

**The negative influence of the entrepreneur's level of higher education on the attractiveness of European SMEs as alliance partners in Brazil: the role of practical experience and international entrepreneurial orientation**

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**Abstract:**

Notwithstanding the contemporary relevance of alliance strategies for SME internationalization, especially in the case of uncertain business environments, few studies have investigated human resource issues in the context of SMEs prior to alliance formation. Even more scarce are studies looking at the impact of a manager/entrepreneur's characteristics on pre-alliance formation, despite recognition of the expected crucial role of the entrepreneur in this context and of the strong connection between an entrepreneur and their SME. Drawing on international entrepreneurship theory and empirical observations from an exploratory study, we propose a *post-hoc* conceptual model. The exploratory empirical part of our study employs a sample of entrepreneurs from biotechnology SMEs in the United Kingdom and Germany intending to ally in a large emerging market (i.e., Brazil). Our empirical observations suggest an anomalous (at first glance) negative association between the entrepreneur's level of higher education (a construct at individual level) and the attractiveness of the SME as a partner-firm vis-à-vis alliance formation (a construct at firm level). Our *post-hoc* model emphasises the role of practical experience and the corresponding levels of international entrepreneurial orientation as theorised variables mediating the observed empirical relationship. We develop theoretical propositions, and suggest practical implications and future research directions.

**Keywords:** international entrepreneur, level of higher education, proactiveness, innovativeness, partner attractiveness, cross-border alliances, BRICS countries, Brazil.

## **Introduction**

The internationalization of Small and Medium-Sized Enterprises (SMEs), including those in high-technology sectors, is vital for sustaining high performance in today's international business environment (Anderson and Boocock, 2002, Li, Li and Dalgic, 2004, Brouthers, Nakos and Dimitratos, 2015). Moreover, in the case of SMEs attempting to expand internationally, it is likely that resource constraints, including the capabilities of the entrepreneur/manager, will not allow the pursuit of acquisition strategies, but will lead to alliance strategies (Brouthers et al., 2015). In the context of high-technology SMEs, the influence of the entrepreneur<sup>i</sup>, often the SME's owner-manager or founder-manager (Fletcher, 2004), on the international strategic activities of SMEs is seen as vital in sustaining competitive cross-border operations. More specifically, managers/entrepreneurs are likely to play a pivotal role in the alliance formation process (Hambrick and Mason, 1984, Hambrick, 2007). However, studies investigating human resource management in the context of SMEs are scarce (Tansky and Heneman, 2003), particularly in the context of international alliances. Moreover, we note calls in the literature for further research on the influence of managers/entrepreneurs in the context of SME partnership formation (Cooper, 2007) and internationalisation (Schweizer, 2012), supporting the need for our study. Although, certain characteristics of managers/entrepreneurs, such as experience, have been noted as important factors in successful SME internationalisation strategies (Calof and Viviers, 1995, Lu and Beamish, 2001), literature about factors supporting or obstructing the acquisition of such experience is also limited.

In this research, we initially conducted an exploratory empirical study and identified an unexpected result, namely, the negative impact of the entrepreneur/manager's level of higher education on their SME attractiveness to alliances in uncertain environments. At first glance, our result is surprising as several studies regarding education in general ascertain positive

effects (e.g., on performance). Therefore, further clarification around this result was deemed necessary. As the basis of our *post-hoc* attempt, we developed the following research question: What mediating factors (at the individual level) will be positively affected by a lower level of higher education and, in turn, impact positively on alliance attractiveness (at the firm level) in the context of our study?

The main contribution of this paper is to theorise that higher levels of higher education may indirectly obstruct the nurturing of international entrepreneurial orientation, which ultimately impacts negatively on an SME's attractiveness for alliances in the context of high-risk and high-uncertainty business environments. Based on the results of our initial exploratory study, as well as drawing on international entrepreneurship theory (Covin and Slevin, 1991, McDougall and Oviatt, 2000) and entrepreneurship theory itself (Miller, 1983, Miller, 2011), we propose a *post-hoc* conceptual model. The model links manager/entrepreneur characteristics at individual level (level of higher education) and SME characteristics at firm level (the SME's attractiveness as a partner towards alliance formation) through theorised mediators. These consecutive mediators are practical experience and international entrepreneurial orientation, the latter represented by proactiveness and innovativeness. 'Proactiveness' – usually associated with high levels of personal initiative (e.g., Tansky and Heneman, 2003) – and 'innovativeness' or entrepreneurial innovation (Autio, Kenney, Mustar, Siegel and Wright, 2014) have been found to affect organizational performance. (Lu and Beamish, 2001, Li, Xin and Pillutla, 2002). Our model extends the current understanding of HR issues at the SME pre-alliance stage, particularly the partner-selection process for alliances in a high-risk and high-uncertainty environment. SMEs operating in volatile business environments, such as high-technology sectors or emerging markets, have been noted as getting most benefit from HRM-related investment (Hayton,

2003). Furthermore, we add to on-going discussion regarding antecedents of entrepreneurial orientation (e.g., George, 2011).

Various factors leading to SME alliance formation have gained the attention of academics (e.g., Marino, Strandholm, Steensma and Weaver, 2002, Ariño, Ragozzino and Reuer, 2008), moved by the high failure rate among such ventures (Kale and Singh, 2009). Few studies regarding the use of alliances by SMEs can be found in the literature (e.g., Alvarez, Barney and Bosse, 2003, Arino, Ragozzino and Reuer, 2008, De Mattos, Burgess and Shaw, 2013).

Investigation of characteristics such as educational level of a manager/entrepreneur (e.g., Anderson and Boocock, 2002, Capelleras, Greene, Kantis and Rabetino, 2010, Cheng, Chan and Leung, 2010) can be expanded to add to the understanding of the relationship between such entrepreneurial characteristics and an SME's attractiveness as a partner-firm *apropos* alliance formation, facilitating the current trend of SME internationalisation. Attractiveness represents "the possession of [...] features that arouse interest" (Oxford English Dictionary). In the context of pre-alliance formation, or for firms attempting to ally, it represents the characteristics of a partner-firm that may be of interest to another partner-firm *apropos* such prospective alliance. The contributions that each partner may potentially bring to the alliance can be the basis for the evaluation of the likelihood of success of such a venture, depending on their value as perceived by each partner (Buckley, Cross and De Mattos, 2015).

In the context of SME alliance formation, attempts to investigate the association between firm-level characteristics and manager/entrepreneur's characteristics (or profile) at the individual level have been rare. Entrepreneur education has been investigated either as one of a number of diverse factors (Wagner and Paton, 2014) and therefore lacking detail in findings (Leonidou, Katsikeas and Piercy, 1998), or considered broadly (Anderson and Boocock, 2002) rather than with attention to specific levels of higher education (e.g., bachelor vs. postgraduate degree). This aspect acquires more relevance in the context of high-technology

sectors, where the acquisition of relevant technical cutting-edge knowledge is expected to require much effort and resources compared to traditional-sector contexts. On the one hand, increasing levels of higher education may be seen as directly associated with advanced skills aimed at theoretically and systematically approaching a problem, if only by increasing the entrepreneur's self-perception of their problem-solving capability (Gist and Mitchell, 1992). On the other hand, a lower level of higher education will by implication allow extra time for the manager/entrepreneur to have gained further practical experience or, ideally, further experience in pre-alliance formation.

In the same way that diversity of practical experience has been linked to higher corporate performance (Beckman and Haunschild, 2002), experience in establishing alliances or related matters has been linked to successful alliance formation (Draulans, deMan and Volberda, 2003), or conversely, lack of alliance experience to alliance failure (Schuler, 2001). This includes the role of the manager/entrepreneur in assessing the potential of alliances (Tyler and Steensma, 1998).

The above reasons justify further studies on antecedents to alliance formation that might increase the likelihood of success. In particular, the limited understanding of the impact of different levels of higher education on pre-alliance formation mediated by the level of practical experience calls for further investigation and theorizing. For the most part in high-technology sectors, it is frequently the case that senior managers/entrepreneurs hold at least graduate if not one or more postgraduate degrees.

The paper is structured as follows. Due to the scarcity of literature linking an entrepreneur's education and its impact on alliances, we synthesise the previous literature on the impact of education on an entrepreneur's general performance and internationalisation capability. Next, we present our empirical study, which forms the basis for the *post-hoc* conceptual model development. Following our empirical observations, we proceed with the

development of the *post-hoc* conceptual model and propositions. We conclude by pointing out theoretical and managerial implications as well as limitations and future research directions.

### ***Impact of education on entrepreneurs' general performance and internationalisation capability***

We have classified into three groups previous studies investigating (directly or indirectly) the impact of educational background (training) on the general performance of managers/entrepreneurs into three groups, considering whether the impact of education on performance had been positive, inconclusive/conditional, or negative (see Appendix A, Table A1). Studies in the first group describe the influence of a higher level of education on a firm's activities and/or performance as positive (Fiss, 2006, Cheng et al., 2010, Schmelter, Mauer, Boersch and Brettel, 2010, Wang, Guidice, Tansky and Wang, 2010). Studies in the second group report inconclusive results (Beal and Yasai-Ardekani, 2000, Capelleras et al., 2010). The third group, comprising a very limited number of studies, accentuates how, under certain conditions, a negative relationship between education and a firm's activities and/or performance may occur (Lee and Tsang, 2001, Wright, Liu, Buck and Filatotchev, 2008, Wu and Wu, 2008). Supporting this observation, educational level has been reported to negatively affect firm growth – a proxy for firm performance – and explained based on the simplicity of managerial skills required to run SMEs compared to those required to run larger firms (Lee and Tsang, 2001). In a parallel line of thought, the importance of practical experience or business knowledge to achieve higher business performance is noted. For instance, Wright et al. (2008) advocate that academically-linked entrepreneurs, who in most cases own patents and have a scientific background and postgraduate degrees, should attempt to complement their lack of business expertise by choosing business partners based in non-university science

parks. Wu and Wu (2008) suggest that managers with a bachelor, as opposed to postgraduate, degree, are associated with a stronger intention to start their own business. Their empirical study was conducted with university students rather than with managers or entrepreneurs. The authors explain their findings as indicating the higher opportunity costs associated with individuals who have pursued postgraduate education as compared to individuals who have pursued only an undergraduate or diploma level of education.

