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Preface

Before you lies my thesis on the determinants of internationalization of university spin-offs. It has been written to fulfill the graduation requirements of the International Management Master of the Business administration program at the Nijmegen School of Management. I was engaged in conducting research and writing this thesis from February 2018 to August 2018.

Although sometimes tiring, working on this thesis has intellectually challenged me and taught me a great deal about several things in the field of business and more specifically, spin-offs. The research has proven to be extremely difficult, as collecting quantitative data and arranging interviews imposed several challenges. Fortunately, my thesis is now finished and I can move on to the next step in my career.

I would like to thank my supervisor, P. Vaessen, for his support and advice during this process. Another thank you for the respondents that took their time to fill in the online survey. Without you I would not have been able to finish my thesis. I also would like to thank the four interviewed experts for their wisdom and perspectives: Vijay Nadadur, Rob Groenendaal, Dick Bos and Auke Douma.

Another gratitude I would like to express is to my family and friends. It was certainly helpful to bat around my ideas with you and your insights helped to constitute progress. My father in particular, your wise words served me well during the writing of my thesis.

Mark Kroes

Nijmegen, 19 August 2018

1 Introduction

The role of the university in the 21th century is changing swiftly and attracting a growing interest in the commercialization of university knowledge (Hogan & Zhou, 2010). In response, universities use spin-off companies as a mechanism to assist in their teaching and research mission and to enhance local economic development (Shane, 2004). Governments and universities recognize the economic impact of USO's (also called academic spin-offs) and foster academic entrepreneurship through technological and innovation policies (Walter, Auer, & Ritter, 2006), resulting in a significant growth of USO's in the past decade (Franco-Leal, Soetanto, & Camelo-Ordaz, 2016).

USO's are often impeded in their growth potential as they suffer from limited resources, insufficient experience and excessive reliance on university support (Soetanto & Van Geenhuizen, 2015). In spite of their limitations, they seek for opportunities to access international markets at an unusual early stage of their establishment (Bjørnåli & Aspelund, 2012). Internationalization offers significant advantages for USO's due to the nature of their innovativeness (Pettersen & Tobiassen, 2012), globally attractive technologies (Kiederich & Kraus, 2009) and knowledge bases (Moen, 2002). Although internationalization remains the preferred growth strategy for many USO's (Bjørnåli & Aspelund, 2012), research has to current knowledge neglect to investigate the determinants and antecedents of their internationalization (Cumming et al., 2009). Additionally, several suggestions have been made for more systemic assessments of the process of internationalization of USO's (Franco-Leal et al., 2016; Rappert et al., 1999; Teixeira & Coimbra, 2014). Therefore, it seems important to understand what enables USO's to internationalize more.

1.1 Scientific discussion

Although some recent studies have focused on the consequences and antecedents of internationalization for USO's, the line of research is argued to be incipient still, as a result of a limited amount of literature (Franco-Leal et al., 2016; Van Geenhuizen et al., 2015; Suzuki & Okamuro, 2015; Teixeira & Coimbra, 2014). Van Geenhuizen et al. (2015) indicated with their research about European USO's that not being active or being only sporadically active in export is associated with missing a wider set of task-specific internationalization skills. These skills encompass preparing/managing changes, like attraction of financial capital and gaining access to market and knowledge channels abroad (ibid.). Suzuki & Okamuro (2015) assert that having high technological capabilities, receiving financial and physical support of a parental institution and being associated with parent universities with high research standards determine the international orientation of academic startups in Japan. Pettersen & Tobiassen (2012) analyzed three Norwegian USO's in the petroleum cluster and found that pre-founding periods and networks are significant in their internationalization. Franco-Leal et al.

(2016) argue that the internationalization performance of USO's has a relationship with the amount of non-academics in the entrepreneurial team. Bjørnåli & Aspelund, (2012) indicated in their research that international activities of academic spin-offs are influenced by the composition of the top management team and board, the resources contributed by its top management team and board, team member characteristics and the age of the firm. Another study indicated that the early internationalization for USO's is determined by a broad set of variables, in three categories: entrepreneur-specific factors, business-related factors and contextual factors, which impact USO internationalization (Teixeira & Coimbra, 2014). The results of these and other studies contain a significant amount of variation (Hogan & Zhou, 2010), which is caused by a lacking universally accepted definition of the USO concept, resulting in ambiguous results (Pirnay et al., 2002). Although this is not the aim of the current study, the USO concept is hereby defined to provide an understanding of the concept and its elements.

Early researchers had the tendency to adopt a broad view of the USO concept. For example, Rappert et al. (1999, p.874) defined USO's as: "a firm whose products or services develop out of technology-based ideas or scientific/technical know-how generated in a university setting by a member of faculty, staff or student who founded or co-founded with others of the firm. This study uses a more narrow definition of USO's by Pirnay et al. (2002, p.356): "new firms created to exploit commercially some knowledge, technology or research results developed within a university". This includes researchers, entrepreneurs, staff and students, who might use the knowledge gained on their program of study, entrepreneurial training from the university and the university's support service in setting up their companies (Hogan & Zhou, 2010).

1.2 Approach

By taking an explorative approach, the emphasis of the study is to improve the knowledge and understanding of international university spin-off activity by contributing to academic and international entrepreneurship literature. In a more practical sense, the key policy implication of the study is the need to support, at a very early stage, USO's that target internationalization opportunities (Cumming et al., 2009). As they experience significant challenges in accessing knowledge required to identify foreign market opportunities and customers (ibid.). Based on the results of this study, policymakers may be able to develop arrangements that revolve around factors relating to internationalization to help USO's in their international endeavors.

Empirically, the research builds on prior suggestions that more research is needed about a specific type of firm: university spin-offs (Miranda et al., 2017; Styles & Genua, 2008; Teixeira & Coimbra, 2014) in an international context (Kiederich & Kraus, 2009). Theoretically, the study intends to provide a bridging of knowledge between internationalization and USO's, as they seem separated in

current literature (Franco-Leal et al., 2016; Teixeira & Coimbra, 2014). The study explores the effect of three types of determinant factors on USO's and their internationalization as suggestions have been made that USO's possess capabilities that positively relate to internationalization (Pettersen & Tobiassen, 2012). One, entrepreneur-specific factors (e.g., an entrepreneurs previous working experience) positively relate to the international performance of USO's as they provide them with tools to exploit opportunities and facilitate their understanding of market conditions and business processes (D'Este et al., 2012). Two, relating to the internal capabilities of firms, business-specific factors have proven to significantly increase the internationalization of firms. Such factors relate to the competitive advantages of USO's, as a result of the exploitation of knowledge (Testa, 2014) and innovation through the deployment of Research and Development (R&D) activities (Li et al., 2012). Three, USO's are heavily influenced by their context (Walter et al., 2006) and rely on support mechanisms for funding and international networks (Teixeira & Coimbra, 2014). Context-specific factors relate to the environment of an USO and influence the sharing of resources and the development of knowledge which have been proved to positively relate to the international performance of firms (Diez-Vial & Montoro-Sanchez, 2017).

In that regard, the aim of the study is to identify and analyze what determines the internationalization of USO's. The central question is: *what and how do factors determine the internationalization of USO's?* Three sub questions have been derived that reflect the three types of factors discussed before: *(1) how do entrepreneur-specific factors affect the internationalization of university spin-offs?, (2) how do business-specific factors affect the internationalization of university spin-offs? and (3) how do context-specific factors affect the internationalization of university spin-offs?* In order to answer these questions, a quantitative multivariate regression analysis has been conducted, supplemented with a qualitative analysis. The following research process was undertaken during the study. The first step was to construct a planning containing tasks, time, progress and a schedule. The second step consisted of the construction of a theoretical framework, followed by the assessment and justification of an appropriate quantitative analysis method in line with existing studies on the determinants of the internationalization of firms (e.g., Kuivalainen et al., 2012; Saarenketo et al., 2004) and USO's (e.g., Bjørnåli & Aspelund, 2012; Van Geenhuizen et al., 2015; Teixeira & Coimbra, 2014). The assessment and justification of an appropriate qualitative analysis followed afterwards. Then, the collection and analysis of both quantitative and qualitative data. The final phase consisted of writing a conclusion based on the primary results along with research limitations and implications.

Furthermore, the study focuses on a sample taken from a population of 567 Dutch and Belgian USO's, associated with organizations that support academic entrepreneurship in Belgium and The Netherlands. The information required to analyze the internationalization of these USO's was

gathered from their entrepreneurs through an online questionnaire. The respondents totaled 70 USO's, of which 42 had international sales. The qualitative analysis consisted of four in-depth interviews with four experts in the field in order to examine how and why certain factors determine the internationalization of USO's.

The remaining parts are structured as follows. Section two provides an extensive review of the relevant literature relating to the subject. The method section thereafter describes the multi-variation technique and qualitative analysis used in this research. This section also explains the data gathering, operationalization of concepts and research ethics. Section four presents the empirical results of the quantitative and qualitative analysis. Section five contains the conclusion and discussion of the results including limitations, managerial and policy implications and suggestions for future research.

2 Theoretical framework

This section discusses the relevant literature on the internationalization of academic spin-offs. The first part contains the conceptualization of internationalization. Thereafter are the propositions related to the concept of USO internationalization in which certain factors are expected to increase the internationalization of USO's. Such propositions need to be in line with academic and international entrepreneurship literature (Musteen et al., 2010; Suarez-Ortega & Alamo-Vera, 2005; Teixeira & Coimbra, 2014) and are a result of the review of existing literature on three types of determinant factors of internationalization; entrepreneur-specific factors, business-specific factors and context-specific factors. The second part of this section is ordered according to this categorization. The section is concluded with a conceptual model.

2.1 The internationalization of university spin-offs

The process of internationalization is to be seen as a firm extending its business operations abroad with a cross-border geographic expansion (Teixeira & Coimbra, 2014). It is argued to be one of the most important strategic decisions firms need to make in their pursuit of growth and performance (Lu & Beamish, 2001; Zhou, 2018). Internationalization or international entrepreneurship is defined as "a combination of innovative, proactive, and risk-seeking behavior that crosses national borders and is intended to create value in organizations" (McDougal & Oviatt, 2000, p. 903).The concept consists of three dimentions: extent (the commitment through the level of resources available), speed (length of time that elapsed between the year the venture was created and the year of its first foreign sales) and scope (number of countries other than country of origin in which the venture generetated sales) (Zahra & George, 2002). The extent dimension indicates a level of commitment based on the level of resources available and therefore takes a resource-based view of USO's. The resource-based view takes a perspective in that resources endowned by a firm can increase its performance (Wernerfelt, 1984). With regard to USO's, certain factors (e.g. technological capabilities) as resources can be exploited to increase the international sales (performance). Thus, the proposed study takes a resource-based view of USO's by focusing on the extent dimension of internationalization.

2.2 Determinants of internationalization

Prior research has shown that internationalization is positively related to a firm's growth and performance (Lu & Beamish, 2001; Bjørnåli & Aspelund, 2012) and found that some factors related to its entrepreneurs and their network, (Van Geenhuizen et al., 2015; Franco-Leal et al., 2016; Bjørnåli & Aspelund, 2012; Teixeira & Coimbra, 2014), internal capabilities (Suzuki & Okamuro, 2015; Bjørnåli & Aspelund, 2012; Musteen et al., 2010), and context (Huynh et al., 2017) impact on a USO's internationalization. By analyzing 144 Italian Small and Medium Enterprises (SME's), Zuchella et al.

(2007) empirically analyzed drivers for early internationalization and categorized them into entrepreneur-specific factors, business-specific factors and context-specific factors. Other studies have used similar categorizations to identify factors relating to the internationalization of firms (Cumming et al., 2009), (Kuivalainen et al., 2012). Teixeira & Coimbra (2014 analyzed the effect of determinants on the speed of internationalization of USO's by acknowledging this categorization. Miranda, Chamorro & Rubio (2017) conducted a literature review on 268 USO-related studies and classified the content into individual-related, firm-related and context-related. To further elaborate on the determinants of internationalization for academic spin-offs the distinction between entrepreneur-specific, business-specific and context-specific factors seems appropriate.

2.2.1 Entrepreneur-specific factors

Entrepreneur-specific factors take a human-centric approach and relate to the entrepreneurs of USO's (Miranda et al., 2017). Certain characteristics such as experience of the entrepreneur can be exploited by a firm and used in international activities. Their characteristics, skills and competences are human capital of an USO and may be used as a resource to exploit international opportunities. Apart from his individual capabilities, an entrepreneur also possesses a network with valuable links that can be used as an resource. An entrepreneurs' network is therefore social capital of an USO. Social capital relates to the embedded resources of a firm, derived from the relationships in the network of individuals (Nahapiet & Ghoshal, 1996). Both human and social capital seem to constitute important factors for the internationalization of USO's. This section addresses these factors and their relationship with internationalization by first discussing human capital, including international experience, prior working experience and knowledge of foreign language. Followed by social capital and its three dimensions: relational embeddedness, cognitive embeddedness and structural embeddedness.

Human capital

In general, the human capital of an enterprise is argued to be an adequate explanation of the international performance of firms (Kuivalainen et al., 2012; Westhead et al., 2001). This is because of the human capacity to exploit and learn from past experiences (Zuchella et al., 2007). The main competitive advantage for USO's is derived from the exploitation of technologies (Pettersen & Tobiassen, 2012). This requires the human capacity to effectively integrate technology components into the business strategy and properly translate the competitive advantage into profitability (Visintin & Pittino, 2014).

Experienced entrepreneurs tend to have well-developed learning processes as a result of being exposed to different situations in multiple international contexts. Their international experience can be used as a substitute for firm-level experience to reduce the liability of foreignness (Efrat & Shoham, 2012). Knight and Cavusgil (2004) found by analyzing 203 firms in Europe that international

entrepreneurial orientation as a result of international experience leads to superior performance in international markets, By quantitatively analyzing 109 Norwegian academic spin-offs, Bjørnåli & Aspelund (2012) show that prior foreign experience of entrepreneurs in USO's was associated with more international involvement. Typically, academic spin-offs are not founded by internationally experienced entrepreneurs, but instead by scientists with high levels of technical expertise coming from local universities, laboratories or subsidiaries (Kiederich & Kraus, 2009). However, through internships, partnerships, congresses, personal life and education, founders may have prior international experience that positively relate to international activities, Zuchella et al. (2007) found by examining 144 Italian SME's. Thus, the internationalization of USO's is to some extent related to the international experience of its entrepreneurs (Franco-Leal, Soetanto & Camelo-Ordaz, 2016). The concept of International experience is defined as "knowledge of, and involvement in, foreign operations" (Li, Qian & Qian, 2012, p. 543). Concerning these suggestions, the international experience is expected to influence the internationalization of USO's.

P1. USO's of which the entrepreneur has more international experience internationalize more.

The prior working experience of entrepreneurs has been acknowledged by researchers to be of importance when analyzing the internationalization of USO's (Van Geenhuizen et al., 2015; Visintin & Pittino, 2014). Prior working experience leads to better evaluation of business opportunities as Kiederich & Kraus (2009) propose in their meta-analysis. It leads to a higher motivation to internationalize, Teixeira & Coimbra (2014) found by analyzing 111 Portuguese academic spin-offs, and can compensate for lacking initial organizational experience, as asserted by Efrat & Shoham (2012) who analyzed 107 Israeli firms. Inexperienced founders and managers in high-technology contexts tend to have more impulsive decision-making and a lower degree of risk aversion (Li et al., 2012), causing a significant amount of firms failing to survive in international markets. Through a quantitative analysis of 103 Italy based USOs, Visintin & Pittino found that individuals with previous entrepreneurial experiences enhance the success of USO's (Visintin & Pittino, 2014). Furthermore, Franco-Leal et al. (2016) found that surrogate entrepreneurs (non-academics) are argued to be critical in the survival of USO's in domestic and international markets, by analyzing 126 Spanish academic spin-offs. This is primarily due that these entrepreneurs stimulate the initial development of the firm, acquirement of resources, securement of enduring financial returns and investments of existing or new investors (Visintin & Pittino, 2014). Apart from scientific experience, commercial experience is also critical for USO growth and the utilization of international capabilities (Pettersen & Tobiassen, 2012). Experience in a multinational firm, commercial firm, similar or different industries is therefore expected to positively relate to the internationalization of USO's (Zuchella et al., 2007). In conclusion,

USO's of which the entrepreneur has more prior working experience are proposed to internationalize more.

P2. USO's of which the entrepreneur has more prior working experience internationalize more.

A significant amount of possibilities arise when entrepreneurs of USO's are able to properly communicate with cross-border business contacts (Zuchella et al., 2007). To communicate, entrepreneurs have knowledge of foreign languages, which is argued by Zuchella et al. (2007) to be the most significant factor for internationalization. Knowledge of foreign languages relates to the communicative capabilities of entrepreneurs and it is suggested to positively influence the internationalization of firms, Abby & Slater (1989) and Clarke (2000) found by a meta-analysis of 55 studies and a quantitative study of 205 Irish based firms. Because of the capability of the entrepreneur to develop an international mindset, the ability to understand foreign languages is a pre-requisite for firms who want to increase international sales (ibid). Furthermore, research has shown that foreign language skills positively influence the exporting of firms since it improves the ability of employees to negotiate contracts and technical specifications (Clarke, 2000). Due to the latter and the high-tech characteristic of USO's, the knowledge of foreign languages of founders is expected to positively influence the internationalization of academic spin-offs.

P3. USO's of which the entrepreneur has more knowledge of foreign languages internationalize more.

Social capital

Well-established links with their industry's network is argued to be a valuable asset for USO's, since it provides a variety of resources (ideas, market information, problem solving, social support and financial resources), Huynh et al. (2017) argue through a quantitative analysis of 126 Spanish university-spinoffs. Hayter (2013) analyzed 117 American USO-entrepreneurs and found that relationships of USO's increase a firm's ability to exploit new opportunities, sell new products or services in existing markets, or enter new international markets. Musteen et al. (2010) found similar results through the analysis of 155 Czech SME's. Through a case-study, Styles & Genua (2008) analyzed four Australian academic spin-offs and provided empirical evidence that USO's have competitive advantages in terms of technology that allows them to easily enter international markets. However as Zhang et al. (2014) argue through a quantitative analysis of 117 Chinese SME's, the extent to which the possession of such advantages results in internationalization is likely contingent upon the ability to overcome resource constraints through their social networks. These networks are necessary for USO's to take advantage of available resource endowments which increase their legitimacy, broaden existing networks and strengthen social capital (Huynh, Patton, Arias-Aranda, & Molina-Férnadez, 2017; Pettersen & Tobiassen, 2012). Drawing on social capital theory and international

entrepreneurship theory, Musteen et al.(2010) analyzed the effect of international networks on the performance of Czech SME's and found that personal ties, language congruency and geographically disperse networks increase internationalization. All these linkages and relationships are considered resources of a firm in the form of social capital. Social capital is "the sum of the actual and potential resources embedded within, available through, and derived from network relationships possessed by an individual or social unit" (Nahapiet & Ghoshal, 1996, p. 243). While no consensus exists on the precise conceptualization of social capital (Musteen et al., 2010), it is composed of three dimensions: relational, cognitive and structural embeddedness (Nahapiet & Ghoshal, 1996).

Relational embeddedness refers to the kind of personal relationships people have developed with each other through a history of interactions (Nahapiet & Ghoshal, 1996), and is characterized by emotional closeness and inter-personal trust (Musteen, Francis & Datta, 2010).The relational embeddedness of firms in its network induces actors to share knowledge without the risk of opportunistic behavior (ibid). Agndal et al. (2008) studied 24 Swedish and New-Zealand SME's and provided empirical evidence that relational embeddedness of a firm is measured by the quantity and quality of its personal ties with actors in its network. A firm will draw on its personal ties for financial funds, social support and market information (Huynh et al., 2017), and to establish legitimacy (Zuchella et al., 2007). Such resources are imperative for internationalization and literature suggests that USO's are more likely to internationalize through the exploitation of network resources by being relationally embedded (Zhang et al., 2014). In conclusion, the following proposition represents this argumentation.

P4. USO's of which the entrepreneur is more relationally embedded internationalize more.

Cognitive embeddedness refers to those resources that provide shared meanings or values, which embody the collective goals, common representations, visions, interpretations, systems of meaning and aspirations of members in a social structure (Nahapiet & Ghoshal, 1996; Pinho, 2016). Pinho (2016) analyzed relational, cognitive and structural embeddedness and the relationship with export performance by examining Portuguese SME's. The concept of cognitive embeddedness is expressed in shared language and story-telling and embraces personal intangible skills and competences embedded in organizations or networks (Musteen et al., 2010; Pinho, 2016). By internationalizing, exporters and intermediaries commit to a relationship with other actors in their network, which increase their tendency to develop shared meanings, a common language and a synchronized vision (Nahapiet & Ghoshal, 1996). This sets the condition for the exchange of information and knowledge, in turn enhancing the efficiency of communication between stakeholders (Pinho, 2016). Therefore, by exploiting certain resources and support from partners in their network, USO's are more likely to pursue an international strategy, primarily through the network of the different stakeholders in the

entrepreneurial team (Bjørnåli & Aspelund, 2012). Consequently, internationalization offers the potential to expand existing networks, which improves performance, survival and growth (Efrat & Shoham, 2012). Cognitive embeddedness influences the extent of success firms have in exploiting early internationalization opportunities (Musteen, Francis & Datta, 2010), through language commonality, cross-cultural communication, learning about foreign markets and minimizing the likelihood of misunderstanding (ibid). USO's heavily rely on (international) networks for their establishment and performance (Huynh et al., 2017; Pettersen & Tobiassen, 2012), and may have already established international ties through previous (scientific) work experience. In conclusion, the cognitive embeddedness of USO's is expected to have a positive relationship with internationalization.

P5. USO's of which the entrepreneur is more cognitively embedded internationalize more.

As opposed to cognitive embeddedness, structural embeddedness describes the overall architecture and configuration of networks (Musteen et al., 2010). Moreover, it relates to the 'actor bonds' in terms of trust, trustworthiness, norms, sanctions, obligations, expectation, identity and identification (Nahapiet & Ghoshal, 1996). It refers to the properties of the social structures of firms, the network of relationships as a whole and the location of actors in this network (i.e. who you reach and how you reach them) (Pinho, 2016). This is useful to mobilize resources and exchange information, which is particularly relevant for USO's who do not own competitive valuable resources to reap the multiple benefits and advantages of being present in international markets. As USO's rely on their networks for social support, financial funds and other resources (Bjørnåli & Aspelund, 2012; Huynh, et al., 2017; Teixeira & Coimbra, 2014), it is expected that by being structurally embedded through strong structural interactions between USO's and their network would foster their resource bases and consequently increase internationalization.

P6. USO's of which the entrepreneur is more structurally embedded internationalize more.

2.2.2 Business-specific factors

Internationalization has previously been linked to the internal capabilities of firms (Knight & Cavusgil, 2004), which relate to their business activities (Kuivalainen et al., 2012; Suarez-Ortega & Alamo-Vera, 2005). Where entrepreneur-specific factors take a human-centric approach, business-specific factors take a firm-centric approach (Cumming et al., 2009; Hayter, 2013). Technological capabilities, size and export strategy are three business-specific factors that may constitute important drivers for the internationalization of USO's. This section addresses these factors respectively.

