

The Rise of technolatinas: measuring the determinants of internationalization for the Brazilian technology start-ups

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*The Rise of Technolatinas: Measuring the Determinants of Internationalization for the
Brazilian Technology Start-ups*

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Abstract

Purpose – This paper examines the determinants of Brazilian Technological start-ups to internationalise. In particular, the paper explores to what extent institutional antecedents, the entrepreneurial social network and market push and pull factors played a role in that outcome.

Design/methodology/approach – The theoretical lens of inter-organizational networks, social networks and the entrepreneurs' cognition were employed to establish the determinants of internationalisation. Case study methodology was adopted to examine ten Brazilian start-up technological companies. The impact of institutional determinants and entrepreneurial characteristics were controlled by selecting the start-up sample that spin out from the technological graduates of one of the Brazilian university. These start-ups were based in the same innovation park and started the business within the span of ten-year time period.

Findings – Our findings suggest that inter-organisational, as well as social networks have played a central role in firms' decisions to internationalise. The firms' customer relationship with the international partners acted as a catalyst to internationalize. Entrepreneurs' cognisance and familiarity of the foreign market acted as a push factor to operate in a new market. Institutional contexts were also determinant in facilitating that outcome, particularly through a joint influence of Governmental, Academic and Industry organizations.

Theoretical/practical implications – The research contributes to the internationalisation literature by introducing the impact of entrepreneurial experience and social networks as a

stimulus for internationalisation. The research outcome has also implications for the policy makers on how triple helix constellations can induce the internationalization of start-ups.

Originality/value – There are only limited studies that concern the internationalisation of start-ups from the BRICS countries. Also, there are no studies from emerging economies focus on entrepreneurs' cognition and social networks, and particularly exploring how technological graduates from the same university, starting a spin-off and opted to internationalise while operating from the same institutional context.

Keywords: emerging markets, multinationals, Latin America, internationalization, institutions, inter-organizational networks, social networks, cognition, start-ups, Technolatinas.

Paper type: Research paper

1. Introduction

Emerging markets are attracting particular attention from politicians, business managers, entrepreneurs and researchers because of their strong economic growth and their increasing influential role in south-south and south-north trade and investments (United Nations Conference on Trade and Development, 2010; World Trade Organization, 2012). The increase in the number of emerging markets multinational enterprises (EMNEs) from these economies has been staggering: in 1992, circa 8.5% of all multinationals in the world were from emerging economies, and this percentage had more than tripled reaching 28.10% by 2005, (Cuervo-Cazurra, 2008; United Nations Conference on Trade and Development, 1993). In 2008, there were more than 21.000 EMNEs, 3.500 being from China, 1.000 from Russia, 800 from India and 220 from Brazil (Organisation for Economic Co-operation and Development, 2009).

Brazil is one of the BRICS countries and the biggest emerging market in Latin America (World Bank, 2011). Like other Latin American countries in the region, Brazil embarked on profound institutional transformations that started in the late 1980's and further accelerated at the

beginning of the 21st century. The aim of the transformations in the region concerned *market liberalization*, privatization of public enterprises, creation of efficient capital markets, abolition of trade barriers and regional integration processes (such as the *Free Trade Association of Latin America*, *Common Market of Central America* or *Common Market of South America*), and economic and social growth (Chudnovsky and López, 2000; Santiso, 2005). These transformations resulted in unparalleled growth in its out- and inflow of foreign direct investment (FDI) and exports: in the late 1990s Brazil's outflow stock was in the world top five with over 41 billion USD and accounted for 53% of all Latin American countries (United Nations Conference on Trade and Development, 2006; Cruz *et al.*, 2012). In 2011 the FDI inflow to Brazil represented 56% of South America having grown to 66 billion USD from 11 billion USD (1996) (World Bank, 2011). Exports of goods grew from 47 billion USD in 1996 to 256 billion USD in 2012 (Stallings and Peres, 2011).

Brazilian enterprise landscape was also positively affected by these processes. According to Instituto Brasileiro de Geografia e Estatística (2014) in 1992, there were 793 industrial firms, which increased to 334,000 in 2012. The commercial sector grew from 55,000 in 1992 to 1.6 million firms in 2012, while the service sector grew from 919,000 in 2002 to 1.17 million in 2012 and accounted for 39% of the 31 million-employee workforce.

The new institutional context also facilitated the advent throughout Latin America of a 'new wave' of technology-based SMEs - designated as 'Tecnolatinas' (NXTP Labs and Surfing Tsunamis, 2012) alluding to technology-based start-ups with international footprint that were created between the 1980s and early 2000s which accounted for an overall valuation of 38 billion USD. Circa 48% of these firms were from Brazil followed by Argentina and Mexico, with activities mostly in high technology such as software and security, digital business, biotechnology, digital medicine, renewable energy, space technologies, financial technologies and agricultural technologies.

Our analysis of the literature led us to identify other key characteristics of these firms. Such as, they were of entrepreneurial nature and emerged in close proximity with knowledge clusters, Brazilian High Education System and the National Network of Technology Parks and Business Incubators. Approximately 60% of the firms incubated were spin-offs of Academia (Associação Nacional de Entidades Promotoras de Empreendimentos Inovadores, 2008; Lahorgue, Guimarães and Aranha, 2012). The majority of these start-ups were early adopters of innovative technologies, most of which were developed within the Academia and Industry alliances. They possessed a high level of expertise that made bigger corporations seek them as *suppliers*, thus some became part of globalized supply chains. They had a strong regional footprint benefiting mostly from the inter-regional economic convergence, cultural and linguistic similarities as most of the Latin America countries are Spanish speaking (Child and Rodrigues, 2005; Amal and Rocha Freitag Filho, 2010; Dib, da Rocha and da Silva, 2010; Nicholls-Nixon *et al.*, 2011; Stallings and Peres, 2011).

The literature identified a gap in terms of the internationalisation of firms from emerging economies, and particularly SMEs and start-ups, especially from Latin America (Bruton, Ahlstrom, and Obloj 2008; Che Senik *et al.* 2011; Coviello and Munro 1995; Kiss, Danis, and Cavusgil 2012; Nicholls-Nixon *et al.* 2011). Having explored the antecedents and the relevant role of technology start-ups in Brazil, we proposed as research question ‘what’ are the determinants of the Brazilian technology start-ups to internationalize?

To investigate this we adopted a multi-disciplinary perspective that captures the interplay of different determinants such *institutional* perspective (North, 1990; Yamakawa, Peng and Deeds, 2007; Stephan and Uhlaner, 2010; Che Senik *et al.*, 2011), *inter-organizational* networks (Ahuja 2000; Baum, Calabrese, and Silverman 2000; Johanson and Mattsson 2015; Johanson and Vahlne 1977), *social networks* and the entrepreneurs’ *cognition* (Zahra, Korri,

and Yu 2005). This guided us to investigate how these can influence firms' internationalisation strategies in the context of Brazilian start-ups.

The paper begins with a literature review on *institutional* theory, *inter-organizational* and *social networks* and how entrepreneurs' *cognition* affects start-ups' internationalisation decisions. It succeeds in substantiating the choice of a qualitative methodology and adoption of multiple case studies and describes the research design and implementation. At the end results are presented and discussed, conclusions are drawn and an analysis is made on research limitations and opportunities for further research.

2. Literature review

Literature on EMNEs assumed that firm's decisions to internationalise was not determined by firms' core competencies, but because they benefited from exploiting their home country advantages such as low-cost factors and access to natural resources (Aggarwal and Agmon 1990; Bhaumik, Driffield, and Pal 2010; Buckley et al. 2007; Wells 2005). Therefore, they could not withstand in international markets because they were short of knowledge related to management, marketing and innovation (Rugman, 1980; Mathews, 2006; Ramamurti and Singh, 2009). Despite this, evidence was found on Asian, South African and South American EMNEs from industry sectors in which they there was no favoured access to natural resources and/or the impact of low-cost factors was irrelevant, but which were very knowledgeable on production technologies developed internally and were challenging multinationals from developed economies (Lall *et al.*, 1983).

Offsetting the core competencies literature (Porter, 1986; Dunning, 2013) evidence was also found on EMNEs internationalizing without having strong competitive advantages but rather sought it as a means of obtaining them (Bonaglia, Goldstein and Mathews, 2007; Athreye and Godley, 2009). For example evidence was found on Chinese firms that have surpassed their

'latecomer' status in terms of technology knowledge having explored original equipment manufacturer and joint-venture alliances (Child and Rodrigues, 2005; Cantwell, Dunning and Lundan, 2010), or through the acquisition of strategic assets such as brands, technology and distribution channels with developed countries multinationals to gain competitive advantages which led them to expand themselves at a later stage (Prashantham and Young, 2004; Mathews, 2006; Chittoor, Ray and Sarkar, 2008; Athreye and Kapur, 2009).