### **The Empirical Study**

#### ***Hypothesis development: association between lower levels of higher education and SME attractiveness as an alliance partner***

The literature suggests that limited attention has been given to comparing different levels of higher education in a manager/entrepreneur. Furthermore, very few studies linking education to performance have looked at pre-alliance formation, and even then, like the studies mentioned above, they have mainly considered the impact of general levels of education on motivation to form alliances (e.g., Ulubasoglu, Akdis and K ok, 2009, Van Gils and Zwart, 2009). We note that most studies investigating the impact of the higher-education level of managers/entrepreneurs on performance compare managers or employees having higher education (i.e., usually a bachelor degree) with those having primary or secondary (including college education) levels of education (e.g., Cooper, Gimeno-Gascon and Woo, 1994, Ulubasoglu et al., 2009), and have generalised their findings considering the relative differences within the levels of education investigated. Such generalizations may not necessarily be applicable to a comparison between different levels of higher education, as for instance when comparing managers/entrepreneurs holding bachelor degrees with those holding postgraduate degrees (e.g., PhD, MSc, MBA, etc.). Therefore, by combining the

above argument with the empirical evidence suggesting the negative effect of education on performance (in the previous section), we suggest the following hypothesis:

*“Managers/entrepreneurs with a lower level of higher education (i.e., holding a bachelor as opposed to a postgraduate degree) are more likely to be associated with SMEs that are more attractive as partners apropos alliance-formation in high-uncertainty and high-risk environments”*

The empirical study below serves as an illustration enabling us to demonstrate the empirical link indicated in Figure 1 (a detailed explanation on the theoretical links in the model are presented in the pot-hoc model development section).

[Figure 1 here]

### ***Research context***

Our research focuses on biotechnology SMEs (i.e., those with fewer than 250 employees) from Germany and the United Kingdom that are intending to form alliances in Brazil, one of the BRICS<sup>ii</sup> countries. A broadened definition of biotechnology firms is used in this study to include not only firms directly engineering biotechnology products, but also those providing inputs to this sector, i.e., suppliers of reagents, equipment, and software (OTA, 1984). Due to its diverse nature, biotechnology does not easily conform to standard industrial classification (SIC) coding; biotechnology products may be found in several industries (Ernst&Young and EuropaBio, 2012).

The biotechnology sector was chosen due to its commercial potential (PTSM, 2008, Ernst&Young, 2010, Ernst&Young, 2011, Nature Biotechnology, 2011a, Nature Biotechnology, 2011b, Ernst&Young and EuropaBio, 2012) and because biotechnology may prospectively help to address some of humanity’s sensitive issues, such as food supply,

health, energy and pollution (Ainsworth, Rogers and Leakey, 2008, Fenning, Walter and Gartland, 2008, Nature Biotechnology, 2008). Furthermore, the role of commercial biotechnology in disseminating the benefits of technological advances is increasing (UNCTAD, 2001, Nature Biotechnology, 2008).

Germany and the United Kingdom were selected for the study because these countries lead the development of European biotechnology (Ernst&Young, 2007, Ernst&Young, 2008, Ernst&Young, 2010, Ernst&Young, 2011). Brazil was selected for this study due to its high potential to attract foreign investment from developed countries, including those in Europe (UNCTAD, 2014). Mirroring other BRICS countries, Brazil has an enormous market and export potential for agricultural, veterinary and pharmaceutical genetically-modified products (e.g., USDA, 2005, UNCTAD, 2009, Nature Biotechnology, 2011a). BRICS countries are characterized by a high level of development in certain industry sectors and institutions (Sauvant, Mendoza and Irmak, 2008), unlike other developing countries, which are characterized by lower stages of industrial development, slower growth rates and lack of high-technology initiatives. Business environments are usually characterised as hostile and uncertain in both emerging markets (e.g., BRICS countries) and dynamic industrial sectors (e.g., biotechnology). The business environment of BRICS countries supports the establishment of cross-border alliances, including technology-driven alliances (UNCTAD, 2005, UNCTAD, 2006, Santos, 2007, UNCTAD, 2010, UNCTAD, 2013).

### ***Sample and data collection***

The unit of analysis of this study is entrepreneurs running SMEs in the biotechnology sector in two developed European countries: Germany and the United Kingdom. Each entrepreneur belongs to a different biotechnology SME, with a one-to-one correspondence. Most of the respondents held the position of Managing Director and several could be called 'Owner-

Managers' (Moran, 1998). All respondents had the explicit intention of entering emerging and uncertain markets, such as Brazil, characterising their SMEs as internationally entrepreneurial (Dimitratos, Plakoyiannaki, Pitsoulaki and Tuselmann, 2010), although none had any past alliance experience. In order to select a sample of entrepreneurs for our study, we randomly picked British and German SMEs from biotechnology business directories (e.g., *The International Biotechnology Directory* and *Bio Technologie Das Jahr-und Adreßbuch*). Entrepreneurs from Germany were selected from SMEs in three main regions, namely, Düsseldorf, Berlin and Munich; British managers/entrepreneurs were selected from firms around Cambridge and London. These areas were chosen because of their high concentration of biotechnology SMEs.

Our sample constitutes a balanced representation of the four general activity areas in the biotechnology sector (OTA, 1984) that, in turn, are based on each firm's main product. Thus, of the sample: (1) 35% of the firms were developing biotechnology products/research (SIC codes such as: 2833, 2834, 2836, 2890, 4953); (2) 29% manufactured instruments and equipment (SIC codes such as: 3500, 3600, 3826); (3) 20% were suppliers of reagents/diagnostics (SIC codes such as: 2800, 2835, 2860); and (4) 16% had software/services as their main focus (SIC codes such as: 7370, 8731, 8742).

The data for this study were collected as part of a multi-part project. We report the general procedures used for data collection. A number of face-to-face semi-structured interviews supported by questionnaires were carried out (Ghauri and Grønhaug, 2010) and 49 completed answers were analysed, *viz.* 24 respondents from British SMEs and 25 from German SMEs. The following question was asked to determine the entrepreneur's educational level: "What is the highest academic award you have received?" Both the level and area of study were derived from this question. Interviews were set up in advance and followed up by telephone

calls. Approximately 65% of the entrepreneurs initially contacted agreed to give an interview. The interviews lasted on average fifty minutes.

### ***Variables***

The dependent variable is binary. It represents two different groups of entrepreneurs and their respective SMEs (a one-to-one correspondence is assumed between each entrepreneur and their respective SME). One group is considered more attractive as partners *apropos* alliance-formation ('1') and the other group less attractive ('0'). This categorization draws on a large study of North American MNCs (Stopford and Wells, 1972) and reflects the presumption that SMEs with higher attractiveness will have better chances of engaging in successful alliance formation. The construct *similarity of expectations between prospective alliance partners* regarding alliance partner contributions, or what each partner expects to give to and get from the alliance, such as, giving or taking knowledge (Huxham and Hibbert, 2008), represents alliance attractiveness (cf. De Mattos et al., 2013). Thus, the higher the similarity (or match) between partners' expectations regarding their mutual contributions, the higher is the attractiveness as potential partners *apropos* alliance-formation. This dyadic view of attractiveness may also be seen as the combination of the perspectives of each partner supported by their individual assessments of the importance of the contributions of their counterpart (De Mattos, Sanderson and Ghauri, 2002, Buckley et al., 2015).

In order to arrive at these two categories, data were collected from eighteen Brazilian biotechnology companies to derive the dependent variable (De Mattos et al., 2013). These firms represented over 90% of the members of ABRABI (Brazilian Biotechnology Association), the only national-level biotechnology association at the time of the study, and were located mainly in the Brazilian states of São Paulo and Rio de Janeiro. A data-set comprising expectations regarding prospective partners' contributions from European and

Brazilian entrepreneurs was used to identify the level of *similarity of expectations*. Specifically, to divide the sample of 49 European SMEs into two groups of nearly identical size, i.e., respectively 24 and 25 SMEs, the level of similarity of expectations was calculated for each European company, utilising Spearman-rho rank-order correlation coefficients (Nie, Bend and Hull, 1970). SMEs with higher coefficients (and thus, higher potential attractiveness as a cross-border alliance partner) were allocated to one group and coded “1”. The remaining companies with lower coefficients were allocated to another group coded “0”.

Our independent variable is a predictor for the logistic regression. The predictor brings together one characteristic of the entrepreneur, i.e. “*Entrepreneur’s level of higher education*”, comprising two dummy variables identifying the level of higher education of each respondent. The first variable was coded “1” for a bachelor degree, “0” otherwise. The second variable was coded “1” for a postgraduate degree, “0” otherwise. It is outside the scope of this study to consider differences between postgraduate courses, as the study focuses on the enhanced ability to solve problems theoretically and systematically, which can be understood as a common learning outcome of postgraduate courses. In order to derive the independent variable or predictor, summated scales (Hair, Black, Babin and Anderson, 2009) were used. The alpha-coefficient for the predictor (Manager/entrepreneur’s level of higher education) was 0.90.

### ***Analytical technique***

A binary logistic regression technique was chosen to verify the hypothesis, for the following reasons: (a) the dependent variable is binary and (b) some of the independent variables are categorical (Tabachnick and Fidel, 2007). Our sample fulfils the requirements of a minimum of five cases per predictor for conducting binary logistic analysis (Hair et al., 2009). Studies employing samples with a relatively low number of cases have been used recently to further

the understanding of high-technology firms (e.g., Marion and Meyer, 2011, De Mattos et al., 2013) or in more general studies (e.g., Draulans et al., 2003, Wright et al., 2008).

### ***Results and discussion for the empirical study***

Descriptive statistics and correlations of the variables comprising the predictor as well as control variables are presented in Tables 1a and 1b. Over half of managers/entrepreneurs (56%) have a postgraduate level of education.

[Tables 1a and 1b here]

Although zero-order correlations were identified (see Table 1b), the tolerances and variance inflation factors (VIF) are within acceptable levels (tolerances > 0.500 and VIF < 2.000), indicating that multicollinearity is not a major problem (Hair et al., 2009). The results of our logistic regression are presented in Table 2. We indicate a base model against which our full model may be assessed. Our hypothesis is supported.

[Table 2 here]

In our full model, Predictor 1 – “*entrepreneur’s level of higher education*”– is significant ( $p < 0.01$ ). Predictor 1 is strong (odds ratio = 2.814; 1/odds ratio = .710). Our full model fits well  $\chi^2(4, N=49) = 11.130, p < 0.05$ , and thus differentiates between entrepreneurs who are more likely to be associated with SMEs that are more attractive as partners *apropos* cross-border alliance-formation in BRICS countries, and entrepreneurs who are more likely to be associated with SMEs that are less attractive as such partners. Entrepreneurs with lower levels of high education (bachelor rather than postgraduate level) are nearly three times more likely to be associated with an SME attractive as a prospective alliance partner. The results indicate that the explained variation of the dependent variable lies between 20.3% (Cox and Snell R Square) and 27.1% (Nagelkerke R Square). We therefore observe an increase in the hit ratio (sensitivity) of over 16%, by including the predictor in the model. The model’s

73.5% classification accuracy of entrepreneurs into their original groups indicates that the precision of the model is good (see Hair et al., 2009).

