How to Become a Start-up Capital

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Abstract

Small, young, flexible and informal start-ups represent an appropriate vehicle for new disruptive products and services. The impact of innovation for nations is extremely high; several countries aim to achieve it, but there is a lack of research to support it. Silicon Valley has a glorious reputation thanks to the high concentration of start-ups. Silicon Valley is the most famous, but it is not the only one. Several sources have emphasized the Northern European town Tallinn as one of the European start-up capitals. Many famous start-ups locate or have started their business in Tallinn. Quantitative research was performed among start-ups in Tallinn, and as a result typical profiles were constructed. The typical founder is a middle-aged, well-educated, financially-secure, ambitious male with prior experience. Start-ups have an innovative product and good team, but should have more patents, investments and co-operation with universities. The expected environment has a good tax system, low corruption, SME support policy, high technological base and access to resources.

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1. Introduction

Innovation is considered the most valued asset a business can possess, as it leads to continuous improvements which guarantee success for companies as well as boosting the region's economy (Fritsch, 2015, p. 128). Nowadays, most innovations do not take place in large companies, as one might presume. Large companies have shown that despite having the financial resources, their research and development (R&D) departments are not as good as they would like, the majority of innovations happen either through open innovations (Chesbrough, 2011) or by acquiring small start-ups (Scott, 2008). Start-ups have proved to be more effective at developing disruptive products and services despite their smallness, incompetence in managerial issues, and lack of resources among other aspects.

It is noticeable that the concentration of start-ups is higher in some places than in others, suggesting that micro- and macro-environmental factors influence the potential for start-ups. This has also been researched in the context of clusters with one significant difference; clusters do not limit companies by age and size (see definition by Porter (1998)) as start-ups do.

Start-up companies revitalize a region's economy, increase its competitiveness and make it more attractive to foreign investors (Cassidy, 2015). Many countries in Europe have understood the power of start-ups and have started to initiate and support start-up activities. At the same time, some regions have been more successful in developing into start-up hubs than others. Therefore, this study aims to identify factors that affect the abundance of start-ups.

Several sources, including the venture capitalist Branson, the journals Wired and Fast Company, and the Bloomberg index have emphasized the Northern European town Tallinn as one of European start-up capitals. Many famous start-ups are located or have started their businesses in Tallinn, including Skype, TransferWise and GrabCAD. Estonia is well-known as an e-country, where many daily activities can be done via the Internet (Cassidy, 2015). Digital infrastructure is considered to be one of the reasons why Estonia in 2014 had the most start-ups (given the population) compared to the rest of Europe (Cassidy, 2015). However, as per the Estonian Research Information System, studies have not been conducted that explain the factors that have contributed to the start-up concentration in Tallinn (Research activity, 2015). Therefore, this research is essential and unique. In addition, a scarcity of micro- and macro-environmental models exist. In these circumstances, there is need to first provide a descriptive overview – it is considered "enormously important" to create "an early and broad understanding" (Brown and Eisenhardt, 1995, p. 353). Taking the European town of Tallinn as an example, this research aims to identify micro- and macro-environmental factors that have an impact on the local concentration. Tallinn is a suitable and interesting town due to its geographical location in Europe and size similar to many towns. The research question is: **What key micro- and macro-environmental factors help to establish a start-up capital?**

A survey was used and 68 responses were gathered from start-ups in Tallinn and analysed statistically. In order to identify the profiles of influential factors, means, regression and t-test analyses were used. In terms of the theory, these profiles help to combine, confirm, extend, and include separate earlier findings from studies of the micro- and macro-environment into a single model. The managerial implications include indications for potential founders entering the field and recommendations for government institutions to improve the context for entrepreneurs.

The remainder of this paper is organized as follows, first a meta-model of micro- and macro-environmental characteristics are constructed from a literature review, covering a wide set of

variables to avoid leaving anything out by accident. Next, the measures of variables, sample size and other methodological issues are discussed. Subsequently, the results of various analyses are presented and discussed to identify peculiarities, extensions and new findings. Finally, concluding remarks about the findings, together with theoretical and managerial implications, limitations and further research ideas are provided.

2. Literature Review

2.1. Start-ups and Start-up Clusters

According to Blank and Dorf (2012, p. xvii), a "start-up is a temporary organization in search of a repeatable, scalable and profitable business model". Scalability refers to the growth potential of a company in grasping global markets in a short period of time (Stampfl, Prügl, Osterloch, 2013, p. 229). In this paper, the definition of a start-up offered by Ries (2011, p. 27) is used: an organization aiming to create a new (innovative) "product or service under extreme conditions of uncertainty". Extreme uncertainty is caused by the innovative product, which has not previously been in the market, making it impossible to forecast the future of the company (Ries, 2011, p. 28). Approximately one in 3,000 to 10,000 ideas reach successful commercialization (Steven and Burley, 1997). Therefore, standardized processes from traditional companies cannot be transferred to unique start-ups (Ries, 201, p. 29).

Many specialists consider six years as the average age for a start-up; at the same time, age is affected by the industry – in biotechnology achieving prospective sales revenue might take up to ten years (Lee, 2005, p. 48). Start-up team membership increases at every stage of development (Sharma, 2015, p. 3). If the number of employees reaches 80 or more, it is hardly considered a start-up (Robehmed, 2013).

Clusters, however, have been defined differently, and one of the most popular definitions comes from Porter (1998, p. 78): "clusters are geographic concentrations of interconnected companies and institutions in a particular field". Later, Porter (2000) extended the definition to related fields as well. In practice, Alcácer and Zhao (2016) recently showed a novel way to identify clusters on the basis of geographic patent density. This research does not focus on field-specific clusters, such as the biotechnology cluster in San Diego or the electronics cluster in Boston (Arikan and Knoben, 2014, p. 477), but location specific. Benefits from industry specific clusters are also not so clear (Ozer and Zhang, 2015, p. 1105). The usual understanding is that clusters help innovation, but the opposite may also be true (Ozer and Zhang, 2015, p. 1105). Start-ups in Tallinn are active in many fields, such as ICT, biotechnology, finance, engineering and so on. The most famous examples are Silicon Valley and Hollywood (Porter, 1998, p. 98). Arikan and Knoben (2014, p. 476) highlight some benefits of clustering such as the identification of partners, "easier initiation" and "increased effectiveness of partnership". Fligstein (2008, pp. 141-148) summarizes the emergence of Silicon Valley, seeing first the huge governmental role in initiating and developing the area, and the significant entrepreneurial role with a networking effect that came later, including "keeping in touch with competitors and customers". Fligstein (2008, pp. 141-148) lists historical causes and government activities behind its emergence: the roots of the electronics industry in the area, the Second World War and post-war era effect when government acted as a buyer (e.g. military deals with the semiconductor industry), establisher of the research infrastructure (as R&D financer (over 70%) and cooperation

developer with universities (e.g. Stanford University)), provider of legislative support for industries (e.g. property rights, Telecommunication Act, immigration relief and tax incentives) – all of which had an impact on the emergence of Silicon Valley. Universities, in turn, encouraged the technology transfer and establishment of companies (e.g. Hewlett-Packard was born this way) (Fligstein, 2008, p. 144).