Emerging markets were also noted to have characteristics that should be taken into account when understanding firms' decisions to internationalize, such as domestic market restrictions (Lall *et al.*, 1983; Wells, 2005), competition (Child and Rodrigues 2005; Chudnovsky and López 2000), or limitations due to the reduced size and purchasing power (Holtbrügge and Kreppel, 2012). On the other hand, institutional influence such as strategic relations established with foreign investors at corporate or governmental level (Bhaumik, Driffield and Pal, 2010), as well as *governmental incentives* (Aggarwal and Agmon, 1990; United Nations Conference on Trade and Development, 2006; Buckley *et al.*, 2007; Kalotay and Sulstarova, 2010) have been found to have a relevant influence on that outcome.

Based on these considerations some authors made noteworthy suggestions that international business theories originated and tested in developed markets would require adaptation (Dunning, 2006; Buckley *et al.*, 2007; Johanson and Vahlne, 2009), whereas others were in favour of generating new theories (Mathews, 2006; Gaur and Kumar, 2009; Ramamurti and Singh, 2009).

2.1. Institutional context

The *institutional* norms, rules, laws, routines, habits, practices and patterns of behaviour mould the action of the agents and affect their interactions. An *institution-based* view of internationalization highlights the outcome of the dynamic interaction between organizations

and *institutions*, according to which strategic choices made by firms reflect formal and informal constraints of a particular background (Yamakawa, Peng and Deeds, 2007). *Institutional* changes influence individuals and firm's actions and encourage new behaviours, cultural values (Stephan and Uhlaner, 2010), conventions (North, 1990), social norms (Webb *et al.*, 2009), and role models (Obschonka *et al.*, 2012).

Scott (1995) argued that a country's institutional context consists of three dimensions: *regulatory*, *normative*, and *cognitive*.

The *regulatory* dimension consists of laws, regulations, and *government policies* that promote certain behaviours and restrict others (Busenitz, Gomez and Spencer, 2000). Countries with high levels of *institutional* development tend to have well-developed financial systems, equity markets, and venture capital industries (Bruton, Fried, and Manigart 2005). They also have well-established legal traditions, systems, and effective enforcement mechanisms, which facilitate new business creation and growth, and protect investors (Kiss and Danis, 2008). Governments can, therefore, create favourable conditions to support and incentivize companies to internationalize (Child and Rodrigues, 2005; Buckley *et al.*, 2007). In this context, institutional reforms towards *economic liberalization* reduce trade barriers and facilitate domestic firms' access to foreign capital, import technologies and resources and thereby helps to overcome the competitive disadvantage vis-a-vis their foreign rivals and bring them closer to their foreign counterparts in terms of cost and quality (Ray, 2003; Luo and Tung, 2007). Conversely, lack of suitable conditions in domestic markets such as insufficient capital, may also influence firms to acquire appropriate *funding* abroad (Holtbrügge and Kreppel 2012; Lall *et al.* 1983).

The *normative* dimension defines which behaviours and values are expected of individuals or organizations, which often are visible through shared norms. Valuing international activity

depends on the country's level of institutional development. Developing economies likely have less experience conducting international business and thus lack strong normative values in support of internationalization (Kiss and Danis, 2008), therefore firms' legitimacy to endeavour such processes (Aldrich and Fiol, 1994; Zimmerman and Zeitz, 2002) depends on the generalized perception that its actions are desirable and appropriate within shared norms and beliefs. Conversely, the potential to enhance legitimacy at home as being associated with prestige international players can also motivate firms to internationalize (Deeds, Mang and Frandsen, 2004; Yamakawa, Peng and Deeds, 2007).

Finally, the *cognitive* dimension reflects how certain knowledge sets become institutionalized and part of a shared social understanding. Therefore, in the context of internationalization, cognitive institutions such as the shared beliefs and values internalized by managers and entrepreneurs may determine the path by which internationalization occurs (Yamakawa, Peng and Deeds, 2007; Kiss and Danis, 2008).

An important contribution of the institutionalist approach is the linkage to the innovation environment at a national, regional or sectoral level, which comprehends all the actors involved in scientific and technological activities, whose interactions contribute to initiate, import, modify and diffuse new technologies (Freeman, 1987). This environment comprises a network of organizations such as firms, industrial research laboratories, universities and government laboratories, support for R&D in industry, the national system of schooling and training and financial institutions (Nelson, 1992).

These heterogeneous networks have an innovation-promoting effect of symbiotic *triple-helix constellations* among universities, industry and governments (Leydesdorff and Etzkowitz, 1998), and are important for the emergence of new forms of knowledge generation (Gibbons, 1994). In this context, academic organizations can play a central role acting as a 'natural

incubator' that provides support structures for researchers, teachers and students to initiate new ventures (Etzkowitz, 2003) and stimulate knowledge sharing and *partnerships* (Subotzky, 1999).

Therefore, and central in this research is also the role played by the Business Incubator belonging to Alberto Luiz Coimbra Institute for Graduate Studies and Research in Engineering (COPPE) at the Federal University of Rio de Janeiro. Created in 1994 it assisted over 70 technology start-ups that generated more than 700 highly qualified jobs and provided support structures to initiate and develop new ventures such as research facilities, research groups, liaisons offices, tech transfer advice (Subotzky, 1999; Etzkowitz, 2003) and entrepreneurship education (Krueger and Brazeal, 1994). It is contiguous to Rio's Technology Park (built in 2003) which houses public and private R&D facilities, multinational companies (such as Petrobras, Eletrobras, General Electric, Schlumberger, Baker Hughes, Halliburton, Siemens) and *governmental support* agencies for innovation and internationalisation of SMEs, such as the Brazilian Ministry of Science, Technology and Innovation (MCTI) or governmental agencies such as Finance of Studies and Projects (FINEP), SEBRAE – Brazilian Service to Support SMEs and the Brazilian National Development Bank (BNDES).

It was also recognised that the availability of *venture capital* is the key to rapid commercialization of innovations mainly because innovative researchers more often leave research laboratories of universities or major enterprises and establish their own start-up companies (Mowery and Rosenberg, 1998; Li and Zahra, 2012). Although not based within the Rio's Technology Park, *venture capital* funds sourced from BNDES - Brazilian National Development Bank established regular contacts with the start-ups.

Highlighting institutional changes imposed by *governmental support* actions in Brazil that contributed to developing a knowledge-intensive economy. As examples of important

transformations occurred in this context, sectoral funds were created for research in oil and gas, electric energy, water and mining (Cardoso Jr, 2009), investments were made in the construction of technology parks and business incubators that hosted more than 6,500 start-ups and 45,000 jobs with annual turnover over 7 billion BRL (Lahorgue, Guimarães and Aranha, 2012), and public-private *venture capital* funds were created and by 2011 more than 3 billion BRL had been invested in approximately 500 start-ups (Ramalho, Furtado and Lara, 2011). Tax efficiency laws and regulations were established to incentivize firms to innovate a (such as ‘Good Law’/ Law number 11.196/2005 and the ‘Innovation Law’/ Law number 10.973/2004) have stimulated bigger companies to invest in R&D therefore motivating them to collaborate with smaller companies in joint R&D projects and activities (Aguiar *et al.*, 2009; Cardoso Jr, 2009; Amal and Rocha Freitag Filho, 2010; Dib, da Rocha and da Silva, 2010; Ramalho, Furtado and Lara, 2011; Stallings and Peres, 2011; Lahorgue, Guimarães and Aranha, 2012).

2.2. The influence of inter-organizational networks

In networks, resources are widely dispersed among various heterogeneous actors (Brass *et al.*, 2004) and there is a division of work, through which firms work interdependently towards attaining complementary objectives rather than independently (Johanson and Mattsson, 2015). Collaboration in terms of R&D projects through utilization of joint resources has the benefit of facilitating access to resources and knowledge needed to be competitive instead of having to internalize it (Baum, Calabrese and Silverman, 2000; Hafeez, Zhang and Malak, 2002b). Therefore, *inter-organizational* ties such as strategic alliances, joint-ventures, and *supplier partnerships* (Gulati, Nohria and Zaheer, 2000; Hafeez, Malak and Zhang, 2007) provide long-term learning advantages as they serve as “information conduits through which news of technical breakthroughs, new insights to problems, or failed approaches travels from one firm to another” (Ahuja, 2000, pp. 427-428). Furthermore, networks provide information on markets (Gulati, Nohria and Zaheer, 2000), increase innovation performance (Ahuja, 2000; Baum,

Calabrese and Silverman, 2000), contribute to lower the transaction costs (Rutashobya and Jaensson, 2004), reduce uncertainty (Brass et al. 2004; Zain and Ng 2006)) and risks (Sharma and Blomstermo 2003, and represent potential economies of scale and scope (Gulati, Nohria and Zaheer, 2000).