USO's are composed of knowledge-intensive operations, as Van Geenhuizen et al. (2015) state in their research on 85 academic spin-offs in various European countries. They operate in highly dynamic environments and are defined by their actions and capabilities, rather than their tangible

assets (Efrat & Shoham, 2012). As an intangible asset, knowledge is the key factor for these firms to thrive in international markets (Oviatt & McDougal, 1994). Knowledge also stimulates technological innovation, as argued by Moen (2002) in a quantitative study on 335 Norwegian and 70 French firms. The extent to which the production process of a firm involves specialized and unique knowledge depends on the deployment and advancement of research and development activities (Teixeira & Coimbra, 2014). This extent is called the knowledge intensity of a firm and considered a fundamental antecedent for internationalization, Testa (2014) argues in her qualitative case study of 6 Italian SME's. The deployment of unique and specialized knowledge drive the technological know-how of USO's, resembled in their technological capabilities. Technological capabilities refer to the dynamic resources of firms and encompass the skills, knowledge and routines involved in generating and managing technological change, whether they concern production activities or investment activities (Gulrajani, 2006). In that sense, USO's which possess better technological capabilities seem to have more potential to foster their innovation and growth potential through internationalization. According to these considerations, USO's with significant technological capabilities are proposed to internationalize more than others.

H7: USO's with more R&D/technological capabilities internationalize more.

The stage model of internationalization is one of the most broadly applied models for internationalization of smaller and larger firms and characterizes internationalization as "an incremental and linear process during which firms progress from limited exploration of international markets through various stages of increasing commitment as they learn and gather resources (Kuivalainen et al., 2012, p. 448). However, this model does not take typical USO's characteristics into account such as short product-life cycles and smaller firm sizes (Li et al., 2012). Both characteristics are argued to be advantages associated with nimbleness and flexibility, providing significant advantages for USO's when targeting global niche markets (ibid). By analyzing 278 US high-tech SME's, Li et al. (2012) found that smaller firms tend to internationalize more. Through an analysis of 286 Spanish SME's, Suarez-Ortega & Alamo-Vera (2005) found that the smaller the size of a firm, the more frequently it associates itself with international activities. Zhou (2018) argues through the analysis of 535 Chinese SME's that smaller firms are more concerned with their international development process. Additionally, Moen (2002) found that smaller exporting firms had a stronger competitive edge in global markets in terms of technology and products. Both Li et al. (2012) and Teixeira & Coimbra (2014) argue that a small firm size is a double edge sword, limiting resources but increasing flexibility and agility. Smaller firms have simpler organizational structures which encourages rapid communication. Which in turn facilitates a firm's ability to internationalize effectively and react efficiently to markets and technological changes. This is argued by Pla-Barber & Escribá-Esteve (2006)

through a cluster analysis and logit regression analysis of a sample of 271 Spanish exporting SME's. Following these considerations, it is expected that smaller USO's internationalize more.

P8. Smaller USO's internationalize more.

International USO's often adopt a strategic international orientation with an export strategy that aims at niche markets to ultimately reach a global market scale(Styles & Genua, 2008; Efrat & Shoham, 2012). Niche markets seem to provide the most potential for USO's as they generally produce highly specialized products that are most attractive in specific niche markets (Teixeira & Coimbra, 2014). The relationship between export strategy and internationalization has been empirically proven to be significant by Cavusgil & Zou (1994) in a qualitative study of 202 export ventures in the US. Export strategy reflects the aspects of the conventional marketing plan of firms, including production, promoting, pricing and distribution (Cavusgil & Zou, 1994). It can be defined as "the manner by which a firm responds to the interplay of internal and external forces to meet the objectives of the export venture" (Cavusgil & Zou, 1994, p. 4). In that sense, the export strategy targeting niche markets is expected to positively relate to the internationalization of USO's.

P9. USO's with a global niche-targeting export strategy internationalize more.

2.2.3 Context-specific factors

Context-specific factors relate to the environment of a firm and is embodied in their external capabilities (Zuchella et al., 2007), which cannot be controlled by the firm (Moen, 2002). By drawing on a data-sample of 149 academic spin-offs, Walter et al. (2006) argue that the performance of USO's is heavily influenced by its context. Certain stakeholders in their environment are argued to be of tremendous worth for USO's, O'Shea et al. (2008) state in their conceptual development paper. In particular, support mechanisms such as incubators or science parks spur USO development by establishing localized instruments for shared resources and knowledge development. These initiatives take part in the form of Technology Transfer Offices (TTO's) and Diez-Vial & Montoro-Sanchez (2017) suggest in their analysis of 318 citing documents that such offices stimulate international progress as well. Sectors and industries have a differential impact on internationally expanding firms, since each firm experiences different barriers and challenges (Madsen, 2013). Through the analysis of a dataset of 900 Danish firms, Madsen analyzed the effect of industry on the internationalization of firms and found that firms in the sectors chemicals, metal and machinery tend to internationalize more. Following these argumentations, support mechanisms and industry seem to impact the internationalization of USO's and this section addresses these factors in that order.

Generally, collaborations with support mechanisms such as incubators and TTO's help USO's to effectively commercialize academic research, but research emphasizing the value of these

mechanisms has been scarce (Colombo et al., 2010; Mustar et al., 2008). Support mechanisms can enhance the awareness of spin-off creation and activity and create opportunities for spin-offs to form new connections (Huynh et al., 2017). Possessing an international network has been argued to increase an USO's international performance (Van Geenhuizen et al., 2015) and literature suggests that Science & Support (S&T) structures are factors which facilitate bridges between USO's and international actors (Diez-Vial & Montoro-Sanchez, 2017). S&T structures are noteworthy instruments for USO's since they provide funds, resources and networks which USO's generally lack (Bjørnåli & Aspelund, 2012). As USO's operate in high-tech markets associated with competitive dynamics, short product-life cycles and ever-changing client demands, they need to stimulate their learning processes (Teixeira & Coimbra, 2014). S&T structures and infrastructures accelerate such processes to ultimately increase the pace and intensity of internationalization, Müller (2010) analyzed in an empirical analysis of 20,000 German knowledge-intensive startups. Teixeira & Coimbra (2014) found that only a small portion of USO's turn to S&T structures for support, however the significance in accessing resources and protecting intellectual property rights because of S&T structures is undeniable. Following these arguments, it is expected that USO's associated with S&T structures have a greater extent of internationalizing.

P10. USO's that rely on support mechanisms from their associated universities internationalize more.

The relationship between industry and internationalization has been empirically proven by Zuchella & Siano (2014) in a quantitative analysis of 103 Italian SME's. Its influence is primarily due to the fact that different firms face different competitive challenges, thus demanding distinct perspectives and strategies (Teixeira & Coimbra, 2014). An important notion is that an excessive focus on industrial needs by academic spin-offs may negatively influence their growth. This is due that commitment can reduce the knowledge available for absorption by USO's to exploit it (Pettersen & Tobiassen, 2012). Müller (2010) indicated that sectoral differences among USO's influence their performance. Furthermore, Li et al. (2012) found that early international performance is related to industry characteristics, as bio and semiconductor firms performed better than firms in other industries. Madsen (2013) argues that differences in characteristics cause firms to perform differently in international markets as a result of being active in different sectors. Following these argumentations, it is proposed that the industry in which a USO operates influences the internationalization of USO's and that some of the USO's tend to internationalize more.

P11. The industry in which a USO operates influences the internationalization of USO's.

2.3 Conceptual model

Figure 2.1 visually shows the abovementioned reasoning and propositions. Since the current study focuses on the determinants of internationalization of USO's, all factors positively relate to the dependent variable internationalization. This is because of the emphasis on which factors are relevant in explaining internationalization for these type of firms. Such a reasoning is in line with international entrepreneurship research, as argued by Texeira & Coimbra (2014) and Zahra & George (2002). Apart from size, all factors are proposed to positively relate to the internationalization of USO's. Size has a negative relationship with internationalization as it has been expected that the smaller a USO, the larger the internationalization.

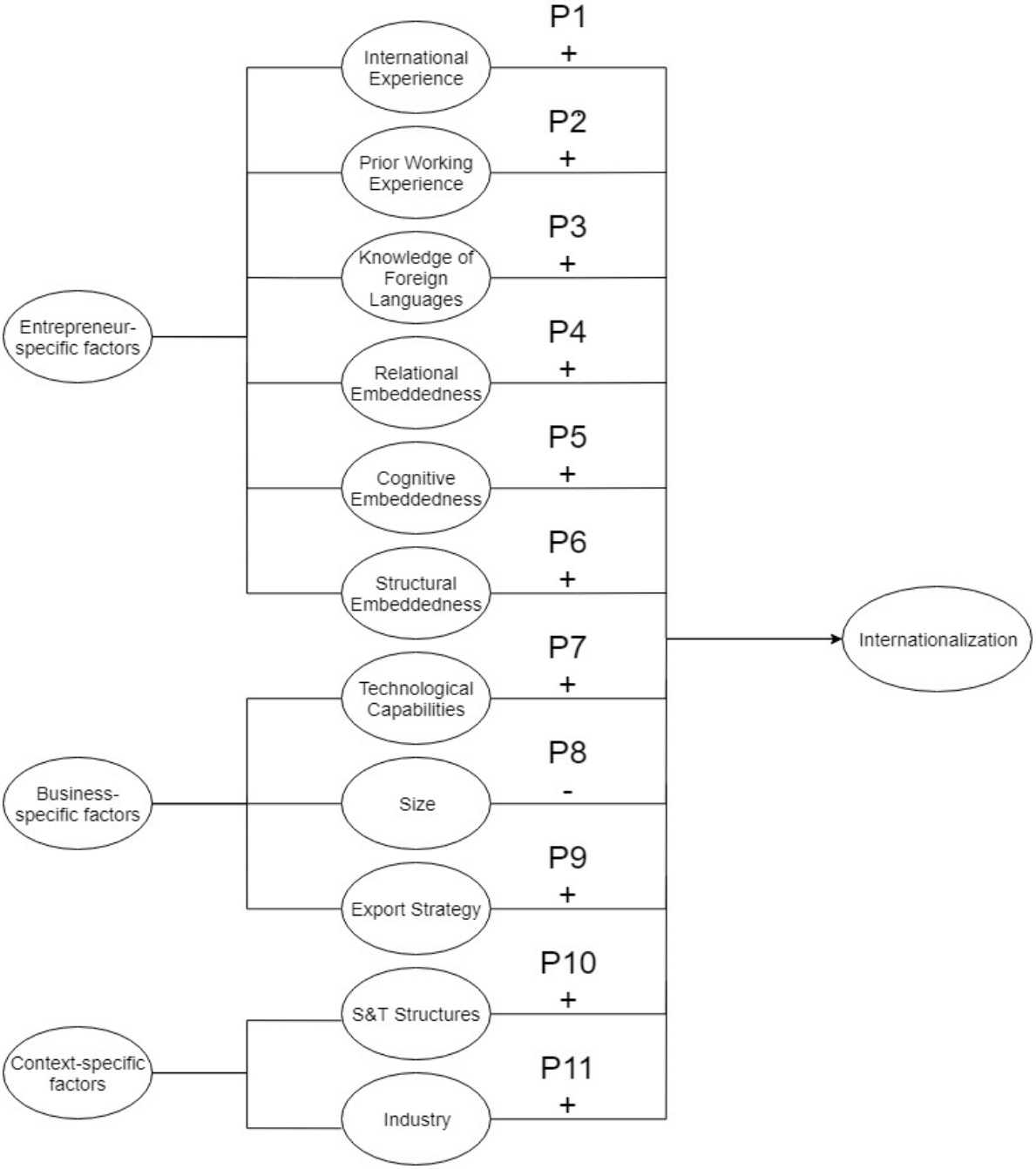

Figure 2.1: conceptual model.

3 Method

This section clarifies and explains the employed quantitative and qualitative analyses. The research design of the quantitative analysis is first elaborated, including the operationalization of the dependent and independent variables and an elucidation on the data sample. Then, the qualitative analysis research design is explained, including the data collection and analysis process and the used measurements and sample. The third paragraph clarifies the safeguarding of the measurements. The section ends with a discussion of the research ethics.

3.1 Research design quantitative analysis

The internationalization in this research has been proxied by the international sales of USO's. The consideration of this proxy implies the use of a distinct estimation method called Ordinary Least Squares (OLS) (Gourlay & Seaton, 2003; Teixeira & Coimbra, 2014). OLS constitutes a method of measurement for the calculation of parameters from a set of equations resulting in an empirical model of which conclusions can be drawn (Balzer & Haendler, 1989). OLS is primarily useful when prior theoretical assumptions need to be tested and a significant amount of independent variables need to be included in the analysis (Dismuke & Lindrooth, 2006). Additionally it is best applied when an analysis has to meet a substantial amount of assumptions (Best, 2014) and when the explained phenomenon is linear and continuous (Baltagi, 1989). Several other studies concerning the internationalization of firms and USO's have used OLS estimation techniques for either their hypothesis or proposition testing (Bjørnåli & Aspelund, 2012; Geenhuizen, van, Ye, & Oliviera, 2015; Suzuki & Okamuro, 2015; Teixeira & Coimbra, 2014).

A questionnaire has been derived based on existing studies (Gourlay & Seaton, 2003; (Musteen, Francis, & Datta, 2010; Pinho, 2016; Teixeira & Coimbra, 2014; Zuche lla, Palamara, & Denicolai, 2007). Following procedures of these studies, the designed and implemented questionnaire targeted a portion of USO's located in several cities in The Netherlands and Belgium, such as Eindhoven, Nijmegen, Delft, Antwerp and Leuven. The questionnaire was composed of five parts: (1) general description of the firm, questions relating to the (2) entrepreneur (working experience, foreign languages and network), (3) business (R&D, size and export strategy), (4) environment (support mechanisms and industry) and (5) international and total sales. The following equation represents the specification of the propositions and their multivariate relationship with internationalization:

Internationalization = β1 + β2international experience.i + β3prior working experience.i + β4knowledge of foreign languages.i + β5relational embeddedness.i + β6cognitive embeddedness.i + β7structural

embeddedness.i + β8technological capabilities.i + β9size.i + β10export strategy.i + β11support mechanisms.i + β12industry.i + *e.i*

Where i represent each USO and *e* is the sample error term.

3.1.1 Measures

The conceptual model shown as discussed in 2.3 consists of 1 dependent variables and 11 propositions. How these have been measured is addressed now.

Dependent variable

As conceptualized by Zahra & George (2002), internationalization consists of the three dimensions: extent, speed and scope (see paragraph 2.1). The present study assumes a one-dimensional approach by focusing on the extent dimension with discarding both speed and scope as irrelevant variables.

The extent dimension of internationalization has been measured by various studies as the amount of firm's sales generated from foreign markets (Van Geenhuizen, Ye & Oliviera, 2015; Franco-Leal, Soetanto & Camelo-Ordaz, 2016; Teixeira & Coimbra, 2014). Internationalization has been measured in this study as the proportion of sales that an USO has done outside of their country's borders (McDougall & Oviatt, 1996). The argumentation for this variable is its relationship with the intensity of total sales and foreign market knowledge, (Boehe, Qian & Peng, 2016), a significant resource for internationalization of knowledge-intensive USO's (Bjørnåli & Aspelund, 2012). Moreover, it has been related to the growth for internationally active firms (Morgan-Thomas & Jones, 2009). Table 3.1 displays the operationalization of the dependent variable. International sales is therefore the proxy of internationalization in the data analysis process.

Table 3.1

Operationalization of dependent variable

Variable	*Item*	*Operationalization /Proxy*	*Questions*
Internationalization	International Sales	International Sales	What is your average annual amount of international sales in €?

Independent variables

Table 3.2 shows the independent variables used in this research, their corresponding items, operationalization/proxies and survey questions.

Table 3.2:

Operationalization of dependent variables

Entrepreneur-specific factors	*Items*	*Operationalization /Proxies*	*Questions*
International experience	International experience (internships, business travels, congresses, etc.)	0 – no; 1 – yes	Do you have any international experience (internships, business travels, congresses, etc.)
	International experience (personal life, travels, contacts)	0 – no; 1 - yes	Do you have any international experience (personal life, travels, contacts, etc.)
	International experience (education)	0 – no; 1 - yes	Do you have any international experience as a result of your education?
Prior working experience	Previous working experience general	0 – no; 1 – yes	Do you have any previous working experience?
	Multinational firm	0 – no; 1 – yes	Do you have any previous working experience in a multinational firm?
	Commercial firm	0 – no; 1 – yes	Do you have any previous working experience in a commercial firm?
	Same industry	0 – no; 1 – yes	Do you have any previous working experience in the same industry as your company?
	Similar industry	0 – no; 1 – yes	Do you have any previous working experience in a similar industry as your company?
	Different industry	0 – no; 1 – yes	Do you have any previous working experience in a different industry as your company?
Knowledge of foreign languages	Knowledge of at least one foreign language	0 – no; 1 – yes	Are you proficient in at least one foreign language (i.e. other than your native one)?
	Knowledge of English	0 – no; 1 – yes	Are you proficient in English?
		0 – no; 1 - yes	Are you proficient in more than two languages?

	Knowledge of two or more languages		
Relational embeddedness	Personal ties	The total number of professional contacts (i.e., customers, suppliers, export agents, or other industry-related contacts) of founder. (1 - low …5 – high) (Dummy, 1: if considered a high amount (4 or 5); 0: otherwise.	Can you assign how much professional contacts (i.e., customers, suppliers, export agents, or other industry-related contacts) you have?
		The total number of personal contacts (i.e., friends and relatives and other non-industry-related contacts) of founder. (1 - low …5 – high) (Dummy, 1: if considered a high amount (4 or 5); 0: otherwise.	Can you assign how much personal contacts (i.e., friends and relatives and other non-industry-related contacts) you have?
Cognitive embeddedness	Common language with network	0 – no; 1 – yes	How many foreign languages do you share with your professional network (i.e., customers, suppliers, export agents, or other industry-related contacts)?
	Common vision with network	0 – no; 1 – yes	Would you argue that you have a common vision with your professional network (i.e., customers, suppliers, export agents, or other industry-related contacts)?
	Common values with network	0 – no; 1 – yes	Would you argue that you have common values with your professional network (i.e., customers, suppliers, export agents, or other industry-related contacts)?
Structural embeddedness	Frequency of interaction	Frequency of interactions (1 - low …5 – high) (Dummy, 1: if considered a high frequency (4 or 5); 0: otherwise.	Please assign the frequency of interactions you have with your network.
Business-specific factors			
R&D/Technological capabilities	Average annual expenditure on R&D as a ratio of Total Sales	(1 - R&D/SALES)	What is your average annual expenditure on Research & Development in €?

Firm Size	Number of employees plus founders in terms of FTE (in ln)	Number of employees plus founders in terms of FTE	What is the number of employees (including founders) in terms of FTE?
Export strategy	Focalized niche strategy	0 – Non-niche strategy 1 – Niche-strategy	Does your firm target non-niche markets or niche markets?
Context-specific factors			
Support mechanisms	Assigning importance to Support mechanisms	Importance of S&T and incubators. Likert scale (1 - low importance …5 – high) (Dummy, 1: if considered highly important (4 or 5) to support mechanisms; 0: otherwise.	Please assign your importance to support mechanisms associated with your firm (e.g. incubators, Science & Technology structures and infrastructures, etc.) 1 – low importance … 5 – high importance.
Industry	Industry	Dummy variable	In what industry or sector does your firm operate?

3.1.2 Sample

In his book 'Researching Entrepreneurship' Davidsson (2004) argues that researchers are recommended to obtain data from a sample of cases that are theoretically relevant, reflect the critical unit of analysis, reflect relevant variances in phenomenon characteristics and realistic from a practical viewpoint. The database of the present study contains a population of academic spin-offs of diverse institutions from multiple regions in The Netherlands and Belgium. The sample is represented by various academic spin-off firms and consist of a substantial degree of variance, including different forms of entrepreneurial characteristics and networks, different stages of development and technology in terms of size and capabilities, ranging in industries and university contexts.

3.2 Research design qualitative analysis

The aim of the qualitative analysis was to find how and why certain factors determine the internationalization of USO's, as to supplement the outcomes of the results of the quantitative analysis to ultimately come to an integrative conclusion. Due to the explorative approach of the study, the goal was to shed light on the underlying relationships between variables in the quantitative analysis (Morgan, 2014). Experts have been questioned to share their thoughts on determinant factors for internationalization of USO's. This requires a thorough investigation of the relationships between the previous mentioned type of factors and internationalization. In-depth interviews are regarded best suitable when a number of perspectives and experiences on a particular idea need to be explored

(Boyce & Neale, 2006). Relating to the exploring aim of the current study, in-depth interviews have been conducted with four experts that shared their perspective on the internationalization of USO's.

3.2.1 Data collection

The data was collected by conducting in-depth interviews. Two of the four interviews have been held via Skype (www.skype.com), a computer program which lets people talk with each other over long distances via the internet. These two interviews have been digitally recorded via a program called Amolto call recorder (www.amolto.com). The other two interviews have been held physically and recorded by an analogue recording instrument. The interviews have been held according to an interview guide, which can be seen in table 1 in the appendix. Both the formulation as the order of the questions was predetermined to increase reliability and ensure that all experts get the same questions (Hennink, Hutter, & Bailey, 2011). The interviews have been structured according to six theme's. The first theme regarded the expertise of the interviewee as in to validate the conducted interviews. The second theme concerned a general question about what experts felt was important for the internationalization of USO's. Then in consecutive order: questions regarding entrepreneur-specific factors, business-specific factors and context-specific factors. The interview closed with asking whether the experts felt that any important factors were missing. Any thoughts, perspectives, ideas or comments that were individual-related (e.g. human capital) (Miranda, Chamorro, & Rubio, 2017) were linked to entrepreneur-specific factors. Perspectives relating to the internal capabilities of USO's and took a firm-centric approach (Cumming et al., 2009) were related to business-specific factors. And comments with regard to the environment of USO's were related to the context-specific factors of USO's (Zuchella et al., 2007). The goal of the interviews was to explore the propositions discussed in section 2 and to reflect on the outcomes of the quantitative analysis. Some of the interviews have been guided into the directions of the three type of factors as to clarify some of the predetermined expectations related to the general theme of the study.

3.2.2 Sample

The interviewees had an affiliation with the topic of the research as they work with USO-related entrepreneurs, facilitate USO processes, work at incubators or own a USO themselves. Table 3.3 shows the sample of the participants in the conducted interviews and their expertise. A more detailed description of the participants can be found in the appendix.

Table 3.3

Participants in conducted interviews

Function - Company	*Expertise*
CEO - Stride.ai Inc	Entrepreneur, Computer Scientist, Public Speaker and owner of an USO
Business Coach – Mercator Launch Radboud University	Business Coach USO's
CEO – Startup Nijmegen	Entrepreneur, start-up business coach
CEO and creative strategist - Studio Fint	Creative Strategist, entrepreneur and incubator affiliate.

3.2.3 Measurement

The operationalization of the propositions as discussed in section 2 is shown in table 3.4. To safeguard a systemic process of the data analysis the propositions have been narrowed down into dimensions and codings. The result of this process is shown below.