2.2. Developing of a Framework

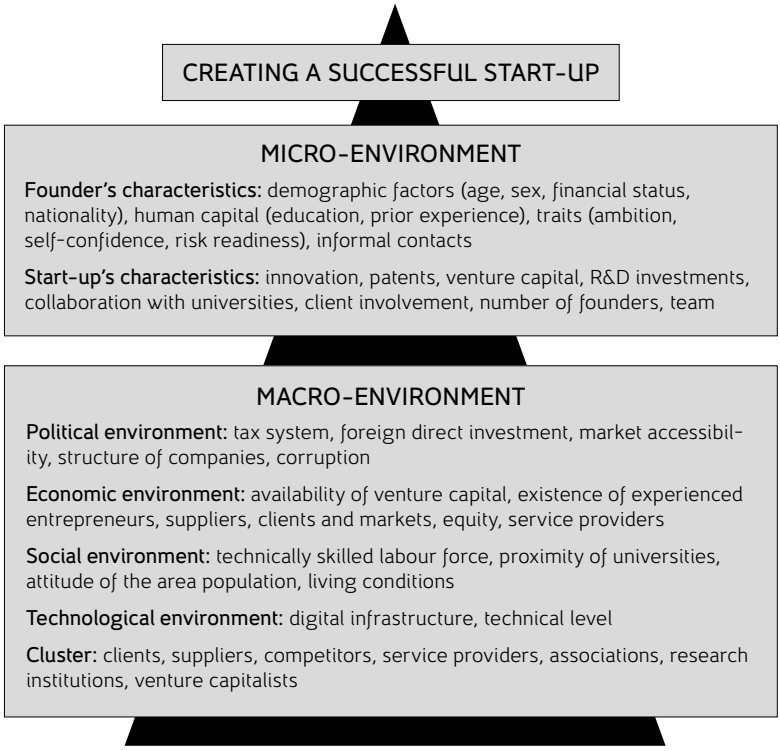
Brown and Eisenhardt (1995, p. 353) emphasize that early descriptive research is "not theoretically integrated with existing research"; therefore, the aim was not to go in-depth with any certain theoretical domain (such as innovation, strategic management, start-ups, corporate governance, transaction cost economics, venture capital, and/or clustering), rather to cover a wide area of constructs and combine them at meta-level.

In economics there are several theoretical frameworks that highlight factors that determine the creation and success of a traditional company (Mietinnen and Littunen, 2013, p. 451). In 1998, a comprehensive model was assembled that determined micro-environmental factors consisting of the characteristics of the founder, business and macroeconomic environment (Mietinnen and Littunen, 2013, p. 451; Watson, Hogarth-Scott, and Wilson, 1998, p. 219). Taking into account the above mentioned elements of the framework and specific start-up literature, the authors have developed a model that illustrates factors influencing the creation of a start-up (Figure 1).

Micro-environment consists of the characteristics of the founder, including demographic factors, human capital, traits (Mietinnen and Littunen, 2013, p. 451; Watson, Hogarth-Scott, and Wilson, 1998, p. 219), informal contacts (Aliaga-Isla, 2014, p. 168) and the characteristics of the start-up, under which factors are compiled according to start-up specific literature including innovation (Groenewegen and de Langen, 2012, p. 158), patents (Karla, 2000, p. 3), venture capital (Lasch, 2007, p. 65), R&D investment (Srithanpong, 2014, pp. 103, 108), collaboration with universities (Zhang and Li, 2010, p. 89), client involvement (Why Startups Fail, 2015), number of founders (Shah, 2015) and team (Wanga and Wu, 2011, p. 713).

Businesses are hugely affected by the external environment in which they operate: if macro-environmental conditions are favourable, there will be more start-ups (Lasch, 2007, p. 63). Gartner (1985, p. 700) has developed 12 of the most important factors of the macro-environment that influence the decision to start a business: availability of venture capital, existence of experienced entrepreneurs, presence of a technically skilled labour force, access to suppliers, access to clients and new markets, government policies (political environment), proximity of universities, access to equity, level of infrastructure, the attitude of the area population, access to service providers, and finally, quality of life.

Figure 1. Creation and success factors for start-ups



Source: Compiled by authors based on Miettinen and Littunen, 2013, and Watson, et al., 1998

The components of government policies have been listed by Lee et al. (2013, p. 337), including tax system, foreign direct investment, market accessibility and the structure of companies. Dreher and Gassebner (2013, p. 416) have also included an important component – corruption – which increases the feeling of uncertainty, and therefore, prevents firms from entering the market. Under technical infrastructure, digital infrastructure is added as it is considered to be one of the reasons why Estonia has an abundance of start-ups (Cassidy, 2015). The authors have placed these above mentioned factors under four environments using the PEST methodology.

The company's external infrastructure including various market players (clients, suppliers, competitors, service providers, associations, research institutions, venture capitalists) are crucial for small resource-poor start-ups (Gelderen et al., 2006, p. 321); therefore, the strength of relationships with these players are examined through the cluster concept.

2.3. Micro-Environmental Factors

FOUNDER'S CHARACTERISTICS consist of 'age', 'sex', 'financial status', 'nationality', 'education', 'prior work experience', and 'prior entrepreneurship experience'. Initially, the founder of a start-up is solely engaged in the development of the company, and therefore, according to Watson, Hogarth-Scott, and Wilson (as cited in Miettinen and Littunen, 2013, p. 452), his/her characteristics have a huge impact on the success of the start-up.

Age. Venture capitalists (VCs) tend to prefer young ambitious founders, as they are more eager to overcome obstacles along the way, easier to influence, and possess fewer bad habits (Wolverson, 2013, p. 1). The same study group has found that age also depends on the start-up company's business: most founders of Internet companies are on average younger because of the low start-up cost and zero need for previous business experience (Wolverson, 2013, p. 1).

In general, middle-age is considered the best age to found a start-up due to the relevant social capital, experience and easier access to capital acquisition (Mietinnen and Littunen, 2013, p. 454). In addition, middle-agers businesses grow better (Wolverson, 2013, p. 1) and billionaire start-ups tend to have experienced older managers (Frick, 2014). Compass (2016, p. 5) findings indicate that the average age of founders in Estonia is 32.9 years, the European and Silicon Valley average is higher (34.5 and 36.2 years respectively).

Sex. Ha and Kim (2013, pp. 44-45) have found that, compared to men, women are not so keen on doing business and that is why there are less women entrepreneurs. Businesswomen start small, as by nature they have lower risk readiness; therefore, male entrepreneurs manage to grow company's size faster (Ha and Kim, 2013, pp. 44-45). Low growth opportunities might be caused by women's most commonly chosen areas of activity (service sector, retail, wholesale), where competition is strong and are, therefore, not attractive to investors, inhibiting women entrepreneurs from obtaining external financing (Jayawarna et al., 2012, pp. 305-306). More recent data shows, by contrast, that female founder participation helps start-ups to achieve better performance compared to men (First Round, 2015). Recent statistics indicate that just 16% of founders in Estonia are women (Compass, 2016, p. 5).

Financial Status. Stucki (2013, p. 25) has mapped financial constraints as an important reason for start-up failure, and found that rich individuals have an advantage in starting up a business due to personal savings, better loan terms (cost and size of the loan) and the possibility of using collateral (Mietinnen and Littunen, 2013, p. 454). Furthermore, the availability of capital eliminates the presence of excess stress, which is caused by the continuous search for capital, and makes it possible to focus on product development (Mietinnen and Littunen, 2013, p. 454).

Nationality. How nations react to situations differs (Hofstede, 2015); for example, Estonians and Russians (majority groups in Tallinn), handle uncertainty avoidance at an average level in contrast to neighbouring nations, Finnish and Swedish people, who handle it at a much lower level. Entrepreneurship is particularly related to the uncertainty avoidance dimension.