The benefits of networks can be particularly relevant for smaller companies that cannot compete based on economies of scale, but rather exploit network access to bigger companies as an alternative method of controlling valuable and essential resources (Madsen and Servais 1997; Zahra et al., 2000). However, because of depending too much on some customers they may have their capacity absorbed and the development of their competencies constrained (Hafeez, Zhang and Malak, 2002a; Grandinetti, Furlan and Camuffo, 2007). As the outcome generated by these collaborative processes is often confidential in nature it also contributes to reinforcing the mutual value of actors as each other's *customers* and *suppliers* and therefore strengthens mutual ties (Johanson and Mattsson, 2015). Likewise, it determines firms' positions within the network, i.e. the role that an organisation has for other organisations, their identity and the relative importance and how they perceive each other in terms of quality, reliability, legitimacy and status (Galaskiewicz, 1985; Baum, Calabrese and Silverman, 2000).

Customer-supplier networks constitute one aspect of the diverse type of relations that can be established in networks, but that has significantly contributed to the decisions of internationalization particularly among smaller firms acting as *suppliers* of bigger companies. Coviello and Munro (1995) identified the existence of network relations that created opportunities and influenced decisions on the selection of foreign markets as well as the process to enter them. Loane and Bell (2006) researched on small companies from the UK, Australia and New Zealand and found evidence that they were willing to follow their *customers* into foreign markets where they were already established and adopted their distribution channels. Similar evidence was found by Deo Sharma and Johanson (1987) on Swedish, Grandinetti,

Furlan and Camuffo (2007) on Italian, Peng and Luo (2000) on Chinese, Batjargal (2003) on Russian, Ciravegna, Lopez and Kundu (2014) on Costa Rican, Amal and Rocha Freitag Filho (2010) and Dib, da Rocha and da Silva (2010) on Brazilian.

2.3. The role of the entrepreneur: social networks and cognition

As organisations are influenced by individual behaviours, *social networks* can affect and shape *inter-organizational* relationships and *social exchange* of information as individuals, not firms recognize opportunities (Ozgen and Baron, 2007). Therefore, *social networks* may influence the internationalization processes of firms (Bell, 1995; Andersen and Buvik, 2002). The relevance of entrepreneur-centred *social ties* in explaining internationalisation decisions is addressed under ‘international entrepreneurship’, which explores firms’ decisions to enter global markets at very early stages, hence giving origin to designations such as ‘Born globals’ (Cavusgil and Knight, 2015), or ‘international new ventures’ (Oviatt and McDougall, 1994).

Exploring internationalisation decisions from a *social network* has the advantage to allow the understanding of why opportunities are recognized beyond *inter-organizational* network boundaries and not restricted by the markets where the firm has business relationships (Ellis, 2000; Johanson and Vahlne, 2009). Indeed, *social ties* facilitate the acquisition of information from the managers’ networks (Wong and Ellis, 2002; Zain and Ng, 2006), former employees, dealer networks or migrating *customers* (Ellis and Pecotich, 2001). When internationalisation is based on the knowledge at the individual level (managerial/entrepreneurial) it constitutes a behavioural-centred (Cyert and March, 1963; Andersen and Buvik, 2002) or *cognitive* approach (Kobrin 1994; Zahra, Korri, and Yu 2005). Hence, opportunity recognition can be driven by prior knowledge, as people are able to recognize opportunities because they have had the relevant knowledge that makes this possible (Shane and Venkataraman, 2000) in regards to markets, institutions and firm’s capabilities (Hafeez and Abdelmeguid 2003; Hafeez, Zhang,

and Malak 2002a, 2002b; Eriksson, Johanson and Majkgård, 2015), therefore influencing subsequent decisions.

Experiential knowledge also influences risk perception, and consequently as market knowledge increases and firms advance in the internationalization process, the perception of risk is likely to fall (Johanson and Vahlne, 1977; Hedlund and Kverneland, 1985; Cavusgil and Naor, 1987). Likewise, international orientation as and indicative of a deeper and broader education, language ability, and travel experience generates proactive behaviours and generate less concerned about risk in relation to international opportunities (Acedo and Jones, 2007). This perspective also explains why firms start internationalization towards geographies with which they perceive a shorter ‘psychic distance’ in regards linguistic and cultural differences or institutional environments (Peng, Wang and Jiang, 2008; Cantwell, Dunning and Lundan, 2010; Johanson and Mattsson, 2015).

3. Research design

A qualitative approach employing multiple case studies was chosen as the appropriate methodology for this research. Following to literature recommendations (McCutcheon and Meredith 1993; Miles and Huberman 1994), we consider our study to be a contemporary phenomenon, which occurs in a bounded context from which it is difficult to separate. Case study approach enables us to ask ‘what’, ‘how’ and ‘why’ questions relevant to a number of variables as teased out of the literature. Here we wish to study how these variables may influence the results thus conferring a holistic perspective to explain the phenomenon (Chetty 1996; Eisenhardt 1991; Johanson and Wiedersheim-Paul 1975; Maxwell 2013; Yin 1984). Using multiple cases and polarity of examples permits further possibilities for complementarity, comparison and replication (Harris and Sutton, 1986; Eisenhardt and Bourgeois, 1988).

3.1. Principles of sample selection

The unit of analysis is the ‘firm’ where we wish to study the ‘decision to internationalize’. Contacts were made with forty-six Brazilian Business Incubators and Technology Parks (June 2012). Emails were sent to explaining the context and research methodology, and positive feedback was received from the Business Incubator belonging to Alberto Luiz Coimbra Institute for Graduate Studies and Research in Engineering (COPPE) at the Federal University of Rio de Janeiro (in September 2012).

COPPE is a renowned as a research-led High Education organisation, which is reflected in its academic outputs, typically producing around 500 master and PhD thesis per year. It has more than 2,000 publications in peer-reviewed journals and has undertaken around 12,000 collaborative projects with the industry. Despite being present in many different domains of Engineering, COPPE has a track-record of research in oil and gas, which was developed after establishing a cooperation protocol with Petrobras - a Brazilian oil and gas conglomerate - intended to strengthen technology transfer and research.

To determine the sample, a questionnaire was sent to COPPE that was internally circulated among 59 incubated and graduated start-ups, aiming to identify which already started their internationalization, and requested information such as names and contacts of firms and respondents, industry segment, the date when they started to internationalize, the chosen countries and the entry mode. Sixteen answers were received from which a sample of ten was chosen based on the polarity and variety of cases. Subsequently, authorization was sought in order to interview their founders/entrepreneurs. Contacts have also been established at management level with representatives from COPPE, BNDES - Brazilian National Development Bank which had a key role in creating nationwide R&D funds and the network of business incubators and technology parks, and *venture capital* fund CRIATEC which raised

capital from private investors and public funds to invest in technology start-ups. Research design and the global methodology are summarized in Table I.

Table I – Research design

<u>Purpose</u>	<ul style="list-style-type: none"> - Understand the primary motivations of start-ups to internationalize and which particular circumstances they were facing when such decisions were made. - Understand the key factors that influenced the choice of markets.
<u>Methodology</u>	<ul style="list-style-type: none"> - Exploratory case study. - Qualitative analysis. - Field observations and interviews. - Document analysis.
<u>Units of analysis</u>	<ul style="list-style-type: none"> - Firm as a single unit of analysis and multiple cases.
<u>Resources</u>	<ul style="list-style-type: none"> - Primary sources: <ul style="list-style-type: none"> • Semi-structured interview with founders, investors and public funding bodies. • Observation of the phenomenon through field visits to the SME headquarters. • Semi-structured interviews with representatives of BNDES, COPPE and public-funded venture capital funds. • All the interviews were made in Portuguese and digitally recorded. - Secondary sources including websites and documentary evidence: market information, sectoral research reports, financial reports,
<u>Methods of data analysis</u>	<ul style="list-style-type: none"> - Interviews were recorded and transcribed - Identification and classification of the key variables. - Identification of causal relations between variables. - Search for common patterns. - Cross-validation of outcomes with different sources. - Triangulation of findings about the use of public funds amongst entrepreneurs, venture capitalists and banks

3.2. Research implementation

Following recommendations from Yin (1984) and Miles and Huberman (1994), the following case boundaries were set up: start-ups were either incubated or graduated from COPPE's Business Incubator, were *suppliers* of technology services to businesses and were created between 1996 and 2012, and started internationalization between 2002 and 2012. Observations and interviews were conducted individually by the main researcher. Interviews were conducted face-to-face, and each interview took four hours on average. A set of question thread was email to the interviewee in advance, but the discussion followed a loose structure for not to disturb

the train of thought of the interviewee. At the beginning, each interviewee was explained the purpose of the research and research methodology.