Table 3.4

Operationalization for the qualitative analysis procedure

Concept	*Dimensions*	*Coding*
Entrepreneur-specific factors	International experience	Internships Education Foreign operations Culture International studies Contexts
	Previous working experience	Learning Decision-making Expectations Knowledge
	Knowledge of foreign languages	Culture Understanding Skills Barriers/obstacles
	Relational embeddedness	Professional ties Personal ties Size and links of network People

	Cognitive embeddedness	Language Values Vision Sharing Synchronization
	Structural embeddedness	Interactions with network Strength of network
Business-specific factors	Technological capabilities	R&D Development Technologies Research Innovation
	Size	Nimbleness Flexibility Speed Agility
	Export strategy	Niche Specialization Orientation Markets
Context-specific factors	Support mechanisms	Incubators Science and Technology parks/structures Institutions Advice International networks Resources
	Industry	High-tech Differences Bio/Pharma/Environment/ Medical

All of the interviews have been completely transcribed, including hesitations and etcetera as to ensure reliability since it provides the option to control the undertaken process (Trumbull, 2005). Three of the four interviews have been held in Dutch and translated in English afterwards. The verbatim transcripts have been added in the appendix. A narrative-design approach has been taken to analyze the transcripts, since the goal of the qualitative analysis was to take an illustrative and explorative approach (Morgan, 2014). A coding scheme has been constructed to analyze the transcripts, based on information from literature. To illustrate the analysis process, an example of the coding scheme has been added in table 2 in the appendix.

3.3 Validity and reliability

Carmines & Zeller (1979) suggest several measures to assess the validity of empirical measures of theoretical concepts employed in social sciences. The most adequate representation of this reasoning is construct validity. Construct validity is: "concerned with the extent to which a particular measure relates to other measures consistent with theoretically derived hypotheses concerning the concepts (or constructs) that are being measured" (Carmines & Zeller, 1979, p. 23). As the current study has a explorative purpose it is in no circumstance to form hypotheses aligned with existing literature. However, since the propositions in section 2 are still woven in theoretical concepts, the validity of the used empirical measure is confirmed. Complementarily, the multivariate regression analysis using OLS has been used in extant research to analyze internationalization (Bjørnåli & Aspelund, 2012; Geenhuizen, van, Ye, & Oliviera, 2015; Suzuki & Okamuro, 2015; Teixeira & Coimbra, 2014). The validity of the interviews has been ensured by verifying the expertise of the interviews through a control question, which had the goal of investigating their affiliations with USO's. Additionally, the underlying theories discussed in section 2 and the explorative purpose of the interviews have been made explicit and guided the selection of the in-depth interviews (Hennink, Hutter, & Bailey, 2011). The outcomes of both the quantitative and qualitative analysis have been compared to theoretical considerations (Golafshani, 2003) to further assess the validity of the concepts discussed in section 2.

Reliability of research is: "the extent to which results are consistent over time and an accurate representation of the total population under study and if the results of a study can be reproduced under a similar methodology" (Golafshani, 2003, p. 3). The reliability of the research has been safeguarded by taking two precautions of quantitative and qualitative research: replicability and repeatability. The reliability of the current study is safeguarded through the possibility to request collected data and the executability of measurement and analyses methods by other researchers.

3.4 Research ethics

No one should be harmed or suffer adverse consequences of the conducted research. In line with the Ethical Principles of Psychologists and Code of Conduct of the American Psychological Association, the research has considered several important issues. To safeguard the research ethics of the present study, three guidelines has been taken into account, based on Cooper & Schindler (2014): explain study benefits, explain participant rights and protections and obtain informed consent. The used survey contained a short description where the study benefits and participant rights and protections were addressed. To obtain informed consent of participants in the survey the introduction has met the following requirements, based on Cooper & Schindler (2014): (1) introduction of the researcher and related institution, (2) brief description of the survey topic, (3) description of target sample, (4) the related research institution, (5) purpose of the research, (6) estimation of the duration to

complete the survey, (7) ensure anonymity and confidentiality, (8) inform of voluntary participation and (9) inform participant of acceptance of item-nonresponse. By incorporating these precautions prior to the data collection process, the research ethics have been taken into consideration. Several precautions have been taken to safeguard the research ethics of the interviews. One, the interviewee was informed of the goal of the study and interview. Second, the rights and protections and the confidentially of the interview was explained. Third, the informed consent was obtained through a control question. The research ethics for the quantitative and qualitative analysis have therefore been ensured by following these procedures.

4 Empirical findings

The following section contains the findings of the multivariate regression analysis on the determinants of internationalization of Dutch and Belgian USO's and the in-depth interviews with experts. The section first discusses the quantitative analysis. The outcomes of the qualitative analysis are added in paragraph 8, however the section addresses the quantitative analysis first. Paragraph 1 elaborates on the analyzed USO's in the data sample. The second paragraph explains the data collection process and the selection of the contacted USO's. The variable construction process of the used items and variables is given in the third paragraph. Paragraph 4 contains the univariate analysis of the dependent and independent variables, followed by an assessment of the correlations and multicollinearity in a bivariate analysis in paragraph 5. The specification of the theoretical multivariate regression model, along with its assumptions, is addressed in paragraph 6. Paragraph 7 consists of the specification and fit of the empirical model. In paragraph 8 the results of the qualitative analysis are integrated with the results of the quantitative analysis as to compare them both to relevant literature. Paragraph 8 ends with a discussion of the goodness of fit of the multivariate regression model. The section finalizes with a post-hoc test to further analyze the outcomes of the analyses.

4.1 Introduction

Table 4.1 shows the location of the USO's in the data sample and the affiliated universities. The majority of them are either located in Nijmegen or Delft, which is a consequence of these universities incubating the largest amount of international USO's (CBS, 2018). University graduates of the Radboud University Nijmegen have the highest tendency of staying in The Netherlands, which relates to a great amount of USO's (ibid.).

4.2 Response

Each of the USO's in the data sample is affiliated with a support structure such as an incubator. The USO's have been found and selected by accessing websites of affiliated support mechanisms or related universities. These websites provided lists of university-related spin-offs and their contact info. As a result, 567 USO's located in The Netherlands and Belgium were contacted by mail for a request to fill in an online survey within a period of 1.5 months. Only 70 answers were obtained from that initial amount of 567 USO's (12.3% response rate). This is probably due to that on the 25th of May, 2018, the Dutch government incorporated the EU data protection law which protects organizations from data leaking (European Commission, 2018). 40 of those 70 responses contained valid answers and have been included in the analysis. 30 of the 40 USO's had international sales and 10 of them had not. 19 of the USO's operated in technological industries or sectors of which 25% in the pharmacy or medical devices industries, 17.5 % in the environment/sustainability/bio industry and 10% of the

USO's were consultancy-related (table 4 in the appendix). The majority of international USO's in The Netherlands operates in the health care industry, according to the Dutch central bureau of statistics, followed by language and culture, education and technology. The lowest amount of international USO's reside in the agriculture and natural environment industry (CBS, 2018), which may be due to the Wageningen University having the lowest amount of international start-ups. However, this is not visible in the statistics of this sample.

Table 4.1:

Distribution of USO's per university

Associated university	*City*	*Country*	*Supporting structure*	*N (%, rounded to one decimal)*
Radboud University	Nijmegen	The Netherlands	Mercator Incubator Nijmegen	6 (15)
Delft University of Technology	Delft	The Netherlands	Yes!Delft	6 (15)
Utrecht University	Utrecht	The Netherlands	Utrecht Holdings	3 (7.5)
Eindhoven University of Technology)	Eindhoven	The Netherlands	STARTUP/ Eindhoven	3 (7.5)
Groningen University	Groningen	The Netherlands	Cube050	1 (2.5)
Leiden University	Leiden	The Netherlands	Centre for Innovation	1 (2.5)
KU Leuven	Leuven	Belgium	KU Leuven Innovation and Incubation Centre	4 (10)
Ghent University	Ghent)	Belgium	Techlane Ghent Science Park	2 (5)
University of Antwerp	Antwerp	Belgium	Science Park University of Antwerp	2 (5)
Anonymous				12 (30)
All				40

4.3 Variable construction

This paragraph discusses the process of which variables and items are incorporated in the multivariate regression analysis. Table 3 in the appendix shows that several items and variables contain a considerate amount of missing values. A Little's test of missing completely at random was computed to check whether the missing values may harm further interpretation. When the results of Little's test are significant, one may draw the conclusion that the missing values of the dataset are indeed harmful. However, this is not the case for the variables listed in table 3 as all missing values are completely at random (p, .195). Table 3.2 and table 4 in the appendix show that the variables international experience, previous working experience, knowledge of foreign languages, relational embeddedness and cognitive embeddedness consist of multiple items. The Cronbach's alpha of these variables were calculated to test whether the items of each corresponding variable may be combined into one variable. Hair et al. (2010) states that combining can be done when items meet a Cronbach's alpha threshold of 0.6. As table 4 shows, this reasoning only applies to the variable of previous working experience (.632). The items of previous working experience have therefore been combined. This is accomplished by summing all values of the five items and then dividing it by the total amount of items, which is five. The items of knowledge of foreign languages could not be combined as a result of a high amount of entrepreneurs speaking one foreign language and English, compared to only 2/3th of entrepreneurs speaking more than two languages. The items of international experience and cognitive embeddedness are too dissimilar to be combined, as resembled by their low value of Cronbach's alpha. The Cronbach's alpha of relational embeddedness is negative due to a negative average covariance among its items. The indication is given that these items are completely separate entities and have therefore been included individually. This resembles the research of Musteen et al. (2010) who analyzed relational embeddedness in the dimensions 'professional contacts' and 'personal contacts'. Several initiatives have been undertaken to improve the Cronbach's alphas of the five variables listed in table 4, however these failed to improve their statistics. Furthermore, the values of relational embeddedness, structural embeddedness and S&T structures have been transformed into 0 (low) and 1 (high), see table 3.2: operationalization. Industry has been dummified into four categories: bio, pharma, consultancy and other. In conclusion, the multivariate analysis consists of one dependent variable and 21 independent variables, as a result of a significant amount of items that could not be combined into individual variables.

4.4 Univariate analysis

Table 3 in the appendix contains a descriptive analysis of the USO's in data sample. The majority of the respondent firms have international sales (75%). 30 of the internationally active USO's are small with a mean of 9.23 persons, including founders in full-time equivalent. The companies differ in size considering the total sales (mean of 803,474.69 €) and international sales (128,625.63 €). The smallest exporter has a total and international sales of < 5000 € (full exporter). The largest USO has a total sales of > 9,000,000 € and international sales of 1,500,000 €. The entrepreneurs of the USO's possess a substantial amount of international experience and a moderate amount of previous working experience. Almost all entrepreneurs have international experience as a result of traveling or internships, as compared to only 72.5% having international experience due to their education. Generally, their previous working experience is a consequence from either working in a commercial firm (65%) and or in a different industry (72.5%). Almost all entrepreneurs speak English and at least one foreign language where 55% speaks more than two. About half of the USO-entrepreneurs are relationally embedded in their network as a result of having professional contacts (52.5%) and personal contacts (50%). With regard to their cognitive embeddedness, 62.5 % speak the same native language with their network, 75% feels they have the same values as their professional network, compared to 85% having the same vision with their professional network. The USO's are moderately structurally embedded since 57.5% frequently interacts with their network. They seem to be moderately R&D-intensive as they on average spent 39.4% of their total sales on research and development, where USO's are typically highly R&D-intensive (Li et al., 2012; Teixeira & Coimbra, 2014). With a small size in terms of founders, they show a internationalization focus on primarily niche-markets (57.5%), as opposed to only 5 USO's with a more broad focus in non-niche markets (12.5%). The USO's are evenly divided considering the importance of support mechanisms for their companies. 47.5% acknowledges that support mechanisms of the university are important and 52.5% considers them less or not important.

Table 4.2 shows the univariate statistics for the dependent and 21 independent variables. Several of the variables listed in the table are exceptionally platykurtic or leptokurtic, meaning their distribution is either peaked when they have positive kurtosis values or flat when they have negative values (Hair et al., 2010). For example, international experience: personal life is extremely leptokurtic due to its kurtosis of 46.000. Apart from their kurtosis, the variables are skewed as well, denoted by their skewness values. Positive skewness indicates a left winged distribution, where a negative value indicates a right winged distribution (Hair et al., 2010). Knowledge of foreign languages: English for example is heavily right winged, which is caused by a compelling amount of entrepreneurs in the data sample that speak English. Both Hair et al. (2010) and Field (2013) assert that in order for variables to be included, both skewness and kurtosis values need to be in the range of |-3| and |3|. As shown by

table 4.2, this is not the case for several variables. Variables may be transformed in order for their statistics to improve, which can be done through the manner of a logarithmic or square root function. Even after transforming, the following variables failed to meet the statistical thresholds of kurtosis and skewness: international experience: internships, international experience: personal life, knowledge of foreign languages: one foreign, knowledge of foreign languages: English, cognitive embeddedness: values, industry: bio and industry: consultancy. They have therefore been omitted from further analysis. The dependent variable international sales had a widely spread distribution and has therefore been transformed by a logarithmic function. Technological capabilities has been transformed by a square root function, primarily because the variable contained negative values. Size had a largely spread distribution and transforming the variable by means of a logarithmic function improved its statistics significantly.

Table 4.2

Univariate Analysis

		Minimum	*Maximum*	*Mean*	*Standard Deviation*	*Skewness*	*Kurtosis*
Dependent variable							
1.	International sales (LOG)	0	14.22	4.370	5.281	.647	-1.526
Explanatory variables							
Entrepreneur-specific variables							
1.	International experience: Internships	1	2	1.96	.206	-4.630	20.315
2.	International experience: personal life	1	2	1.98	.147	-6.872	46.000
3.	International experience: education	1	2	1.74	.444	-1.126	-.767
4.	Previous working experience	1	2	1.642	.282	-.670	-.035
5.	Knowledge of foreign languages: one foreign	2	2	23	0	.	.
6.	Knowledge of foreign languages: English	1	2	1.95	.221	-4.292	17.285
7.	Knowledge of foreign languages: more than two	1	2	1.55	.504	-.209	-2.062
8.	Relational embeddedness: professional contacts	0	1	0.53	.506	0	-2.097
9.	Relational embeddedness: personal contacts	0	1	.5	.506	0	-2.108

10.	Cognitive embeddedness: language	1	2	1.63	.490	-.537	-1.085
11.	Cognitive embeddedness: vision	1	2	1.77	.427	-1.330	-.247
12.	Cognitive embeddedness: values	1	2	1.87	.339	-2.314	3.353
13.	Structural embeddedness	0	1	.59	.498	-.380	-1.959
Business-specific factors							
14.	Technological capabilities (SQT)	0	1	.698	.390	-1.101	-.464
15.	Size (LOG)	0	3.91	1.665	1.093	0.35	-.769
16.	Export strategy	1	2	1.82	.390	-.1775	1.234
Context-specific factors							
17.	Support mechanisms	0	1	.49	.506	.053	-2.108
18.	Industry: bio	0	1	.128	.339	2.314	3.534
19.	Industry: Pharma	0	1	.256	.442	1.161	-.691
20.	Industry: Consultancy	0	1	.103	.307	2.726	5.722
21.	Industry: other	0	1	.513	.506	-.053	-2.108

4.5 Bivariate analysis

Table 4.3 displays the correlations of the included dependent and independent variables. The table shows the absence of any significant relationship with international sales. No multicollinearity can be detected for the variables as they meet the threshold of <0.85 (Hair et al., 2010). Additionally, table 5 in the appendix shows that the tolerance-values for all independent variables meet the threshold of >.10 and the variance inflation factor of < 10. Therefore it can be concluded the variables listed in table 4.3 have no violating presence of multicollinearity.

It turns out that none of the independent variables have a significant relationship with the dependent variable. This indicates of a lacking substantiate linkage between certain factors and the internationalization of USO's, which is in contrast with the literature as discussed in section 2. Furthermore, the table shows several significant correlations between independent variables. International experience: education negatively correlates with the industry: other variable at an alpha level of .05. The reason for it may be that USO's operating in other industries such as energy, microelectronics or robotics have entrepreneurs that studied in fields which provide less opportunities

to for example study abroad or work in international contexts (Bakia, Murphy, Anderson, & Trinidad, 2011). Relational embeddedness: professional contacts significantly correlates with the structural embeddedness variable. In the survey, the responded entrepreneurs were asked to answer the amount of interactions they have with their professional network. This explains the high positive correlation shown in the table. The larger USO's in the data sample may have larger budgets to spend on their R&D department, which is resembled in the significant correlation in the table. Compared to other technological companies, pharmaceuticals tend to stay relatively small in The Netherlands (CBS, 2018). This is resembled in the used data sample as USO's operating in the pharmaceutical industry are relatively small compared to other industries. The industry: other negatively correlate with the industry: pharma as well since entrepreneurs in the survey were asked to answer only their main industry of operation and can therefore not exist in multiple industries in the dataset.

Table 4.3

Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. International Sales (Log)	1	-.007	.015	.078	.294	-.153	-.007	.012	.119	.265	.381	.082	.039	-.097	0.66
2. International experience: education		1	-.116	.006	-.249	.168	-.014	-.208	-.175	.158	-.071	-.321	.041	.107	**-.383***
3. Previous working experience			1	.129	.208	.051	.106	.177	.028	.300	.198	-.407	.272	.265	.100
4. Knowledge of foreign languages: more than two				1	.247	.201	-.182	.132	.108	.117	0.82	-.027	.133	.043	-.029
5. Relational embeddedness: professional contacts					1	-.150	-.116	.225	**.483****	.285	.046	-.295	.182	.072	.024
6. Relational embeddedness: personal contacts						1	.258	-.169	-.187	-.073	-.106	-1.27	-.076	-.015	-.026
7. Cognitive embeddedness: language							1	.027	.159	-.167	-.035	.097	-.183	-.294	-.008
8. Cognitive embeddedness: vision								1	-.086	-.324	.126	-.227	-.075	.162	.129
9. Structural embeddedness									1	.302	-.062	.067	.126	-.096	-.096
10. Technological capabilities										1	**.488***	-.298	.184	-.118	.092
11. Size											1	-.292	-.061	**-.603****	.376
12. Export strategy												1	.187	.088	.127
13. Support mechanisms													1	.271	-.105
14. Industry: Pharma														1	**-.602****
15. Industry: other															1

Description: statistical significance : * p<, 05; ** P<, 01

4.6 Multivariate analysis

A multivariate explorative analysis has been conducted to provide a better understanding of the relationship between the international sales of USO's and the independent variables. Model assumptions have been investigated according to the linearity of the measured phenomenon, constant variance of the residuals, independence of the residuals and normality of its distribution.

4.6.1 Linearity of the phenomenon

The residual plot has been examined as to determine whether the assumption of linearity upholds for the multivariate relationship in this research. A slight indication of a pattern can be seen in figure 1 in the appendix and questions the linearity for the regression variate. Figures 4a-g shows the partial regression plots for all independent variables, which do not display any violations. Several corrective actions have been executed as to improve the non-linearity shown in figure 1. Hair et al. (2010) discusses multiple of these corrective actions for violations of the linearity assumption of a regression variate. The first corrective action that may be executed is the inclusion of nonlinear relationships with polynomial terms. However, as is shown in the partial regression plots in the appendix, no curvilinear relationships exist between these independent variables and the dependent variable and consequently no polynomial term improved linearity. Based on the visual investigations of the partial scatterplots, the assumption has been made that the phenomenon is in fact linear.

4.6.2 Constant variance of the residuals

The scatterplot does not seem to indicate a large amount of unequal variance for the residuals as they are somewhat evenly spread. A Levene's test of homogeneity of variance is derived for each individual independent variable to test whether the patterns impact the regression variate in a violating manner. Table 6 in the appendix displays these statistics and it can be seen that the variables international experience: education, relational embeddedness: professional contacts, structural embeddedness, technological capabilities, export strategy and both industries are significant in the Levene's test. Therefore indicating that these variables have a violating presence of unequal variances. Such a violation significantly impacts the interpretation of the model. Consequently, these variables have been omitted from the regression model. The other variables meet the assumption of constant variance for the residuals and have been included for further analysis.

4.6.3 Independence of the residuals

Hair et al. (2010) suggests that plotting the residuals against any possible sequencing variable is a method to identify the independence of residuals. The scatterplots in figure 4a-g display no violating dependency of the residuals since no abnormal patterns can be seen . Therefore no variables have been excluded based on the independency of the residuals.

4.6.4 Normality of the residuals' distribution

A histogram has been constructed to visually investigate the normal distribution of the residuals. As can be seen in figure 2 in the appendix, the histogram indicates a violating presence of non-normality since the majority of the residuals stick above the normality line. Since this is only a simple way to check for the normality assumption, a normal probability plot has been constructed (figure 3 in the appendix). If a distribution is normal, the residual line closely follows the diagonal (Hair et al., 2010). As can be seen in the figure, this argumentation does not apply for the current data. Therefore it is not possible to assume that the residuals are normally distributed. As a consequence, it is not possible to extrapolate the results of the current study to the population of USO's.

4.7 Model specification

Based on the theory of Collis and Montgomery (2006) a sequential search method is most relevant in exploratory research when all variables of a regression model are considered for inclusion. Models A-C in table 4.4 shows this process, where the effect of three types of variables have been included. Model A contains only entrepreneur-specific factors and it can be seen that personal contacts and vision negatively relate to international sales. However, by including size in model B, the variables previous working experience and language become negative as well. The knowledge of foreign languages seems to be less influential when the size of an USO is included. By including support mechanisms in model C the coefficients of previous working experience and vision increased and language has shifted into a positive coefficient. Model C, including all variables, has an R^2 of .099. This indicates an explained variance of 9.9% and a low ability to generalize the empirical model. As a result thereof, no strong pronunciations can be done for the population. Furthermore, the table shows that the knowledge of foreign languages of USO-entrepreneurs have the most influential impact on the international sales of USO's, without considering size and support mechanisms. Moreover, all variables lack to be significant at all three alpha levels of 1, 5 and 10% . Therefore neglecting to provide empirical evidence for the determinants of internationalization of USO's in the sample. Additionally, the model consists of no influential observations (see partial regression plots in the appendix) and the analysis has been continued without any further interference. The paragraph hereafter elaborates on the results of the multivariate regression analysis, complemented with a qualitative analysis.