In 2014, Estonia, of which Tallinn is the capital, started to issue e-residence, which allows foreigners to use the same e-benefits as citizens: register companies, sign contracts, open bank accounts and so on (Shabbir, 2014). E-residency is expected to increase the attractiveness of Estonia as a place to start-up compared to other European Union member states (Shabbir, 2014). Since the law came into force more than a year ago, its first effects should already be visible. According to recent data, there are more than six thousand e-residents, which exceeds government expectations (Pau, 2015).

Education. Education as a source of knowledge, skills, discipline, motivation and self-confidence, makes it possible to deal with complex problems (Ucbasaran et al., 2008, p. 156). Moreover, highly educated entrepreneurs receive higher returns because they are more capable of identifying business opportunities (Ucbasaran et al., 2008, p. 156). Most successful start-ups are created by university doctoral or post-doctoral students that have already found an industrial partner (Vunder, 2015). It is not yet clear whether the benefits come from education or personal traits (Elmuti et al., 2011, p. 254).

Prior Experience. Work experience increases an individual's adaptability to new situations, the likelihood of becoming more productive in future work and the potential for setting up a business (Ucbasaran et al., 2008, p. 156).

Entrepreneurship experience equips a start-up founder with social connections and skills, which allow access to the necessary resources, especially monetary resources (Zhang, 2011, p. 187).

Traits. Entrepreneurs have a major impact on other members of the organization, and therefore, it is important to control and improve one's weakest traits (Toegel and Barsoux, 2015). The big five traits are neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness, where the most important is extraversion (weight 0.31), least important is agreeableness (0.08) and neuroticism has a negative impact (-0.24) (Judge et al., 2002, p. 770). Traits may change with age (Specht et al., 2011), which means that related variables are interconnected to each other. Specifically for a start-up founder, the most important traits are ambition, self-confidence and risk readiness, which help deal with the stress of the high failure rate among start-ups (Gelderen et al., 2005, p. 367). A small dilemma can be identified here – these traits lead the founders to stay in the company for a long time, but for the sake of higher start-up valuation, it is better if the founder gives up control before the third year (Wasserman, 2016). A study from the Netherlands showed that 33% of technology start-ups bankrupt in five years (Groenewegen and De Lange, 2012, p. 156).

Informal Contacts. It is well known that informal relationships and the resources located within them are taken into account when starting a business (Aliaga-Isla, 2014, p. 168). Using personal contacts to find partners, financiers, competent employees or knowledge is common in the case of start-ups (Bureth et al., 2007, p. 275). Based on network theory the contacts held by the entrepreneur are important for success, as they provide access to necessary resources on attractive terms (Semrau and Werner, 2013, p. 501). Furthermore, the effect of partners is complex; for example, if the company has many contacts outside the cluster, then this also leads to increasing contacts inside the cluster (Arikan and Knoben, 2014, p. 487).

To sum up the founder's characteristics, the perfect start-up founder is a middle-aged (Mietinnen and Littunen, 2012, p. 454) male (Ha and Kim 2013, pp. 44-45) with good financial status (Mietinnen and Littunen, 2012, p. 454), higher education, previous work and entrepreneurship experience (Ucbasaran et al., 2008, p. 156), and equipped with many informal relationships (Bureth et al., 2007, p. 275). Regarding traits, the founder should be low in neuroticism and agreeableness, but highly open to experiences and can be described as a conscientious extrovert (Toegel and Barsoux, 2015). Furthermore, he/she should be ambitious, self-confident and risk-ready (Gelderen et al., 2005, p. 367).

START-UP'S CHARACTERISTICS consist of 'a patent', 'venture capital', 'R&D investments', 'collaboration with universities', 'client involvement', 'a number of founders', and 'a team'. Beside founder characteristics, the start-up's various in-house resources create a sustainable competitive advantage (Wanga and Wu, 2011, pp. 708-709). According to resource-based theory, strategically valuable resources should be complex, rare, in-imitable and irreplaceable so as to prevent competitors acquiring the same resources (Wanga and Wu, 2011,pp. 708-709; Barney, 1991). A start-up aims to create an innovative product, which has a pivotal role in ensuring competitive advantage (Ries, 2011, p. 27). Various studies have shown that a high level of innovation is closely linked to the growth of the company (Groenewegen, de Lange 2012, 158). Therefore, the next section explores how the start-up's resources enhance opportunities for success.

Patent. A patent creates a 20-year government-backed monopoly during which the company can secure its position in the market and ensure brand loyalty (Karla, 2000, p. 3). Berte (2010, p. 38) has added that the start-up's internal capacity is often measured in number of patents and certificates, indicating its intellectual property and protection from competitors entering the market.

Licensed patents for start-ups engaged in scientific discoveries are the only tangible property against which to negotiate with potential partners and investors (Bureth et al., p. 201, pp. 259-260). Patents are useful in certain industries, in some others they do not bring any sales benefit (especially during the first years for mechanical industry SMEs) (Agostini et al., 2015) or are easily imitable (Bettis and Hitt, 1995) and companies find it is worth imitating others, despite regular disputes over patents often going to court (Rungi and Kolk, 2012). Patenting a work process is more important than patenting a product (Datta et al., 2015, p. 230), and even if patenting, it is difficult to grant success, especially in clusters with high workforce mobility (Schilling and Phelps, 2007, p. 1125).

VC. Venture capital fund managers are constantly looking for new investment opportunities, which means they are the professionals assessing a start-up's potential; therefore, the quality of a start-up is often measured by the VCs it is linked to (Fitza et al., 2009, p. 390). As a result, start-ups are willing to pay a premium for being linked with prominent VCs; after financial objectives start-ups also consider strategic objectives (Park and Steensa, 2012, p. 3). VCs remove the financial restraints and enable a start-up to concentrate on the implementation of the business plan with the desired team members, and further increase the potential for success (Lasch, 2007, p. 65). Moreover, VCs assist start-ups in hiring key personnel and participate in decision-making (Bonini et al., 2012).

R&D Investments. Modern world economy is described as a knowledge-based economy where knowledge is the most important resource and learning the most important process (Srithanpong, 2014, p. 103). It has been found that R&D and innovation significantly increases the company's opportunities for success: more money spent on R&D, the greater the productivity of the company (Srithanpong, 2014, p. 108). R&D is crucial in keeping up with market changes, customer demands, and to remain competitive as improving product innovation; R&D is considered particularly important in high-tech sectors (Conte and Vivarelli, 2014, pp. 1337-1338). In contrast, Hughes (2007, p. 20) has found that growth and productivity is based on the diffusion of the innovations "throughout the system", not only dependent on high-tech sectors.

Collaboration with Universities. University-business collaboration is one of the four roles for universities (Hughes, 2011, p. 20). Zhang and Li (2010, p. 89) found that collaboration with research institutions has the greatest impact on innovation. The opportunity to carry out R&D activities using external resources (mainly universities) are particularly attractive to small start-ups with limited internal resources (Wang and Shapira, 2012, p. 201). However, university-industry collaboration does not affect the number of patents and articles, which is the main interest of university scientists, even more, collaboration with a business departments in university (source for business model innovation) may reduce the number of citations for the university scholars (Salimi et al., 2015). In general, university collaboration is seen as a less important source for innovation than customer- and supplier collaboration (Hughes, 2011, p. 34).

Client Involvement. For a start-up, it is crucial to validate ideas with potential clients during the development process in order to identify product-market fit, as initial prototypes never match market needs 100% (Blank and Dorf, 2012, p. 22).

However, client involvement is not always good, innovation may fail from being too client focused (Christensen, and Bower, 1996, pp. 197, 198, 205), as Henry Ford (founder and CEO of Ford Motor Company) said "if I had asked people what they wanted, they would have said faster horses" (Dumitrescu et al., 2011, p. 24). Regional companies for Tallinn and surrounding areas are characterized as too client focused (Rungi and Stulova, 2015).