The model more accurately classifies a group of entrepreneurs who are more likely to be associated with SMEs that are less attractive as partners in cross-border alliance-formation in BRICS countries (79.2%) as compared to a group of entrepreneurs who are more likely to be associated with SMEs highly attractive as such partners (68.0%).

Three control variables were included in the model – firm age, total number of employees, and annual turnover, but did not influence the model significantly (see Table 2).

In the context of the European SMEs used in our study, we demonstrate a negative influence from the manager/entrepreneur's level of higher education on the attractiveness of their respective SME as a partner *apropos* cross-border alliance formation with a typical Brazilian SME. Our results suggest that a relatively lower level of higher education (bachelor rather than postgraduate degree) increases the potential attraction of an SME from a developed country *apropos* alliance formation in Brazil, as a BRICS country (see Figure 2).

[Figure 2 here]

Our results support those entrepreneurs holding empiricist (hands-on) perspectives, contrary to those relying more on academic qualifications. Furthermore, the time spent on pursuing academic qualifications, which is counted in years if not in decades, can be seen as time not adding to the development of business experience, and therefore might be perceived as having limited value in cross-border alliance-formation scenarios. By implication, our result offers additional evidence regarding the negative effect of education on SME performance in general (e.g., Wright et al., 2008), and highlights the importance of practical experience as opposed to theoretical knowledge for effective international entrepreneurship. In the context of SMEs particularly, the level of education and/or training may be of lesser

importance, as the operations present a relatively lower complexity (e.g., Lee and Tsang, 2001).

### ***Post-hoc* conceptual model and propositions**

Based on the empirical study presented previously, we develop in this section our *post-hoc* conceptual model, as indicated in Figure 1. Prior to presenting our model, we provide a summary regarding international entrepreneurial orientation (IEO), international entrepreneurship (IE), and related concepts.

The discussion of international entrepreneurship (theory) and international entrepreneurial orientation originated in the seminal articles of McDougall (1989) and Oviatt and McDougall (1994) as an attempt to differentiate international from domestic entrepreneurship (Covin and Miller, 2014). This theoretical development filled a gap left by international business research, which focused on firms rather than entrepreneurs (McDougall, 1989). It also reflects the attempt to explain differentiated firm performance due to increasing dynamism and competition in the international business environment using the actions of the entrepreneur.

International entrepreneurship theory - broadly, a body of interlinked concepts supporting the investigation of international entrepreneurship - aims at predicting the activities and behaviour of international entrepreneurs. Definitions of international entrepreneurship have varied from emphasizing entrepreneurial behaviour (e.g., McDougall and Oviatt, 2000) to those encompassing a broader range of activities around the identification of opportunities regarding future goods and services (e.g., Shane and Venkataraman, 2000, Oviatt and McDougall, 2005). In this study we adopt the earlier group of definitions, which emphasize

the characteristics of the entrepreneur and their effect on strategy and procedures formation within their respective SME, and on the SME image thereof.

An associated concept, entrepreneurial orientation, attempts to unveil the essence of the entrepreneur (Lumpkin, 2011). At the individual level, it relates to the process by which an entrepreneur forms a new venture (Lumpkin and Dess, 1996). This action encompasses the exploration and identification of suitable opportunities, as well as the implementation of a strategy to benefit from those opportunities. The study of international entrepreneurial orientation (McDougall and Oviatt, 2000) and cross-national comparisons of entrepreneurial orientation (Knight, 1997) from the start followed international entrepreneurship theory development. The concept of entrepreneurial orientation has been developed drawing on the strategy literature and focuses on the firm level (e.g., Miller, 1983). Further reflection regarding the international context led to the adoption of those dimensions more suitable to represent the international entrepreneurial orientation. International entrepreneurship theory predicts cross-border entrepreneurial behaviour based on three entrepreneurial dimensions – risk-taking, proactiveness, and innovativeness, the combination of which characterizes international entrepreneurial orientation. The theory predicts that successful international entrepreneurial orientation is associated with higher-than-average risk-taking, proactive and innovative attitudes in an SME entrepreneur/senior manager. Other studies have theorized additional dimensions as important, for instance the five dimensions proposed by Lumpkin and Dess (1996) - innovativeness, risk taking, proactiveness, competitive aggressiveness and autonomy, or used other definitions (see Oviatt and McDougall, 2005).

Our study follows the three dimensions indicated by Miller (1983), which were later proposed as the essential dimensions for entrepreneurial orientation across borders by McDougall and Oviatt (2000). One major concern of Oviatt and McDougall (2005) study was determining any mediating and moderating influences of international entrepreneurship on

the speed of internationalization. Paralleling this idea, in our study we examine the existence of mediating influences between an entrepreneur's characteristics and the effects of those characteristics on pre-alliance formation.

Today's international business environment brings not only threats but also numerous opportunities to expand internationally. Considering business activities across borders, scholars have attempted to further existing understanding of how an SME, which is usually associated with an individual entrepreneur, might succeed in this environment. In such a context, the design of creative strategies by entrepreneurs/SMEs becomes essential to secure higher returns, which may sometimes be the minimum required for survival. Thus, as distant markets as well as innovative products raise the level of uncertainty in a business venture (De Mattos et al., 2013), a risk-taking rather than accommodated entrepreneurial attitude can bring rewards in the face of such volatile conditions. In the same vein, a proactive rather than reactive attitude in an entrepreneur should facilitate the identification, selection and implementation of opportunities. This is reinforced by the entrepreneur's capability to assess the commercial potential of an innovation – in short, innovativeness.

### ***Post-hoc conceptual model***

Our *post-hoc* conceptual model sequentially links level of higher education, practical experience, entrepreneurial orientation and attractiveness of an SME *apropos* cross-border alliance formation (see Figure 1). The model establishes a theoretical link between the empirically observed (and at first glance anomalous) negative association of the level of higher education of an entrepreneur and the attractiveness of their respective SME as an alliance partner. It proposes two consecutive theoretical mediating variables linking level of higher education and alliance attractiveness, i.e. levels of practical experience and corresponding levels of proactiveness and innovativeness. We note that attractiveness to

alliances is a concept at firm level (and was conceptualised independently of levels of higher education), whereas the initial four variables (level of higher education, practical experience, and proactiveness and innovativeness) are defined at individual level. This corroborates the idea that entrepreneurship is an organization-dependent phenomenon (Covin and Slevin, 1991); however, antecedents to the organisational entrepreneurial dynamic may include entrepreneurs' individual characteristics.

Our model focuses only on two entrepreneurial dimensions – proactiveness and innovativeness. We propose that these two dimensions have practical experience as an antecedent. We understand “proactiveness or proactive behaviour” in an international entrepreneur as associated with a pragmatic or practice-oriented approach towards their environment, that is, an approach emphasizing a certain level of practical experience in parallel with a certain level of theoretical knowledge. An entrepreneur's proactive behaviour will tend to modify the firm's internal as well as external environment (Covin and Slevin, 1991). Rather than accepting situations as they are, a proactive entrepreneur can be expected to improve conditions linked to a particular situation. Proactiveness is a behavioural dimension and its importance derives from the fact that it determines how the entrepreneur approaches opportunities – in other words, through proactiveness, opportunities become business realities. We understand “innovativeness” as the international entrepreneur's ability to assess the commercial viability of novel technological solutions and innovative ways in foreign markets, and not only as their ability to come up with new solutions (i.e. creativity).

Our *post-hoc* theoretical model furthers our understanding of the role of the entrepreneur as previously suggested by the Covin and Slevin (1991) model. Our model links entrepreneurs concomitantly to both the external and internal environments through, respectively, ‘practical experience’ and subsequently ‘proactiveness and innovativeness’. We believe that, perhaps more than as an inventor, the differentiating skill of a successful

entrepreneur is the ability to see the synergy between resources available to the SME and specific opportunities in the external environment.

Potential benefits to the firm have been associated with an entrepreneur's open attitude towards the external environment (Dibrell, Craig and Hansen, 2011). More specifically, their ability to perceive matches between their internal capabilities and the external environment, be it the needs of prospective clients/consumers or prospects of profitable partnerships, is an important factor that differentiates the likely-successful from the unlikely-successful venture. This ability becomes even more crucial when doing business under certain harsh contingencies like dealing in uncertain competitive environments or/and with complex/sophisticated technologies (De Mattos et al., 2013). Regarding the former, the entrepreneur's experience will help to avoid non-viable deals, whereas concerning the latter it will help the entrepreneur find innovative solutions.

Below we explain the theoretical links in the *post-hoc* model (see Figure 1) and offer propositions. We start by the link at the right side of Figure 1 and discuss consecutively the links towards the left side.

#### *Linking proactiveness, innovativeness and attractiveness for alliance formation*

As depicted in Figure 1, we now discuss the proposed theoretical link between 'levels of proactiveness and innovativeness' and 'levels of attractiveness of the SME as a partner *apropos* alliance formation'. According to international entrepreneurship theory, proactive behaviour is deemed vital for a company to form alliances overseas (e.g., Stuart, 2000, Lavie, 2006, Poulis, Mo and Poulis, 2012). For instance, a proactive approach can be expected to support the identification of suitable partners; similarly, a proactive approach to identifying market needs may circumvent limitations in developing innovative products or services hindered by SME resource constraints. Drawing on earlier studies, proactive behaviour has

been associated with firms that influence their environment by establishing or attempting to establish leadership regarding the introduction of new products, development of new technologies, or use of new business or administrative routines and procedures (Miller and Friesen, 1978, Covin and Slevin, 1991). Entrepreneurial firms achieve this by boldly identifying and pursuing opportunities faster than the competition (Mintzberg, 1973, Miller and Friesen, 1978). Frequently, the latter is made possible through strong efforts to scan the environment as well as the delegation of responsibilities down the managerial hierarchy (Miller and Friesen, 1978, Covin and Slevin, 1991, Cousins, Lawson, Petersen and Handfield, 2011).