Table 4.4

Multivariate regression analysis (OLS) on the determinants of the internationalization of Dutch and Belgian USO's (dependent variable: international sales of USO's (Log))

	International Sales	*International Sales*	*International Sales*
Explanatory variables	β (SE)	β (SE)	β (SE)
Entrepreneur-specific factors	Model A	Model B	Model C
1. Previous Working Experience	.031 (3.787)	-.653 (4.536)	-1.061 (4.762)
2. Knowledge of Foreign Languages (P3c): more than two	2.151 (2.260)	.773 (2.598)	.723 (2.657)
3. Relational embeddedness (P4b): personal contacts	-1.570 (2.190)	-1.770 (2.485)	-1.617 (2.571)
4. Cognitive Embeddedness: language (P5a)	.407 (2.306)	-.186 (2.628)	.245 (2.925)
5. Cognitive embeddedness: vision (P5b)	-1.782 (2.474)	-.202 (3.118)	-1.22 (3.192)
Business-specific factors			
7. Size (P8)		1.148 (1.341)	1.115 (1.373)
Context-specific factors			
9. Support Mechanisms (P10)			1.033 (2.793)
Model specifications			
F-value	.307	.355	.311
F-change	.	.048	-.044
R^2	.056	.092	.098
R^2 change	.	.036	.006
N	40	40	40

Description:
Statistical significance - * p < ,1; ** p < ,05; *** p < ,01

4.8 Results

4.8.1 Entrepreneur-specific factors

The quantitative analysis failed to provide any empirical evidence for the significance of entrepreneur-specific factors. The contrary is given in the qualitative analysis however. Regarding proposition 1, the expectation was that the international experience of entrepreneurs would increase the internationalization of USO's. The items related to the first proposition lacked the substantial requirements for a quantitative analysis. Accordingly, proposition 1 is uncertain to be substantiate and rejected nor accepted in this research. The results cannot support prior research of Zuchella et al. (2007), who argued the importance of international experience, however lacked the empirical evidence to back the substantiation of this factor for the internationalization of firms as well. On the contrary however, experts assert the international experience of USO-entrepreneurs to be critical for internationalization. This is due to that prior exposure to multiple contextual differences and foreign cultures (Douma, 2018, p.96) helps entrepreneurs to express themselves in international contexts, lowers barriers (Nadadur, 2018, p.74) and creates their playing field (Douma, 2018, p.98). Entrepreneurs that have encountered people from multiple countries have improved language skills and are better prepared when facing these countries again (Bos, 2018, p.89). Additionally, the international orientation of entrepreneurs developed by prior international experience positively relates to internationalization (Groenendaal, 2018, p.83). The main element in these arguments is the capacity of the entrepreneur to exploit and learn past experiences (Kuivalainen et al., 2012; Westhead et al., 2001, Zuchella et al., 2007). The encounters with other cultures, understanding differences and cultural fit cannot be taught, it needs to be experienced (Douma, 2018, p.97), which is why USO's with international experienced entrepreneurs internationalize more. Furthermore, a common process for more developed USO's that underwent a successful period is to attract and select surrogate entrepreneurs (Franco-Leal et al., 2016). For example, an internationally experienced CEO has the capacity to make important choices for the international expansion of USO's, capacities which starting entrepreneurs or scientists generally lack (Groenendaal, 2018, p.83). Thus, the internationalization of USO's is not primarily determined by capable and experienced entrepreneurs, but more by the composition of the entrepreneurial team (Groenendaal, 2018, p.86). This includes the incorporation of non-academics, which has empirically been proved to be significant in the internationalization of USO's (Franco-Leal, Soetanto, & Camelo-Ordaz, 2016). Therefore, the internationalization of USO's does not primarily depend on the experience of one entrepreneur, but more on the skills and competences of a team (Groenendaal, 2018, p.86).

Proposition 2 denoted the expectation that USO's of which the entrepreneur had more previous working experience, would internationalize more. The negative coefficient in model A (P2) indicates a negative relationship between the previous working experience of an entrepreneur and the international sales of USO's and therefore contradicts that expectation. However, the proposition is rejected accordingly as the variable failed to be insignificant in explaining the internationalization of USO's. This outcome is partly in line with research by Zuchella et al. (2007), who proved that previously working in a family business positively relates to internationalization. Experts believe however that the previous working experience is vital for the internationalization of USO's. Primarily due that it provides entrepreneurs with knowledge of the 'playing field' (Groenendaal, 2018, p.84) and of markets (Douma, 2018, p.99). Working in large corporations prior to the establishment of the USO is argued to be vital for entrepreneurs of USO's which pursue international activities (Nadadur, 2018, p.78). Such capacities are developed as a result of being subjected to "political games, seeing how people look at markets, who they do business with and which parameters to use when not to conduct business" (Bos, 2018, p.91). Experience provides entrepreneurs with competences to make the right decisions during internationalization processes of USO's (Bos, 2018, p.91). The reasoning for this proposition is in line with Visintin & Pittino (2014) and Pettersen & Tobiassen, 2012, who proved that the involvement of the entrepreneur in commercial activities results in more international actions.

The knowledge of foreign languages of entrepreneurs was expected to positively relate to the internationalization because it provides them with an international mindset and a capacity to adequately negotiate contracts and understand technical know-how (Clarke, 2000). No pronunciations can be done for proposition P3a and P3b (see table 3 in the appendix). The statistical requirements are lacking for these two items and can therefore be rejected nor accepted, causing uncertainty whether these relationships are true. P3c reflects the proposition that entrepreneurs who speak more than two foreign languages significantly increases the internationalization of USO's. This proposition is rejected. On the other hand, experts believe that the knowledge of foreign language positively relates to internationalization, also resembled in the positive coefficient in model A. Zuchella et al. (2007) found that knowledge of foreign languages of entrepreneurs significantly increases the internationalization of firms. This is due to having knowledge of foreign languages decreases the obstacles related to communication (Bos, 2018, p.89), provides a better understanding of cultures (Groenendaal, 2018, p.84) and provides the ability to think differently (Nadadur, 2018, p.76). As a result of having that knowledge, when communicating with partners in the international network of USO's, "entrepreneurs are able to properly articulate and understand propositions of international parties" (Douma, 2018, p.98). That improves the market introduction and to understand the size of international markets (Douma, 2018, p.99), which in turn increases internationalization.

The social capital derived from the network of the entrepreneur of USO's is argued to be one

of the most vital factors for the internationalization of USO's (Bos, 2018, p.89). The first dimension of social capital, relational embeddedness, relates to having ties with your professional and personal network. With regard to P4a, no empirical evidence exists for the proposition that having more professional contacts as an USO-entrepreneur increases internationalization. It is therefore uncertain whether this proposition upholds for the USO's in the sample. Qualitative analysis indicated that professional contacts in a network are extremely important, especially for starting USO's as it provides them with collaborators, facilitators and advisors to guide decision-making in international situations (Nadadur, 2018, p.76). Entrepreneurs use their network to come in contact with even more experienced entrepreneurs, that guide starting USO's in their international endeavors (Bos, 2018, p.89). One expert suggests that USO's who enter culturally distant countries should look in their network for a trusted advisor who is locally and culturally embedded (Douma, 2018, p.5). Such an intermediary can guide entrepreneurs in the right direction and link them with trustworthy stakeholders (Douma, 2018, p.100). P4b reflects the expectation that personal contacts of entrepreneurs increases the internationalization of USO's. The negative coefficient in table 5 contradicts this prior proposed expectation. Complementarily, this proposition failed to be significant and is therefore rejected in this research. The negative relationship represented in table 4.4 reflects the results of Musteen et al. (2010), who found evidence that the reliance of entrepreneurs on their personal ties results in less internationalization. Experts argue the opposite. When an entrepreneur is relationally embedded in their network, they have access to funds, finance, opportunities and markets (Groenendaal, 2018, p.84) that helps them for their international initiatives.

It was expected prior to the regression analysis that the cognitive embeddedness of an entrepreneur would increase the internationalization of USO's. P5a, P5b are both rejected as a result of them not being significant. P5c lacked the statistical requirements in order to be included in analysis and uncertainty resides in its relationship with international sales. The rejection of the first two propositions is in line with Pinho (2016), who analyzed whether social capital positively influences the internationalization of SME's and found no empirical evidence for this relationship. One expert states that entrepreneurs of USO's who are cognitively embedded in the ecosystem of their university have the tendency to internationalize more. This is due to that skills, capabilities, values, visions and resources of staff, students and entrepreneurs are compounded and shared in that ecosystem, which helps USO's with internationalization (Nadadur, 2018, p.79). As a result of speaking similar languages and resembling cultures, USO's who are cognitively embedded with countries in close proximity tend to internationalize more in those countries (Douma, 2018, p.100). This is complemented with having partners in those countries that share their vision and values with those of USO's (Douma, 2018, p.100). This reasoning is backed by Pinho (2016) that argues that the synchronization of goals, visions, values and languages improves the efficiency and exchange of information and knowledge between

stakeholder.

P6 represents the proposition that USO-entrepreneurs who are structurally embedded, as a result of frequently interacting with their network, tend to internationalize more. This proposition did not meet the statistical requirements for a multivariate regression analysis. As a consequence, proposition 6 is uncertain to be true for the USO's in the data sample. Experts assert that apart from ties, the strength of links with stakeholders in a network is exceptionally valuable for internationalization. Being structurally embedded in, or strongly connected to, your network helps undertake collaborations, primarily with affiliated universities (Nadadur, 2018, p.76). A great amount of USO's are affiliated with international consortiums, as a results of operating in pharmaceutic or medical industries (Groenendaal, 2018, p.84). Interacting with those consortiums creates opportunities, enables the access to other markets and provides entrepreneurs with advice for international decision making. Huynh et al. (2017) found similar results which resemble the argumentation that strong network links increase the internationalization.

4.8.2 Business-specific factors

P7 represents the proposition that the technological capabilities of USO's are expected to increase their internationalization. Due to the incapability to meet statistical thresholds, P7 has been rejected nor accepted and the determining influence of this factor is questionable. Prior research has proved that USO's and high-tech companies that substantially invest in their R&D department internationalize more, faster and have a higher chance to survive in international markets (Efrat & Shoham, 2012; Li et al., 2012; Teixeira & Coimbra, 2014). Experts and prior research stress the gravity of the factor for multiple reasons. One, USO's thrive on their high rate of innovation, which is fueled by their R&D-intensity (Li et al., 2012). USO's in technology industries have incentives to international sales as they opt for larger markets to achieve returns which are in line with high technological development costs (Zahra & George, 1999). Experts corroborate that reasoning and add that technological capabilities require high costs to develop and maintain, but low costs to implement elsewhere (Douma, 2018, p.99), causing those companies to internationalize more. And two, their high investments in R&D allows USO's to surge the value of their products and services (Groenendaal, 2018, p.85), enabling them to differentiate from competitors. Additionally, technology has no strong cultural links and can therefore easily be scaled internationally (Douma, 2018, p.100).

Proposition 8 denoted that smaller USO's have a higher tendency to internationalize than larger USO's. The positive coefficient in table 4.4 contradicts that reasoning as it indicates that larger USO's have more international sales. Size cannot be considered a determinant factor for the internationalization of USO's as the variable failed to emerge significant. The positive coefficient indicates that larger USO's internationalize more. This confirms more classical theories of

internationalization (Johanson & Vahlne, 1977) and contradicts the framework discussed in section 2. Larger firms gradually increase their commitment in international markets because of organizational learning and an increasing market knowledge. The impression is given that this applies to larger USO's as well. As a result of having more resources, market knowledge and commitment larger USO's internationalize more than smaller USO's (Kuivalainen et al., 2012). The outcome regarding proposition 8 is not supported by experts. Smaller USO's have the advantage of being nimble, flexible, move swiftly (Nadadur, 2018, p.76) and are more capable of responding quickly to international opportunities as a consequence of market disruptions (Li et al., 2010). Small, lean and flexible USO's tend to react more to international opportunities and therefore internationalize more (Douma, 2018, p.99). This relates to the age of USO's as well, since inexperienced entrepreneur of younger and smaller USO's are not aware of the possible risks inherent in international contexts and therefore may not hesitate to exploit given international opportunities (Li et al., 2010). Moreover, larger, slow and bureaucratic USO's "to be more cautious when pursing international possibilities" (Douma, 2018, p.99) and may therefore internationalize to a lesser extent than smaller ones do.

P9 reflects the expectation that USO's with a niche-focusing export strategy tend to internationalize more. The support has failed to be obtained for this proposition as a result of lacking statistical properties. Uncertainty still exists whether this proposition holds true for the USO's in the data sample. From literature it is argued that firms and USO's in global niche markets internationalize more (Zuchella et al., 2007; Styles & Genua, 2008). The logic behind it is that USO's need access to global markets in order for them to break-even (Pettersen & Tobiassen, 2012) and to acquire first-class technologies (Nadadur, 2018, p.76), which are found in niche markets. Additionally, USO's who focus on niche markets are more specialized (Douma, 2018, p.100). To be known for that specialization helps to be found by customers internationally (Nadadur, 2018, p.77) and therefore increases international sales. Specialized USO's internationalize more than those who do not, which is due that entrepreneurs of those USO's tend to possess a strategic international orientation (Groenendaal, 2018, p.86). Niche markets provide USO's with opportunities, customer-aligned demand and a self-created market gap which they can exploit for internationalization (Douma, 2018, p.100). Firms with generic products in non-niche markets have the tendency to focus on domestic markets, since those markets provide sufficient demand (Moen, 2002) and lack the pressure and need to internationalize. A pitfall of niche USO's is the complexity that products and services in these markets inherently possess, which increase costs and commitment (Zahra & George, 1999).

4.8.3 Context-specific factors

No context-specific factors seem to constitute important determinants of the internationalization of USO's. P10 reflects the expectation that support mechanisms such as incubators and S&T structures cause USO's to internationalize more. According to the statistical analysis this does not apply for the USO's in the sample as empirical support is lacking. Consequently, proposition 10 is rejected. Teixeira & Coimbra (2014) came to the same conclusion, as support mechanisms were deemed irrelevant as a determinant for the internationalization of USO's in Portugal. As shown in table 3 in the appendix, about halve of the USO's in this sample felt that support mechanisms were important. This may be caused by the intrinsic motivation and traits that some entrepreneurs possess. These traits cause them to not rely on institutions for their firm's success (Nadadur, 2018, p.80). The other halve consists of scientists who lack the entrepreneurial traits in order for their firms to grow. Those scientists therefore reside to for example incubators in search of networks, finance, visibility and advice (Bos, 2018, p.93). One expert acknowledges the importance of support mechanisms in the context of internationalization due to the availability of international networks (Groenendaal, 2018, p.84). Through those international networks, USO's get access to funding, finance and other stakeholders, which increase the internationalization (Bjørnåli & Aspelund, 2012). Additionally, incubators and similar institutions have an international orientation and culture that pushes affiliated USO's to search for opportunities across borders (Douma, 2018, p.101).

With regard to proposition 11, it is uncertain whether industry increases the internationalization of USO's in this sample. This is a consequence of the dummy's bio, pharmacy, consultancy and other industries failing to meet statistical thresholds. Proposition 11 is therefore rejected nor accepted and no pronunciations based on the quantitative analysis can be formulated. As opposed to Teixeira & Coimbra (2014), who obtained empirical support for the hypothesis that USO operating in certain sectors internationalize to a larger extent and with a faster pace. This is due that USO's in high-tech industries have a substantial amount of knowledge, investment and rely on international infrastructure for their technological developments (Nadadur, 2018, p.80). Additionally they are composed of "business models that are easily up scaled internationally (Bos, 2018, p.94) and therefore have more international potential (Douma, 2018, p.102). The majority of USO's in the data sample have medical affiliations (beta-kind of companies) with high specialization, which relates to them targeting niche markets and narrow industries in global markets (Groenendaal, 2018, p.86). High-tech companies tend to have larger investments costs that need to be regained (Li et al., 2010) and provide non-culturally

linked solutions, therefore adhering to more international demand (Douma, 2018, p.102).

In conclusion, several important factors suggested by theoretical frameworks did not provide significant coefficients and can therefore not be considered determinants of internationalization for the USO's in the sample. Solely including entrepreneur-specific factors in the model denotes an explained variance of 5.6%. Including a business-specific factor, size, heavily influenced the entrepreneur-specific factors. The conclusion can be drawn that factors related to the entrepreneurs primarily have a negative influence on the international sales of USO's when size is taken into consideration. The lacking significant variables in the models only give an indication of this argumentation. The inclusion of a context-specific variable did not heavily influence the overall model. The generalizability of the model including all variables is at a critical low point. One, the small N of 40 in the final model influences the R^2 in such a manner that no conclusions can be drawn for the rest of the population (i.e. university spin-offs in general). Second, the low value of 9.9% and the absence of significant variables indicates that other independent variables exist which explain the internationalization of USO's. This excludes the variables previous working experience, knowledge of foreign languages: more than two, relational embeddedness: personal contacts, cognitive embeddedness: language, cognitive embeddedness: vision, size and support mechanisms for the current sample as they have not emerged significant in explaining the international sales of USO's. The variables and the items of international experience, knowledge of foreign languages: one foreign and English, relational embeddedness: professional contacts, cognitive embeddedness: values, technological capabilities, export strategy and industry lacked the statistical requirements in order to be analyzed. It is therefore uncertain whether these factors increase the internationalization of USO's and be considered determinants.

4.9 Post-Hoc analysis

The previous paragraphs show the multivariate regression analysis and qualitative analysis on the determinants of internationalization of USO's. As the analysis provided ambiguous results, a post-hoc analysis has been conducted to provide some verification of these findings. Table 3 in the appendix shows a binary variable of internationalization (0 = no, 1 = yes) for 40 USO's. A logistic regression has been executed which included a dependent variable on a binary measurement scale. The dependent variable is based on prior explained information in section 3 and previous research (Morgan-Thomas & Jones, 2009; Teixeira & Coimbra, 2014). The logistic regression has been executed due to its robustness, diagnostics and ease of interpretation (Hair et al., 2010), which is particularly applicable for the verification of previous results. Table 4.5 shows the outcomes of this analysis.

As the statistical inspections did not differ from the ones discussed in paragraph 4.6, the

assumptions for the logistic regression are met. This includes the assumption of a dichotomous measurement scale for the dependent variable, as two groups are represented (group 1 = no, group 2 = yes). The non-rejection of the null hypothesis of the Hosmer and Lemeshow test for the conventional significance levels indicate that model A in table 4.5 is acceptable (Teixeira & Coimbra, 2014). The model shows the absence of any variables that significantly relate to the dependent variable. The Nagelkerke-statistic indicates a moderate goodness of fit for the model. The Cox & Snell statistic indicates a 30% likelihood of the variable internationally operating is explained by the model (Cox & Snell , 1971). Both these statistics indicate that model A is statistically sufficient for further analysis.

Table 4.5

Logistic regression analysis on the determinants of the internationalization of Dutch and Belgian USO's (dependent variable: internationally operating (binary 0 = no, 1 = yes))

	International Sales
Explanatory variables	β (SE)
Entrepreneur-specific factors	Model A
1. Previous Working Experience	-1.133 (1.814)
2. Knowledge of Foreign Languages (P3c): more than two	-.785 (1.153)
3. Relational embeddedness (P4b): personal contacts	.246 (1.050)
4. Cognitive Embeddedness: language (P5a)	-1.374 (1.288)
5. Cognitive embeddedness: vision (P5b)	1.699 (1.329)
Business-specific factors	
7. Size (P8)	1.022 (.624)
Context-specific factors	
9. Support Mechanisms (P10)	1.605 (1.177)
Model specifications	
Hosmer-Lemeshow test (p-value)	3.426 (.847)
Cox & Snell R^2	.229
Nagelkerke R^2	.321
N	40

Description: Statistical significance - * p < ,1; ** p < ,05; *** p < ,01

The post-hoc logistic regression analysis confirms the prior multivariate regression analysis in the sense that no variables significantly relate to the internationalization of the USO's in the data sample. However, it completely contradicts the prior found relationships of entrepreneur-specific factors. As can be seen in table 4.5, the variables knowledge of foreign languages: more than two, relational

embeddedness personal contacts, cognitive embeddedness: language have contradicting coefficients when compared to model A in table 4.4. The relationships of previous working experience, size and support mechanisms have been confirmed by the logistic regression model.

As a result of no significant variables, the post-hoc test verified the previous statements concerning the absence of significant relevant variables for the internationalization of USO's in this sample. Furthermore, the contradicting coefficients resulted in more ambiguity for the entrepreneur-specific factors. Three of the nine relationships were confirmed according to their coefficients and similar relationships when compared to Model A in table 4.4.

5 Conclusion

USO's are highly valued by governments and universities due to their job-creation and stimulation of innovative processes (Miranda et al., 2017). Their technological and innovative capabilities ensure that these ventures possess greater potential to develop wealth-creating business models than other high-tech companies (Teixeira & Coimbra, 2014). Although internationalization is the most viable growth option for USO's (Bjørnåli & Aspelund, 2012) and extensive internationalization seems attractive for these firms, the amount of research on the determinants of internationalization is scarce. Since both The Netherlands and Belgium are considered export-focused countries (CBS, 2018; Trading Economics, 2018), understanding the internationalization of USO's is particularly important for policymakers and managers who aspire to expand across their borders. As such, the elucidation which factors lead to more internationalization of USO's helps entrepreneurs, managers and university-affiliates with their policies, initiatives, investments and decision-making to foster academic entrepreneurship and international competitiveness of USO's.

The multivariate regression analysis did not result in any emergence of significant factors. As the empirical regression model has a critical low explaining variance of 9.9% and compellingly violates the assumption of normality, it is in no circumstance to adequately represent the population of USO's. The results of the current research can therefore not be extrapolated to USO's outside of the used data sample.

However, several formulated propositions can be confirmed according to the outcomes of the qualitative analysis. It has been argued by experts that the entrepreneur is of significant worth for the internationalization of an USO. Factors related to the entrepreneur are therefore considered important determinants from a qualitative perspective. However, as none of the corresponding factors resulted to be significant in quantitative analysis, the propositions cannot be corroborated and ambiguity still resides concerning these factors. The post-hoc test increased that ambiguity as a result of contradicting coefficients in two regression analyses.

Business-specific factors such as technological capabilities and export strategy are considered critical for the internationalization of USO's, as asserted by experts. The internal capabilities of USO's determine their internationalization as they foster knowledge base exploitation and differentiation (Testa, 2014). Therefore the conclusion is drawn from a qualitative perspective that smaller USO's, more technically capable USO's and USO's that target niche-markets internationalize more. Nonetheless, ambiguity exists regarding this statement as no business-specific factors emerged to be significant in both the multivariate regression analysis and the post-hoc test.

Context-specific factors have been proposed in this study to increase the internationalization of USO's. Supporting mechanisms have been argued by experts to be substantial for the internationalization of firms as they provide them with funds, advice and international networks. The positive coefficients in the quantitative analysis and post-hoc test reflect that reasoning. As a result of not being significant and due to insufficient statistical properties, the propositions regarding context-specific factors cannot be considered determinants of internationalization of USO's. This contradicts the results of the qualitative analysis, which indicated that USO's that value support mechanisms actually internationalize more. Additionally, USO's in high-tech industries have been argued to internationalize to a higher extent since technology is easily transferable when compared to for example consultancy-related services.

With regard to managerial and policy implications, the key feature of the study was the need to support USO's that target internationalization opportunities, as they find the ability to identify foreign market opportunities and customers challenging (Cumming et al., 2009). The analysis suggests that networks and experience are critical for internationalization and universities are advised to facilitate meetings and seminars between less and more experienced entrepreneurs. These meetings should revolve around the support of internationally endeavoring USO's, where the international experience and the understanding of cultural differences of the experienced entrepreneurs is deemed extremely important. Failure in international markets is common for USO's that are contrived of academic entrepreneurs (Bjørnåli & Aspelund, 2012), due to the lacking entrepreneurial capabilities of scientists. Such USO's should be complemented with an entrepreneurial team, including surrogate (non-academics) entrepreneurs, which has proven to positively relate to internationalization (Franco-Leal et al., 2016). The entrepreneurial team in that sense, consisting of founders, scientists and advisors, is argued by experts to be vital for internationalization. USO-founders should question their capabilities and consider whether to supplement their skills with those of others in order for them to successfully internationalize. Furthermore, entrepreneurs and universities should recognize the significance of firm size when internationalization is considered. Larger firm size may be related to having a larger pool of resources (Kuivalainen et al., 2012) and international networks, both important feats that relate to internationalization (Huynh et al., 2017). In that sense, smaller USO's may want to consider seeking help from support mechanisms for resources and international networks to increase their international success.