Number of Founders. The different skills and abilities of co-founders complement each other; furthermore, having many founders increases the social network from which to find the needed resources (Shah, 2015). "Multi-founder firms are more valuable" (Chen et al., 2012, p. 414) with the optimal number of founders believed to be two to three (Chen et al., 2012, p. 406) because if the founding team is too large then the founders do not retain the power of control for long (Wasserman, 2016); however, this is more an individual level issue than a company issue.

Team. Srithanpong (2014, p. 108) has found that the quality of a team is determined by its skills and productivity. Usually, in the early stages of a start-up, employees are part of the founder's social network, which creates a relationship of trust ensuring employee commitment to the objectives of the organization and better performance (Wanga, Wu, 2011, p. 713). The use of a personal network also means the founder stays in charge for longer time (Wasserman, 2016).

To summarise the characteristics of the start-up, a successful start-up has an innovative product (Ries, 2011, pp. 28-29) as evidenced by the multitude of patents (Bureth et al., 2010, pp. 259-260), the amount of venture capital (Lasch, 2007, p. 65), investments in research and development (Srithanpong, 2014, pp. 103, 108), and cooperation with academic institutions (Wang and Shapira, 2012, p. 201). Moreover, the client is engaged in the product development process (Skok, 2015), the optimal number of founders is two to three (Shah, 2015), and a competent team is a necessity (Allis, 2015).

Reviewing the micro-environmental factors described at the creation of a start-up, the entrepreneur can significantly increase the chances of future success. Numerical success can be measured, of course, when the company is starting to produce its first revenue from sales.

2.4. Macro-Environmental Factors

In this chapter, the macro-level factors that initiate a start-up are discussed. The authors have identified the main macro-environmental factors (for details see section 2.2. Developing a Framework) that affect business creation, and have placed them in accordance with the PEST-analysis under the political, economic, social or technological environment.

The impact of macro-environmental factors depend on the policy system used at the national level; for example, in the case of a "free-market view" the emphasis is on the start-ups and the governmental role is insignificant; second, in a "developmental state" strong government coordination is in place to manage skilful human resources (locals and migrants), and finally, in the "complex-evolutionary approach" attention is on "entrepreneurial behaviour" (Dodgson et al., 2011, pp. 1147-1148). Fligstein (2008, pp. 131, 141-150) points out that the government should not intervene in the market; nevertheless, companies are not kept apart from the government, on the contrary, the government impact and influence on them is huge. However, the Estonian government policy is not to intervene as much as, for example, the US government did in Silicon Valley during its emergence. Low government intervention is also supported by the pessimistic view held by Shane (2009, pp. 142-145), who indicates that start-ups in certain industries (e.g. retail) do not create much innovation or jobs (maximum approx. 1–7%). Such start-ups are not very productive, they lose jobs year-by-year, pay below the average

and will not produce growth. Strong government incentives will lead unemployed people to become entrepreneurs in industries with "low barriers" and high failure rate (Shane, 2009, pp. 143). The government's focus should be on "a small number of high-growth start-ups" – those performing R&D (Shane, 2009, p. 146).

POLITICAL ENVIRONMENT consists of 'tax system', 'foreign direct investment', 'market accessibility', 'the structure of companies', and 'corruption'.

Tax System. A supportive tax system was one of the reasons Silicon Valley emerged (Fligstein, 2008). According to the Tax Foundation, Estonia has the most competitive tax system in the OECD: low income tax (20%), profit investments and foreign profits are not taxable (territorial tax system, thus avoiding double taxation), and in the case of real estate only land is taxed (Pomerleau and Lundeen, 2015). Despite a positive attitude towards Estonia's tax system, tax issues are still relevant among start-up companies in Estonia (Compass, 2016, p. 7).

Foreign Direct Investment (FDI). The public sector is responsible for laws preventing discrimination and ensuring equal treatment for foreign investors whose organizations offer strategies, leadership skills, and other resources that enhance the country's economic development through learning from them, and through increased gross domestic product, but some protectionism is usually still present (Lee et al., 2013, p. 339). Findings for Eastern Europe show that from the country perspective, limiting FDI is not always bad (Kattel et al., 2009).

Market Accessibility. Easy access to different export markets is crucial for the growth of domestic enterprises, this is guaranteed by bilateral and multilateral trade negotiations (Lee et al., 2013, p. 339). However, start-ups face the reality that their name is not known and their product is probably disruptive, which makes it difficult to export (Moore, 1991).

Structure of Companies. The public sector should promote market diversity (micro- and small businesses) in order to ensure continuous innovation, and hence, the competitiveness of the sector (Lee et al., 2013, p. 338). On the other hand, Hughes (2007, p. 20) claims "transformations in large business processes drive innovation and productivity" as these firms exist, meaning they are active on daily basis. On the whole, Estonia is characterized by a very high concentration of micro companies (1–9 employees), reaching 90% in 2013 (Eesti statistika aastaraamat 2015, p. 217).

Corruption. Public sector corruption creates mistrust in the government and restricts free competition, which discourages economic development (Ionescu, 2014, p. 126). High levels of corruption might prevent the formation and growth of start-ups, since they have limited resources and contacts (Zhang and Li, 2010, p. 90). Transparency International sets Estonia's corruption perception index at 69, where 100 is free of corruption, and 0 is highly corrupt (Perceptions Index…2015).

Generally, the political environment in Estonia is considered positive by start-up companies, both in areas of local and national government (rated 50% and 66% positive respectively), "whereas the global average lies at only 25%" (Compass, 2016, pp. 3, 7).

ECONOMIC ENVIRONMENT includes a wide variety of start-up specific economic aspects, such as 'venture capital', the 'existence of experienced entrepreneurs', 'suppliers', 'clients and markets', 'equity', and 'service providers'.

VC. Venture capital funds not only provide financial resources, but they are also considered to be value-adding investors who contribute to start-up strategy creation and implementation (Fitza et al., 2009, p. 390). Therefore, many start-ups count on foreign investors because after

Tranferwise and Taxify, it seems that Tallinn has attracted their attention (Ransom, 2015). However, only 28 Estonian start-ups have obtained an investment from a major foreign investor (Bershidsky, 2015). The average seed round in Estonia provides funds for start-ups in the vicinity of $400–450 thousand, which is lower than the European average ($600–650 thousand) or Silicon Valley's average ($900–950 thousand) (Compass, 2016, p. 5). It is known that VCs in Europe invest less than in the US (van den Berghe and Levrau, 2002). Some researchers (Shane, 2009) regard VCs as very selective in terms of who to invest in; some others refer to current funding practices very close to the pre-bubble situation.

The Existence of Experienced Entrepreneurs. Experienced entrepreneurs can offer mentoring and other necessary resources to start-ups and act as role-models, they are also vital for the region's economy (Feld, 2012, p. 24). Next to experienced mentors, the role of accelerators is extremely important, providing contacts and advice from different experts and companies in regard to the market, financing, cooperation, and so on. The plurality of contacts is always useful; for example, being too tightly closed around one corporate investor may limit a start-up's options for obtaining resources from other sources (Park and Steensma, 2012, p. 3).

Suppliers. The role of suppliers in innovation is greater than that of universities (Hughes, 2011, p. 34). Reputable suppliers ensure high-quality inputs and help to switch to a circle of suppliers (Bhalla and Terjesen, 2013, p. 172). For new ventures it might be difficult to secure long-term contracts with reputable suppliers under the desired conditions; therefore, project-based outsourcing is often the only option (Bhalla and Terjesen, 2013, p. 176).

