



**An analysis of determinants of university's employee's
intrapreneurial behavior – case of Latvian universities**

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Biographic note

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Abstract

Ever-changing role of universities not only in the eyes of society but in terms of countries economic growth is compelling universities to act more entrepreneurial in order to increase competitive advantage and operate in the resource restrictive environment. Intrapreneurship has proven to have a positive effect on the performance and growth of an organization, therefore, understanding the drivers of employees intrapreneurial behavior is a key to the successful implementation of intrapreneurial activities.

Studies in intrapreneurship research field have been increasing, the emphasis has been on the organizations operating in the industrial sector. Public sector organizations and intrapreneurial activities within have been overlooked, resulting in almost nonexistent research.

Intrapreneurial behavior is affected by internal and external factors resulting in increased performance results, economic development, knowledge sharing and active intrapreneurial activities. This study aims to analyze the effect that organizational, individual and environmental determinants of intrapreneurship have on the employee's intrapreneurial behavior in the Latvian higher education sector. Data was collected through a survey of the faculty and staff of the public and private higher education institutions in Latvia that resulted in 390 valid responses.

The main findings suggest that employees' intrapreneurial behavior is affected by the levels of horizontal participation within the university, trust in employees' manager, technological opportunities the environment is offering, and innovativeness. The results indicate that the university should be more aware of environmental munificence rather than focusing on environmental hostilities.

Key-words: Intrapreneurship, intrapreneurial behavior, higher education, university.

JEL-Codes: I23, O31, J45, L26

Resumo

Há constantes mudanças nos papéis das universidades, nem sempre aos olhos da sociedade, mas em termos de crescimento económico dos países faz com que elas agem de uma maneira mais empreendedora de forma a poder aumentar a sua vantagem competitiva e operar num ambiente de recursos restritivo. Intraempreendedorismo tem provado ter um efeito positivo no desempenho e crescimento de uma organização, sendo que, entender as razões por detrás do comportamento intraempreendedor de funcionários é a chave para uma implementação de sucesso em atividades intraempreendedoras.

Estudos na área de pesquisa de intraempreendedorismo têm aumentado, a ênfase tem estado em organizações a operar no sector da indústria. As organizações de sector público e suas atividades intraempreendedoras têm sido negligenciadas resultando em estudos quase inexistentes.

Comportamento intraempreendedor é afetado por factores internos e externos resultando num aumento no resultado do desempenho, desenvolvimento económico, partilha de conhecimento e atividades intraempreendedoras ativas. Este estudo tem por objectivo analisar o efeito de condicionantes organizacionais, individuais e ambientais que o intraempreendedorismo tem sobre o comportamento intraempreendedor dos funcionários no sector do ensino superior Letão. Foram recolhidos dados através de uma pesquisa da faculdade e seus funcionários do ensino superior público e privado da Letónia resultando em 390 sondagens válidas.

As principais conclusões sugerem que, o comportamento intraempreendedor dos funcionários é afectado por níveis de participação horizontal dentro da universidade, confiança nos gestores dos funcionários, oportunidades tecnológicas que o meio ambiente oferece e inovação. Os resultados indicam que a universidade deveria estar mais ciente num ambiente liberal em vez de se focar num ambiente hostil.

Palavras-chave: Intraempreendedorismo, Intraempreendedor, comportamento, ensino superior, universidade.

Códigos-JEL: I23, O31, J45, L26

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List of abbreviations

CFI – Comparative fit index
CMIN – Chi-square
CMV – Common-method variance
CR – Competitive rivalry
D – Dynamism
EUA – European University Association
F – Formalization
GFI – Goodness of fit index
HP – Horizontal participation
IG – Industry growth
N – Sample size
NC – Normed chi-square
PI – Personal initiative
RA – Resource availability
RMSEA – Root Mean Square Error of Approximation
RT – Risk-taking
TM – Trust in manager
TO – Technological opportunities
TTO – Technology Transfer Office
UoC – Unfavourability of change
USA – United States of America
VP – Vertical participation

1 Introduction

Interest in entrepreneurial activities taking place in universities has grown recently not only between academic researchers and universities, but also in the midst of the companies and government policy makers (Yusof et al., 2010).

The reasons for the rise are mainly two-fold. Firstly, the rise of commercialization of the research work done in universities that lead to the Bayh-Dole Act (Patent and Trademark Law Amendments Act) in the United States of America (USA) in 1980. Secondly, the ever-changing role of universities in the national economic and innovative environment (Yusof & Jain, 2010).