3.3. Data analysis

Data was transcribed and was checked for inconsistencies, faults or interpretation errors through the process of reducing data for each case using the chronology of events and recorded in dual-entry matrices. Primary and secondary sources of data were systematically analysed to ensure consistency and to reduce the possibility of letting researchers' reasoning interfere with analysis (Eisenhardt, 1991; Miles and Huberman, 1994; Maxwell, 2013). Establishing contacts with different stakeholders and direct observations allowed the triangulation of findings thus providing a stronger validation of the information obtained. In terms of conducting a comparatively study of the case companies, the qualitative responses were compared subjectively against each other by giving a subjective score as will be explained later.

4. Results and Discussions

A demography of the sample start-ups is illustrated in Table II. All of these SMEs were set-up between 1996 and 2012, nine of these had below 50 employees, and eight of them had annual turnover below 1 million USD. Postgraduate students graduated in technology were the founders of these firms. Actually, the start-ups (A1, A2, G1, O1, P1, S1, and W1) were also spin-offs of a research projects initiated at COPPE and one of a research project initiated between COPPE and the Brazilian Armed Forces (S1), of which G1, O1, S1 and P1 co-own patented technology (see Table II).

Table II – Synopsis of the sample

Start-up	Founders teams	Core competencies and IP (if applicable)	Main sectors served	Year of creation	Number of Workers (2012)	Turn-over (2012)	Date when internationalization started	Internationalization activity	Markets entered
<i>A1</i>	Graduate students (COPPE)	Metrology and hydrology	Production of electricity (wind, hydro), exploration and transport of oil and gas	2001	6	< 1 million USD	2012	IE	Argentina
<i>A2</i>	Graduate students (COPPE)	Metrology, hydrology and bathymetry	Production of electricity (wind, hydro), exploration, and transport of oil and gas, port management	2006	35		2008	Export (30% of the total sales)	Argentina, Venezuela
<i>G1</i>	Graduate students (COPPE)	IP for remote monitoring and geo-referencing	Heavy construction and infrastructure.	2009	15		2010	Export (50% of the total sales)	Canada, Chile
<i>H1</i>	Graduate students (COPPE) and non-academics	Software for managing HR functions and processes	Service sectors, such as banks, insurance companies, public entities, wholesalers and retailers	1996	47		2002	Export (5% of the total sales)	Spain, Chile, Colombia, Mexico
<i>II</i>	Graduate students (COPPE)	E-commerce and data security	E-commerce retail	2008	18		2010	Export (10% of the total sales)	USA, Argentina, Colombia, Uruguay
<i>O1</i>	Graduate students (COPPE) and non-academics	IP for identifying oil exudation on the seabed, using satellite images	Oil exploration	2010	4		2012	IE	USA, Mexico
<i>S1</i>	Graduate students (University of S. Paulo) and Brazilian Armed Forces (non-academics)	IP for underwater surveillance and remote monitoring with drones	Oil, gas, chemicals and petrochemicals	2008	37		2010	IE	Venezuela
<i>WI</i>	Researchers and graduate students (COPPE)	Industrial processes and materials using the Computational Fluid Dynamics methodology	Industrial sector, particularly in automotive and aviation	2012	3		2012	IE	Argentina, Uruguay

Start-up	Founders teams	Core competencies and IP (if applicable)	Main sectors served	Year of creation	Number of Workers (2012)	Turn-over (2012)	Date when internationalization started	Internationalization Activity	Markets entered
V1	Graduate students (COPPE) and non-academics	Operations and industrial processes reengineering using operations research and mathematical optimization models	Manufacturing, telecommunications, trade, transport and logistics	2002	250	10 million USD	2010	Export (20% of the total sales)	UK
P1	Graduate students (COPPE) and non-academics	IP for Manufacturing high-performance polymers for cold welding, used in the maintenance of heavy industrial equipment	Exploration and transport of oil and gas, steel, mining, aerospace, chemical, manufacturing companies, electricity distribution	2008	45	5 million USD	2011	IE	Argentina, Chile, Venezuela

Of importance is the second but right most column of Table II that indicates the measure of internationalisation in terms of export intensity that involves if the company was making irregular export (IE), exporting regularly, or making FDI. The majority of the SMEs started their internationalization at their early years of inception, exceptions are for A1, V1 and H1, which started to internationalise after having attained some growth in the domestic market.

Actually, start-ups V1 and H1 accumulated enough profits (not in the Table) facilitating their internationalisation through FDI. Five of these companies (A1, O1, S1, W1 and P1) were irregular exporters (IE). All firms were providers of services to other businesses (B2B). One of the common elements of all these companies was that even within the domestic market (in Brazil), their main *customers* were multinationals firms, some of which were ‘Multilatinas’. These multinationals were the key players in heavy industries such as hydroelectricity, wind- and coal-powered electricity production, transport, oil and gas, mining, telecommunications, infrastructure, steel production, automotive, aviation, shipbuilding, chemicals and petrochemicals. Interesting to note that Brazil is a large exporter of products from these heavy

industries. However, three of the start-ups (I1, H1, and V1) had multinational *customers* from developed economies operating in Brazil (I1 worked for Walmart/USA, and H1 and V1 for Santander Bank and Telefonica from Spain, respectively).

A subjective benchmarking method was adopted to compare the strength of determinants for internationalisation amongst these start-ups. From the triangulation sources, if the researcher assumed that a determinant is strongly impactful (in relative sense) in internationalisation decision, it is assigned '***'. If the impact is medium, it is assigned '**'. However, if the impact is weak or nil, it is assigned '*' (see Tables III, IV and V).

4.1. Institutional determinants

From a *regulatory* perspective (Scott, 1995), reforms towards *economic liberalization* were beneficial for firms (Luo and Tung 2007; Ray 2003) as they have reduced trade barriers and interest rates. *Governmental actions and incentives* (Child and Rodrigues, 2005; Buckley *et al.*, 2007) were also created to support SMEs and start-ups to internationalize in providing information on foreign markets, searching for *partners*, and subsidising the internationalization through grants. For the purpose of this research we operationalise Scotts (1995) regulatory perspective in the context of *institutional* determinants, *economic liberalisation*, *public support services*, *public funding* and *venture capital* funding. Table III provides a summary of the outcome of the data analysis related to these institutional determinants that made an impact on the sample start-ups to internationalise.

All the start-ups confirmed that the Brazilian *economic liberalization* process in terms of the abolition of market barriers for trade of goods and services benefited them transactions and exports to foreign countries. Firms H1 and V1 (***) were relatively more mature in the sample (started in 1996 and 2002, respectively, see Table II) had more experience in capitalising these

benefits, and therefore have learnt how to utilise reduction of interest rates, as well as negotiate *funding* mechanism more effectively with banks.

Table III – Institutional determinants in making decisions to internationalize

Institutional Determinants	Sample Start-ups									
	A1	A2	G1	H1	I1	O1	P1	S1	V1	W1
<i>Economic liberalization</i>	**	**	**	***	**	**	**	**	***	**
<i>Support Services (COPPE/ public organizations)</i>	**	**	**	*	*	***	***	***	*	**
<i>Public Funding</i>	**	**	**	*	*	**	**	**	*	**
<i>Venture Capital Funding</i>	*	*	*	*	*	*	***	**	*	*
Overall *'s	7	7	7	6	5	8	10	9	6	7

Key: '*' = weak impact; '**' medium impact; '***' = strong impact

Support from COPPE was found relevant for all start-ups except for H1, I1 and V1 that were already graduated (left the business incubator) at the time they started their internationalization and had their own offices moved to Rio's city centre. O1, P1 and S1 with their core products in oil and gas sector recognized COPPE had a very strong influence in their internationalization decisions. This is because COPPE's core competence resides in the oil and gas sector, and therefore it was able to provide relevant contacts with foreign *customers* and *partners*.

As explained earlier, *public funding* was made available to Brazilian firms in terms of sizeable grants (staring 100K to 500k USD) to promote innovation and internationalisation. Note that companies (A1, A2, G1, O1, P1, S1 and W1) that were still based at Rio's technology park and COPPE business incubator benefitted most from the *public funding* mechanisms. As these firms were spin-offs from research projects that started when the founders were the post-graduate students at COPPE, they were very familiar with these *public funding* programmes, and their business model relied heavily on these funds. In implementing these projects, they

established connections with domestic and international *partners* thus allowing them to expand business. P1 and S1 operating in the capital-intensive oil and gas sector. Having consumed the public development funds for the proof of concept and research, these start-ups needed funds for capacity building to manage expansion and pay for sourcing materials, cost of operations, logistics and outsourcing some part of the business. CRIATEC *venture capital* fund invested in 2008 in S1 and in 2010 in P1 and, which aimed to support primarily their market growth and ongoing product development and cover for the OPEX.