Clients and Markets. In terms of location, Estonia is rather peripheral and the local market is small (population only 1.3 million); therefore, start-ups must consider moving beyond the country's boundaries to be closer to its customers (Cassidy, 2015). Bloomberg's co-author Bershidsky (2015) finds that among Estonian start-up founders those who will become multi-millionaires operate the company elsewhere – Skype is registered in Luxembourg and the United States, Playtech on the Isle of Man and Transferwise in the United Kingdom. The customers and markets are abroad, and proximity to the customer is vital (Bershidsky, 2015).

Equity. Garage-style entrepreneurs in the case of start-ups are common, recently even in biotechnology, where consolidations and continuous releases of research equipment have produced an affordable surplus in the secondary equipment markets (Grohn and Moody, 2015, p. 61). Moreover, start-ups can use co-working spaces, which in Tallinn are offered for a small membership fee and allow members to attend events, establish contacts and become part of a start-up network (About Garage48 HUB, 2015).

Service Providers. Service providers are intermediaries for many businesses, and therefore, have a broad relationship network (Zhang and Li, 2010, p. 88). They can assist new ventures to switch to the network, contributing to the company's innovation by increasing the external search options for innovation, at the same time reducing the cost of the search (Zhang and Li, 2010, p. 92).

SOCIAL ENVIRONMENT is the third PEST component, covering 'technically skilled labour force', 'proximity of universities', 'attitude of the area population', and 'living conditions'.

Technically Skilled Labour Force. Most popular areas of business creation in Estonia are largely related to ICT; therefore, several foreign publications have concluded there is an abundance of talent in the field of ICT in Estonia (Ransom, 2015). Actually, Estonia is lacking IT specialists; therefore, the government is promoting IT curricula and supporting IT students (Rikken, 2013). Given the shortage of IT talent in Tallinn, their price has risen rapidly, and

some start-ups (e.g. Skype) have also already begun to search for competent employees beyond the national borders (Sivonen, 2012).

Proximity of Universities. University collaboration has lost its importance (Godin and Gingras, 2000), but universities are still useful where core/basic research is involved (Saez et al., 2002). Since technology develops cyclically then at certain stages research is more useful than at others (Buganza and Verganti, 2009). In Europe, cooperation between innovative industries and universities has increased (Buganza and Verganti, 2009; Arvanitis et al., 2011; Bercovitz and Feldmann, 2006, p. 175). Cooperation with universities is not always easy, especially since universities involve bureaucracy, and inadequate behaviour and understanding (Siegel et al., 2003). Universities are often free to choose their fields of competence (Haldane Principle) (Hughes, 2011, p.10), which might not match the interests of start-ups. Cooperation also has expectations and pre-requisites for companies, such as sufficient age, size and investment in R&D (Arvanitis et al., 2011). Initial requirements (age, size) are especially difficult for start-ups to meet.

Attitude of the Area Population. The society that supports the entrepreneurs' ideas and initiatives creates a foundation for a dynamic economy, where it is attractive to pursue a career in business (Grigore and Mitroi, 2012, p. 150). High levels of entrepreneurship in the region contribute to innovation, encourage competition, increase economic development and create new jobs (Gelderen et al., 2006, pp. 319-320). At the same time, Shane (2009, p. 8) has found that only 1.7 per cent of job growth in Sweden was generated by firms two years old and younger. Overall, Estonians appreciate the contribution of enterprises to employment, but 71% of Estonians think that business owners reap personal gain at the expense of the employees (EU average 57%). Entrepreneurs receive little appreciation from Estonian society, although the government has compiled a plan of action to enhance their image (Eestlaste ettevõtlusaktiivsusest, 2015).

Living Conditions. More attention is turned to improving the quality of life in regions of greater migration and continuous population growth (White and Wynne, 2015). Openness of region is required for good living conditions of multicultural migrants. Studies have shown that of Silicon Valley and Route 128, which enjoyed a similar stage of development in the 1980s, only Silicon Valley became successful because it possesses a culture of openness and exchange of information, allowing quicker adaptation to change (especially to new technologies), more rapid spread of innovation in the region and a more rapid response to market changes (Feld, 2012, p. 24).

TEHCNOLOGICAL ENVIRONMENT contains 'digital infrastructure', and 'technical level'.

Digital Infrastructure. Estonia has implemented technological solutions for daily life: a free personalized transportation card, smart-post, free Wi-Fi, ID cards with chips and mobile parking (Ross, 2015). Due to Estonia's ICT reputation, it is fairly simple for ICT companies to receive subsidies from the European Union (Bershidsky, 2015). In 2000 "E-stonia" approved a law considering Internet access as a human right which was followed by a costly project that brought the Internet to rural areas (Estonia: An insight into…2015). Such widespread use of the Internet has allowed the development of an e-government, which is one of the most outstanding in the world (Estonia: An insight into...2015).

Technical Level. The World Economic Forum considers Estonia very competitive compared to other Eastern European countries, regardless of poor transport connections, especially flight connections (Hõbemägi, 2015). These concerns are being dealt with at the

moment via two projects: Rail Baltica, connecting Estonia to Central and Western Europe (The Rail Baltica Project, 2015) and the Helsinki-Tallinn tunnel allowing access to Scandinavia (Oll, 2015).

In conclusion, on the macro-environmental level business creation is initiated by a competitive tax system (Pomerleau and Lundeen, 2015), sufficient foreign direct investment, accessibility to foreign markets, public policies supporting SMEs (Lee et al., 2013, p. 339), low level of corruption (People condemn ... 2015), availability of venture capital (Fitza et al., 2009, p. 390), presence of experienced entrepreneurs (Feld, 2012, p. 24), access to suppliers (Bhalla and Terjesen, 2013, pp. 172, 176), easy access to markets and customers (Bershidsky, 2015), access to property and equipment (Rankings, 2015), access to service providers (Zhang and Li, 2010, pp. 88, 92), competitive employees and affordable wages (Ransom, 2015), university proximity (Zhang and Li, 2014, p. 90), population that possesses business supportive attitude (Berte, 2010, p. 48), a high quality of life (White and Wynne, 2015), a good digital infrastructure (Bershidsky, 2015), and an overall good technical level (Hõbemägi, 2015).

3. Methodology

3.1. Micro-Environmental and Macro-Environmental Factors

For a comprehensive analysis, continuous linear scale micro-environmental factors were selected: financial status, work experience, entrepreneurial experience, education, product competitiveness, number of patents, investments in R&D, customer engagement and a competent team (Table 1).

Only three traits were added to achieve a comprehensive analysis: ambition, self-confidence and risk readiness, as according to Gelderen et al. (2005, p. 367), these are extremely important specifically for start-up founders. Other personal qualities and abilities are general and apply to all leaders and managers. In addition, the authors avoid adding personal traits for analysis, since a number of studies have shown that they are not so significant (Elmuti, 2011, p. 253).

Macro-environment is observed through four environments: political (tax system, foreign direct investment, market accessibility, structure of companies, corruption), financial (venture capital, experienced entrepreneurs, suppliers, customers and markets, equity, service providers), social (technically skilled labour force, proximity of universities, the attitude of the population, quality of life) and technological (digital infrastructure, overall technical level). All factors under each environment (mentioned in parentheses) were summed up and averaged (aggregated). A total of four macro-environments (political, financial, social and technological) are comprehensively analysed.