Due to the scarce resources of SMEs in general, entrepreneurs are more likely to attempt projects sequentially (as opposed to concurrently), which has been noted as sustaining optimism (Ucbasaran, Westhead, Wright and Flores, 2010), and thereby the positive mind-set necessary for alliance formation. Winston Churchill's words seem appropriate here: "Success is the ability to go from failure to failure with no loss of enthusiasm" (Oxford Dictionary of Quotations, 2004). In the context of entrepreneurship, the above quote means that entrepreneurs who perceive their own failures as opportunities to learn will indeed not lose enthusiasm; on the contrary, they will realise that they may have the upper hand in any future deal thanks to what they have learnt. Thus, the entrepreneur's ability to assess the prospective returns of a new project draws on the degree of learning accomplished whilst dealing with external and internal environmental forces (De Vries, 1977) as well as on their expertise and previous related experience working in other firms or industries. Entrepreneurs who manage to learn from failures can be expected, by implication, to fine-tune their capability of evaluating opportunities for partnerships reinforcing, in turn, their SME's readiness (or attractiveness) for alliances.

*Proposition 1: Entrepreneurs with high levels of proactiveness and innovativeness will be perceived as having higher levels of entrepreneurial orientation, which should ultimately enhance the image of their respective SMEs and increase attractiveness as an alliance partner for another firm (i.e. focal firm).*

*Linking levels of higher education, practical experience, proactiveness and innovativeness*

We now discuss, as depicted in Figure 1, the proposed theoretical link between ‘levels of practical experience’ and ‘levels of proactiveness and innovativeness’. We argue that proactive and innovative entrepreneurs will follow a balanced approach regarding the cost-benefit of academic achievements represented by decisions related to pursuing (or not) further studies in higher education *vis-à-vis* the acquisition of practical experience, the latter being pivotal in establishing international alliances. This situation reflects the importance of a “hands-on” approach (Becherer and Maurer, 1999) to learning. It is linked to higher exposure to real-world problems and by implication may be associated with less time spent pursuing theoretical studies. To the extent that proactiveness leads an individual to modify their environment (Bateman and Crant, 1993, Crant, 1995) or a manager to modify their firm’s environment, it seems logical to assume that proactive managers/entrepreneurs will display both awareness of and concern with what is necessary for their SME to thrive in a particular business environment. In other words, they should possess practical skills in assessing the situation and opportunities in their business environment (Gaur, Mukherjee, Gaur and Schmid, 2011), thereby identifying and correctly evaluating prospective business deals and internal capabilities. This should support the firm’s engagement with those opportunities.

Entrepreneurs characterised by such proactiveness should influence positively how the firm’s effectiveness in problem-solving is perceived. Proactive entrepreneurs in a CEO position will tend to have larger networks, and thus more sources of information. This will

favour high-potential partnership solutions arising from external personal networks (Zhou, Wu and Luo, 2007, Hanna and Walsh, 2008), such as links to organizations/institutions for which they have previously worked and personal contacts within the industry. An established personal network should increase knowledge regarding the activities of potential alliance partners. It facilitates the identification of strong prospective partners in control of useful complementary resources. This phenomenon has been noted with regard to established corporations (Anh, Baughn, Hang and Neupert, 2006). These information sources may only be put to effective use if the entrepreneur is able to match it with the constraints of their own firm. Moreover, access to a great number of possible opportunities will require analysis of most pathways and the selection of a few to be pursued. In this way, the entrepreneur makes it possible for these business opportunities to materialise into profitable business deals. This activity will require an effective environment-scanning and sieving capability (Miller and Friesen, 1978, Hambrick, 1981, Cousins et al., 2011), which in SMEs would be mainly an activity closely supervised if not carried out solely by the entrepreneur. Entrepreneurs or SMEs operating without the latter capability are unlikely to achieve good outcomes. Also, it seems reasonable here that experience will positively influence this entrepreneurial capability.

Reinforcing this argument, SMEs will use previously-established networks to locate the knowledge necessary to develop new products and sustain high performance (e.g., Steensma, Marino and Weaver, 2000, Steensma, Marino, Weaver and Dickson, 2000, Lohrke, Kreiser and Weaver, 2006, Arino et al., 2008). In other words, entrepreneurs supported by their social network should be able to obtain “critical information in a timely manner” (Cheng and Lin, 2009, p.72) and thus increase the chances of international alliance formation. Moreover, the entrepreneur will judge what is critical or not based partially on previous related practical experiences.

We propose that an entrepreneur's innovativeness or ability to come up with new solutions is linked not only to expertise around the specific technological area but also to practical experience. Innovativeness connects strongly to a sense or ability to identify commercial potential regarding novel innovative propositions. An entrepreneur's talent in identifying existing opportunities, to select those that are feasible, and to implement the necessary steps to take advantage of those selected opportunities may be seen as associated with their past practical business experience, such as previous dealings and assessment of projects or business prospects (Vaghely and Julien, 2010, Barreto, 2011)<sup>iii</sup>. Entrepreneurs with such talents can be expected to generate long-term benefits for the firm. A successful project should provide high gains (Covin and Slevin, 1991), support growth and expansion (Mintzberg, 1973) or sustained competitive advantage (Covin and Slevin, 1989) in the long-term, and be feasible in the short-term.

Furthermore, we propose that an entrepreneur's proactive and innovative behaviour can be expected to lead them away from lengthy and theory-based studies. This will limit their academic achievements but will also allow more time for them to gain practical experience and strengthen their perceptions of its importance. Therefore, we expect that through acquired practical experience, managers/entrepreneurs with a lower level of higher education (i.e., an undergraduate as opposed to a postgraduate degree), will be better prepared to identify and embark on entrepreneurial opportunities such as cross-border alliance formation. In this manner, their SME becomes more attractive as a partner. From the above discussion we develop the following two propositions:

*Proposition 2: Entrepreneurs with a high level of practical experience are more likely to have high levels of proactiveness and innovativeness.*

*Proposition 3: Entrepreneurs with a lower level of higher education (as opposed to entrepreneurs with a higher level of higher education) are more likely to have more practical experience.*

Summarising the above arguments, we arrive at the full model (Figure 1) and pull together the three links discussed above as one overall proposition:

*Overall Proposition: Entrepreneurs with a lower level of higher education (as opposed to entrepreneurs with a higher level of higher education) are more likely to have more practical experience, which in turn should directly and positively affect their proactiveness and innovativeness, leading to more entrepreneurial orientation and ultimately transforming their SMEs into a more attractive alliance partner for another firm (i.e. focal firm).*

Through the investigation of the theoretical relationships presented in Figure 1, we further the understanding of the impact of international entrepreneurs' characteristics mediated by practical experience and the corresponding levels of two entrepreneurship dimensions – proactiveness and innovativeness – on the potential of SMEs to be attractive cross-border alliance partners for another firm, and thus contribute to on-going discussions on HR issues in the international entrepreneurship field.

### **Conclusion and theoretical implications**

This paper advances human resource management and international entrepreneurship theory by examining the entrepreneur as a human resource factor. This is important because in the context of high-technology SMEs, the entrepreneur as a human resource factor is even more crucial, as idiosyncratic realities may require tailored strategies (Bamberger, Bacharach

and Dyer, 1989, Tansky, Soriano and Dobon, 2010). Broadly, a number of gaps remain to be investigated in the intersection of human resource management and entrepreneurship (Soriano, Dobon and Tansky, 2010).

In the ever increasing search for overseas opportunities (Brouthers et al., 2015), one avenue available for SME internationalization is alliance formation. Alliances are strategies increasingly been utilised to bypass resource constraints, at times caused by a hostile business environment (Kreiser and Davis, 2010). It is important to identify what factors will make SME alliance formation easier, similarly to the continuing research on the process of SME internationalization (e.g., Kuivalainen, Sundqvist, Saarenketo and McNaughton, 2012, Musteen, Datta and Francis, 2014).

This paper extends our understanding regarding the influence of managerial/entrepreneurial characteristics on pre-alliance formation in high-risk and high-uncertainty business environments. We examine the effect of an entrepreneur/manager's level of higher education on their SME's attractiveness as a prospective international-alliance partner from the perspective of a focal firm. We depart from our empirical observations that indicate the negative influence of entrepreneurs' levels of higher education on the attractiveness of their SME to alliances. We then propose a post-hoc conceptual model (see Figure 1) linking the above constructs and theorising the existence of two consecutive mediators: levels of practical experience and the corresponding levels of two dimensions of entrepreneurial orientation, proactiveness and innovativeness. In this manner, we provide a theoretical foundation and deepen understanding of the relationship between an individual manager/entrepreneur's level of higher education, and the attractiveness of their respective SME as a partner for alliance-formation.

By linking managerial characteristics at individual level with outcome at firm level, we provide a theoretical explanation of the influence of levels of higher education on an SME's

attractiveness as an alliance partner. Specifically, we propose that a lower level of higher education (as opposed to higher levels of higher education) is likely to be associated with higher levels of practical experience (as opposed to lower levels of practical experience), as a result of more time available to acquire relevant experience. We suggest that this will in turn affect positively two dimensions of entrepreneurial orientation, i.e. proactiveness and innovativeness. As a consequence of this sequence of links, a more experienced, and hence more proactive and innovative, entrepreneur is perceived as a more suitable agent to foster alliances in a high-risk and high-uncertainty environment, and this ultimately makes the SME a more attractive cross-border alliance partner.

Our study furthers the understanding of entrepreneurs' experience as a prospective mediating construct supporting pre-alliance formation by strengthening the international entrepreneurial orientation image and in turn the attractiveness prospective alliance partners for alliances in uncertain and volatile environments. Previous studies have investigated each dimension of our post-hoc model, however considering different outcomes and different combinations. For instance, entrepreneurs' experience has been noted as having undergone a limited conceptual development within international entrepreneurship (Jones and Casulli, 2014). In this context, experience has been put forward as affecting the identification and exploitation of cross-border opportunities (Chandra, Styles and Wilkinson, 2009, Filatotchev, Liu, Buck and Wright, 2009). Previous studies have linked entrepreneurs' experience and knowledge regarding business, management, or technologies with securing entrepreneurial high performance (e.g., Bloodgood, Sapienza and Almeida, 1996, Staniewski, 2016). Other studies found that business experience may decrease or cancel out the positive effect of certain factors (e.g., sustainability behaviour) on entrepreneurial intention and optimism (Kuckertz and Wagner, 2010, Ucbasaran et al., 2010), which will ultimately affect the entrepreneurial mind-set. Some types of experiences such as experiencing business failure or whether the

experiences followed a sequential rather than a concomitant pattern will also affect the entrepreneur mind-set (Ucbasaran et al., 2010, Morris, Kuratko, Schindehutte and Spivack, 2012). As entrepreneur behaviour and values across different countries may differ as well as be similar (McGrath and MacMillan, 1992, Lussier and Pfeifer, 2000), previous business experiences in different countries, and the associations developed thereof should be helpful to support entrepreneurial objectives.