As to current knowledge, no prior research has been conducted that analyzes the extent dimension of internationalization for USO's. More extant research is needed that focuses on this dimension in the context of USO's. This research failed to provide empirical evidence for this dimension as a result of a considerate low amount of generalizability of the models in the regression analysis and the absence of any significant variables. In line with Zuchella et al. (2007) and Texeira and

Coimba (2014), entrepreneur-specific, business-specific and context-specific factors are considered important categories for the internationalization of USO's. The qualitative analysis has showed the value of these factors and their relationship with internationalization in an USO-context. However, since none of the eleven prior proposed variables emerged as significant, more research is need that include these variables in the context of USO internationalization.

Several limitations exist for the current research. First, the exceptionally small sample as a result of a low response-rate influenced and biased the results of the multivariate regression analysis. Future research should undertake vital steps in the data collection process to anticipate and prevent a low response-rate. Second, the sample included of USO's in two countries: The Netherlands and Belgium, who are quite similar in terms of university structures, culture and governance. As a consequence, the results obtained from the multivariate regression analysis can by no means be extrapolated to USO's in other countries. Since experience in multiple cultural contexts and the knowledge of foreign languages has been argued to be extremely valuable in internationalization, future research should explore how cultural and national differences affect the internationalization of USO's. Third, as a consequence of normality assumption violation the applicability of the research is at a critical low point. Combined with a low amount of explained variance, the results of the regression analysis cannot be generalized. Fourth, the implicit assumption has been made that internationalization is a positive deliberate process and all USO's have the intention to internationalize. As 9 of 10 international start-ups fail (Krishna, Agrawal, & Choudhary, 2016), this may not always be the case for USO's as well. Fifth, internationalization in this research has been acknowledged as the extent in which firms internationalize. It is therefore considered one-dimensional and therefore does not completely capture the complexity of the concept as three-dimensional with scope and speed as influential dimensions.

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7 Appendix

Table 1: Interview guide	
Structure	*Components*
1. Introduction	Thanking the interviewee Introduce interviewer Explain conducting research Purpose Confidentially Tape
2. Questions	
A. Expertise	Would you kindly explain your affiliation with the subject of the thesis?
B. General question	What is in your eyes important for the internationalization of USO's?
Follow-up	What are important factors? Which characteristics are important?
C. Entrepreneur-specific factors	
P1 International experience	The following proposition comes from literature: explain P1.
Follow-up	What could be the reasons for this relationship? Why?
P2 Previous working experience	The following proposition comes from literature: explain P2.
Follow-up	What could be the reasons for this relationship? Why?
P3 Knowledge of foreign languages	The following proposition comes from literature: explain P3.
Follow-up	What could be the reasons for this relationship? Why?
P4 Relational embeddedness	The following proposition comes from literature: explain P4.
Follow-up	What could be the reasons for this relationship? Why?
P5 Cognitive embeddedness	The following proposition comes from literature: explain P5.
Follow-up	What could be the reasons for this relationship? Why?
P6 Structural embeddedness	The following proposition comes from literature: explain P6.
Follow-up	What could be the reasons for this relationship? Why?
D. Business-specific factors	
P7 Technological capabilities	The following proposition comes from literature: explain P7.
Follow-up	What could be the reasons for this relationship? Why?
P8 Size	The following proposition comes from literature: explain P8.
Follow-up	What could be the reasons for this relationship? Why?
P9 Export strategy: niche	

Follow-up	The following proposition comes from literature: explain P9. What could be the reasons for this relationship? Why?
E. Context-specific factors P10 Support mechanisms Follow-up P11 Industry Follow-up	The following proposition comes from literature: explain P10. What could be the reasons for this relationship? Why? The following proposition comes from literature: explain P11. What could be the reasons for this relationship? Why?
F. Missing factors	Do you feel that any factors are missing for the internationalization of USO's? Why, please explain.
3. Closing	Thank you for your time.

Table 2: Code scheme

Citations	*Open coding*	*Axial coding*	*Selective coding*
Yeah so the thing is, once you are a student at an international university, especially a foreign student at such an university. What happen is you are naturally more open and go and present your2 ideas, you don't have the barriers which you will have otherwise you know.	International university Foreign student	Education	International experience
Yeah so as a student I had worked at the university as a researcher associate and I used to chatbolt the university of georgia and the university of kentucky. Because of the scholarship, that was my eh, I have worked for full time in the US yes and so yeah I did work.	Multiple universities	Education	
Exactly, eh. So that is a perspective that I learned and always had the interest for these topics and eh. And that was a result of being part in a international society and primarily, my first international encounter was Kopenhagen. That was where, for the first time that you are becoming part of that. By being exposed to that international society, eh and making friends around the world, eh. That is what makes your playing field and your space..	Exposure to an international society	Education	
And so the international experience helps you tremendously. It's really difficult in general, even if you have been in other countries still. So, yeah, eh. I have some experience internationally as well. And I was a excited, aggressive guy that thought he knew it all. Well, eh, It just does not work that way. How do you call it, eh.	Think different	Learning	

So, eh, the human capital aspect of it. Teaches you to at least in my opinion. Teaches you to be more confident, start having degree of self-beliefs and that's what helps you think I would say radically different from a lot of smarter people who run start-ups.	Learning Think different	Learning	
We attract an experienced CEO that has multiple experiences, that takes a part in the company. Eh, so I think that eh, Yeah, for sure since he has worked in multiple companies and been in other situations, eh. So yeah it is a combination of research with the CEO that complementarily works in spin-offs in international markets.	Multiple companies and situations internationally	Contexts	
Then your product is linked to the market and eh. And for the advice part that may be a bit different. For me, eh. Personally where factors where eh. You being present in such countries, traveling over there, eh. And also eh, the ecosystem of the university. For example, I followed a course that was called internationalization, and eh. There we were exposed to multiple contextual differences and cultures, I mean that they drive on the left side of the road in other countries for example. That it's polite to act in certain countries and more examples, eh.	Present in other countries Ecosystem of the university Exposure to multiple contextual differences	Contexts	
Exactly, eh. So that is a perspective that I learned and always had the interest for these topics and eh. And that was a result of being part in a international society and primarily, my first international encounter was Kopenhagen. That was where, for the first time that you are becoming part of that. By being exposed to that international society, eh and making friends around the world, eh. That is what makes your playing field and your space.	Exposure to an international society	Education	
	Understanding cultural fit	Contexts	

Eh, hm… I think it's extremely valuable, eh. Because I think eh that a big part of the success of an entrepreneur that pursues international initiatives or just goes abroad, is just cultural fit and eh. To understand the parties that you're working with. Eh.			
Yeah it is so valuable when you know the contexts and now and then I eh, speak with friends that want to spar about such topics and eh. And the thing is, you can tell people but experiencing it yourself is way different and eh. That international experience, being present, doing business with Chinese, Indians and Africans, eh. That is exceptionally important, on the hand because of the chance of success and on the other hand because of also because of the eh. Possibility to see if the potential is there and eh to make the decision at all to go over there.	Present in international contexts	Contexts	

Table 3: Descriptive analysis of the sample of Dutch and Belgian USO's

	Yes (%)	*Estimated means*	*Missing values (%)*
Internationalization			
USO's: international sales	30 (75)	N/A	0
International Sales (LOG)	N/A	128625.62	11 (25.6)
Entrepreneur-specific factors			
P1. International experience:			
a. Internships, etc.	39 (97.5)	1.97	0
b. Personal life	39 (97.5)	1.97	0
c. Education	29 (72.5)	1.73	0
P2. Previous working experience:			
a. International firm	16 (40)	1.45	6 (15)
b. Commercial firm	26 (65)	1.76	6 (15)
c. Similar industry	21 (52.5)	1.62	7 (17.5)
d. Same industry	18 (45)	1.52	6 (15)
e. Different industry	29 (72.5)	1.84	6 (15)
P3. Knowledge of foreign languages:			
a. One foreign	40 (100)	2	0
b. English	38 (95)	1.95	0
c. More than two	24 (55)	1.55	0
P4. Relational embeddedness			
a. Professional contacts (high)	21 (52.5)	.53	0
b. Personal contacts (high)	20 (50)	.5	0
P5. Cognitive embeddedness			
a. Language	25 (62.5)	1.62	0
b. Vision	30 (75)	1.77	1 (2.5)
c. Values	34 (85)	1.87	1 (2.5)
P6. Structural embeddedness: interactions (high)	23 (57.5)	.58	1 (2.5)
Business-specific factors			
P7. Technological capabilities	N/A	213526.17	3 (7.5)
P8. Size	N/A	9.32	5 (12.5)
P9. Export strategy: niche	23 (57.5)	1.18	12 (30)
Context-specific factors			
P10. Support Mechanisms	19 (47.5)	.48	1 (2.5)
P11. Industry		7.97	1 (2.3)
a. Environment	1 (2.5)		
b. Sustainability	1 (2.5)		
c. Bio	5 (12.5)		
d. Pharmacy or medical devices	11 (25)		
e. Microelectronics	1 (2.5)		
f. Consultancy-related	4 (10)		
g. Other	17 (42.5)		

Little's MCAR Test : Chi-Square = 192.953, DF = 177, Sig: .195

Table 4: Construction of variables

Variable	*Cronbach's Alpha*	*Items*
International Experience	.118	Internships Personal life Education
Previous working experience	.632	International firm Commercial firm Similar industry Same industry Different industry
Knowledge of foreign languages	.314	One Foreign English Two or more languages
Relational embeddedness	-.353	Professional contacts Personal contacts
Cognitive embeddedness	.290	Language Vision Values

Table 5: Multicollinearity statistics

		Tolerance-value (VIF)
Explanatory variables		
1.	International Experience (P1): education	.596 (1.678)
2.	Previous Working Experience (P2)	. 596 (1.691)
3.	Knowledge of Foreign Languages (P3a): more than two	787. (1.271)
4.	Relational embeddedness (P4a): professional contacts	.471 (2.125)
5.	Relational embeddedness (P4b): personal contacts	.744 (1.345)
6.	Cognitive Embeddedness: language (P5a)	.610 (1.640)
7.	Cognitive Embeddedness: vision (P5b)	.531 (1.883)
8.	Structural Embeddedness (P6)	.524 (1.907)
9.	Technological Capabilities (P7)	.627 (1.594)
10.	Size (P8)	.472 (2.120)
11.	Export Strategy (P9)	.540 (1.851)
12.	Support Mechanisms (P10)	.588 (1.701)
13.	Industry: pharma (P11d)	.361 (2.769)
14.	Industry: other (p11h)	.381 (2.625)

Figure 1: Scatterplot

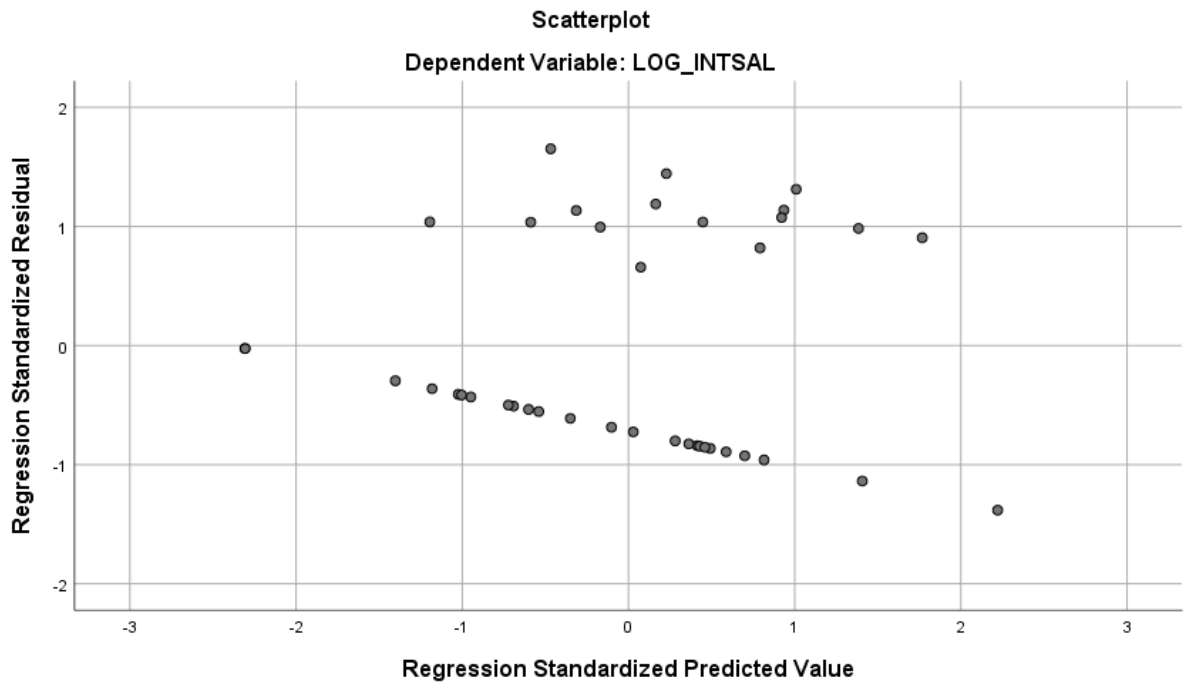


Figure 2: Histogram

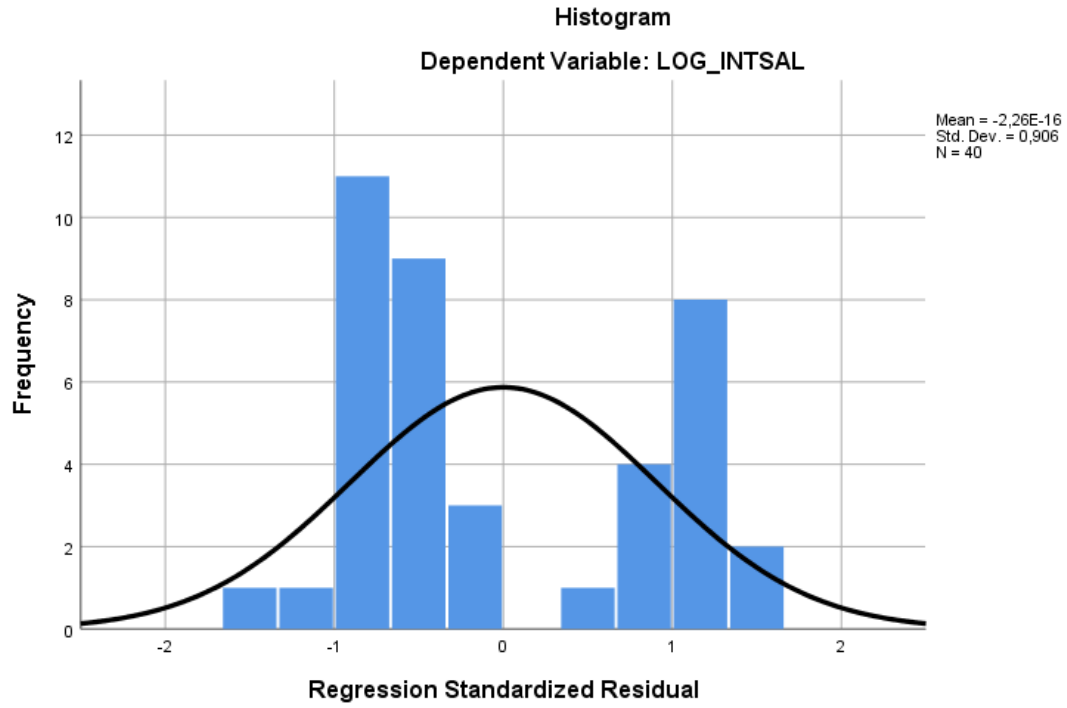


Figure 3: Probability plot

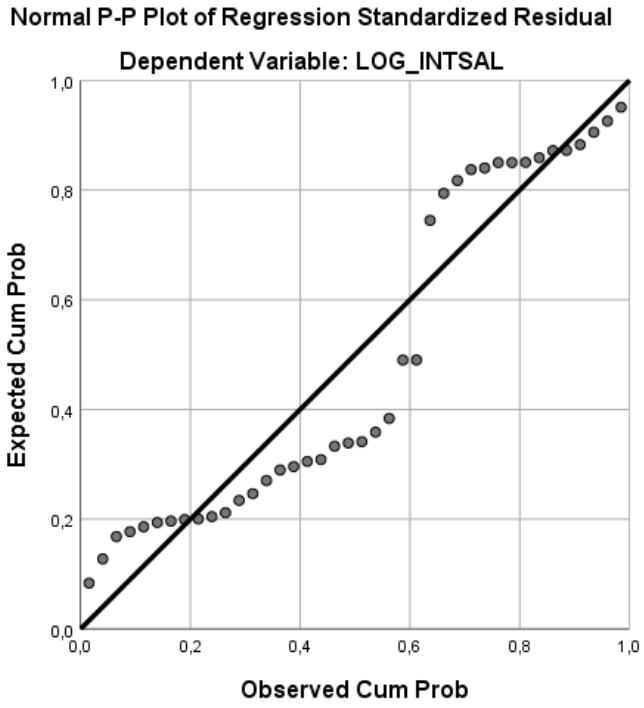


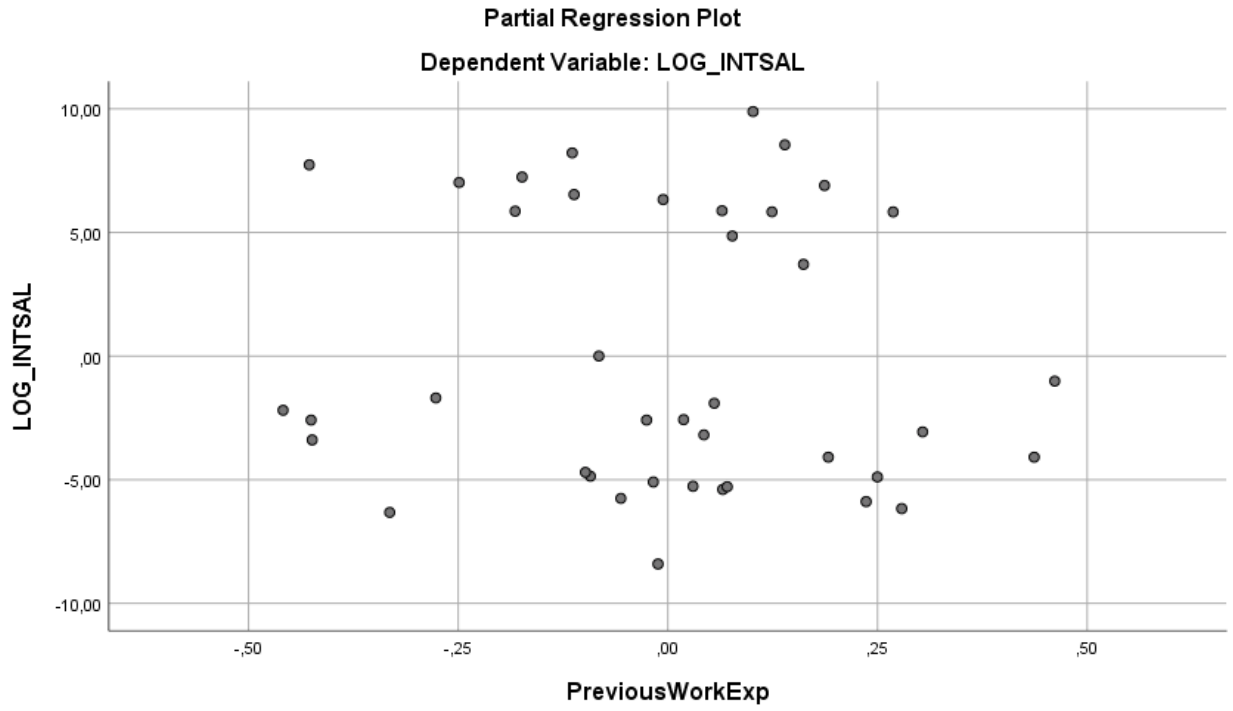
Table 6: Homogeneity statistics

		International Sales
		Levene statistic (sign.)
Explanatory variables		
1.	International Experience (P1a): education	4.409**
2.	Previous Working Experience (P2)	2.791
3.	Knowledge of Foreign Languages (P3c): more than two	.003
4.	Relational embeddedness (P4a): professional contacts	122.728***
5.	Relational embeddedness (P4b): personal contacts	.026
6.	Cognitive Embeddedness: language (P5a)	.153
7.	Cognitive Embeddedness: vision (P5b)	.686
8.	Cognitive embeddedness: values (P5c)	1.069
9.	Structural embeddedness (P6)	126.749***
10.	Technological capabilities (SQT) (P7)	11.752***
11.	Size (P8)	.264
12.	Export Strategy (P9)	3.609*
13.	Support Mechanisms (P10)	.003
14.	Industry: pharma (P11d)	8.500***
15.	Industry: other (P11h)	75.567***

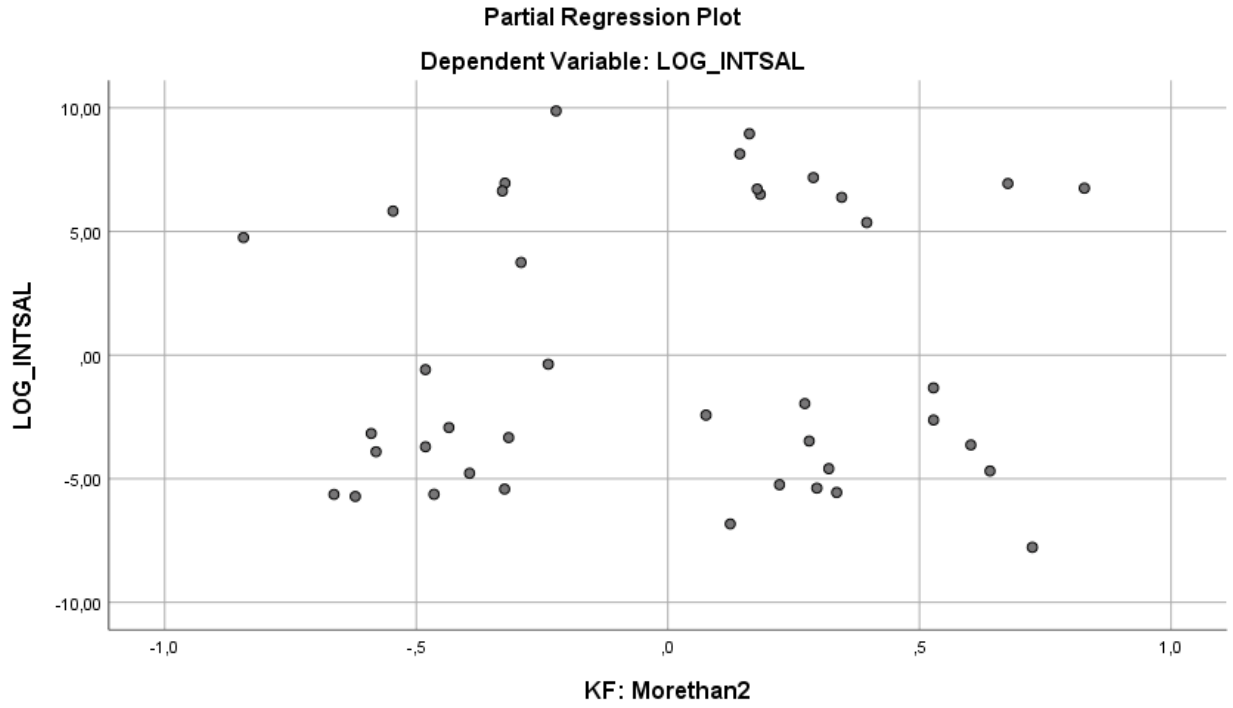
Description: Statistical significance - * p < ,1; ** p < ,05; *** p < ,01