4.2. The influence of inter-organizational networks

In the light of above literature, we operationalise the inter-organisational network under *dragging impact of customer demand* (to follow main customers who were internationalising) (Gulati, Nohria and Zaheer, 2000), *collaboration* with international *partners* (Madsen and Servais, 1997; Ahuja, 2000; Baum, Calabrese and Silverman, 2000) and *search for suppliers* (Gulati, Nohria and Zaheer, 2000; Johanson and Mattsson, 2015). Table IV summarizes the perception of the sample firms in regards of how *inter-organizational* networks have impacted on their internationalisation decisions.

Table IV – Inter-organizational networks and decisions to internationalize

Determinants of internationalisation	Sample Start-ups									
	A1	A2	G1	H1	I1	O1	P1	S1	V1	W1
<i>Dragging impact of customer demand</i>	***	***	**	*	***	***	**	**	**	**
<i>Collaboration with international partners</i>	**	**	**	***	*	**	**	**	*	**
<i>Search for suppliers</i>	*	*	*	*	*	*	*	*	*	***
Overall *'s	6	6	5	5	5	6	5	5	4	7

Key: '*' = weak impact; '**' medium impact; '***' = strong impact

As illustrated above *customer demand* was the main stimulus to make internationalisation decision for nine start-ups, except H1. Demand was either from customers that have made FDI abroad or from their subcontractors in these geographies. The most frequent practice were direct requests to supply services for them, but there were also opportunities to participate in joint bids to public and private procurement calls. *Customer demand* was perceived stronger by A1, A2 and O1 which were providers of services to companies that were establishing large operations abroad (mostly in South and Central America) related to oil and gas offshore exploration. In all these cases, they had established strong relations with key Brazilian multinationals. However, in the case of I1 (the e-commerce security software supplier for Walmart) the drag impact was strong (***) as it successfully managed to roll-out their domestic experience of working with the local Walmart subsidiary in Brazil, to the main Walmart in the USA. This resulted in a much bigger gain compared to the domestic market. Subsequently, I1 used this success to further spin-out in North, Central and South America.

All other start-ups perceived a relevant effect of *customer demand* that dragged them to foreign countries (G1, P1, S1, V1, and W1). In case of H1 the *pull* effect from *customer demand* was less strong (*) as customers that bought human resource software technology from them in Brazil did not need to purchase this again.

Collaboration with international partners such as private firms, R&D organisations and universities (A1, A2, G1, O1, P1, S1, and W1) was noted (**) by the companies that regularly sought *funding* from public grants to promote innovation and international growth (see Table III). This collaboration contributed to mature technology development and to raise the awareness of business opportunities abroad as they made direct contacts with potential customers. H1 established a collaboration with a Spanish company to create a joint-venture in order to enter European markets.

W1 (software supplier of fluid modelling for aviation, shipping and automotive) was the only in the sample that sourced specialist software from an Italian company build their competencies, and became the provider and licensure of this software in Brazil and Latin America. The use of the new capability allowed them to differentiate their offers in the domestic and regional market whilst increasing their productivity gains.

These relationships established between *customers* and *suppliers*, as well as a joint-ventures demonstrate the importance for start-ups of inter-organisational ties to focus towards developing long term relationships and knowledge (Ahuja, 2000; Gulati, Nohria and Zaheer, 2000; Hafeez and Abdelmeguid, 2003). From our sample only H1 started a joint-venture to access to European market, whilst H1 resorted to access resources through contractual/licensing agreement to build their capability and market reach.

4.3. The role of the entrepreneur: social networks and cognition

The context of internationalisation has influenced the cognitive behaviour of Brazilian entrepreneurs (Scott, 1995). This has stimulated an attitude of change and adaptation (Webb *et al.*, 2009; Obschonka *et al.*, 2012). Table V summarizes the perception of the sample firms in regards of how *social networks* and the *experiential knowledge* of these entrepreneurs have impacted on their decisions to internationalise.

Table V – Social networks and cognition effect on the decisions to internationalize

Determinants of internationalisation	Sample Start-ups									
	A1	A2	G1	H1	I1	O1	P1	S1	V1	W1
<i>Social networks</i>	*	*	***	***	**	***	*	*	***	*
<i>Experiential knowledge in foreign markets</i>	*	**	***	**	**	***	**	**	***	*
Overall *'s	2	3	6	5	4	6	3	3	6	2

Key: '*' = weak impact; '**' medium impact; '***' = strong impact

The influence of founders' interpersonal ties was relevant in influencing their firms' strategy towards internationalisation. The impact of *social networks* was more extensive and relatively strong (***) for entrepreneurs who also have had working experience (maximum 5 years) abroad prior to start-up their companies (G1, H1, I1, O1 and V1). In case of I1 the founders' *social network* was not as strong due to their relative young age and less foreign experience compared to the others in the sample. All have adopted social networks to access information about foreign institutional environments, business practices and business opportunities (Wong and Ellis, 2002; Zain and Ng, 2006)

In the case of G1 (remote sensing technology for oil exploration and mining) the entrepreneur was of Canadian citizenship and had extensive contacts in North America. One of the founders of V1 (Business consulting) had Italian citizenship, and the other team members, all had relevant experience of working abroad in developed countries (mostly Europe). Two of the five founders in this company had some experience of working at the senior executive level. O1 (Satellite imagery for oil spillage) founders (a team of two) had prior experience working abroad for Brazilian multinationals.

In the case of H1 and V1, the two oldest start-ups in the sample (established 1996 and 2002, respectively), they have had developed stronger networks in Brazil and abroad as a result of their business longevity. Nevertheless, A1 (metrology and hydrology) which also had a substantial longevity (established 2001), however, reported a weak (*) *social networks*.

In terms of entrepreneur's international experience and knowledge, G1, and V1 had extensive foreign work experience (***) due to their citizenship (in Canada and Europe, respectively). On the other hand, A2, I1, H1, P1 and S1 had relatively less *international experience*. P1's founders had previous experience working for other Brazilian industries in South America. S1 (surveillance of underwater structures) benefited from the fact that some members of the

founding team were related to the Brazilian Armed forces and had extensive international military experience.

5. Conclusions

This paper examined the determinants of Brazilian Technological start-ups to internationalise, and it particularly explored to what extent institutional antecedents, the entrepreneurial *social network* and market *push* and *pull* factors played a role in their decision to internationalise. The theoretical lens of *inter-organizational* networks, *social networks* and the entrepreneurs' *cognition* were employed to establish the determinants of internationalisation. Internationalisation of start-ups was influenced by *push* factors related to entrepreneurs' *social ties* and *cognition* of foreign markets, *economic liberalization* and *governmental support* policies, and on *pull* factors related to the effect generated by *customers* that were already internationalized.

The combined effect of *push* and *pull* factors interplayed in the firms' decisions to internationalization highlights the role of networks in that process. *Social networks* of managers and entrepreneurs were considered important to the extent that they allowed them to access information about foreign markets, institutions and business practices (Wong and Ellis, 2002; Zain and Ng, 2006). Experiential knowledge acquired by prior working experience had more impact in the firms decisions in comparison with social networks (Shane and Venkataraman, 2000; Hafeez and Abdelmeguid 2003; Hafeez, Zhang, and Malak 2002a, 2002b; Eriksson, Johanson and Majkgård, 2015).

Inter-organizational networks were also important in the outcome. In this context highlighting the effect of customer demand in dragging companies abroad (Coviello and Munro, 1995; Gulati, Nohria and Zaheer, 2000; Ellis and Pecotich, 2001; Loane and Bell, 2006; Hafeez, Malak and Zhang, 2007). Collaboration with international partners was also important

particularly related to cooperation in R&D projects and joint-ventures (Baum, Calabrese and Silverman, 2000; Gulati, Nohria and Zaheer, 2000; Hafeez, Zhang and Malak, 2002b; Hafeez, Malak and Zhang, 2007) and also joint ventures).

Sharing a similar *institutional* context also affected the outcome. In this context economic liberalization factors and support services from governmental organisations were the most noted (Ray, 2003; Luo and Tung, 2007). Governmental initiatives related to funding were also important (Child and Rodrigues, 2005; Buckley *et al.*, 2007) but less noted, whilst venture capital funding has only benefited two start-ups (Mowery and Rosenberg, 1998; Li and Zahra, 2012).

Considering the framework in which startups have developed, and the facilitating role of different organisations such as Academia (COPPE), Industry (research laboratories and key industry players) and Government organisations/agencies (MCTI, SEBRAE, BNDES, CRIATEC) and Ministry of Science, technology and Innovation, we could confirm the importance of *triple-helix constellations* (Nelson, 1992; Leydesdorff and Etzkowitz, 1998; Etzkowitz, 2003) for the internationalization of firms.