Some studies have also examined the influence of proactiveness and innovativeness on performance in the context of cross-border market entry (Dai, Maksimov, Gilbert and Fernhaber, 2014). Other studies attempted to investigate the combined or independent effects of these two IEO sub-dimensions considering a number of outcomes such as sales growth (Kreiser, Marino, Kuratko and Weaver, 2013), innovation generation (Pérez-Luño, Wiklund and Cabrera, 2011), regional expansion (Boso, Oghazi and Hultman, 2017). This has importance for HR issues in an SME, and the SME's perceived image thereof.

The implicit assumption in our study is that in the context of SME internationalisation, there is a strong association between perceptions regarding an entrepreneur and perceptions regarding the SME they are associated with. For instance, it seems logical that if the owner-manager/entrepreneur is perceived as entrepreneurial and experienced, their image is transferred to their SME and the firm is seen as more open to the pursuit of new opportunities and challenges; therefore, the SME becomes a more attractive alliance partner. Thus, a stronger entrepreneurial orientation (a concept at managerial or individual level) will increase an SME's attractiveness as an alliance partner for another firm (a concept at firm level).

### ***Managerial implications***

Partner selection is one of the critical managerial choices determining alliance success (Shah and Swaminathan, 2008). We offer managerial implications to address this issue. Further

understanding of HR issues that could facilitate the pre-alliance stage, particularly the partner-selection process, is therefore essential. Cross-border alliances have proven to be an invaluable mechanism to support the endeavour of firms to deal with today's fierce competitive environment.

Regarding high-technology pre-alliance formation stage in BRICS countries (or other high-risk and high-uncertainty countries), our study suggests that SMEs should consider lower levels of higher education and its positive association with practical experience – and with proactiveness and innovativeness – as more appropriate and desirable managerial characteristics. In practical terms an SME seeking to enter an overseas market characterised by high-uncertainty should consider the level of practical experience that their managers have in that particular location (or similar locations). Based on those characteristics, firms should be able to decide whether in-house managers can be allocated to a certain cross-border pre-alliance project, or whether there is a need to recruit an external advisor to initiate the pursuit of cross-border alliance opportunities. Regarding the latter, third-parties have been identified as supporting cooperation initiatives (Hanna and Walsh, 2008).

Although our results favour relatively lower levels of higher education, the importance of training should not be underestimated. The training choices made by senior managers/entrepreneurs may have strategic implications for the SME. For instance, managerial training with a focus on pre-alliance formation skills might influence the design, and support the implementation, of effective strategies. In short, the right balance between education and training on the one hand, and practical experience and IEO on the other should be sought.

Managers/entrepreneurs will be expected to behave proactively, undertaking a continuous search for opportunities as well as strengthening and broadening their network contacts in the new business environment. We suggest that one role for a manager/entrepreneur regarding

these tasks is that of an “ambassador” for the SME or its external liaison. An entrepreneur’s mind-set open to novel ideas will also support perception of the SME as innovative. In alliances between SMEs and large firms identifying and hiring senior managers with appropriate skills for alliances, such as the right mind-set and high network capital, has been identified as an effective strategy (Alvarez et al., 2003).

### ***Limitations and future research directions***

Limitations of this study pave the way for further research within this field. Our first limitation is the choice of Brazil as representative of BRICS countries, which are characterised as high-risk and high-uncertainty large emerging economies (LEMs). Practical experience could be expected to be of greater need in such environments when compared with more stable economies, where institutions are well-established (Peng, Wang and Jiang, 2008). Thus, we could speculate that the results of this study should be similar if the study is replicated in other LEMs, but would most likely differ if conducted in developed countries. Furthermore, although emerging markets are treated as a group to differentiate them from other developing countries, there exist many historical, economic and cultural differences within BRICS countries that are likely to influence their respective business environments. Future research may apply our *post-hoc* model in the context of pre-alliance formation to other large emerging markets (e.g., BRICS countries) or other countries or regions with high-uncertainty business environments.

Another limitation is the focus on a high-technology sector. Different levels of higher education are commonly found among entrepreneurs/managers in high-technology or knowledge-intensive sectors (Madsen, Neergaard and Ulhøi, 2003), so our results and implications should be applicable to such sectors. However, the former situation might not be encountered in other business sectors, and consequently our findings may not apply to those

sectors. Hence, research regarding the applicability of our findings to low-technology business sectors could be an interesting avenue for further research.

Third, our study did not differentiate between postgraduate awards (e.g., MBA, MSc, PhD in various fields). It is possible that different postgraduate degrees may impact on alliance formation in other ways. Therefore, further studies could examine these differences and their implications in more depth. Moreover, our dependent variable was developed on the basis of entrepreneurial perceptions regarding partner contributions to the alliance, ultimately generating an index reflecting the potential of a specific SME to form cross-border alliances. Thus, it would be valuable to define other indices of potential for successful alliance-formation.

Furthermore, future studies could consider the relative importance of proactiveness vis-à-vis innovativeness in a high-uncertainty context. The relative influence of the two sub-dimensions chosen to represent IEO on the business environment of LEMs i.e. proactiveness vis-à-vis innovativeness is not clear (Kreiser et al., 2013). Further studies could also assess the association of personal networks with proactiveness and innovativeness in the context of alliance-formation, paralleling studies investigating internationalisation and firm performance (e.g., Zhou, Barnes and Lu, 2010) (Zhou et al.2010 JIBS). In our study, personal networks appear to be linked to an entrepreneur's proactiveness, although we did not examine this issue directly.

In addition, the study considers only one partner perspective, and the focal firm is a typical Brazilian SME. Future studies could examine how level of higher education may relate to both partners in an alliance. Moreover, drawing on the idea of resource complementarity as the alliance motivation, one could speculate whether a partner with a lower level of higher education will find a partner with a higher level of higher education attractive, and *vice versa*.

And finally, while our small sample size was appropriate for our exploratory investigation, future studies should make use of larger samples to test our theoretical propositions.

## References

- Ainsworth, E.A., Rogers, A. and Leakey, A.D.B. (2008), "Targets for Crop Biotechnology in a Future High-CO<sub>2</sub> and High-O<sub>3</sub> World," *Plant Physiol.*, 147, 13-19.
- Alvarez, S.A., Barney, J.B. and Bosse, D.A. (2003), "Trust and its alternatives," *Human Resource Management*, 42, 393-404.
- Anderson, V. and Boocock, G. (2002), "Small firms and internationalisation: learning to manage and managing to learn," *Human Resource Management Journal*, 12, 5-24.
- Anh, P.T.T., Baughn, C.C., Hang, N.T.M. and Neupert, K.E. (2006), "Knowledge acquisition from foreign parents in international joint ventures: An empirical study in Vietnam," *International Business Review*, 15, 463-487.
- Arino, A., Ragozzino, R. and Reuer, J.J. (2008), "Alliance dynamics for entrepreneurial firms," *Journal of Management Studies*, 45, 147-168.
- Ariño, A., Ragozzino, R. and Reuer, J.J. (2008), "Alliance Dynamics for Entrepreneurial Firms," *Journal of Management Studies*, 45, 147.
- Autio, E., Kenney, M., Mustar, P., Siegel, D. and Wright, M. (2014), "Entrepreneurial innovation: The importance of context," *Research Policy*, 43, 1097-1108.
- Bamberger, P., Bacharach, S. and Dyer, L. (1989), "Human-resources management and organizational-effectiveness - high technology entrepreneurial startup firms in Israel," *Human Resource Management*, 28, 349-366.
- Barreto, I. (2011), "Solving the Entrepreneurial Puzzle: The Role of Entrepreneurial Interpretation in Opportunity Formation and Related Processes," *Journal of Management Studies*, 49, 356-380.
- Bateman, T.S. and Crant, J.M. (1993), "The proactive component of organizational behavior: A measure and correlates," *Journal of Organizational Behavior*, 14, 103-118.
- Beal, R.M. and Yasai-Ardekani, M. (2000), "Performance implications of aligning CEO functional experiences with competitive strategies," *Journal of Management*, 26, 733-762.
- Becherer, R.C. and Maurer, J.G. (1999), "The proactive personality disposition and entrepreneurial behavior among small company presidents," *Journal of Small Business Management*, 37, 28-36.
- Beckman, C.M. and Haunschild, P.R. (2002), "Network learning: The effects of partners' heterogeneity of experience on corporate acquisitions," *Administrative Science Quarterly*, 47, 92-124.
- Bio-Technologie (1996), "Das Jahr -und Adreßbuch 95/96," Berlin: Verlag.
- Bloodgood, J.M., Sapienza, H.J. and Almeida, J.G. (1996), "The Internationalization of New High-Potential U.S. Ventures: Antecedents and Outcomes," *Entrepreneurship: Theory & Practice*, 20, 61-76.
- Boso, N., Oghazi, P. and Hultman, M. (2017), "International entrepreneurial orientation and regional expansion," *Entrepreneurship & Regional Development*, 29, 4-26.
- Brouthers, K.D., Nakos, G. and Dimitratos, P. (2015), "SME Entrepreneurial Orientation, International Performance, and the Moderating Role of Strategic Alliances," *Entrepreneurship: Theory & Practice*, 39, 1161-1187.
- Buckley, P.J., Cross, A. and De Mattos, C. (2015), "The Principle of Congruity in the Analysis of International Business Cooperation," *International Business Review*, 24, 1048-1060.
- Calof, J.L. and Viviers, W. (1995), "Internationalization Behavior of Small- and Medium-Sized South African Enterprises," *Journal of Small Business Management*, 33, 71-79.
- Capelleras, J.L., Greene, F.J., Kantis, H. and Rabetino, R. (2010), "Venture Creation Speed and Subsequent Growth: Evidence from South America," *Journal of Small Business Management*, 48, 302-324.
- Chandra, Y., Styles, C. and Wilkinson, I. (2009), "The recognition of first time international entrepreneurial opportunities: Evidence from firms in knowledge-based industries," *International Marketing Review*, 26, 30-61.