Figure 4: Partial regression plots

A



B



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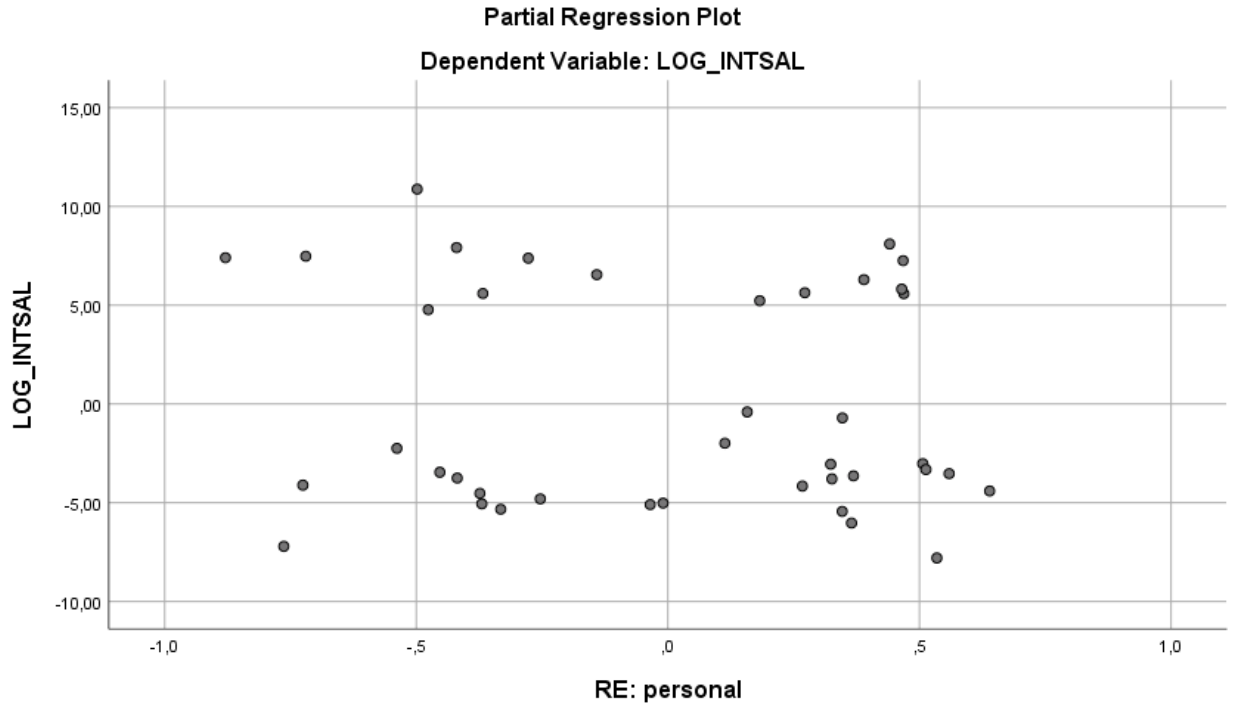
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LOG_INTSAL
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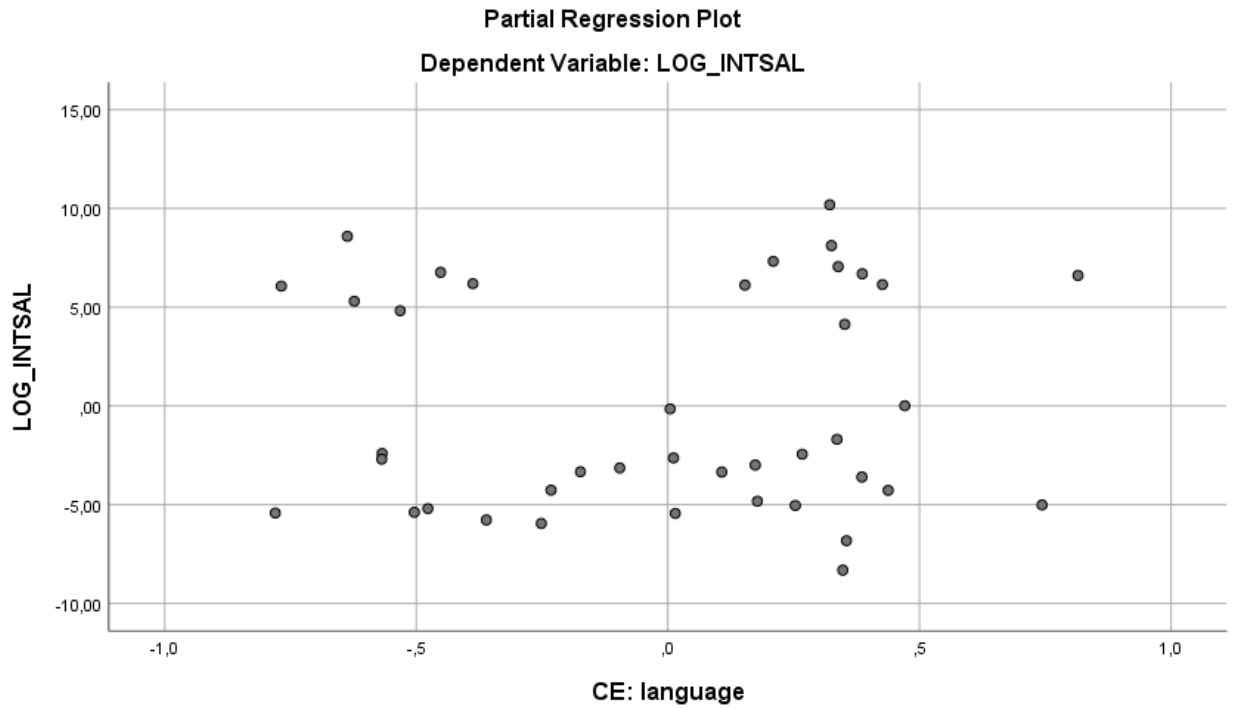
10,00
5,00
,00
-5,00
-10,00
-1,0
-,5
,0
,5
1,0
RE: personal

D


Partial Regression Plot
Dependent Variable: LOG_INTSAL
LOG_INTSAL
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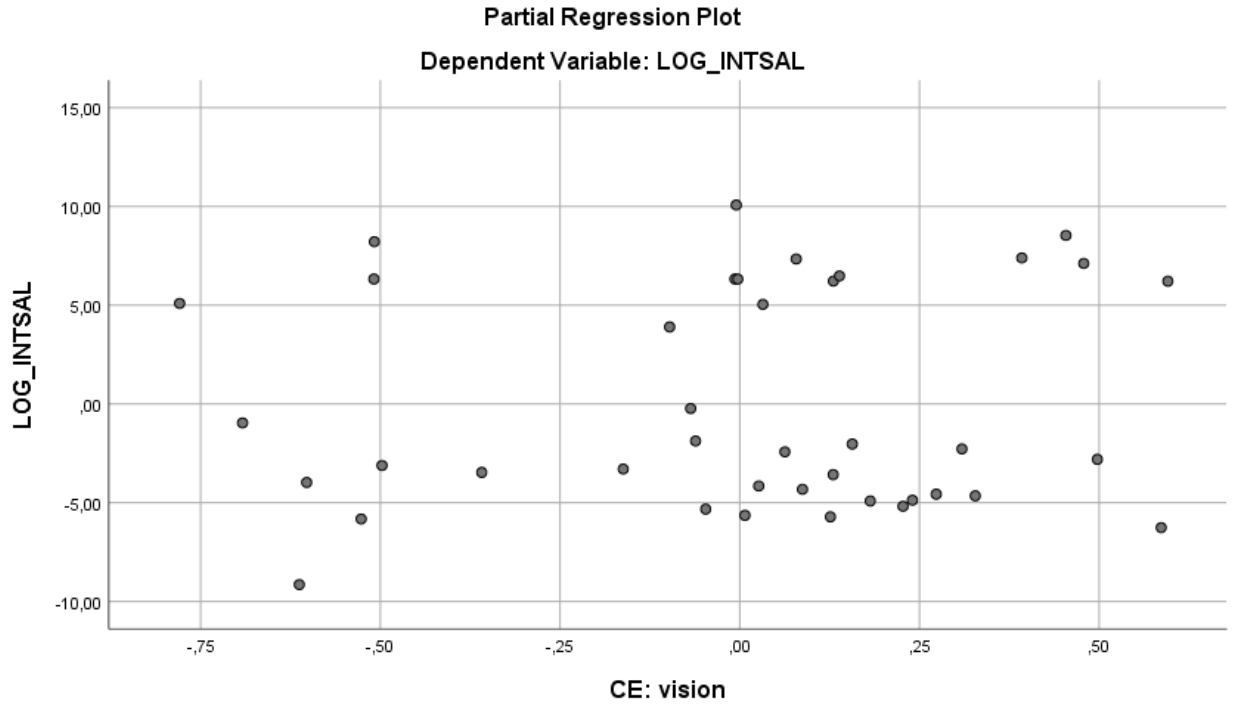
,00
-5,00
-10,00
-1,0
-,5
,0
,5
1,0
CE: language

E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LOG_INTSAL
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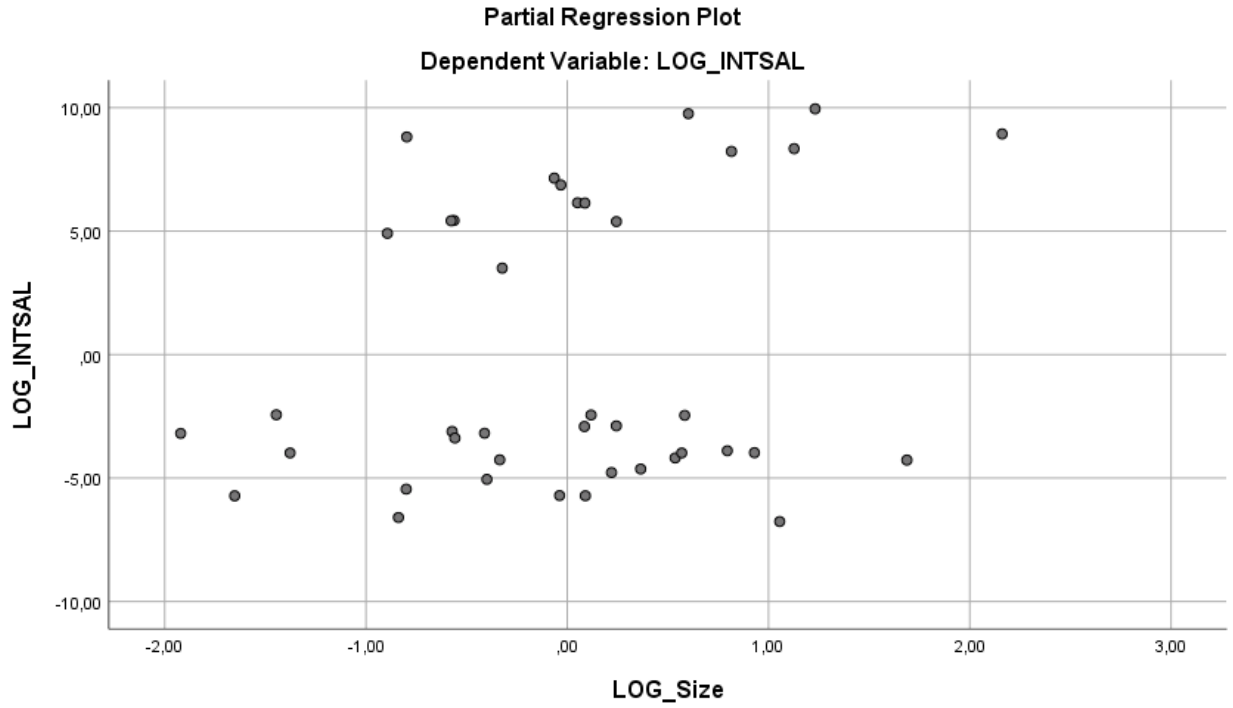
,00
-5,00
-10,00
-,75
-,50
-,25
,00
,25
,50
CE: vision

F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-10,00
-2,00
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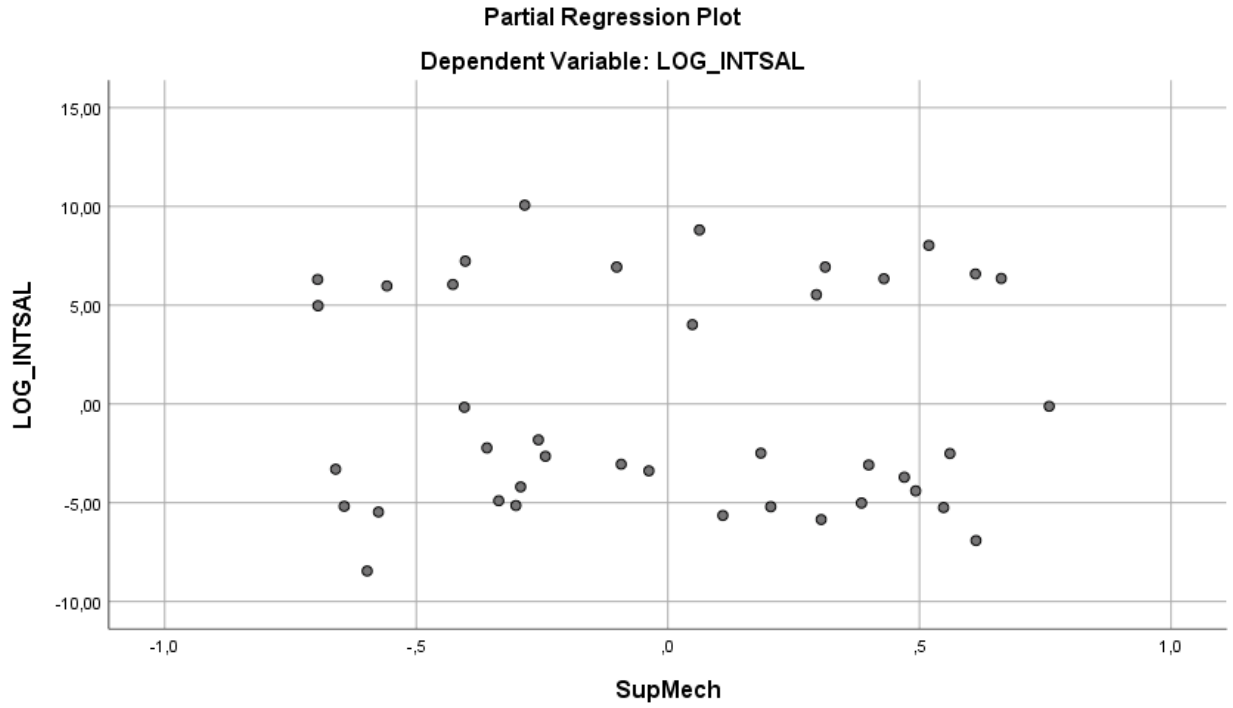
,00
1,00
2,00
3,00
LOG_Size

G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Dependent Variable: LOG_INTSAL
15,00
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-1,0
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,5
1,0
SupMech

Qualitative data

Transcript Verbatim Interviewee 1

Name:	Vijaykant Nadadur
Company:	Stride.ai Inc
Expertise:	Entrepreneur, Computer Scientist, Public Speaker, Techstars '16 Alum Lived and worked in four continents, studied at four universities.
Date – Time:	22 June 2018 - 10:00
Place:	Nijmegen (Skype call to Eindhoven)
Pages:	13

M = Mark Kroes
V: Vijay Nadadur

Start of Transcript

M: So my first question will be: have you ever been in contact with university spin-offs or worked with university spin-offs?

V: Eh, our start-up uh be a university spin-off, it could be considered one. Not because eh, you know, we came out of the university but, my master's thesis.

M: Your, eh the connection is lost, I'm losing you.

V: Hello.

M: Hello, there you are.

V: Sorry, so yeah because my master's thesis became my company, I would say we are kinda an university spin-off.

M: Well okay, cool. Well since I'm looking for the determinants of internationalization for these eh kind of companies. Eh in your opinion, what kind of factors or things do determine the internationalization for these type of firms. Does it matter if they start are a company that from inception operates internationally or after a while, that does not matter. Maybe some opinions or thoughts about it? Do know that you can always end the interview and that I record it, are you okay with that?

V: Sure, so eh I think there is a strong correlation but I am not an expert to say there is a causation. But I will give you my background, I am originally from India.

M: okay

V: I've studied at the University of Georgia, got my PHD in 2008 and I spend until 2011 at the University of Georgia. And then I spend more, I got a master's at Georgia. Then I got the university of Kentucky to get another master's in ANY Biopharmatics and that there the idea was incepted and a few years later and six years later we are talking. So my point is, yeah and then once we started then I lived in Lisbon, Portugal for an expatriation program in Paris for another program and Chile. And of course the US which is like a second home to me. And now the Netherlands because of my relationship with HightechXL. And there is a bank called Newton.

M: Okay yeah,

V: Yeah so the thing is, once you are a student at an international university, especially a foreign student at such an university. What happen is you are naturally more open and go and present your ideas, you don't have the barriers which you will have otherwise you know.

M: So you have already some kind of international network.

V: Yes international network and exposure to international culture.

M: Right.

M: Ehh so, ehh before your company and eh. I'm trying to link with my study. I made some categorization of factors that determine the internationalization of such firms.

V: Uhu.

M: And eh. The first category is entrepreneur-specific factors.

V: Uhu.

M: You can think about the social and human capital. Are you familiar with those terms.

V: Yes, yes definitely.

M: Right, so the human capital, I looked at the knowledge of foreign languages for example, or at the background of an entrepreneur.

V: uhu.

M: Could you maybe share your thoughts about those type of factors and internationalization?

V: Eh, yes I would against say yes to that. So think about it this way right, now again eh, I'm from a city called bangladore, what is know of the silicon valley of India.

M: Okay cool,

V: Right, so eh what is and you know it is not surprising that there are a lot of dutch people a lot of french people in bangladore, so I would consider that eh the social capital of that but like you already have eh an inclination doing something international maybe you would also agree with this but somebody from Amsterdam would have a more international outlook than someone from Idaho.

M: Right. Yeah

V: But of course in the Netherlands it is a different case, it is an hour long train drive to Amsterdam and there we are but in countries like India everything is centered around a big metropolis. So I would say eh yeah the social capital is really a big factor for me to be where I am today.

M: Uhu

V: and now we are talking about the human capital of it. Now, my personal background, like I spoke seven different languages. I was raised in various parts of India and that gave me an opportunity to think differently because my definition of entrepreneurship is really culture intuitive. Why would be an entrepreneur which is risk and eh economic uncertainty, okay when you can have a job at a big company and have a comfortable life, right?

M: Right.

V: So, eh, the human capital aspect of it. Teaches you to at least in my opinion. Teaches you to be more confident, start having degree of self-beliefs and that's what helps you think I would say radically different from a lot of smarter people who run start-ups.

M: Okay that is pretty clear, and eh did you have any previous working experience prior to your company now.

V: Yes, I worked at for eh a french-american company back in India called Elcatel for two years.

M: alright and is that a commercial company and already international, was the company that you worked for an international company?

V: Yeah it is a huge company, a telecom giant, I interacted with people from Spain, France, England and eehhh in my work it's a.

M: Alright, so we already discussed your background. Did you already have some international experience, prior to the establishment of your company?

V: Yeah so as a student I had worked at the university as a researcher associate and I used to chatbolt the university of georgia and the university of kentucky. Because of the scholarship, that was my eh, I have worked for full time in the US yes and so yeah I did work.

M: Ehm, I'm going to ask some questions about more business specific factors, eh. And eh one of which is technological capabilities or companies, I mean your company is a technology company right?

V: so yeah, it's a techno

M: alright, so would you argue eh i should ask you ask you it this way. If you try to relate technological capabilities of companies with, so companies with a good R&D department for example. If you link that to internationalization. Would you argue that they internationally more and why, why would that make more sense. Are they more prepared for example.

V: Yes, yes, let me tell you at our own experience, and eh having seen a lot of companies do what we do. A number is that, (silence).

M: Ho I'm losing the connection.

V: Whenever the call goes off, don't mind calling me again, because the internet is a little sloppy.

M: alright that's fine okay. eh we were discussing the technological capabilities. Could you give an example?

V: like Facebook started their AI center in Lewis, but instead they picked Paris instead of US. Of all the research is really abstract and you need people from various backgrounds and various walks of life to come together on a common goal and solve it right ? And that being said eh it is like the first step you want to look for different ideas, fresh ideas. You don't just want to reinforce what is going on but you want to take new ideas. So internationalization is like the first step for carrying solid research. Now, I come from Bangladore, India where we have amazing access to talent, right? Way more than Europe or the US.

M: Yeah

V: But then when it comes to research we try to collaborate as much with universities internationally and that helps us a lot.

M: Right so you'd argue that the quality of the university is a major factor for internationalization for USO's

V: Yes definitely I agree,

M: So yeah, another factor that comes from theory is size and when the size of the company when it internationalizes from the theory it is argued that a smaller company

V: Uhu

M: has more international success or has is more determined to internationalize than a company than a company let's say larger, what are your thoughts on that?

V: I would agree, see we operate in five continents right. We are a US company, we have an office in

Bangalore, we try to be in Europe, either Paris or Eindhoven. And eh we already have clients in five continents about Africa, Australia, Asia eh Europe and North-America right. So, eh the there's quite a strong reason why we are trying to focus on internationalization because A. eh we have international success, B. we are nimble we can move fast, we are not definitive in a big market. You know, what here is my only market and we only put resources here. We have already done it. I have a big success, so we don't have that legacy right?

M: Uhu

V: So we are trying to explore and we want to succeed internationally. And also I would agree one more factor is like. Currently, we live in a really connected world. I don't see huge differences between the customer requirements in India, Europe or the Us or let's say.

M: Primarily due to globalization? Alright.

V: Yes,

M: Eh, well thank you, there is another factor what is called the focalization of your export strategy.

V: Uhu.

M: Which is more specifically on targeting on a specific type of market. And for USO's this is usually the distinction between anon-niche or niche market. Eh, and that's another factor so, USO's, either target non-niche, just like every other generic market. Or they target really specific niche market which is quite common with technology spin-offs. What are your thoughts about linking that with internationalization. So targeting niche international markets or international non-niche markets. Would you argue?

V: Eh, I, I would argue that niche, irrational markets not just whole broad because I feel let's say take the name Tata steel. A lot of people in Europe would know that.

M: Yeah

V: Because a brand like Tata, which is Indian, which can cover any company any part of the world right. But for a start-up, I mean we would like to be known only for AI or for enterprises versus automation and finance. I don't want to be known for anything else. That's my goal right. We focus on a few things. When coming from a university, especially with a formal education. You tend to be more focused on specializing, you want to be really good at something, rather than rigid many things. I would argue that eh that is a prime factor which would lead a university spin-off when going for a niche market, as opposed to a generic market.

M: Alright. Really clear, thank you. Another one that is really a major factor is, eh and also came from my quantitative analysis significant. Is science and technology structures

V: Uhu

M: For example like incubators at a university. Technology transfer offices at the university or any kind of support that comes from the university.

V: Uhu

M: Which is more like a context-specific factor. What are your thoughts on that? As a factor for internationalization of spin-offs.