This conclusion which are a novelty in relation to BRICS countries can, therefore, be relevant to support public policies aiming to support internationalisation of start-ups and SMEs from emerging economies.

References

Acedo, F. J. and Jones, M. (2007) 'Speed of internationalization and entrepreneurial cognition: Insights and a comparison between international new ventures, exporters and domestic firms', *Journal of World Business*, 42(3), pp. 236–252. doi: 10.1016/j.jwb.2007.04.012.

Aggarwal, R. and Agmon, T. (1990) 'The international success of developing country firms:

role of government-directed comparative advantage', *MIR: Management International Review*, 30(2), pp. 163–180.

Aguiar, M., Becerra, J., Juan, J. De, Leone, E. and Nieponice, G. (2009) *The 2009 BCG Multilatinas: A Fresh Look at Latin America and How a New Breed of Competitors Are Reshaping the Business Landscape*, *The Boston Consulting Group*. Boston.

Ahuja, G. (2000) 'Collaboration Networks, Structural Holes, and Innovation: A Longitudinal Study', *Administrative Science Quarterly*. SAGE Publications, 45(3), p. 425. doi: 10.2307/2667105.

Aldrich, H. E. and Fiol, C. M. (1994) 'Fools rush in? The institutional context of industry creation', *Academy of Management Review*. Academy of Management, 19(4), pp. 645–670. doi: 10.5465/AMR.1994.9412190214.

Amal, M. and Rocha Freitag Filho, A. (2010) 'Internationalization of small and medium sized enterprises: a multi case study', *European Business Review*. Emerald Group Publishing Limited, 22(6), pp. 608–623. doi: 10.1108/09555341011082916.

Andersen, O. and Buvik, A. (2002) 'Firms' internationalization and alternative approaches to the international customer/market selection', *International Business Review*, 11(3), pp. 347–363. doi: 10.1016/S0969-5931(01)00064-6.

Associação Nacional de Entidades Promotoras de Empreendimentos Inovadores (2008) *Portfólio de Parques Tecnológicos no Brasil*. Brasília.

Athreye, S. and Godley, A. (2009) 'Internationalization and technological leapfrogging in the pharmaceutical industry', *Industrial and Corporate Change*. Oxford University Press, 18(2), pp. 295–323. doi: 10.1093/icc/dtp002.

Athreye, S. and Kapur, S. (2009) 'Introduction: The internationalization of Chinese and

Indian firms--trends, motivations and strategy', *Industrial and Corporate Change*. Oxford University Press, 18(2), pp. 209–221. doi: 10.1093/icc/dtp007.

Batjargal, B. (2003) 'Social Capital and Entrepreneurial Performance in Russia: A Longitudinal Study', *Organization Studies*. SAGE Publications, 24(4), pp. 535–556. doi: 10.1177/0170840603024004002.

Baum, J. A. C., Calabrese, T. and Silverman, B. S. (2000) 'Don't go it alone: Alliance network composition and startups' performance in Canadian biotechnology', *Strategic management journal*, 21(3), pp. 267–294.

Bell, J. (1995) 'The internationalization of small computer software firms', *European Journal of Marketing*. MCB UP Ltd, 29(8), pp. 60–75. doi: 10.1108/03090569510097556.

Belso-Martínez, J. (2006) 'Why are some Spanish manufacturing firms internationalizing rapidly? The role of business and institutional international networks', *Entrepreneurship & Regional Development*. Routledge, 18(3), pp. 207–226. doi: 10.1080/08985620600565409.

Bhaumik, S. K., Driffield, N. and Pal, S. (2010) 'Does ownership structure of emerging-market firms affect their outward FDI? The case of the Indian automotive and pharmaceutical sectors', *Journal of International Business Studies*. Palgrave Macmillan UK, 41(3), pp. 437–450. doi: 10.1057/jibs.2009.52.

Bonaglia, F., Goldstein, A. and Mathews, J. A. (2007) 'Accelerated internationalization by emerging markets' multinationals: The case of the white goods sector', *Journal of World Business*, 42(4), pp. 369–383. doi: 10.1016/j.jwb.2007.06.001.

Brass, D. J., Galaskiewicz, J., Greve, H. R. and Tsai, W. (2004) 'Taking stock of networks and organizations: a multilevel perspective', *Academy of Management Journal*. Academy of Management, 47(6), pp. 795–817. doi: 10.2307/20159624.

Bruton, G. D., Ahlstrom, D. and Obloj, K. (2008) 'Entrepreneurship in emerging economies: Where are we today and where should the research go in the future', *Entrepreneurship Theory and Practice*, 32(1), pp. 1–14.

Bruton, G. D., Fried, V. H. and Manigart, S. (2005) 'Institutional Influences on the Worldwide Expansion of Venture Capital', *Entrepreneurship Theory and Practice*. Blackwell Publishing Ltd., 29(6), pp. 737–760. doi: 10.1111/j.1540-6520.2005.00106.x.

Buckley, P. J., Clegg, L. J., Cross, A. R., Liu, X., Voss, H. and Zheng, P. (2007) 'The determinants of Chinese outward foreign direct investment', *Journal of International Business Studies*. Palgrave Macmillan UK, 38(4), pp. 499–518. doi: 10.1057/palgrave.jibs.8400277.

Busenitz, L. W., Gomez, C. and Spencer, J. W. (2000) 'Country institutional profiles: unlocking entrepreneurial phenomena', *Academy of Management Journal*. Academy of Management, 43(5), pp. 994–1003. doi: 10.2307/1556423.

Cantwell, J., Dunning, J. H. and Lundan, S. M. (2010) 'An evolutionary approach to understanding international business activity: The co-evolution of MNEs and the institutional environment', *Journal of International Business Studies*. Palgrave Macmillan UK, 41(4), pp. 567–586. doi: 10.1057/jibs.2009.95.

Cardoso Jr, J. C. (2009) *Brasil em desenvolvimento: estado, planejamento e políticas públicas*, Brasília: Ipea. Brasília: IPEA.

Cavusgil, S. T. and Knight, G. (2015) 'The born global firm: An entrepreneurial and capabilities perspective on early and rapid internationalization', *Journal of International Business Studies*. Palgrave Macmillan UK, 46(1), pp. 3–16. doi: 10.1057/jibs.2014.62.

Cavusgil, S. T. and Naor, J. (1987) 'Firm and management characteristics as discriminators of

- export marketing activity', *Journal of Business Research*, 15(3), pp. 221–235. doi: 10.1016/0148-2963(87)90025-7.
- Che Senik, Z., Scott-Ladd, B., Entekin, L. and Adham, K. A. (2011) 'Networking and internationalization of SMEs in emerging economies', *Journal of International Entrepreneurship*. Springer US, 9(4), pp. 259–281. doi: 10.1007/s10843-011-0078-x.
- Chetty, S. (1996) 'The Case Study Method for Research in Small-and Medium-Sized Firms', *International Small Business Journal*. Sage Publications Sage CA: Thousand Oaks, CA, 15(1), pp. 73–85. doi: 10.1177/0266242696151005.
- Child, J. and Rodrigues, S. B. (2005) 'The Internationalization of Chinese Firms: A Case for Theoretical Extension?', *Management and Organization Review*. Blackwell Publishing Ltd., 1(3), pp. 381–410. doi: 10.1111/j.1740-8784.2005.0020a.x.
- Chittoor, R., Ray, S. and Sarkar, M. B. (2008) 'Strategic responses to institutional changes: "Indigenous growth" model of the Indian pharmaceutical industry', *Journal of International Management*, 14(3), pp. 252–269. doi: 10.1016/j.intman.2008.05.001.
- Chudnovsky, D. and López, A. (2000) 'A third wave of FDI from developing countries: Latin American TNCs in the 1990s', *Transnational corporations*, 9(2), pp. 31–73.
- Ciravegna, L., Lopez, L. and Kundu, S. (2014) 'Country of origin and network effects on internationalization: A comparative study of SMEs from an emerging and developed economy', *Journal of Business Research*, 67(5), pp. 916–923. doi: 10.1016/j.jbusres.2013.07.011.
- Coviello, N. E. and Munro, H. J. (1995) 'Growing the entrepreneurial firm: networking for international market development', *European journal of marketing*, 29(7), pp. 49–61.
- Cruz, A. I. G., Ambrozio, A. M. H. P., Puga, F. P. and Sousa, F. L. (2012) *A economia*

brasileira: conquistas dos últimos dez anos e perspectivas para o futuro. Edited by BNDES.
Rio de Janeiro.

Cuervo-Cazurra, A. (2008) 'The multinationalization of developing country MNEs: The case of multilatinas', *Journal of International Management*, 14(2), pp. 138–154. doi: 10.1016/j.intman.2007.09.001.