- Cheng, H.L. and Lin, C.Y.Y. (2009), "Do as the large enterprises do? Expatriate selection and overseas performance in emerging markets: The case of Taiwan SMEs," *International Business Review*, 18, 60-75.
- Cheng, L.T.W., Chan, R.Y.K. and Leung, T.Y. (2010), "Management demography and corporate performance: Evidence from China," *International Business Review*, 19, 261-275.
- Coombs, J. and Alstn, Y.R. (1996), "The International Biotechnology Directory 1996," Basingstoke: MacMillan Press.
- Cooper, A.C. (2007), "Behavioral characteristics of entrepreneurial activity," *Strategic Entrepreneurship Journal*, 1, 145-146.
- Cooper, A.C., Gimeno-Gascon, F.J. and Woo, C.Y. (1994), "Initial Human and Financial Capital as Predictors of New Venture Performance," *Journal of Business Venturing*, 9, 371-395.
- Cousins, P.D., Lawson, B., Petersen, K.J. and Handfield, R.B. (2011), "Breakthrough Scanning, Supplier Knowledge Exchange, and New Product Development Performance," *Journal of Product Innovation Management*, 28, 930-942.
- Covin, J.C. and Slevin, D.P. (1989), "Strategic management of small firms in hostile and benign environments," *Strategic Management Journal*, 10, 75-87.
- Covin, J.C. and Slevin, D.P. (1991), "A conceptual model of entrepreneurship as firm behaviour," *Entrepreneurship, Theory and Practice*, Fall, 7-25.
- Covin, J.G. and Miller, D. (2014), "International Entrepreneurial Orientation: Conceptual Considerations, Research Themes, Measurement Issues, and Future Research Directions," *Entrepreneurship Theory and Practice*, 38, 11-44.
- Crant, J.M. (1995), "The Proactive Personality Scale and Objective Job Performance Among Real Estate Agents," *Journal of Applied Psychology*, 80, 532-537.
- Dai, L., Maksimov, V., Gilbert, B.A. and Fernhaber, S.A. (2014), "Entrepreneurial orientation and international scope: The differential roles of innovativeness, proactiveness, and risk-taking," *Journal of Business Venturing*, 29, 511-524.
- De Mattos, C., Burgess, T.F. and Shaw, N.E. (2013), "The impact of R&D-specific factors on the attractiveness of small- and medium-sized enterprises as partners vis-à-vis alliance formation in large emerging economies," *R&D Management*, 43, 1-20.
- De Mattos, C., Sanderson, S. and Ghauri, P. (2002), "Negotiating alliances in emerging markets-Do partners' contributions matter?," *Thunderbird International Business Review*, 44, 701.
- De Vries, M.F.R.K. (1977), "The Entrepreneurial Personality: a Person at the Crossroads," *Journal of Management Studies*, 14, 34-57.
- Dibrell, C., Craig, J.B. and Hansen, E.N. (2011), "How managerial attitudes toward the natural environment affect market orientation and innovation," *Journal of Business Research*, 64, 401-407.
- Dimitratos, P., Plakoyiannaki, E., Pitsoulaki, A. and Tuselmann, H.J. (2010), "The global smaller firm in international entrepreneurship," *International Business Review*, 19, 589-606.
- Draulans, J., deMan, A.-P. and Volberda, H.W. (2003), "Building Alliance Capability:: Management Techniques for Superior Alliance Performance," *Long Range Planning*, 36, 151-166.
- Ernst&Young (2007), "Beyond borders - the global biotechnology report 2007 (European country profiles 2007 - a supplement)," London: Ernst & Young.
- Ernst&Young (2008), "Beyond borders - the global biotechnology report 2008," London: Ernst & Young.
- Ernst&Young (2010), "Beyond borders - global biotechnology report 2010," London: Ernst & Young.
- Ernst&Young (2011), "Beyond borders - global biotechnology report 2011," London: Ernst & Young.
- Ernst&Young and EuropaBio (2012), "What Europe has to offer biotechnology companies – Unraveling the tax, financial and regulatory framework," London. Available at <http://www.ey.com>. Accessed: 25th May 2012.
- Fenning, T.M., Walter, C. and Gartland, K.M.A. (2008), "Forest biotech and climate change," *Nature Biotechnology*, 26, 615-617.

- Filatotchev, I., Liu, X., Buck, T. and Wright, M. (2009), "The export orientation and export performance of high-technology SMEs in emerging markets: The effects of knowledge transfer by returnee entrepreneurs," *Journal of International Business Studies*, 40, 1005.
- Fiss, P.C. (2006), "Social influence effects and managerial compensation evidence from Germany," *Strategic Management Journal*, 27, 1013-1031.
- Fletcher, D. (2004), "International entrepreneurship and the small business," *Entrepreneurship and Regional Development*, 16, 289-305.
- Gaur, A.S., Mukherjee, D., Gaur, S.S. and Schmid, F. (2011), "Environmental and Firm Level Influences on Inter-Organizational Trust and SME Performance," *Journal of Management Studies*, 48, 1752-1781.
- George, B.A. (2011), "Entrepreneurial Orientation: A Theoretical and Empirical Examination of the Consequences of Differing Construct Representations," *Journal of Management Studies*, 48, 1291-1313.
- Ghauri, P.N. and Grønhaug, K. (2010), *Research methods in business studies: A practical guide*, London: Pearson.
- Gist, M.E. and Mitchell, T.R. (1992), "Self-Efficacy - A Theoretical-Analysis of its Determinants and Malleability," *Academy of Management Review*, 17, 183-211.
- Hair, J.F., Black, W.C., Babin, B.J. and Anderson, R.E. (2009), *Multivariate Data Analysis: a Global Perspective*, New Jersey: Pearson.
- Hambrick, D.C. (1981), "Specialization of Environmental Scanning Activities among Upper Level Executives," *Journal of Management Studies*, 18, 299-320.
- Hambrick, D.C. (2007), "Upper echelons theory: An update," *Academy of Management Review*, 32, 334-343.
- Hambrick, D.C. and Mason, P.A. (1984), "Upper Echelons - The Organization as a Reflection of its Top Managers," *Academy of Management Review*, 9, 193-206.
- Hanna, V. and Walsh, K. (2008), "Interfirm cooperation among small manufacturing firms," *International Small Business Journal*, 26, 299-321.
- Hayton, J.C. (2003), "Strategic human capital management in SMEs: An empirical study of entrepreneurial performance," *Human Resource Management*, 42, 375-391.
- Huxham, C. and Hibbert, P. (2008), "Manifested Attitudes: Intricacies of Inter-Partner Learning in Collaboration," *The Journal of Management Studies*, 45, 502-529.
- Jones, M.V. and Casulli, L. (2014), "International Entrepreneurship: Exploring the Logic and Utility of Individual Experience Through Comparative Reasoning Approaches," *Entrepreneurship: Theory & Practice*, 38, 45-69.
- Kale, P. and Singh, H. (2009), "Managing Strategic Alliances: What Do We Know Now, and Where Do We Go From Here?," *The Academy of Management Perspectives*, 23, 45.
- Knight, G.A. (1997), "Cross-cultural reliability and validity of a scale to measure firm entrepreneurial orientation," *Journal of Business Venturing*, 12, 213-225.
- Kreiser, P.M. and Davis, J. (2010), "Entrepreneurial Orientation and Firm Performance: The Unique Impact of Innovativeness, Proactiveness, and Risk-taking," *Journal of Small Business & Entrepreneurship*, 23, 39-51.
- Kreiser, P.M., Marino, L.D., Kuratko, D.F. and Weaver, K.M. (2013), "Disaggregating entrepreneurial orientation: the non-linear impact of innovativeness, proactiveness and risk-taking on SME performance," *Small Business Economics*, 40, 273-291.
- Kuckertz, A. and Wagner, M. (2010), "The influence of sustainability orientation on entrepreneurial intentions - Investigating the role of business experience," *Journal of Business Venturing*, 25, 524-539.
- Kuivalainen, O., Sundqvist, S., Saarenketo, S. and McNaughton, R. (2012), "Internationalization patterns of small and medium-sized enterprises," *International Marketing Review*, 29, 448-465.
- Lavie, D. (2006), "The Competitive Advantage of Interconnected Firms: an Extension of the Resource-based View," *Academy of Management Review*, 31, 638.

- Lee, D.Y. and Tsang, E.W.K. (2001), "The effects of entrepreneurial personality, background and network activities on venture growth," *Journal of Management Studies*, 38, 583-602.
- Leonidou, L.C., Katsikeas, C.S. and Piercy, N.F. (1998), "Identifying Managerial Influences on Exporting: Past Research and Future Directions," *Journal of International Marketing*, 6, 74-102.
- Li, J.T., Xin, K. and Pillutla, M. (2002), "Multi-cultural leadership teams and organizational identification in international joint ventures," *International Journal of Human Resource Management*, 13, 320-337.
- Li, L., Li, D. and Dalgic, T. (2004), "Internationalization Process of Small and Medium-sized Enterprises: Toward a Hybrid Model of Experiential Learning and Planning," *MIR: Management International Review*, 44, 93-116.
- Lohrke, F.T., Kreiser, P.M. and Weaver, K.M. (2006), "The influence of current firm performance on future SME alliance formation intentions: A six-country study," *Journal of Business Research*, 59, 19.
- Lu, J.W. and Beamish, P.W. (2001), "The internationalization and performance of SMEs," *Strategic Management Journal*, 22, 565-586.
- Lumpkin, G.T. (2011), "From legitimacy to impact: moving the field forward by asking how entrepreneurship informs life," *Strategic Entrepreneurship Journal*, 5, 3-9.
- Lumpkin, G.T. and Dess, G.G. (1996), "Clarifying the entrepreneurial orientation construct and linking it to performance," *Academy of Management Review*, 21, 135-172.
- Lussier, R.N. and Pfeifer, S. (2000), "A Comparison of Business Success versus Failure Variables between U.S. and Central Eastern Europe Croatian Entrepreneurs," *Entrepreneurship: Theory & Practice*, 24, 59.
- Madsen, H., Neergaard, H. and Ulhøi, J.P. (2003), "Knowledge-intensive entrepreneurship and human capital," *Journal of Small Business and Enterprise Development*, 10, 426-434.
- Marino, L., Strandholm, K., Steensma, H.K. and Weaver, K.M. (2002), "The moderating effect of national culture on the relationship between entrepreneurial orientation and strategic alliance portfolio extensiveness," *Entrepreneurship Theory and Practice*, 26, 145.
- Marion, T.J. and Meyer, M.H. (2011), "Applying Industrial Design and Cost Engineering to New Product Development in Early-Stage Firms," *Journal of Product Innovation Management*, 28, 773-786.
- McDougall, P.P. (1989), "International Versus Domestic Entrepreneurship: New Venture Strategic Behavior and Industry Structure," *Journal of Business Venturing*, 4, 387.
- McDougall, P.P. and Oviatt, B.M. (2000), "International entrepreneurship: The intersection of two research paths," *Academy of Management Journal*, 43, 902-906.
- McGrath, R.G. and MacMillan, I.C. (1992), "More like each other than anyone else? A cross-cultural study of entrepreneurial perceptions," *Journal of Business Venturing*, 7, 419-429.
- Miller, D. (1983), "The correlates of entrepreneurship in 3 types of firms," *Management Science*, 29, 770-791.
- Miller, D. (2011), "Miller (1983) Revisited: A Reflection on EO Research and Some Suggestions for the Future," *Entrepreneurship Theory and Practice*, 35, 873-894.
- Miller, D. and Friesen, P.H. (1978), "Archetypes of Strategy Formulation," *Management Science*, 24, 921-933.
- Mintzberg, H. (1973), "Strategy-Making in 3 Modes," *California Management Review*, 16, 44-53.
- Moran, P. (1998), "Personality characteristics and growth-orientation of the small business owner-manager," *International Small Business Journal*, 16, 17-38.
- Morris, M.H., Kuratko, D.F., Schindehutte, M. and Spivack, A.J. (2012), "Framing the Entrepreneurial Experience," *Entrepreneurship: Theory & Practice*, 36, 11-40.
- Musteen, M., Datta, D.K. and Francis, J. (2014), "EARLY INTERNATIONALIZATION BY FIRMS IN TRANSITION ECONOMIES INTO DEVELOPED MARKETS: THE ROLE OF INTERNATIONAL NETWORKS," *Global Strategy Journal*, 4, 221-237.
- Nature Biotechnology (2008), "FDA launches priority vouchers for neglected-disease drugs (by Emily Waltz)," in *Nature Biotechnology*, pp. 1315-1316.