Table 1. Micro- and macro-environmental measures (independent variables)

Factors	Source	Scale	Source of the scale
Micro-factors			
Financial status	Miettinen and Littunen (2013)	8-step linear scale	Authors
Level of education	Ucbasaran et al (2008)	5-step Likert scale	
Previous work experience (scale 6)	Ucbasaran et al (2008)	6-step linear scale	Authors
Previous entrepreneurship experience (scale 6)	Zhang (2011)	6-step linear scale	Authors
Ambition (trait)	Gelderen et al (2005)	5-step Likert scale	
Self-confidence (trait)	Gelderen et al (2005)	5-step Likert scale	
Risk readiness (trait)	Gelderen et al (2005)	5-step Likert scale	
Product competitiveness	Wanga and Wu (2011)	5-step Likert scale	
Number of patents (scale 4)	Bureth et al (2010)	4-step linear scale	Authors
Investments in R&D (scale 19)	Srithanpong (2014)	19-step linear scale	Authors
Customer involvement in product development	Skok (2015)	5-stepLikert scale	
Competence of the team	Wanga, Wu (2011)	5-step Likert scale	
Aggregated macro-factors			
Political environment (tax system, FDI, market accessibility, structure of companies, corruption)	Gartner (1985)	5-step Likert scale	
Economic environment (VC, existence of experienced entrepreneurs, suppliers, clients and markets, equity, service providers)	Gartner (1985)	5-step Likert scale	
Social environment (technically skilled labour force, proximity of universities, attitude of the area population, living conditions)	Gartner (1985)	5-step Likert scale	
Technological environment (digital infra-structure, technical level)	Gartner (1985)	5-step Likert scale	

3.2. Sample

A questionnaire consisting of 30 questions was prepared based on factors that were previously discussed in the literature review. Questions where categorized under four themes: start-up profile, start-up founder's characteristics, start-up characteristics and analyses of macro-environment, including the PEST and cluster concept. The authors used Google Research to conduct the questionnaire and MS Excel to process the data. The questionnaire was sent out on 4 May 2015, and three weeks response time was given and two reminders sent.

There are no official statistics for how many start-up companies exist in Tallinn; however, there are many umbrella organizations such as workshops, incubators, accelerators (Tehnopolis), garage competitions (Ajujaht, Garage48) that possess an overview of the start-ups that exist. On the basis of their data and the databases of StartSmart, CrunchBase and Gust, a population with 209 companies was constructed and approached electronically (by e-mail), 72 of them responded, but four responses had to be removed due to their location outside of Tallinn, leaving 68 in the final sample (response rate 33%). A representative sample size was calculated to be 66

(confidence level 95%, confidence interval ±10%) (Sample Calculator, 2015), making the sample size of 68 companies acceptable. Some specific analyses (e.g. regression) require a five to one ratio for sample size (five responses to one independent variable), which was not followed here due to the aim of a descriptive overview; however, this has an impact on generalizability.

The profiles of founders, companies and the environment were constructed on the basis of descriptive statistics, and were further elaborated using regression analyses and t-tests. The choice of statistical analysis methods is based on observable practices in descriptive overview research (Brown and Eisenhardt, 1995) and the research question of this paper. The research question seeks to find out the influence of characteristics in absolute values (using mean and standard deviation figures) and in regard to output variables (using regression analyses). Due to some dichotomous variables (e.g. sex), the profile was further evaluated using several t-tests. Regression analyses and t-tests are used with limitations; the samples had largely normal distributions (except, for example, 'founders' age'), for the regression there was no multi-collinearity (all coefficients were below 0.7), and the sample size did not match the five to one ratio (see Table 1 for the number of independent variables). However, statistics have a tendency to be roughly right, which is enough for an initial descriptive overview.

Start-up failure rate is high in its first years (Groenewegen and De Lange, 2012, p. 156); therefore, after more than a year had passed from the time the survey was carried out, the authors checked the success bias by measuring and comparing the bankruptcy rate among respondents and non-respondents. A small sub-sample of 10 companies was chosen from both and the start-up's existence was checked through credit information availability. The survival rate for respondents was higher (80%) than for non-respondents (60%), indicating the existence of a success bias.

In order to increase the paper's validity further, the respondent bias was examined to see whether there is a significant difference in responses between early and late respondents. Several trait variables were tested, out of which only 'risk readiness' showed early respondents to be statistically more optimistic (M=4,41) than late respondents (M=3,94) ($p<0,05$).

4. Results and Discussion

4.1. Descriptive Overview

Kirkpatrick (1991) emphasizes, among other traits, ambition, which as seen from Table 2 has the highest value (M=4.50, SD=0.743). Ambition is particularly important in the initial phases of a start-up, when risk and accompanying stress is higher, and this trait helps overcome difficulties (Gelderen et. al., 2005, p. 367). The average start-up age among the respondents is 2.47 years (SD=1.774), which shows that many start-ups are still in the early phases of their lifecycle, considering the maximum age of a start-up (six to ten years). Start-ups consider the technological environment supportive (M=4.40, SD=0.658); in Estonia the reputation of IT and daily high-tech solutions are evident (Bershidsky, 2015). Team is seen as competent (M=4.37, SD=0.710), which, according to Srithanpong (2014, p. 108), refers to the quality and skills of the team that determines the company's productivity. One respondent commented: "Many assume start-up success is based on a good idea, in fact, much more important is the implementation of the idea on which investors are basing their decision to invest". Tallinn's start-up founders feel, therefore, that they have a good team with which to implement innovative ideas.

Table 2. Descriptive statistics and regression results: impact of micro- and macro-environment factors on turnover, R&D investment and cooperation

Factors	M	SD	Model 1: dep. variable 'turnover'	Model 2: dep. variable 'R&D'	Model 3: dep. variable 'cooperation'
Micro-factors					
Financial status	3.34	1.175	0.390	1.134 *	0.031
Level of education	3.25	0.677	0.021	0.854	-0.029
Previous work experience (scale 6)	3.05	1.484	-0.170	-0.371	0.075
Previous entrepreneurship experience (scale 6)	2.52	1.387	-0.331	1.081 **	0.022
Ambition	4.50	0.743	0.026	1.201	0.395 ***
Self-confidence	4.16	0.803	-0.143	0.369	-0.021
Risk readiness	4.24	0.755	0.257	-0.909	-0.178
Product competiveness	4.16	0.771	0.626	0.861	0.011
Number of patents (scale 4)	1.57	0.957	-0.621 *	1.916 **	0.131 *
Investments in R&D (scale 19)	4.94	5.676	0.161 **		0.012
Customer involvement in product development	3.82	1.021	0.133	0.184	0.115 *
Competence of the team	4.37	0.710	-0.402	-0.229	0.093
Aggregated macro-factors					
Political environment	3.34	1.045	0.179	1.695	0.187 *
Economic environment	3.31	0.961	0.431	-2.927 **	-0.121
Social environment	3.24	0.964	-0.909	2.188	0.128
Technological environment	4.40	0.658	-0.129	-1.780	0.012
R^2			0.582	0.468	0.500
F			1.304	2.638 ***	2.754 ***
No. of observations			32	61	61

*p-value < 0,1; **p-value < 0,05; ***p-value < 0,01

Number of patents has the lowest average value (M=1.57, SD=0.957), which may cause uncertainty for a start-up, as their product can be copied by competitors, and they are not protected from the market entry (Berte, 2010, p. 38). In general, scientific discoveries are patented (Bureth et al., 2010, pp. 259-260), but only very few respondents dealt with this innovation type (RESP=8; 12%). Pursuing and maintaining a patent might be time-consuming due to legal disputes (Love, 2013, p. 1320), and that might be another reason why many start-ups do not have any. Start-up founders in Tallinn have little previous work (M=3.05, SD=1.484) or entrepreneurial experience (M=2.52, SD=1.387); however, the most popular age group is 25–29 (RESP=30; 44%), which makes it difficult for these founders to have many years of experience due to their young age. The value of previous experience is even lower here than in other recent research (Compass, 2016).