V: Ah I see, I would argue that eh slightly differently, you see.

M: Eh we lost the connection.. Hello?

M: Ah here we are again.

V: Yeah sorry about that.

M: No it's alright.

V: Yeah one of the things that I would argue like you need actual, you don't need to rely on actual support like a take a huge transfer of anything of that sort, the fact you are part of an ecosystem in the university. That you are by definition accepted by as an expert especially in the grad school, the masters and PHD. Your work already has impact in your scene your papers getting published and you know have a network of experts by your transfers your advisors your collaborators. I would argue that these factors matter more than anything else because you tend, I mean like I'm enlightened at so many universities so many places around the world to give talks.

M: Yeah,

V: And more often than not I'm invited as an expert speaker, I mean even if I speak wrongly people believe that, I mean I don't do that but haha.

M: Hahaha

V: The point being eh, universities give you that power and I guess that's the biggest factor in universities. Becoming, the students becoming an entrepreneur eh, as opposed to the direct eh benefits that they can get.

M: Alright, so especially for people that are starting to becoming an entrepreneur, they especially rely on the ecosystem, not so much on the incubators or S&T structures?
V: Yes,

M: Okay, eh. So another eh major factor is the industry. Eh.

V: Uhu

M: Certain industries tend to of, USO's tend to enact more internationally, they have more international success. So, for example, bio, pharma or technological eh. As opposed, or agri-food or consultancy are the first two examples and there are a couple more and Eh, robotics etc. They have more international success

V: Uhu

M: Eh what are your thoughts on that?

V: I would agree, so let's say a biopharma or like you know a tech company is going to be more successful as a USO. As opposed to let's say putting a state plant. That's quite the difference because you know we are talking about the modern tech world. Which really needs the newest and greatest. The other things are mostly victoriaans style, so you need much capital, you need state-funding. Obviously in that market, eh where more than knowledge capital you need infrastructure and actual capital eh.

M: Uhu

V: Eh, the university spin-offs are not going to do better. But i'm not surprised of the technology element because the condition that has to do business, resorted to, is not based on a just eh the investment and infrastructure but also the innovation and knowledge capital. This is what drives primary innovation here.

M: Alright. Eh Another question regarding eh, a more social capital. There's a specific dimension called cognitive embeddedness.

V: uhu,

M: Two of those are vision and values. And eh from literature the argumentation that if you have, if you share a vision with your network, your professional network but also your personal network you tend to have more international success. What do you comment on that? What are your thoughts?

V: Yes, eh I would argue that yes. When you share it's a power of compounding. Its a power of

M: Oh the connection is lost.

V: Are you able to hear me now?

M: Yeah I can hear you.

V: So yeah it's the power of compounding, right? So like, what eh when you share obviously the thing is eh. It just compounds, it doesn't banish. I guess a university by definition helps you collaborate and that heard, the entirety of sharing and collaboration comes from. And that harbors success so like.

What seemingly is counterintuitive to a lot of people from the outside world. But I would strongly substantiate the theory here. I have experienced it myself.

M: Okay so yeah we have discussed a lot of several different factors. In your opinion eh, are there any factors missing or are there any things you would like to comment on? USO's which kind of factors are really important for their international success. For their international process or?

V: Eh. Okay. Eh, okay so yeah. Can you repeat the question so that I can.

M: Yeah. In your opinion, apart from the factors that we discussed. What are things, factors determinants important for the internationalization of USO's?

V: I think we covered most. So let's recapture. So I would see the reputation of the university, the ecosystem of the university. The kind of people you work with. And one thing I guess, more eh a key factor which we don't normally tend to talk about is: the location of the university right? I know. Location

M: The geographical location or?

V: Yes the geographical location like.

M: Could you elaborate on that?

V: Yeah, an average university located in New York will produce more entrepreneurs compared to a fancy university in Nebraska.

M: Uhu

V: Right, because obviously like eh, access to the capital. I mean, that's for Stanford graduates raise more capital compared to any other university because they are close to silicon valley right?

M: Uhu yeah.

V: So, I would argue like that is one factor that we did not discuss, but it is a very important factor. And the other factor is like I mean, eh. Assuming you're part of the university eh, assuming you have the drive to be an entrepreneur, you will be an entrepreneur, if you don't have any financial burdens right? That's why you will be surprised that more PhDs and more masters will start a company. Compared to more MBA students. Because MBA's you have spent a lot of money and you'll already have financial burdens.

M: uhu uhu.

V: So despite the fact that they have better understanding of the business world it is more likely that a masters or a PHD will have more companies compared to an MBA.

M: Right, but does that also take up for does that also apply to for example Dutch universities. Because we do not have burden or a financial burden. But we do not really MBA specialized type.

V: Oh, right, oh okay. I'm sure that when you get a free that's was my next point actually. In my case I was able to do that in the US right? I would say that the same thing in Europe, people get a scholarship right. You don't have to be pay for it. So yes, you don't have that financial burden. So you should have the liberty to make choices, I guess eh the ability to not have a financial burden can also be a factor which boosts these kind of innovation.

M: Right. Well that was really clear, so yeah. Vijay I don't have any more questions for you to answer here. Thank you so much.

V: No problem Mark. Good luck with your study.

End of transcript.

Transcript Verbatim Interviewee 2

Name:	Rob Groenendaal
Company:	Mercator Launch
Expertise:	Business Coach University Spin-offs
Date – Time:	27 June 2018 – 10:00
Place:	Nijmegen
Pages:	5

Interview was in Dutch, translated to English in order to properly interpret the information.

R: Rob Groenendaal
M: Mark Kroes

Start of Transcript

M: Well the first question, what is in your eyes important for the internationalization of USO's? Which factors are important? Which characteristics do they need to have? Oh eh, one second, eh. It is important for me to note that you can always end the interview if you want to and that you are free to not answer any questions in the interview eh, are you fine with that?

R: Certainly

M: okay good, eh. So where.

R: You triggered me with the things that you said, eh with the Amsterdam. Eh I you look at our spin-offs, the definition of spin-offs in our reach of the University. When a finding comes from research and sort of transfers their research to a start-up. It's a startup.

M: Yeah of course.

R: Of a company, and that knowledge often a part of a scientist integrates in the new company, not always necessarily. After a while a contract is constructed, included with licenses and sorts. Those things, do you have the same definition?

M: Yes.

R: Because that is important. You should do that with Dick Bos as well because he does not come necessarily from USO's. Because that is your target group right? Spin-offs

M: Yes, but in the definition however. Everyone that has studied at a university enriched themselves with knowledge from the university. Started a company with that knowledge.

R: Yeah,

M: Is in theory already a spin-off.

R: Yeah, that's the more broad definition. We, we, in practice separate them from if knowledge from the university is part of the spin-off. Some sort of project from the university to the external environment, with a contract, judicial and business development. Then it's a real USO. When you finish your masters and you start a company over two years, it does not mean that it's a real spin-off.

M: Good that we that clear, eh, eh. So what do you think is important for the spin-offs affiliated with the Radboud? Which factors or what determines the internationalization of those?

R: Well, eh. A lot of them in our eh community are already international. You've seen them, Novolanguage right? At Mercator. Eh, A lot of them are already international so. From those, the majority are medical spin-off companies. Which are generally already in scientific consortiums. That provides them with a network, funding etc. etc.

M: Okay.

R: So what you see is, a lot of them are international from start. And that consortium creates that orientation, eh. That network is so important to them. It attracts funding, we have European funding currently as well, eh. But also that network is what provides them with opportunities, with a market etc. We have Gight now, a company that provides lighting for elderly people.

M: Uhu,

R: That is a company that is from the start an international spin-off, because it can be applied anywhere you know. It's not that it only works locally here in elderly homes. And another, Sython is really successful because of its targeted market. It works in all parts of the world, because people are sick everywhere right?

M: Yeah, totally.

R: So yeah spin-offs and factors that make them internationalize. I think a lot of things are important. But it depends on the product, and on the target market. If it may be used everywhere, such as Novolanguage, who focuses on language. English is spoken anywhere and Chinese is pretty big. Their orientation towards international markets is what determines the success because it provides them with opportunities, markets etc. Ehhh, so.

M: Okay. Eh so yeah that was more a general question, now more in particular about certain factors from theory. These are eh, categorized according to entrepreneur-specific factors, business-specific factors and context factors.

R: Alright, sounds logical.

M: The first factor, which is pretty important, is international experience, what are your thoughts about that in line with the internationalization of spin-offs?

R: Well you know, scientists are not per se entrepreneurs, they sometimes just roll into a spin-off because of the transfers from research to society, and eh. Usually what we do here, is that if the spin-off is generating positive revenues and growing, eh. We attract an experienced CEO that has multiple experiences, that takes a part in the company. Eh, so I think that

M: he has international experience usually?

R: Yeah, for sure since he has worked in multiple companies and been in other situations, eh. So yeah it is a combination of research with the CEO that complementarily works in spin-offs in international markets.

M: so eh yeah, would you argue, because the next factor is previous working experience, that this eh also applies to this factor? Eh, as a determinant.

R: yeah so, international experience is somewhat the same. It provides entrepreneurs but also CEO's with knowledge of the playing field, knowledge of the game. That works in international markets, because you know what to expect in some situations. Therefore you can anticipate and put together people to congruent in a sense. Eh, but I think the knowledge of the field is what works.

M: Okay, so the experience of the CEO, not the entrepreneur/scientist?

R: Usually not no, eh yeah.

M: Yeah so the next factor is the knowledge of foreign languages, such as English, how does that apply in your opinion?

R: Well, yeah it's good to speak the language to understand others or some sort.

M: eh okay so yeah, another factor which we discussed a bit, would be the network. What role does the network play in the internationalization of USO'S?

R: yeah so eh, as I said it helps with funding, eh, it helps with the people that worked in multiple countries can help to make decisions and eh, yeah.

M: And eh I will say this in English, how embedded you are in your network, how would that help?

R: So yeah, embeddedness helps, if you are strongly connected to your network you will know that they want and they will help you. It helps you in general.

M: So, thank you, eh. So, now I will ask some questions about more business-specific factors, eh. The first one eh, is eh, technological capabilities or R&D intensity. Which means eh the more a company invests in the R&D department, in relation with their sales, the more technological capable they are. How is that related to the internationalization of USO's?

R: yeah so it's all about worth enhancing. If you invest a lot in the R&D and stimulate the innovation of the firm, eh. Than you increase the worth of the product right? So yeah that helps in international markets to differentiate you from competitor and the way people want to see the products. Eh, so that helps since a more complete and innovative product stimulates people in buying the products.

M: okay, clear thanks. Eh, yeah so apart from those capabilities, the size of the company is important according to theory. Eh and you should interpret it like this, the smaller the company, the easier to internationalize, the better etc. How does that work in your opinion?

R: Eh, so eh.. wow. What happens a lot with these spin-offs is that they outsource a lot of operations. So they outsource things, a lot of medical companies right? They need it each other in a consortium, or in international projects. But it helps to move fast etc as well of course. I don't know for the rest eh, eh.

M: Yeah, eh, okay. And what about the companies targeting niche-markets. In theory the argumentation is that companies, high tech presumably, target more niche markets and therefore internationalize more. So,

R: Yeah, eh, well a lot of the spin-offs here are really Beta kind of companies, with an incredible type of specialization. So that narrows down the markets they are in. And it narrows down their focus as well. Because a lot of them are only in those markets, and do not have really generic products, such as Syntion.

M: So eh, you would say that a lot of them target niche-markets?

R: Yeah I agree with the theory then on this point. Eh.

M: Okay, good. The next factors are more on the environment of the spin-offs, eh. Context-specific factors.

R: Okay, yeah.

M: Eh, the first one is support mechanisms such as incubators and science and technology centers. Science park for example. Eh, how do they relate to the internationalization?

R: Eh, well with the R&D for example. Such an institution provides the network where smaller USO's can cooperate with other to for example share the investment in R&D, such as Synthion. And we provide financing and such, funding from the EU. And we can answer questions and such, so it is really a facilitating function that eh, the Mercator Launch has.

M: And in the survey, around halve of them thought that support mechanisms were important, eh can you explain?

R: Eh, so yeah I eh, think that has to do a lot with that a lot of entrepreneurs just go for it. They do not need help from other institutions, since they know what they need to do. And eh just take the risk for it. So other, maybe more scientists and researchers will need help with their start-ups. Eh. So it depends on the entrepreneur if he or she thinks it's important, I mean some of them have experience or networks, some do not.

M: Thanks, eh, so, eh. The next factor is the industry, and you can see it like eh. Some companies operating in some sectors internationalize more. So eh, take biopharma or robotics, from theory they internationalize more than other sectors. Or as consultancy firms.

R: Eh,, so yeah I'm thinking of industries that are not internationally, I mean every one of them is international now right? Haha. I do not know of any that only focus locally. I mean yeah if you have bigger companies they intentionally focus on international markets. All of the USO's here are internationally present, maybe one is not. And eh yeah if you have a consultancy firm for example, they usually are more focused locally, because that is normal. Eh,

M: Yeah okay. Well I think that's more or less all of the factors. Are there in your eyes, any factors missing that determine the internationalization of these spin-offs?

R: Eh, well yeah. I think we discussed the majority of them. So one big crucial factors is the team, eh.

M: The entrepreneurial team?

R: What's that exactly?

M: The team including founders, scientists etc.

R: So yeah, indeed the team is vital, for the validation of what you want to do. Search for it you know, if you want to be an entrepreneur, go for it. Look for the environment, such as a knowledge center, a university etc. Try to think in solutions when facing problems, and do not back away from it. Go for it.

M: okay, any more.

R: no, not really I mean entrepreneurs, if they want to be one, they will get there anyway. That's the thing in my experience. But, look for help.

M: Okay, thank you so much Rob.

R: No problem. Good luck.

End Transcript.

Transcript Verbatim Interviewee 3

Name:	Dick Bos
Company:	Startup Nijmegen
Expertise:	Entrepreneur, start-up business coach
Date – Time:	28 June 2018 – 15:00
Place:	Nijmegen
Pages:	9

Interview was in Dutch, translated to English in order to properly interpret the information.

D: Dick Bos
M: Mark Kroes

Start of Transcript.

M: So Dick, thank you so much for your time.

D: Yeah, no problem. Difficult thesis you have.

M: So first off, are you aware that you can eh, always end the interview if you want to and feel free to do not answer any question that you do not want to eh.

D: Okay, good.

M: so eh, yeah. First question will be, eh, in your eh, opinion what are important factors for such startups? What determines their internationalization, how do they do that?

D: So that's difficult, hard question, it's complicated.

M: Yeah true, but that makes it really relevant due to insufficient amount of research about it.

D: Yeah hard to answer, but let eh us start off with an introduction. My name is Dick Bos, I am from Startup Nijmegen and I think that you can teach entrepreneurships, because it is really easy. You organize a few things, you make sure you have good business model and then you earn some money. Do what you like and do what you're good at.

M: Yeah.

D: I think entrepreneurship should be taught by entrepreneurs and not by entrepreneurship and innovation and such curriculum where entrepreneurship plays a key role.

M: Uhu.

D: People do that and can think, shit what do I have to do now? No idea. I am an experienced entrepreneur, have been doing it for 35 years. Stopped. And now I facilitate entrepreneurs by answering their questions. Currently I have 25 partners helping me. They give three seminars per month.

M: Yeah,

D: The weird thing is, that if you're working with your startup and you have questions, who is going to help you? Your father, sister or bank?

M: The best is of course working people with people who have experienced it.

D: The weird thing is, there's nothing where you can reach out to. No startup place exists. Why not? If you want to learn football, it exists. For every profession such an institution exists with control mechanisms that control and validate for he? Are you still proficient in your task? We do it for apple orchard workers, for lawyers, chefs and for wine-servers. And entrepreneurs do not possess such, entrepreneurs are required to do it themselves.

M: And is that because it is not tacit?

D: It's really tacit.

M: It is?

D: Entrepreneurship can be taught. Very easily even. But you have do it. That's the difference, you shouldn't' talk about it, you should do it. It's visible immediately. That does not mean that someone that is not an entrepreneur, can't become one.

M: Yeah,

D: It means practicing things, making mistakes and go for it. My guess is that 50% of all entrepreneurs fail within the first five years. They know it from New-Zealand all the way to Greenland and we have known it for 500 years. And because it's customary, we don't change it.

M: No, uhu.

D: So if we try to change entrepreneurship and learn it in practice. Supported by experienced guys. Then, perhaps we can change that percentage to 70 or 80%. If that is true, I've only been going at it for two years, then it's a major difference. We started with 13 entrepreneurship, currently with 90. This year 30 will source out. They al enlisted 1, 2, 3, 4 employees and they're all looking for a place in the city of Nijmegen because they want to maintain a connection with startup. Cool.

M: yeah indeed that is really amazing. Good to see that it works.

D: That does not answer your question I think? Haha.

M: Haha no, but I do see some similarities with things that I read. I think that a lot of similarities exist between start-ups and spin-offs. And I think that if we speak about international start-ups, eh I can ask a few questions about those and I will focus on that group.

D: Yeah, eh that's fine.

M: So yeah I can analyze that as well, that's no problem.

D: Alright,

M: Before that I ask some questions about more specific factors, what do you feel is important for the internationalization of these start-ups?

D: Eh, well the success or failures of them, maybe not a really satisfying answer is, especially for the ones that fail is that a market is lacking. A really big silencer is that for 90% of the entrepreneurs that do not make it the first five years. If you read their reports, why did they quit? Not every one of them went bankrupt. Why did the other 50% quit. There was not a sufficient market. But they have not analyzed the market anyway. And they give the reason: It cannot be analyzed, because it is really innovative. But that's nonsense, everything can be analyzed.

M: alright.

D: But that means that innovative products cannot be researched? Well that is really bullshit. You can analyze everything, but we are really opportunistic, we are stubborn. We want that our idea is successful, but we do not analyzed. Because what if the result comes in that it cannot be done. Then that means that I cannot start the company, while I enjoy it so much to start it. And those mistakes are made by starting entrepreneurs, but also by experienced ones. With experienced entrepreneurs, this percentage of failing is even higher.

M: Uhu,

D: Because they say, eh. We have experienced it before. I've money to spend, that market is mine. I will upscale my business. But I will not do research, not analyze the product in a new market. In retrospect, they will tell me that they should have.

M: And why is that? Are they scared for the outcome?

D: Eh, yeah. Scared, Stubborn, opportunistic, eh. I'll buy that market. Eh. Greediness. Hornyness, Ego, eh. That is continue,

M: okay.

D: And that is with internationalization as well. So if eh, build a market in The Netherlands, or in a country. What tells me that such a product will work in other nations as well? And then they say yeah, but how often have I seen it go wrong?

M: alright, informative.

D: Yeah, but we have lots of examples. I mean, liquorice in The Netherlands. Everyone wants to eat that right? And the same type of candy in Russia, they won't eat it. They're scared to death, have you ever eaten a black candy? Or poffertjes in America. It's smaller than a pancake, they will not eat it. It is really weird,

M: I think it's culturally embedded.

D: Yeah, but why don't we research it first.

M: Okay, so it's a pitfall?

D: Yeah, so we think it works over here, let's scale it to somewhere else. And what's easy then? Germany, Belgium. First the Flemish so we don't have to translate.

M: I've learned that it within The Netherlands, it can be quite different.

D: Yeah and they say: if it works in Nijmegen, it works anywhere haha.

M: Okay, haha. Eh, so if we take the entrepreneur of these start-ups. Eh, One factor that comes from literature is international experience, eh. And my proposition is then, if the entrepreneur has more international experience before he starts the startup. Then, he will internationalize more. Eh.

D: Of course, of course, you have more live experience, you have better language skills, you take less risks. You have less of an obstacle to skype with the whole world, or speak to them in person. You're more of a world citizen, eh. So if you have traveled the world and you return to the village of Nijmegen, eh and you start something. It's way easier to sell something in Germany, Sweden, England or Spain, because you have encountered them during your travels. Your network is important and they guts to speak with other cultures. We also know that the diversity of cultures help you as a person and a firm gigantically. We have InterVision groups here. Every starter

M: uhu,

D: They eh, start with an InterVision group, we try to make it as diverse as possible. So application builders with a coach and eh, male, female, the age of 20 and 60. Exactly what you need, the sharing of competences. Be vulnerable. International is exactly the same.

M: uhu.

D: And so the international experience helps you tremendously. It's really difficult in general, even if you have been in other countries still.

M: yeah I can imagine.

D: So, yeah, eh. I have some experience internationally as well. And I was a excited, aggressive guy that thought he knew it all. Well, eh, It just does not work that way. How do you call it, eh.

M: Yeah,

D: And eh it works that way. You have to make sure. You know what you talk about. Like Belgium, you need a guy who knows the country.

M: so that is the international experience that you have gotten from that?

D: yeah, indeed. But it should have studied more, asked more questions. It's the same everywhere. If you go Arnhem for example, a tremendous culture shock. It will work, if you just ask questions, in stead of telling what you are planning.

M: Okay, clear. Thank you.

D: It's a mindset. The majority of these here are experiencing difficulty with finding next clients. Usually the business already looks really good. But they will search for someone else for the sales. Wake up man, do you know the costs of such?

M: yeah, eh haha.

D: Selling is asking questions.

M: Okay, that's a personal note then. Haha.

D: Haha alright.

M: Okay, and they just talk?

D: Yeah and luckily that is a tendency that is increasing more recently.

M: Okay eh. And eh. More focused on the working experience that some entrepreneurs have before they start a company.

D: Yeah that helps, gigantically. My oldest son has started for himself. And I discourage him at first, go start at Shell, somewhere at a large corporation. You learn about processes, you have so much luggage.

M: Wow, maybe it's in the blood.

D: Yeah, but what I am missing is the experience. So sometimes he calls me. His name is Mark as well haha. He's missing some luggage of experience. It is just really easy if you have experienced in a

political game at a large company. So you know how people look at markets, with who they do business with, how they use parameters to not do business, eh and etc.

M: yeah,

D: Eh. So he would have way more advantage I he had worked at a large corporation. Not a real job, he has not been in a real process. He also did an internship, so he has seen something from the world.

M: Alright, eh. My next question regards the network of an entrepreneur, or a business. What influence does a network have? For the internationalization, what are your thoughts?

D: I think it's almost half of it. For the chance of success. You have to imagine, I have 25 partners here and I tell every startup. Use those experienced guys. Not because of what they can do, but who they know. So, do your pitch, tell what you can do and ask if the experienced entrepreneur wants to be a customer. "But, he is not my target group". True, but he knows people who are your target group. If you ask the question, then you're having a conversation and he will tell you who he knows. So it's not about the experience of the people you know, the network. But more the people that they know. So, is network important? It may be the most important factor.

M: Yeah, okay.

D: We have a woman over here.

M: So yeah, for your sales, but also for international sales it would be important to have a network.

(…)

D: A while back, the CEO of Unilever has gotten a sustainable key from the city of Nijmegen and I got invited to a diner. Really cool, but I asked, can I bring three starting entrepreneurs with me? So they can expand their network.

M: Uhu,

D: So at the end of the diner, I talked to the CEO and said: "Hi Paul I brought three startups with me." "Oh great." And he got up and started talking to them. And one of them needed a connection in Oman and Mister Polman got it for him. So yeah, networking is exceptionally important.