Cyert, R. M. and March, J. G. (1963) *A behavioral theory of the firm*, Englewood Cliffs, NJ. Englewood Cliffs NJ: Prentice-Hall.

Deeds, D. L., Mang, P. Y. and Frandsen, M. L. (2004) 'The Influence of Firms' and Industries' Legitimacy on the Flow of Capital into High-Technology Ventures', *Strategic Organization*. SAGE Publications, 2(1), pp. 9–34. doi: 10.1177/1476127004040913.

Deo Sharma, D. and Johanson, J. (1987) 'Technical consultancy in internationalisation', *International Marketing Review*. MCB UP Ltd, 4(4), pp. 20–29. doi: 10.1108/eb008339.

Dib, L. A., da Rocha, A. and da Silva, J. F. (2010) 'The internationalization process of Brazilian software firms and the born global phenomenon: Examining firm, network, and entrepreneur variables', *Journal of International Entrepreneurship*. Springer US, 8(3), pp. 233–253. doi: 10.1007/s10843-010-0044-z.

Dunning, J. H. (2006) 'Comment on Dragon multinationals: New players in 21st century globalization', *Asia Pacific Journal of Management*. Kluwer Academic Publishers, 23(2), pp. 139–141. doi: 10.1007/s10490-006-7161-1.

Dunning, J. H. (2013) *International production and the multinational enterprise*. London: Routledge.

Eisenhardt, K. M. (1991) 'Better stories and better constructs: the case for rigor and comparative logic', *Academy of Management Review*. Academy of Management, 16(3), pp.

620–627. doi: 10.5465/AMR.1991.4279496.

Eisenhardt, K. M. and Bourgeois, L. J. (1988) ‘Politics of strategic decision making in high-velocity environments: toward a midrange theory’, *Academy of Management Journal*.

Academy of Management, 31(4), pp. 737–770. doi: 10.2307/256337.

Ellis, P. (2000) ‘Social Ties and Foreign Market Entry’, *Journal of International Business Studies*. Palgrave Macmillan UK, 31(3), pp. 443–469. doi: 10.1057/palgrave.jibs.8490916.

Ellis, P. and Pecotich, A. (2001) ‘Social Factors Influencing Export Initiation in Small and Medium-Sized Enterprises’, *Journal of Marketing Research*. American Marketing

Association, 38(1), pp. 119–130. doi: 10.1509/jmkr.38.1.119.18825.

Eriksson, K., Johanson, J. and Majkgård, A. (2015) ‘Experiential Knowledge and Cost in the Internationalization Process’, , *Networks and Power:*

Etzkowitz, H. (2003) ‘Innovation in innovation: The triple helix of university-industry-government relations’, *Social science information*, 42(3), pp. 293–337.

Freeman, C. (1987) ‘Technical Innovation, Diffusion, and Long Cycles of Economic Development’, in *The Long-Wave Debate*. Berlin, Heidelberg: Springer, pp. 295–309. doi: 10.1007/978-3-662-10351-7_21.

Galaskiewicz, J. (1985) ‘Interorganizational relations’, *Annual review of sociology*, 11(1), pp. 281–304.

Gaur, A. S. and Kumar, V. (2009) ‘International Diversification, Business Group Affiliation and Firm Performance: Empirical Evidence from India’, *British Journal of Management*.

Blackwell Publishing Ltd, 20(2), pp. 172–186. doi: 10.1111/j.1467-8551.2007.00558.x.

Gibbons, M. (1994) *The new production of knowledge : the dynamics of science and research in contemporary societies*. London: Sage.

- Grandinetti, R., Furlan, A. and Camuffo, A. (2007) 'Knowledge and capabilities in subcontractors' evolution. The Italian case', in Edward Elgar Publishing (ed.) *Small and Medium-Sized*, pp. 125–139.
- Gulati, R., Nohria, N. and Zaheer, A. (2000) 'Strategic networks', *Strategic management journal*, 21(3), pp. 203–215.
- Hafeez, K. and Abdelmeguid, H. (2003) 'Dynamics of human resource and knowledge management', *Journal of the Operational Research Society*. Palgrave Macmillan UK, 54(2), pp. 153–164. doi: 10.1057/palgrave.jors.2601513.
- Hafeez, K., Malak, N. and Zhang, Y. B. (2007) 'Outsourcing non-core assets and competences of a firm using analytic hierarchy process', *Computers & Operations Research*, 34(12), pp. 3592–3608. doi: 10.1016/j.cor.2006.01.004.
- Hafeez, K., Zhang, Y. B. and Malak, N. (2002a) 'Core competence for sustainable competitive advantage: a structured methodology for identifying core competence', *IEEE Transactions on Engineering Management*, 49(1), pp. 28–35. doi: 10.1109/17.985745.
- Hafeez, K., Zhang, Y. B. and Malak, N. (2002b) 'Determining key capabilities of a firm using analytic hierarchy process', *International Journal of Production Economics*, 76(1), pp. 39–51. doi: 10.1016/S0925-5273(01)00141-4.
- Harris, S. G. and Sutton, R. I. (1986) 'Functions of parting ceremonies in dying organizations', *Academy of Management Journal*. Academy of Management, 29(1), pp. 5–30. doi: 10.2307/255857.
- Hedlund, G. and Kverneland, A. (1985) 'Are Strategies for Foreign Markets Changing? The Case of Swedish Investment in Japan', *International Studies of Management & Organization*. Routledge, 15(2), pp. 41–59. doi: 10.1080/00208825.1985.11656408.

Holtbrügge, D. and Kreppel, H. (2012) ‘Determinants of outward foreign direct investment from BRIC countries: an explorative study’, *International Journal of Emerging Markets*, 7(1), pp. 4–30.

Instituto Brasileiro de Geografia e Estatística (2014) *Demografia das Empresas 2012, Estudos & Pesquisas Informação Econômica*. Rio de Janeiro.

Johanson, J. and Mattsson, L. (2015) ‘Internationalisation in Industrial Systems — A Network Approach’, in *Knowledge, Networks and Power*. London: Palgrave Macmillan UK, pp. 111–132. doi: 10.1057/9781137508829_5.

Johanson, J. and Vahlne, J. (1977) ‘The Internationalization Process of the Firm—A Model of Knowledge Development and Increasing Foreign Market Commitments’, *Journal of International Business Studies*. Palgrave Macmillan UK, 8(1), pp. 23–32. doi: 10.1057/palgrave.jibs.8490676.

Johanson, J. and Vahlne, J. (2009) ‘The Uppsala internationalization process model revisited: From liability of foreignness to liability of outsidership’, *Journal of International Business Studies*. Palgrave Macmillan UK, 40(9), pp. 1411–1431. doi: 10.1057/jibs.2009.24.

Johanson, J. and Wiedersheim-Paul, F. (1975) ‘The internationalization of the firm? Four Swedish cases’, *Journal of Management Studies*. Blackwell Publishing Ltd, 12(3), pp. 305–323. doi: 10.1111/j.1467-6486.1975.tb00514.x.

Kalotay, K. and Sulstarova, A. (2010) ‘Modelling Russian outward FDI’, *Journal of International Management*, 16(2), pp. 131–142. doi: 10.1016/j.intman.2010.03.004.

Kiss, A. N. and Danis, W. M. (2008) ‘Country institutional context, social networks, and new venture internationalization speed’, *European Management Journal*, 26(6), pp. 388–399. doi: 10.1016/j.emj.2008.09.001.

Kiss, A. N., Danis, W. M. and Cavusgil, S. T. (2012) 'International entrepreneurship research in emerging economies: A critical review and research agenda', *Journal of Business Venturing*, 27(2), pp. 266–290. doi: 10.1016/j.jbusvent.2011.09.004.

Kobrin, S. J. (1994) 'Is There a Relationship Between a Geocentric Mind-Set and Multinational Strategy?', *Journal of International Business Studies*. Palgrave Macmillan UK, 25(3), pp. 493–511. doi: 10.1057/palgrave.jibs.8490209.

Krueger, N. F. and Brazeal, D. V. (1994) 'Entrepreneurial potential and potential entrepreneurs', *Entrepreneurship theory and practice*, (18), pp. 91–104.

Lahorgue, M. A., Guimarães, G. and Aranha, J. A. (2012) *Estudo, Análise e Proposições sobre as Incubadoras de Empresas no Brasil*. Brasilia.

Lall, S., Chen, E., Katz, J., Kosacoff, B. and Villela, A. (1983) *The new multinationals: the spread of Third World enterprises*. Chichester: Wiley.

Leydesdorff, L. and Etzkowitz, H. (1998) 'The triple helix as a model for innovation studies', *Science and public policy*, 25(3), pp. 195–203.