Entrepreneurial activities in already existing organizations – called intrapreneurship, not only facilitates firms' performance and growth (Antoncic et al., 2001), but also creates a competitive advantage in the nowadays fast changing economic landscape (Etzkowitz, 2003).

In order to survive, universities are forced to compete for scarce resources by generating part of their own support mechanisms (Etzkowitz, 2003).

Moreover, Etzkowitz (2003) not only regards these processes as changes taking place in the higher education sector but as revolutions themselves. Where, based on the researcher, the first revolution took place at the end of the 19th century when, additionally to teaching – the main work of universities at the time, research was added and regarded as an equally important task.

The second so-called revolution shaped the academic world in the mid-20th century when a third main universities' function – economic development was added alongside teaching and research (Etzkowitz, 2003). Third and the latest installment in the higher education sector, which is taking place nowadays, includes not only the above-mentioned core functions of the university but also commercialization of research, university-industry engagement, and knowledge exchange in general (Abreu et al., 2016).

Inevitably, not only the system of higher education has changed, but also employees working in the sector. Mueller (2006) argues that in order to produce, identify and exploit knowledge within the university, the existing knowledge base and the absorptive capacity of the employees are needed. Therefore, an employee of the university can help to recognize and create opportunities for further improvement of the university and also to

support other colleagues, who have chosen to act as intrapreneurs, by creating a supportive intrapreneurial culture around them (Glassman et al., 2003).

Moreover, in order for the employees to successfully engage in intrapreneurial actions, the full support of an organization is needed, meaning that not only the culture but also the whole environment of an organization needs to be positioned towards intrapreneurship (Smith et al., 2016).

Intrapreneurship is a complex and multilevel process, which, in order to give a deeper understanding of the factors involved in intrapreneurial activities themselves and the outcomes they result in, needs to be studied from at least three levels, individual, organizational and environmental (Rigtering et al., 2013).

Most of the theoretical frameworks of intrapreneurship have been created and conducted in America, and at the same time, they are being considered universal (Turro, 2016). Antoncic and Hisrich (2001) are convinced that research done in examining different intrapreneurship dimensions and their effects on performance is limited because most of the frameworks which can be found have not been tested or are limitedly tested in different economic and cultural environments or different industries. The majority of studies put emphasis on the industrial sector and focus on either small, medium, big or nonprofit organizations operating in the industrial sector (Turro et al., 2016), which makes global perspective harder to attain.

Regarding the higher education sector and any form of entrepreneurship-related activities taking place in universities, two most used research paths by researchers are distinguishable. First, many scientists (Breznitz et al., 2008; Corsi et al., 2016; De Silva, 2016) analyze academic entrepreneurship. Second, researchers focus on the impacts and determinants of an entrepreneurial education taking place in universities (Bae et al., 2014; Belwal et al., 2015). A small overview of both of the two paths can be found in the next chapter.

Nonetheless, a separate but no less important factor of entrepreneurial activities taking place in the academic sector has not yet been fully researched. The intrapreneurship concept has been limitedly studied in public organizations in general. As higher education sector is part of it, a closer look is needed to fully understand the processes that are in place. But at the moment, existing studies indicate that there is a gap in the research field because there are almost no studies conducted which take into consideration employee's

intrapreneurial behavior in the education sector (Boon et al., 2013), especially from the perspective of an employee.

The intrapreneurial employee is one of the main sources for initiating intrapreneurial projects that can lead to other funding possibilities. It has been seen as a consequential step towards the university system where economic development has been recognized as important as the traditional duties (Rothaermel et al., 2007). University and industry are linked closer than ever before, in most cases through the incentive of the national governments (Etzkowitz, 2003).

In most cases, intrapreneurship and intrapreneurs have been viewed as a part of entrepreneurship as a sub-category, without trying to understand the unique drivers behind the employee's decision to engage in the intrapreneurial project (Martiarena, 2013).

Therefore, the main aim of this study is to analyze the effect of internal and external determinants on the intrapreneurial behavior of employee working in a university. Moreover, we want to identify the main factors which are affecting employee's decision to engage in intrapreneurial activities, and analyze the overall relationships between all of the three-level factors – individual, organizational and environmental. Specifically, we want to answer the question: “How is employee's intrapreneurial behavior affected by internal and external determinants in Latvian Universities?”