4.2. Founder's Profile

A start-up founder in Tallinn has above average financial status (M=3.34; SD=1.175), is Estonian (RESP=56; 82%), male (RESP=57; 84%), aged 25–29 (RESP=30; 44%), with a Bachelor (RESP=39; 57%) or Master degree (RESP=20; 29%), but possesses little work (M=3.05; SD=1.484) and business experience (M=2.52; SD=1.387). The results confirm most prior findings (for age (Wolverson, 2013; Compass, 2016), for sex (Ha and Kim, 2013; Compass, 2016), for education (Vunder, 2015), and for experience (Ucbasaran et al., 2008)) and places them within a single profile. Considering their traits, start-up founders can be described as open to experience (M=4.61; SD=0.602) and very ambitious (M=4.50; SD=0.743). The proposed ambitious behaviour is interesting because according to Hofstede, this area (Estonia) is characterized by average uncertainty avoidance (Hofstede, 2015). This result is especially interesting since the majority of the founders were local people. Rungi (2015) showed that activities differ stage-by-stage in the lifecycle; Table 3 indicates that this may be dependent on traits required for different stages. Lastly, due to limited means, start-ups use various resources from informal relationships (RESP=59; 87%) (e.g. see the role of the founders' network from Wasserman, 2016).

4.3. Company Profile

The average age of a start-up company in Tallinn is 2.47 years, they are micro enterprises operating in the information and communication sector (RESP=22; 32%), mostly with software (RESP=20; 91%). The product is sold mainly on the B2B market (RESP=25; 37%), or on both markets: B2B, B2C (RESP=32; 47%), and the clients are located abroad (born global) (RESP=50; 74%). A start-up in Tallinn has two founders (RESP=26; 38%), the product is competitive (M=4.16; SD=0.771), the team is competent (M=4.37; SD=0.710), the client is involved in the product development process (M=3.82; SD=1.021), and personal savings of the founders are used to finance the start-up's activities (RESP=57; 84%). There is little cooperation with scientific institutions (RESP=45; 66%), which is supported by Hughes (2011), most start-ups do not own patents (RESP=46; 68%) and investments in R&D are less than 10,000 euros (RESP=30; 44%). Current research places the equilibrium point for 'number of founders', which varies between not alone (Chen et al., 2012) to not too many (Wasserman, 2016), at two in Tallinn (Estonia).

4.4. Macro-Environmental Profile

The most positive factor of the **political environment** is the lack of corruption (M=4.10; SD=0.941), but tax system is perceived as less favourable than average (M=2.94; SD=1.051), which confirms the Compass (2016) findings.

From the **economic environment**, start-up founders perceive the availability of service providers as very good (M=4.07; SD=0.852), and the lack of venture capital as the worst factor (M=2.61; SD=0.996), which is consistent with results from respondents that illustrated self-financing as the most common way to find capital. Low investments are common for the European area (Van den Berghe and Levrau, 2002), and Estonian numbers are presumably lower (Bershidsky, 2015; Compass, 2016).

The **social environment** shows a rather large number of competent workers (M=3.76; SD=0.918), which is surprising because the Estonian media has suggested a significant lack of

competent staff (Rikken, 2013). Although below average, it is believed that universities promote entrepreneurship (M=2.48; SD=1.091; indicated also in Silicon Valley (Fligstein, 2008)) – a factor which has the lowest median from the analysis of the macro-environment. This result is unexpected, since innovation is the core concept for start-ups (Ries, 2011, pp. 28-29), and Zhang and Li (2010) found that cooperation with universities, trade associations and venture capitalists improves product innovation, unless the company does not practice cross-border collaboration or deals with large-scale exports. Rungi and Stulova (2014, p. 695), in turn, have explained that cooperation with universities is particularly affecting product innovation and less technological innovation, the last which is mainly practiced in Tallinn as 32% of the start-ups are dealing with ICT. On the other hand, cooperation with universities might suffer due to expectations and pre-requisites that are difficult for start-ups to meet (Arvanitis et al., 2011). However, steps have been taken to enhance the interaction between universities and businesses; for example, by establishing the technology transfer office (Mektory) in a local leading technology university, which aims to inspire student start-ups to move forward (Mektory, 2015).

The **technological environment** ranks, as expected, the most favourable environment compared with the above mentioned. Surprisingly, the overall technological level (M=4.48; SD=0.660) is considered to be even better than the digital infrastructure (M=4.31; SD=0.656), which Estonia has been praised for around the world.

4.5. Impact of Micro- and Macro-Factors on Turnover, R&D and Cooperation

The profiles of important factors are further clarified according to their impact on (traditional and start-up specific) dependent variables: turnover, R&D investment and cooperation.

Turnover. According to Table 2, start-up turnover is affected most by product competitiveness (β=0.626), and as per Ries (2011, pp. 28-29), an innovative product has a central role in ensuring the success of a start-up. Secondly, a favourable economic situation (β=0.431) strongly affects turnover, which means when a start-up has all the relevant parties (VCs, experienced entrepreneurs, suppliers, customers and markets, equity and service providers) present and accessible, it is more likely to achieve economic success. For example, a loyal customer base ensures immediate success. Thirdly, the good financial status of start-up founders (β=0.390) also impacts turnover. Wealthier people might have more experience in the field of asset management (What Startup Founders Need…2015), which could increase sales, and personal capital also makes it possible to cover unexpected costs.

R&D. R&D investments are positively affected by social environment (β=2.188), number of patents (β=1.916; $p<0.05$), and the political environment (β=1.695). If a region has cheap competent personnel, university support for entrepreneurs, a supporting attitude from the population and attention turned towards quality of life, more will be invested in R&D. Hence, the idea at Mektory should create a good foundation to increase business investments as it also sells university projects (Mektory, 2015). Patent protection will not allow competitors to enter the market, and therefore, a start-up can focus on the continuous improvement of its product (Berte, 2010, p. 38) by making larger investments in R&D. A favourable tax system, availability of foreign direct investment, simplicity of foreign market access, government support for small businesses, and a lack of corruption encourages R&D investments because the political environment is supportive, understandable and transparent.

Cooperation. Ambition (β=0.395; $p<0.01$), good political environment (β=0.187) and an abundance of patents (β=0.131; $p<0.1$) initiates cooperation. Ambition raises a person's internal

coercion, which can help them overcome difficulties (Gelderen et al., 2005, p. 367). To overcome these difficulties ambitious people tend to search for solutions externally. A political environment where corruption is low, the state supports entrepreneurship and grants easy access to foreign markets – all helps to enable cooperation. If in a region there are a large number of foreign direct investments, then this might affect cooperation positively as, for example, VCs require a high level of collaboration when investing (Ramadani, 2009, p. 257). Patents protect the start-up's ideas from competitors, and this may be the reason why a start-up that is holding a patent is more open to cooperation.

4.6. Differences Among Founders' Sex and Start-up's Lifecycle Stages

Due to lack of participants in certain sample groups, for instance females, re-grouping was carried out for analysis purposes; therefore, females and mixed founders were put in the same group. Table 3 illustrates the differences between groups – men vs. others, start-ups in late vs. early stages of the lifecycle –and the results are discussed below.

Men vs. others. Men invest more in R&D compared to women founders or start-ups where both sexes are present. According to Ha and Kim (2013, pp. 44-45), women are less risk-ready, which means that men are more likely to ensure the rapid growth of a company (Ha and Kim, 2013, pp. 44-45) and invest more in R&D. Moreover, men consider the political situation more favourable, which might encourage them more to start their own business.