- Nature Biotechnology (2011a), "Amgen's Brazilian buying spree (by Jeniffer Rohn)," in *Nature Biotechnology*, pp. 561.
- Nature Biotechnology (2011b), "Public Biotech 2010-the Numbers, (by Brady Huggett, John Hodgson and Riku Lahteenmaki)," in *Nature Biotechnology*, pp. 585-591.
- Nie, N.H., Bend, D.H. and Hull, C.H. (1970), "SPSS - Statistical Package for the Social Sciences," New York: McGraw-Hill.
- OTA. (1984), "U.S. Congress, Office of Technology Assessment, Biotechnology in a Global Economy, Washington, DC: U.S. Government Printing Office."
- Oviatt, B.M. and McDougall, P.P. (1994), "Toward a theory of international new ventures," *Journal of International Business Studies*, 25, 45.
- Oviatt, B.M. and McDougall, P.P. (2005), "Defining International Entrepreneurship and Modeling the Speed of Internationalization," *Entrepreneurship Theory and Practice*, 29, 537.
- Oxford Dictionary of Quotations (2004), ed. E. Knowles, Oxford, New York: Oxford University Press.
- 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*, 39, 920-936.
- Pérez-Luño, A., Wiklund, J. and Cabrera, R.V. (2011), "The dual nature of innovative activity: How entrepreneurial orientation influences innovation generation and adoption," *Journal of Business Venturing*, 26, 555-571.
- Poulis, K., Mo, Y. and Poulis, E. (2012), "Domestic firms competing with multinational enterprises: The relevance of resource-accessing alliance formations," *International Business Review*, 21, 588-601.
- PTSM (2008), "Global and US Biotech Markets Show Strength, (by Patricia Van Arnum)," Pharmaceutical Technology Sourcing and Management.
- Santos, J. (2007), "Strategy Lessons from Left Field," *Harvard Business Review*, 85, 20-21.
- Sauvant, K.P., Mendoza, K. and Irmak, I. (2008), *The Rise of Transnational Corporations from Emerging Markets: Threat or Opportunity?*: Edward Elgar Publishing.
- Schmelter, R., Mauer, R., Boersch, C. and Brettel, M. (2010), "Boosting Corporate Entrepreneurship through HRM Practices: Evidence from German SMEs," *Human Resource Management*, 49, 715-741.
- Schuler, R.S. (2001), "Human resource issues and activities in international joint ventures," *International Journal of Human Resource Management*, 12, 1-52.
- Schweizer, R. (2012), "The internationalization process of SMEs: A muddling-through process," *Journal of Business Research*, 65, 745-751.
- Shah, R.H. and Swaminathan, V. (2008), "Factors influencing partner selection in strategic alliances: The moderating role of alliance context," *Strategic Management Journal*, 29, 471-494.
- Shane, S. and Venkataraman, S. (2000), "The promise of entrepreneurship as a field of research," *Academy of Management Review*, 25, 217-226.
- Soriano, D.R., Dobon, S.R. and Tansky, J. (2010), "GUEST EDITORS' NOTE: LINKING ENTREPRENEURSHIP AND HUMAN RESOURCES IN GLOBALIZATION," *Human Resource Management*, 49, 217-223.
- Staniewski, M.W. (2016), "The contribution of business experience and knowledge to successful entrepreneurship," *Journal of Business Research*, 69, 5147-5152.
- Steensma, H.K., Marino, L. and Weaver, K.M. (2000), "Attitudes toward cooperative strategies: A cross-cultural analysis of entrepreneurs," *Journal of International Business Studies*, 31, 591-609.
- Steensma, H.K., Marino, L., Weaver, K.M. and Dickson, P.H. (2000), "The influence of national culture on the formation of technology alliances by entrepreneurial firms," *Academy of Management Journal*, 43, 951-973.
- Stopford, J.M. and Wells, L.T. (1972), *Managing the multinational enterprise : organization of the firm and ownership of the subsidiaries*, New York: Basic Books.
- Stuart, T.E. (2000), "Interorganizational alliances and the performance of firms: A study of growth and innovation rates in a high-technology industry," *Strategic Management Journal*, 21, 791-811.
- Tabachnick, B.G. and Fidell, L.S. (2007), *Using Multivariate Statistics*, Boston: Pearson Education.

- Tansky, J.W. and Heneman, R. (2003), "Guest editor's note: Introduction to the special issue on human resource management in SMEs: A call for more research," *Human Resource Management*, 42, 299-302.
- Tansky, J.W., Soriano, D.R. and Dobon, S.R. (2010), "GUEST EDITORS' NOTE: WHAT'S NEXT? LINKING ENTREPRENEURSHIP AND HUMAN RESOURCE MANAGEMENT IN GLOBALIZATION," *Human Resource Management*, 49, 689-692.
- Tyler, B.B. and Steensma, H.K. (1998), "The effects of executives' experiences and perceptions on their assessment of potential technological alliances," *Strategic Management Journal*, 19, 939.
- Ucbasaran, D., Westhead, P., Wright, M. and Flores, M. (2010), "The nature of entrepreneurial experience, business failure and comparative optimism," *Journal of Business Venturing*, 25, 541-555.
- Ulubasoglu, M., Akdis, M. and Kök, S.B. (2009), "Internationalization and alliance formation: evidence from Turkish SMEs," *International Small Business Journal*, 27, 337-361.
- UNCTAD (2001), "World Investment Report 2001: Promoting Linkages," New York and Geneva: United Nations.
- UNCTAD (2005), "World Investment Report 2005: Transnational Corporations and the Internationalization of R & D," New York and Geneva: United Nations.
- UNCTAD (2006), "World Investment Report 2006: FDI from Developing and Transition Economies: Implications for Development," New York and Geneva: United Nations.
- UNCTAD (2009), "World Investment Report 2009: Transnational Corporations, Agricultural Production and Development," New York and Geneva: United Nations.
- UNCTAD (2010), "World Investment Report 2010: Investing in a Low-Carbon Economy," United Nations.
- UNCTAD. (2013), "World Investment Report 2013: Global value chains: investment and trade for development."
- UNCTAD. (2014), "World Investment Report 2014: Investing in the SDGs: an action plan."
- UNCTAD. (2015), "World Investment Report 2015: Reforming International Investment Governance. New York and Geneva: United Nations."
- USDA. (2005), "United States Department of Agriculture. Soybean baseline projections, 2005-14 <<http://www.ers.usda.gov/Briefing/SoyBeansOilCrops/2005baseline.htm>> (Accessed 15 Jan 2008)."
- Vaghely, I.P. and Julien, P.-A. (2010), "Are opportunities recognized or constructed?: An information perspective on entrepreneurial opportunity identification," *Journal of Business Venturing*, 25, 73-86.
- Van Gils, A. and Zwart, P.S. (2009), "Alliance formation motives in SMEs: An explorative conjoint analysis study," *International Small Business Journal*, 27, 5-37.
- Wagner, R. and Paton, R.A. (2014), "Strategic toolkits: seniority, usage and performance in the German SME machinery and equipment sector," *International Journal of Human Resource Management*, 25, 475-499.
- Wang, S., Guidice, R.M., Tansky, J.W. and Wang, Z.M. (2010), "When R&D Spending is Not Enough: The Critical Role of Culture When You Really Want to Innovate," *Human Resource Management*, 49, 767-792.
- Wright, M., Liu, X.H., Buck, T. and Filatotchev, I. (2008), "Returnee entrepreneurs, science park location choice and performance: An analysis of high-technology SMEs in China," *Entrepreneurship Theory and Practice*, 32, 131-155.
- Wu, S. and Wu, L. (2008), "The impact of higher education on entrepreneurial intentions of university students in China," *Journal of Small Business and Enterprise Development*, 15, 752-774.
- Zhou, L., Barnes, B. and Lu, Y. (2010), "Entrepreneurial proclivity, capability upgrading and performance advantage of newness among international new ventures," *Journal of International Business Studies*, 41, 882.
- Zhou, L., Wu, W. and Luo, X. (2007), "Internationalization and the performance of born-global SMEs: the mediating role of social networks," *Journal of International Business Studies*, 38, 673-690.