(… Dick speaks with a partner)

M: So eh yeah a more business-specific factor would be the size of the company. And then theory argues that the smaller a company, the easier it is to internationalize. What are your thoughts about that reasoning?

D: Eh, you address me with both formal and informal haha.

M: Haha sorry, I will stop that.

D: So eh, yeah it highly depends on the product and the service. There are a lot of products that can be easily sold internationally. We have gift wrapping company here. And he made a success in The Netherlands and he can be successful in Germany right?

M: Uhu,

D: Yes. So he only has to take himself into account. He already has verification from multiple countries. Currently, we have been working together for a year and he is operating in ten countries. It's just copy and paste, due to the characteristics of the product and the website.

M: But that is in contrast to what you just have said. So the product is not entangled with the country that is sold in.

D: What do you mean?

M: Well you told a story about cookies and you need research to analyze which countries are attractive. But this entrepreneur is just copying and pasting.

D: Yeah, eh. That is true, since does not do any market research. But the difference is that eh. Is, eh. The investments are not the same. And with cookies, it is a lot about flavor. And the good thing here is, the website was easily translatable and eh. The only investment was to translate the site. So, eh.

M: It's a really generic type of product?

D: it's a generic product. And with cookies it's the same, however they are bought in a supermarket and not online. And then you're accustomed with marketing, branding, a lot of regulations etc. And with gift wrapping you do not have the same processes.

M: Uhu, so.

D: We even said, make the company international first, before entering The Netherlands. And then you will get the demand from a corner that you had not anticipated before. So he tried the Scandinavian first and then expanded to other countries. So first international, build a platform and then the rest.

M: Okay. I will make a small link another factor: A niche or non-niche focus of a startup. And the generic products which we just discussed. If we take the gift wrapping example, which is really a non-niche focus. Compared to USO's, spin-offs are usually high-tech companies. Especially these type of companies tend to focus on niche markets, as a consequence they have a higher likelihood to internationalize.

D: Of course, but do not underestimate the gift wrapping. You have a lot of wrapping websites, but no gift wrapping websites.

M: uhu.

D: Which makes you think, hasn't that been around for a while?

M: Yes.

D: But that is the niche. So if you take taxis for example. Try to make a food-taxi, where they first ask what you want to eat, and then ask where you want to go. Then it becomes a niche. And that is with those spin-offs as well, with the firms from the hospital as well. But it is becoming increasingly difficult.

M: uhu.

D: Eh, if it is compellingly innovative, you need to explain a lot of things. Then you have to sell what does not exist yet. That's incredibly hard. But if it is an existing product which can adhere to a niche? Well then it will be significantly easier. The market entry will be so effortless.

M: uhu.

D: I know, thirty years ago. We had these profession magazines. And one of them started a kiting magazine. Such a stupid idea I thought, not knowing that 80,000 people fly kites in The Netherlands. And that is what made it a great success. The magazine still exists to this day.

M: Okay, so that is a niche. Eh. So I have some questions related to the context of the companies. One of which are the institutions such as incubators, Mercator at the University.

D: Is that an incubator?

M: Yeah, and more of them exist. There are multiple corporate incubators, HighTechXL in Eindhoven etc. But eh, what is the importance of these mechanisms for these startups, for the internationalization?

D: Network, knowledge and information, finance and funding. Visibility, eh. Accelerations of ambitions, eh. And I am skeptical about them though.

M: Yeah?

D: Yeah, so what a lot of them are lacking is entrepreneurship. Sociologists, business administrators that support the entrepreneurs while they haven't sold a thing. And then they jointly go for a goal, sitting together a salad bar or barista. But to truly connect to a business, you need entrepreneurs for that. And the difficulty with incubators at ABN, KPN or Aethlon, is that they enforce the governance rules apply to the startups. Which lags the startups. Because every department starts with a disruptive thing, which really needs different rules and regulations. They put the startup in an incubator that does not synchronize well.

M: And eh. Ok.

D: So my experience is, I am an innovation manager as well, and I spoke with one of my old colleagues. He wanted to disrupt the lease market with Mercedes-Benz. And I told him, you cannot do that in-house. You need to develop the concept externally from the company and then integrate it again. And so they did, they started here with three people and currently have 1,500 cars driving around the country. Mercedes-Benz is building them an office and trying to get them in-house again.

M: Okay. Eh, the last factor that comes from theory is industry. Certain companies in certain industries internationalize more. Eh, or they sell more on international markets, and especially high-tech companies such as bio and firms as agri-food tend to do that less often. What are your thoughts about that view?

D: Yeah, that depends on the eh, that it is less costly. I mean, for Uber it is really easy to internationalize, for Booking.com as well.

M: yeah,

D: And they are usually located in one place and have eh, multiple offices around the world. I don't know if you're familiar with the company Methics. They developed software that helps you construct your own application. They started in Rotterdam, it is a software product. They are currently in Seattle and Rotterdam with 600 employees instead of three people.

M: Wow, in thirteen years.

D: Yeah, so it is huge. The value of the company is probably around a couple billion now, but they have not earned single penny yet. But everybody believes in them and the concept, business model and it is easily for upscaling. It is a tech-firm, so effortlessly to scale up. And certainly, if it is related to algorithms and robotics, because that makes it easy to copy and paste.

M: of course.

D: I mean, go build a chemical plant, where the demand is high. But if DSM wants to, they first have to negotiate for another five years.

M: Okay. That is pretty characteristic for a spin-off indeed. Eh, so I think we addressed the majority of the factors. Eh, do you think that any factors are missing, apart from the ones that we discussed, which are important for internationalization of these startups? We addressed entrepreneur-specific factors, business-specific factors and context-specific factors.

D: Eh. Well we discussed the generic products, but what's most important is of course is: does your firm add something, do you have a story and is it value-increasing?

M: Is there a market?

D: Is there a market. And eh, do you differentiate from your competitors? I mean your unique selling point is incorporated a lot, but it is an old term. The modern term is way better, which is a unique buying reason. We always say, from a selling perspective, we try to take a marketer-kind of reasoning. We still have the tendency to think from the sending perspective. I mean, how stupid is that?

M: yeah, uhu.

D: A unique purchase reason, then I want to have you, then you will grow. That is the only thing that you need to be good at.

M: So, other people want to have your products or your company.

D: Yeah, and you cannot influence a lot of things, so just ask them.

M: yeah, so really insightful Dick, apart from the things we discussed, I feel that I learned a lot myself today.

D: Really?

M: Yeah, so thank you so much.

D: Okay, no problem and good luck.

M: Thanks.

End of Transcript.

Transcript Verbatim Interviewee 4

Name:	Auke Douma
Company:	Studio Fint
Expertise:	Creative Strategist, entrepreneur, has worked with multiple spin-offs and start-ups around the world.
Date – Time:	6 July 2018 – 16:00
Place:	Nijmegen (Skype call to Amsterdam)
Pages:	10

Interview was in Dutch, translated to English in order to properly interpret the information.

A: Auke Douma

M: Mark Kroes

Start of Transcript

M: Hi Auke,

A: Hi Mark.

M: Thank you so much for your time and for this interview.

A: Yeah no problem. Of course

M: Eh, small introduction, eh. After that I will ask what your expertise is. I'm currently conducting my master thesis on USO's, which are companies that use knowledge or information, patents, etc. of the university to start a company. And more specifically I'm looking for what makes it that these companies can internationalize, which factors are relevant in that sense.

But eh, maybe first a question regarding your expertise and have you ever been in contact with these type of companies?

A: Okay.

M: Or eh, start-ups, in that sense. Oh, and eh quite important is that you can always choose to not answer a question and end the interview if you want to. Is that okay for you?

A: Yeah, of course, haha makes me think.

M: good, so eh yeah the question was have you ever been in contact with eh.

A: Eh, have to think about that question but I feel that I can probably answer that question. Eh, what I do with my company. I will give some background first. I studied in Delft at the technical university and a study that is called industrial product design. And my specialization was strategic product design. Eh, and that focuses on the last part of the establishment of a company. From a problem to actually entering a market. Not really determined on the actual designing of products, but more on the development of concepts and market enters etc. And my finishing project was a start-up called hyperwash, who had the plan to make a wash machine for the Indian market. Women there do the laundry by hand, but it gives them bruises, takes a lot of time and a electrical wash machine is not a really good contextual fit. And my assignment was to do a market introduction. And eh that illustrates a bit what I studied and what I do with my company. Eh, because I started that company during my

studies, eh, 6 or 7 seven years ago, because I like to do graphical things. Designing brands, logo's etc. eh.

M: Uhu

A: And eh. After my studies the company grew that I could live from it. But I felt that graphical design is too one-dimensionally and eh after I while I started helping brands and companies with the introduction of new products. And eh, that is how it started. Not every project is that fun, but most of them are haha.

M: Haha yeah.

A: I'll finish the story, I've studied in India, Denmark, Greece and lived in several places around the world. During that time the realization came to me that I wanted to do something with social impact, so how do you realize such initiatives at the bottom of a market in Africa. And eh, if we're closer to home I would like to talk about sustainability.

M: Funny that you mention it. Because it's been addressed quite often during my master's, base of the pyramid it's called right?

A: Yeah exactly, that is exactly the thing. My colleague laughs when I talk about it haha.

M: both of my interests are right there as well so, that's good.

A: So yeah, eh. My focus lies in those areas. The BOP area.

M: Thank you for your story. EH, since I'm looking for factors that determine the internationalization of USO's, eh. First a more general question, what are in your eyes important factors for the internationalization of USO's? Examples are factors related to entrepreneurs, businesses or contexts.

A: Yeah, eh.

M: But eh a general question, what do you think is important for these companies/

A: Eh, yeah. Before I answer that question, I would like to take a step aside first and eh. My company's business is probably consultancy and giving advice regarding these type of projects and initiatives eh. And that is totally different from a start-up or a small enterprise that develops a project, say a washing machine or app. Eh.

M: Okay.

A: Then your product is linked to the market and eh. And for the advice part that may be a bit different. For me, eh. Personally where factors where eh. You being present in such countries, traveling over there, eh. And also eh, the ecosystem of the university. For example, I followed a course that was called internationalization, and eh. There we were exposed to multiple contextual differences and cultures, I mean that they drive on the left side of the road in other countries for example. That it's polite to act in certain countries and more examples, eh.

M: Okay, yeah.

A: and that is eh qualitatively grounded. In the Netherlands we are really individualistic and in India people are more collectivistic. So yeah,,

M: Hofstede's dimensions?

A: Exactly, eh. So that is a perspective that I learned and always had the interest for these topics and

eh. And that was a result of being part in a international society and primarily, my first international encounter was Kopenhagen. That was where, for the first time that you are becoming part of that. By being exposed to that international society, eh and making friends around the world, eh. That is what makes your playing field and your space.

M: And eh if you look at the companies that you advice.

A: Yeah,

M: What would be important factor for them?

A: Eh. Let me think,

M: I mean, some of those companies are international right I presume?

A: Yeah, apart from that company, I mean know another one which you can perhaps use in your report.

M: Eh, so what does determine their internationalization?

A: Well with that firm it was due to eh, the possibility for that start-up to adhere to the market. That entrepreneur was not that socially related, but we knew that BOP was there, the margins are small but there is four billion to be gained.

M: Yeah, so a lot of wealth, but it is just heavily distributed. Eh.

A: yeah, a lot of opportunities in the market and I have to say. I, eh, I, try to live as green as possible but the majority of the projects that I do, how socially related it is, eh. There is always a commercial element in it. I always try to make sure that it is not completely depended on donor money. So, eh. Another start-up is called pula and eh. You can search for it. Getpula.com. And I jointly started it with some other people. Eh.

M: Uhu.

A: Eh. And eh. That start-up we develop an app that helps companies that collect human waste from septic tanks in African cities.

M: Yeah, okay. Good-looking website as well man.

A: Haha thanks I made that as well.

M: Eh, and let me see I eh. I eh, developed that whole product and I did the proposition and a part of the business case in the past 1.5 years. And there is what the reason for it is the internationalization, because primarily, these problems do not arise in the Western world eh. And A lot of problems are present in the rest of Africa, lot of illegal dumping and that influences the environment of course and the health of people in cities. So eh, yeah it is really problem-driven, a sort of international market. And eh I think the belief that we, the western world have such knowledge and experience to develop profound solutions for these problems. And I think eh, If I hear myself talking that that could be an important factor eh.

M: Eh,

A: Eh, to crib other ideas and then apply them somewhere else. Eh.

M: okay, that is a pretty clear narrative, thank you eh. Now some more specific questions regarding your opinion about those. And eh the first international experience of the entrepreneur, eh. You can

emphasize on your own experience, but perhaps also the companies that you give advice to. If the eh, entrepreneur has international experience, how does that influence the internationalization of these companies?

A: Eh, hm… I think it's extremely valuable, eh. Because I think eh that a big part of the success of an entrepreneur that pursues international initiatives or just goes abroad, is just cultural fit and eh. To understand the parties that you're working with. Eh.

M: Yeah okay.

A: Simple example, by spending one year in India, Eh. I now know how uncertain agreements are in India. A year in The Netherlands can be way more valuable than spending a year in India. Simple things, that the planning is final when doing business in Africa, eh. Yeah, that is I mean you can add to that list.

M: You'd say that you're better prepared for international contexts?

A: Yeah it is so valuable when you know the contexts and now and then I eh, speak with friends that want to spar about such topics and eh. And the thing is, you can tell people but experiencing it yourself is way different and eh. That international experience, being present, doing business with Chinese, Indians and Africans, eh. That is exceptionally important, on the hand because of the chance of success and on the other hand because of also because of the eh. Possibility to see if the potential is there and eh to make the decision at all to go over there.

M: And eh. Okay.

A: I don't know if you look at internationalization, I mean look at it with a sort of BOP-type of lens. But eh, you it can also be between The Netherlands and Germany or England or whatever, eh. That is a bit different of course, due to them not being so culturally different. Eh. Yeah, let's say the harder countries to reach, it is pretty valuable in my opinion.

M: okay, eh. That is good, it matches with the theory so. Eh. Same sort of question, only then eh. More about the working experience that a entrepreneur has prior to the start of a company.

A: Yeah,

M: of the entrepreneur, what kind of influence does that have?

A: Well, eh. Personally I had no experience abroad. I just went to Denmark, I just went to India. Eh,

M: And your experience with other companies? I mean, there you encounter entrepreneurs as well.

A: Eh, yeah.

M: Can you imagine what their work experience does for their international endeavors?

A: Let me think about that. I would say, that at start of this year, I was in Africa and most of the entrepreneurs over that that I spoke with, with a Western background, eh. They have been around for a while, they come there often, have been in the market for a while. Eh, I would argue that the majority of them have international work experience Yeah.

M: Okay, and what would make them more suitable for internationalization? Better prepared or?

A: Eh, yeah I think so. That would summarize it probably yeah. To know what to do and knowledge of the market is extremely important. Insight, in, in the market. Which is difficult to validate from The

Netherlands and eh, to conceptualize how big the market is. That just works better if you're locally operating.

M: Uhu

A: Yeah, so something in that direction I guess.

M: Okay, yeah this works, and another factor eh. Is the knowledge of foreign languages. Eh. Can you imagine how that would work with internationalization? If you speak more languages, every one you speak would help?

A: Eh, I think so for two reasons. One, because you need it. Eh, and two, eh. My experience is that language is really closely linked to culture and so. I spoke, during the end of India a little bit of Hindi. And it helps you to better understand and context eh, as well. My personal experience is that eh. Certain if you're speaking of start-ups where the proposition has not been completely developed and some things need to change in a international market, eh. Those need some iterations before it's completely clear. And eh, I facilitate sometimes these projects where we have to think about these things. And I notice that I's really hard to get things perfectly sharp. And that is really difficult in English even and in Dutch, but it's even harder. Eh, you need some sort of nuance to properly articulate and to understand which proposition you're going to have, market introduction and how large the market is.

M: Yeah.

A: eh, who is the market, who is the customer. Eh, why is it your customer, which things to weigh in your decisions. And eh. I did some sessions with Africans that did not speak English very well and then it becomes really difficult to get across what you should and should not do.

M: Okay, clear. Thanks. And eh, what is an important variable is the network. And from literature it is described as social capital.

A: Yeah,

M: And eh, that is looking at the network as a resource. And then endow that. What is your opinion about social capital with regard to internationalization? Why is it important? What is the influence?

A: Well I think that eh it's pretty valuable but not a necessity. But it can be valuable eh. Because it really helps, in a new culture, other context eh. That you have contacts that guide you in the right direction and people that you can trust. In India, I've got some good friends, so whenever I want to, you know, have a new proposition, does this work? And with them I can just ask them without like a India filter, you know. Because they really know that it's like and that is what you know. I don't know if it really is in line with your question but.

M: Yeah it does.

A: Eh, so that eh. That is valuable, I'm thinking what I should answer apart from these things.

M: Eh yeah so. Well what also comes from literature is that eh if you speak the same language, have the same values and vision with your network, that it helps with internationalization.

A: Well, eh I can imagine. Perhaps a good example of a start-up which I know is eh, formitable. They make reservations software for restaurants. Eh, smart algorithms and apps that. And eh, what they experience for scaling is that eh, they are currently still in The Netherlands because eh, but they can easily go to Belgium, France. Because those markets are in pretty close proximity to The Netherlands,

due to that those markets are quite similar. If you go to Germany with a bicycle, you would not make it, because the infrastructure would be insufficient or not present at all. And it would not be comparable, I mean if you go Spain or Portugal or Italy, it would work. Because maybe people over there like to eh, just to go La Vida Loca and enter casually, bonnefooi. Because eh, England, Scandinavia or etc would be quite logical for them.

M: Yeah, okay. It is pretty culturally linked then?

A: Yeah, eh. They know the market and the network over there, in those countries.

M: Okay and eh, I've got some business specific factors, one of which eh. Technological capacity of a start-up. Eh, and then the same question. What effect would that have on internationalization? And you can imagine that firms that invest substantially in their R&D department, eh.

A: Yeah.

M: High-tech companies primarily, they internationalize more.

A: Eh.

M: What are your thoughts about that?

A: Why would that be then? Or do I need to answer that haha.

M: Well yeah, what is your viewpoint in that? What is your opinion? I won't answer it, because that's when I steer the question then.

A: Haha. I understand, eh. Let me try to repeat the question, so companies that have a large tech department, have the tendency to internationalize more?

M: Eh, yeah kind off.

A: Eh, well what I can imagine is that eh. The technology is less culturally-linked so eh. When you are the counterpart of that restaurant right, which is locally bounded, where you do not adhere to the local market, local products. Then you eh, the chances that you do that in Amsterdam or Shanghai are of course nihil. Eh, if you. My colleague is talking as well. He says, if you have that technology, high costs to develop and high R&D costs but low costs to implement it elsewhere. Eh, so that would explain it I think, I think that is relevant.

M: Okay, good answer. Eh, the next factor is the size of the company. The strange thing is, eh, that smaller companies internationalize more. Smaller spin-offs internationalize more. Eh.

A: Okay, that is quite logical I think. Eh, that is probably because the larger a company becomes, the more stagnant the company becomes. The longer you will work with companies, the more surprised you will get that some eh. Companies can become slow bureaucratic organizations. And eh, that is not that lean and flexible. So then a lot of people and processes need to be moved if eh, if you want to have the soap of Unilever on the other side of the ocean. And eh, yeah so if you have a firm with 20 employees then, eh and you make soap. You see a chance, then you just jump in.

M: yeah.

A: I feel that that is it, you are more lean when you are smaller.

M: okay, clear. And eh, a lot of these type of companies focus on niche markets. And eh.

A: Yeah.

M: And eh, the expectation is that they tend to internationalize more.

A: Yeah.

M: And why would that be you think?

A: Eh, once again the simple answer would be. Eh, as a small firm you need to specialize, you cannot go to broad, so that you have a nice would be logical, eh. You, your potential to adhere to a large public, you created your own market cap because you chose to go niche.

M: Yeah.

A: So, eh for example if you go for all types of bikes or you go for all types of mountain bikes, yeah only 5% of the Dutch people rides on mountain bikes so yeah, maybe even less. So that is logical to look for other countries to enlarge your sales. That does not necessarily mean eh. The difference can still be quite big eh.

M: Yeah, so usually, it are pretty big companies that sell just one type of product, for example the medical industry eh. They sell one small thing that is really specialized and internationally the demand is just pretty big.

A: I see the same thing happening on IT-level. Eh.

M: Yeah. So I've got two factors left and these are more related to the context in which a USO operates. And one of them is, eh, the value of a support mechanisms eh such as incubator at the university, however some Science and Technology parks exist at the university that help such companies to internationalize,

A: Yeah.

M: And eh, what is your standpoint on that?

A: What kind of role those incubators play in the internationalization?

M: Yeah.

A: Eh.

M: Why they are compelling?

A: Well, eh the incubator that I'm familiar with is YES!Delft at the TU-Delft. Eh, that is pretty good one as well I think.

M: That is really good one indeed.

A: Eh.

M: They create a lot of good companies, because I have studied them as well. Eh.

A: Eh, when I was studying, I did some work for some start-ups there as well. Eh. Let me think, yeah. I think they do play a big role for eh. My experience with these organizations is the climate, eh. Like we will become the next silicon valley. We are going to conquer the world, so eh. Yeah. There is some sort of culture that they feel that they will conquer the whole world eh.

M: Okay.

A: And just putting the focus on infinite of course helps with looking further than your nation's borders. Eh.

M: So it is a bit about the orientation that these organizations have?

A: Eh, yeah that would summarize it a bit. Let me think, I have to dig a bit since I haven't visited in a while. Well maybe also the exposure to investors. And eh, the benefit is that these things are always in English and eh. The focus on international investors, the focus on multinational companies in the business, that want to coach and help with advice.

M: Uhu.

A: So maybe in that direction?

M: Okay, yeah I think those are important values. And eh, eh, spin-offs that operate in certain industries, and then you can think about high-tech companies.

A: Yeah.

M: So pharma, bio etc. Tend to internationalize more. Why would that be, you think?

A: I think the argument that we just gave was, eh. That high R&D and development costs would, they need to be regained and that would play a role and eh. Perhaps also because they have larger problems that they solve, which are not country-bounded. But more, people-linked, so eh. The more medical club, yeah so headaches is what everyone has in the world so eh. If you invent a pill for that, logical. Eh, you just said, I mean that would be stupid to only sell in The Netherlands.

M: yeah logical if you want to serve the whole world haha. Okay, eh.

A: So eh perhaps, maybe the industry is the answer to that question. Eh, that eh, yeah if you have a company that does something with Gouda cheese. That makes sense to do that in The Netherlands but eh. But eh if you do that in other countries that would eh, haha, do the same thing probably.

M: Eh, yeah okay. Well now we discussed a lot of different factors. Do you feel that some are missing? Eh, we first a more general question. Do you think, apart from the ones we discussed that something should be added?

A: Good question. Eh. I would say that you have, if you have market potential, that that would be the largest push. So, eh. The green mountains across the borders. That would mean to be the reason to go take a look. Eh. If you are really missing somethings? Eh. We have addressed it a bit, but if there are opportunities, what I just mentioned. Learn it over here and then do it abroad, is I think a really strong reason that that would have some influence. I don't know if I can add any more.

M: well yeah, then I think that we have discussed everything. Well thank you so much Auke. I gained a lot of information and we came across a lot of things that I read so.

A: Ah good job.

M: So for the remaining. I do not have any more questions, so thank you.

A: My pleasure.

End of Transcript.