Table 3. T-test results: differences among founders' sex and start-up's lifecycle stages

Factors	Men (47 RESP) vs. others (21 RESP)					Start-ups in late stages (25 RESP) vs. start-ups in early stages (40 RESP)				
	Men		Other		p	Late-stages		Early-stages		p
	M	SD	M	SD		M	SD	M	SD	
Financial status	3.28	1.297	3.50	0.827		3.24	1.268	3.45	1.085	
Level of education	3.28	0.649	3.19	0.750		3.00	0.577	3.40	0.709	**
Previous work experience (scale 6)	3.11	1.509	2.89	1.449		3.17	1.267	3.08	1.612	
Previous entrepreneurship experience (scale 6)	2.55	1.457	2.43	1.248		2.72	1.542	2.43	1.318	
Ambition	4.47	0.718	4.57	0.811		4.64	0.569	4.40	0.841	
Self-confidence	4.17	0.842	4.14	0.727		4.24	0.831	4.13	0.791	
Risk readiness	4.26	0.765	4.19	0.750		4.12	0.833	4.35	0.700	
Product competitiveness	4.21	0.720	4.05	0.887		4.38	0.495	4.05	0.876	
Number of patents (scale 4)	1.54	0.959	1.62	0.973		1.71	1.122	1.53	0.877	
Investments in R&D (scale 19)	5.87	6.265	2.74	3.088	**	6.83	6.565	4.03	4.930	*
Customer involvement in product development	3.87	0.992	3.71	1.102		3.76	1.012	3.93	1.047	
Competence of the team	4.34	0.700	4.43	0.746		4.40	0.764	4.33	0.694	
Political environment	3.43	0.753	3.12	0.542	*	3.33	0.806	3.36	0.663	
Economic environment	3.40	0.743	3.19	0.451		3.39	0.685	3.29	0.645	
Social environment	3.25	0.616	3.22	0.532		3.25	0.449	3.25	0.677	
Technological environment	4.41	0.574	4.35	0.587		4.44	0.601	4.43	0.513	

Late vs. in early stages of the lifecycle. Start-ups in the late stages of their lifecycle have invested more in R&D, which might come from the fact that these companies have operated longer and have invested to reach the position they are in at present. Srithanpong (2014, pp. 103, 108) has also claimed larger companies invest more in R&D and Hughes (2007, p.20) has added that for innovation, productivity is driven by "transformations in large business process[es]". On the other hand, start-up founders in the late stages are less educated compared to founders in the early stages. Perhaps education is considered to be an important factor when creating a start-up, but in the later stages of the lifecycle experience outweighs the level of education.

5. Conclusions

Start-up clusters are attracting increased interest. Potential start-up founders should evaluate the location of the forthcoming company, and one good choice would be to locate in a start-up cluster. There are many start-up clusters available; therefore, the founder should check whether they fit in to maximize the benefits. It turns out that start-up clusters informally propose typical profiles for their member companies. Typical profiles in this study were combined with descriptive statistics and further clarified using regression and t-test analyses.

In response to the RQ "what key micro- and macro-environmental factors help in becoming a start-up capital", research showed that start-up entrepreneurs feel the most favourable aspects in Tallinn are high level of technological environment, competent team members and their own ambition. On the negative side Tallinn's start-up founders lack previous work experience, entrepreneurship experience and possess none or few patents.

When comparing different groups the following trends appeared:

- Men invest more in R&D and feel the political environment is more favourable compared to all female or male and female founders;
- Start-ups in the late stages have made more investments in R&D and their founders possess lower levels of education compared with start-ups in the early stages.

Managerial implications. Aspects of the research produced managerial implications that define factors for a successful start-up. Legislative issues, such as female board member quota, have emerged for government reasons to force certain trends; therefore, our recommendations for sex, age and other factors define groups which are most active in the start-up field. It is up to companies, whether they follow external mainstream trends or their own internal beliefs and wishes.

Theoretical implications. The main theoretical contribution is the description of a new field – start-up capital. While there exists research about the macro-environment (e.g. Fligstein, 2008 and Shane, 2009) and less about the micro-environment (e.g. Miettinen and Littunen, 2013), viewing them together and particularly in this area was largely missing. The given profiles (see above) indicate what factors were considered most important and what less.

Several previous theoretical findings – significance of ambition as a trait (Gelderen et al., 2005), prevalence of middle-aged (Miettinen and Littunen, 2013; Wolverson, 2013), men (Ha and Kim, 2013) with access to capital (Miettinen and Littunen, 2013) – found additional proof in Tallinn. Some of these findings were not so obvious, for example, according to Hofstede (2015), the region (Estonia) is characterized as feminine; however, most of the start-up founders were male.

Nevertheless, the research also highlights many new aspects. First, prior experience seems not to be as important as it used to be (Ucbasaran et al., 2008); the reasons for this could be the constantly changing world. Second, the surprisingly low level of cooperation with universities may come from the nature of local start-ups, where companies target non-technological business model innovations at the same level as technological innovations, where cooperation with universities is more required (Saez et al., 2002). Third, the low number of patents is industry and country specific – in the ICT industry patents are not so important, as these are frequently copied and become the basis of law suits (Bettis, and Hitt, 1995; Rungi and Kolk, 2012; Eichenwald, 2014), and Eastern European countries are less patent-oriented than their US counterparts. Fourth, in addition to patents, the political environment is important, where the main drawback from the start-up point of view relates to a tax system that is not very favourable.

Limitations. The size of the sample of start-ups in Tallinn remained low in absolute terms, which affects generalizability; however, it is also important to consider that the exact number of start-ups in the city is not known (there are no official statistics outside SME figures due to the newness of the field and problems defining start-ups), but both the scale of the city (population is 440 thousand inhabitants) and the country (Estonian population is 1.3 million) are low when expecting high numbers of start-ups.

The research setting for this study provides a comprehensive descriptive overview of a field that has attracted little research in a context that has not been studied at all – Tallinn as a start-up capital. Since there are no well-defined constructs to provide the right set of variables, common for all new fields (Brown and Eisenhardt, 1995), a wide set of variables were included, which in turn posed an increased demand for sample size, but the higher epistemological requirements were sacrificed for phenomenological reasons. The strategic management community encourages the use of a broad range of new methods taken from other fields (Arora et al., 2016), the affect of which on generalizability is not yet fully known.

Another issue for generalizability arises from the context; while Tallinn is representative of Europe, its context is closer to Eastern Europe and its size (nearly half a million citizens) does not match high metropolises. On the other hand, Tallinn's figures are quite close to Estonian, European and Silicon Valley average figures in respect to several questions (such as female quota, age, work experience) (Compass, 2016), which increases generalizability in these and related questions. There is also a contradiction in that according to some sources (e.g. Shane, 2009, p.142), the high rate of start-ups (being referred to as a start-up capital) can actually indicate a non-deliberate non-wealthy country context.

Further research. Further research could include many avenues. One promising avenue would be a repetition of the questionnaire with a larger sample excluding less relevant factors. The sample could cover other start-up capitals in the European region; for example, Nice (France), Barcelona (Spain) or Berlin (Germany). Moscow (Russia) could be also interesting as a comparison, since the current sample (Tallinn, Estonia) also included many Russians. A second option is to identify relevant factors by performing a factor analysis on the basis of the current or an extended sample. The third interesting avenue would be to perform in-depth qualitative research in start-ups to find out how certain profiles help achieve success, in order to find the cause for the quantitative results.

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