Li, Y. and Zahra, S. A. (2012) 'Formal institutions, culture, and venture capital activity: A cross-country analysis', *Journal of Business Venturing*, 27(1), pp. 95–111. doi: 10.1016/j.jbusvent.2010.06.003.

Loane, S. and Bell, J. (2006) 'Rapid internationalisation among entrepreneurial firms in Australia, Canada, Ireland and New Zealand', *International Marketing Review*. Edited by C. Styles. Emerald Group Publishing Limited, 23(5), pp. 467–485. doi: 10.1108/02651330610703409.

Luo, Y. and Tung, R. L. (2007) 'International expansion of emerging market enterprises: A springboard perspective', *Journal of International Business Studies*. Palgrave Macmillan UK,

38(4), pp. 481–498. doi: 10.1057/palgrave.jibs.8400275.

Madsen, T. K. and Servais, P. (1997) ‘The internationalization of Born Globals: An evolutionary process?’, *International Business Review*, 6(6), pp. 561–583. doi: 10.1016/S0969-5931(97)00032-2.

Mathews, J. A. (2006) ‘Dragon multinationals: New players in 21st century globalization’, *Asia Pacific Journal of Management*. Kluwer Academic Publishers, 23(1), pp. 5–27. doi: 10.1007/s10490-006-6113-0.

Maxwell, J. A. (2013) *Qualitative research design : an interactive approach*. SAGE Publications.

Miles, M. B. and Huberman, A. M. (1994) *Qualitative data analysis: A sourcebook*. SAGE Publications.

Mowery, D. C. and Rosenberg, N. (1998) *Paths of innovation : technological change in 20th-century America*. Cambridge: Cambridge University Press.

Nelson, R. R. (1992) ‘National innovation systems: a retrospective on a study’, *Industrial and corporate change*.

Nicholls-Nixon, C. L., Davila Castilla, J. A., Sanchez Garcia, J. and Rivera Pesquera, M. (2011) ‘Latin America Management Research: Review, Synthesis, and Extension’, *Journal of Management*. SAGE PublicationsSage CA: Los Angeles, CA, 37(4), pp. 1178–1227. doi: 10.1177/0149206311403151.

North, D. C. (1990) *Institutions, institutional change, and economic performance*. Cambridge: Cambridge University Press.

Obschonka, M., Goethner, M., Silbereisen, R. K. and Cantner, U. (2012) ‘Social identity and the transition to entrepreneurship: The role of group identification with workplace peers’,

Journal of Vocational Behavior, 80(1), pp. 137–147. doi: 10.1016/j.jvb.2011.05.007.

Organisation for Economic Co-operation and Development (2009) *Latin America Economic Outlook 2010*. Paris.

Oviatt, B. M. and McDougall, P. P. (1994) ‘Toward a Theory of International New ventures’, *Journal of International Business Studies*. Palgrave Macmillan UK, 25(1), pp. 45–64. doi: 10.1057/palgrave.jibs.8490193.

Ozgen, E. and Baron, R. A. (2007) ‘Social sources of information in opportunity recognition: Effects of mentors, industry networks, and professional forums’, *Journal of Business Venturing*, 22(2), pp. 174–192. doi: 10.1016/j.jbusvent.2005.12.001.

Peng, M. W. and Luo, Y. (2000) ‘Managerial ties and firm performance in a transition economy: the nature of a micro-macro link’, *Academy of Management Journal*. Academy of Management, 43(3), pp. 486–501. doi: 10.2307/1556406.

Peng, M. W., Wang, D. Y. L. and Jiang, Y. (2008) ‘An institution-based view of international business strategy: a focus on emerging economies’, *Journal of International Business Studies*. Palgrave Macmillan UK, 39(5), pp. 920–936. doi: 10.1057/palgrave.jibs.8400377.

Porter, M. E. (1986) *Competition in global industries*. Boston: Harvard Business School Press.

Prashantham, S. and Young, S. (2004) ‘The internet and the internationalisation of small knowledge-intensive firms: promises, problems and prospects’, *International Journal of Entrepreneurship and Small Business*, 1(1/2), p. 153. doi: 10.1504/IJESB.2004.005382.

Ramalho, C., Furtado, C. V. and Lara, R. (2011) *A indústria de private equity e venture capital: 2º censo brasileiro*. ABDI.

Ramamurti, R. and Singh, J. V. (2009) *Emerging multinationals in emerging markets*.

Cambridge: Cambridge University Press.

Ray, S. (2003) 'Strategic adaptation of firms during economic liberalisation: Emerging issues and a research agenda', *International Journal of Management*.

Rugman, A. M. (1980) 'Internalization as a general theory of foreign direct investment: A re-appraisal of the literature', *Review of World Economics*. Springer Berlin Heidelberg, 116(2), pp. 365–379. doi: 10.1007/BF02696864.

Rutashobya, L. and Jaensson, J. (2004) 'Small firms' internationalization for development in Tanzania', *International Journal of Social Economics*. Emerald Group Publishing Limited, 31(1/2), pp. 159–172. doi: 10.1108/03068290410515484.

Santiso, J. (2005) 'La emergencia de las multilatinas', *Revista de la CEPAL* 86, 16, pp. 363–371. doi: LC/G.2382-P.

Scott, W. R. (1995) *Institutions and organizations*. Thousand Oaks: SAGE.

Shane, S. and Venkataraman, S. (2000) 'The promise of entrepreneurship as a field of research', *Academy of Management Review*. Academy of Management, 25(1), pp. 217–226. doi: 10.5465/AMR.2000.2791611.

Stallings, B. and Peres, W. (2011) 'Is economic reform dead in Latin America? Rhetoric and reality since 2000', *Journal of Latin American Studies*, 43, pp. 755–786.

Stephan, U. and Uhlaner, L. M. (2010) 'Performance-based vs socially supportive culture: A cross-national study of descriptive norms and entrepreneurship', *Journal of International Business Studies*. Palgrave Macmillan UK, 41(8), pp. 1347–1364. doi: 10.1057/jibs.2010.14.

Subotzky, G. (1999) 'Alternatives to the entrepreneurial university: New modes of knowledge production in community service programs', *Higher education*, 38(4), pp. 401–440.

United Nations Conference on Trade and Development (1993) *Transnational Corporations from Developing Countries: Impact on Their Home Countries*. New York.

United Nations Conference on Trade and Development (2006) *World Investment Report*. New York.

United Nations Conference on Trade and Development (2010) *Integrating Developing Countries' SMEs into Global Value Chains, United Nations conference on trade and development*. New York.

Webb, J. W., Tihanyi, L., Ireland, R. D. and Sirmon, D. G. (2009) 'You Say Illegal, I Say Legitimate: Entrepreneurship in the Informal Economy', *Academy of Management Review*. Academy of Management, 34(3), pp. 492–510. doi: 10.5465/AMR.2009.40632826.

Wells, L. T. (2005) *Third World multinationals : the rise of foreign investment from developing countries*. Boston: MIT Press.

Wong, P. L. K. and Ellis, P. (2002) 'Social Ties and Partner Identification in Sino-Hong Kong International Joint Ventures', *Journal of International Business Studies*. Palgrave Macmillan UK, 33(2), pp. 267–289. doi: 10.1057/palgrave.jibs.8491016.

World Bank (2011) *World development report 2011: conflict, security, and development*. Washington.

World Trade Organization (2012) *International Trade Statistics 2012*. Geneva.

Yamakawa, Y., Peng, M. W. and Deeds, D. L. (2007) 'What Drives New Ventures to Internationalize from Emerging to Developed Economies?', *Entrepreneurship Theory and Practice*. Blackwell Publishing Inc, 32(1), pp. 59–82. doi: 10.1111/j.1540-6520.2007.00216.x.

Yin, R. (1984) *Case study research*. Beverly Hills: SAGE.

Zahra, S. A., Ireland, R. D. and Hitt, M. A. (2000) ‘). International expansion by new venture firms: International diversity, mode of market entry, technological learning, and performance’, *Academy of Management Journal*. Academy of Management, 43(5), pp. 925–950. doi: 10.2307/1556420.

Zahra, S. A., Korri, J. S. and Yu, J. F. (2005) ‘Cognition and international entrepreneurship: implications for research on international opportunity recognition and exploitation’, *International business review*, 14(2), pp. 129–146.

Zain, M. and Ng, S. I. (2006) ‘The impacts of network relationships on SMEs internationalization process’, *Thunderbird international business review*, 48(2), pp. 183–205.

Zimmerman, M. A. and Zeitz, G. J. (2002) ‘Beyond survival: achieving new venture growth by building legitimacy’, *Academy of Management Review*. Academy of Management, 27(3), pp. 414–431. doi: 10.5465/AMR.2002.7389921.