lot from traditional FDI - and that even the group of emerging countries cannot be considered as a homogeneous group. While comparative analyses can signalize to best practices and suggests some successful policies to foster foreign investments, only in-depth studies can reveal the true facets of each country's idiosyncrasies.

An interesting investigation for future researchers would be to assess of the impact that more technologically intensive investments, and specially those driven by the pursuit of technological assets, would have on the domestic economy. Studies on the field of absorptive capacities and technological spillovers would say that there is much gain in this type of foreign incursion. There is a lot still to be unveiled about the investments of Brazilian firms – and the dissemination of more information on this subject can be of great value to forecoming investments and policies that want to support the internationalization of firms.

Important aspects regarding the political environment and specific regulatory issues still need further attention. In Brazil, a still conservative approach from the Government regarding outward FDI is one of the main reasons for low levels of foreign investment from Brazilian firms. Among the several barriers to a broader foreign insertion, firms from the sample have cited the heavy tax burden in the home country, along with the high costs of capital to fund foreign ventures (Carvalho *et al.*, forthcoming). Such difficulties could be lessened with an active policy aimed at fostering the internationalization of domestic

firms. In this regard, the difference is also comparable to Asian countries. The Chinese Government, for instance, has a very active engagement in influencing firms' decision to invest with its "Go Global" strategy, and many authors question the very possibility of Chinese firms becoming multinational without the Government support (Child and Rodrigues, 2005; Cai, 1999; Luo and Tung, 2007). The policy scenario in Brazil remains unclear, with some policies being proposed, approved, but still not thoroughly disseminated among investors and causing controversy in the political ambit. Such topic is a rich one to be further researched.

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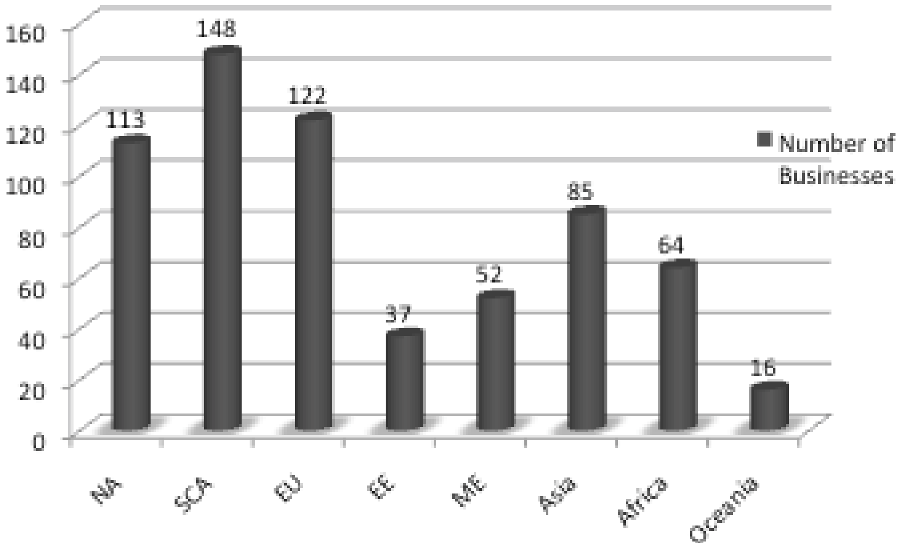
Table 1: Brazilian Investments by sector

Sector	Nr. firms
Food & Beverages	9
Wholesale & Retail	8
Construction	6
Automotive & Aeroespace	5
Rubber & Plastic	1
Construction materials	5
Pulp & Paper	3
Textile, apparel & Shoes	6
Eletronic equipment	3
Pharmaceutical, Hygiene & Cosmetics	2
Metalmechanic	1
Chemical & Petrochemical	6
Mineral extraction, Oil & Gas	2
Agroindustry	7
Communication Services	2
Transport Services	7
Financial Services	3
Consulting, Auditing, Advertising & other professiona services	4
Mettalurgy & Siderurgy	6
Technology (IT)	1
Energy	6

Source: elaborated by the author with data from the Global Players Survey, 2007.

Picture 1: Brazilian investments by region of destination



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