**Table 1a.**  
**Descriptive Statistics**

<i>Predictors</i>	<i>No</i>	<i>Items</i>	<i>Mean</i>	<i>SD</i>
<b>P1 Senior Manager's Educational Level</b>	1	Senior Manager educational level – degree	.370	.486
	2	Senior Manager educational level - postgraduate	.560	.502
<b>Firm age (years)</b> (key: '1' ≤ 5, 6 ≤ '2' ≤ 15, 16 ≤ '3')	3	1 <sup>st</sup> control variable	2.12 (14.19) <sup>1,2</sup>	.754 (11.91) <sup>1,2</sup>
<b>Total no. employees</b> (key: '1' ≤ 10, 10 < '2' < 50, 50 ≤ '3')	4	2 <sup>nd</sup> control variable	1.96 (48.43) <sup>2</sup>	.763 (82.09) <sup>2</sup>
<b>Turnover</b> (key: '1' < £0.6mio, £0.6mio ≤ '2' < £3.5mio, £3.5mio ≤ '3')	5	3 <sup>rd</sup> control variable	1.98 (3796.4) <sup>2</sup>	.803 (5205.9) <sup>2</sup>

<sup>1</sup> Two outliers were not considered when calculating this parameter (i.e., family SMEs of one century of age and over).

<sup>2</sup> Parameters calculated for the original variables.

**Table 1b**  
**Correlations**

<i>Variables</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
<b>1. Senior Manager's Educational Level</b>	1			
<b>2. Firm age (years)</b>	.116	1		
<b>3. Total employees</b>	-.166	-.113*	1	
<b>4. Turnover</b>	.081	-.221	-.597	1

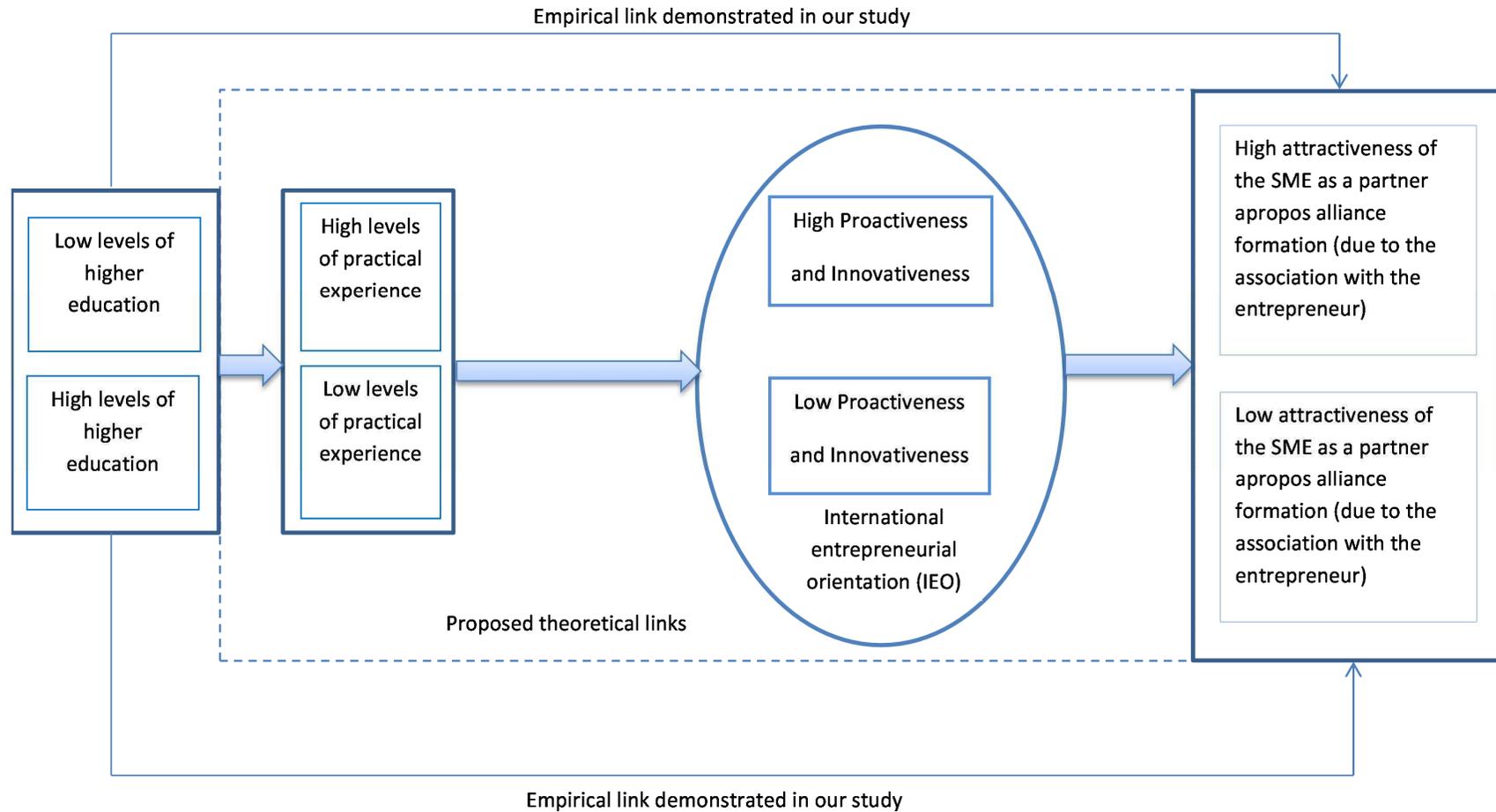
\* Significance  $p < 5\%$

**Table 2****Results of logistic regression for likelihood of alliance formation**

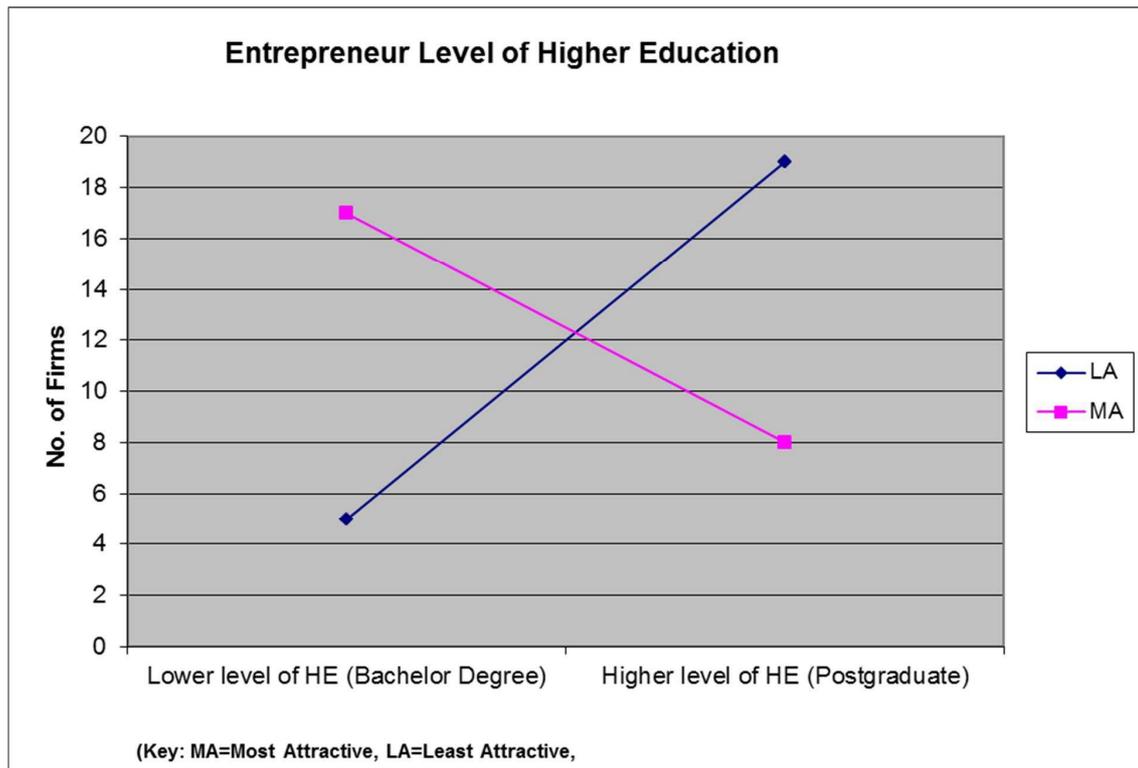
	Base model			Full model		
	$\beta$	SE	Exp(B) - Odds Ratio	$\beta$	SE	Exp(B) - Odds Ratio
Intercept	-.417	.872	.659	-.543	.982	.581
<b>H1 Entrepreneur's Level of Higher Education</b>	-	-	-	-1.035**	.353	.355
Firm age	.005	.009	1.005	.002	.010	1.002
Total employees	-.167	.506	.846	.095	.564	1.100
Turnover	.347	.489	1.415	.176	.547	1.192
Chi-square ( $\chi^2$ )			1.232			11.130*
Cox & Snell R <sup>2</sup>			.025			.203
Nagelkerke R <sup>2</sup>			.033			.271
Log likelihood			66.676			56.778
Correct classification			57.1%			73.5%
n (firms)			49			49

\* Significance p<5%, \*\* Significance p<1%

**Figure 1: International entrepreneurial behaviour in a high-risk and uncertain environment**







**Figure 2: Comparison between the most attractive and the least attractive SMEs vis-à-vis the manager/entrepreneur level of higher education**

## Appendix A

**Table A1. Selected previous studies investigating (directly or indirectly) the impact of educational background (training) on performance**

Educational background (academic training) of managers/entrepreneurs	a. Direct or indirect positive association	Anh et al. (2006); Auh and Menguc (2009); Brownell (2006); Cheng et al. (2010); Garcia-Aracil and de Lucio (2008); Hsu (2007); Jiang and Murphy (2007); Robinson and Sexton (1994); Schmelter et al. (2010); Wang et al. (2010); Fiss (2006);
	b. Conditional / Inconclusive	Beal and Yasai-Ardekani (2000); Burt et al. (2000); Traynor and Traynor (1992); Capelleras et al. (2010); Patzelt et al. (2009);
	c. Direct or indirect negative association	Dimov and Shepherd (2005); Lee and Tsang (2001); Wright et al. (2008); Wu and Wu (2008)

Notes:

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<sup>i</sup> The terms ‘manager’ and ‘entrepreneur’ are used in this study interchangeably, for reasons that are clarified in the empirical part of the study.

<sup>ii</sup> BRICS countries refer to Brazil, Russian Federation, India, China and South Africa; UNCTAD. (2015), "*World Investment Report 2015: Reforming International Investment Governance*. New York and Geneva: United Nations."

<sup>iii</sup> See Vaghely and Julien (2010) for a review regarding entrepreneurs’ opportunity identification capability.