Chapter 2 reviews existent relevant literature. It explains what intrapreneurship concept means, how it manifests and what are the outcomes of implementing intrapreneurial practices in an organization and goes on with a brief description of related concepts: academic entrepreneurship and entrepreneurial education, and a multilevel approach to intrapreneurial studies. Then, chapter 3 discusses the factors that at the internal (organizational and individual) and external (environmental) level affect intrapreneurship and employee's intrapreneurial behavior. Chapter 4 follows with the development of the theoretical model and hypothesis, explanation of the sampling, data collection and analysis made. The results of the empirical study will be presented in Chapter 5, leading to Chapter 6 where the conclusions, theoretical and practical contribution and research limitations of the current study are drawn.

2 Intrapreneurship and Universities

In order to fully understand the existing debate in the intrapreneurship research field that has led to different perspectives/dimensions of intrapreneurship studied, this chapter presents the main definitions of intrapreneurship and relevant terms used alongside in the literature. Afterwards, a discussion about intrapreneurial activities taking place in universities follows with the overview of the organizational and individual outcomes that intrapreneurship presents. Next, a brief review of academic entrepreneurship and entrepreneurial education taking place in universities is presented, concluding with an analysis of the multilevel approach used in intrapreneurship studies.

2.1 Intrapreneurship

Throughout the years, researchers have tried many times to describe what intrapreneurship actually means, how it manifests, and what are the outcomes of implementing intrapreneurial practices in an organization. Nevertheless, it is still hard to find consensus among researchers defining intrapreneurship, due to the use of many terms describing the same concept (Agca et al., 2012). Sharma and Chrisman (1999) even believe that due to the lack of consistency between studies, a confusion regarding the intrapreneurship concept in the research field has been created.

Historically, one of the first times intrapreneurship concept appeared was when Pinchot (1985, p.3) described it as “*a method of using the entrepreneurial spirit where many of our best people and resources are*”. At the time, Pinchot called it *intrapreneuring*. Since then, alongside intrapreneurship, researchers use terms such as corporate entrepreneurship, corporate venturing (Parker, 2011), internal corporate entrepreneurship, internal entrepreneurship and strategic renewal (Sharma et al., 1999).

According to Parker (2011), out of many available alternatives, three most-used terms nowadays are intrapreneurship, corporate entrepreneurship, and corporate venturing. In most of the cases, all three of them are used interchangeably.

Corporate entrepreneurship and corporate venturing unlike intrapreneurship concept focus mainly on the organizational aspects of intrapreneurial activities taking place in the organization. Rigtering and Weitzel (2013, p.338) consider corporate entrepreneurship as “*a tool for practitioners to enhance a firm’s performance and to foster innovation and*

opportunity exploitation within a firm”. The aim of corporate entrepreneurship is to create a change in corporate policies, organizational renewal and in flexibility by moving the organization towards more innovative, proactive and risk-taking practices among employees (Rigtering & Weitzel, 2013).

Corporate venturing has been defined as “*corporate entrepreneurial efforts that lead to the creation of new business organizations within the corporate organization*” by Sharma and Chrisman (1999, p. 18-19). In this case, the organization is expected to take advantage of either new market exploitation and/or new product offerings.

Regarding intrapreneurship, most of the recent studies have applied one of the broadest definitions of intrapreneurship introduced by Antoncic and Hisrich (2001, p.498), which characterize intrapreneurship as „*entrepreneurship within an existing organization, [...] a process that goes on inside an existing firm, regardless of its size, and leads not only to new business ventures but also to other innovative activities and orientations such as development of new products, services, technologies, administrative techniques, strategies, and competitive postures*“ (Agca et al., 2012; Antoncic & Hisrich, 2001; Antoncic et al., 2003; Turro, 2016).

As entrepreneurial activities taking place in the already existing organization are considered to be a multi-level process that can happen at all levels of the organization, choosing to view and study them from the corporate entrepreneurship or corporate venturing perspective alone means that other involved levels such as the individual are not taken into consideration. Because corporate entrepreneurship and corporate venturing perspective regard entrepreneurial activities that are taking place in the already existing organization as a top-down process, mainly looking at the organizational and environmental factors (Rigtering & Weitzel, 2013; Zahra, 1995). Therefore, in this study, we have chosen to view and study intrapreneurship perspective because it provides broader and more holistic view.

In order to reveal how intrapreneurship manifests within the organization, researchers look at intrapreneurship either through one or more dimensions of intrapreneurship (Agca et al., 2012; Antoncic & Hisrich, 2001; Burstrom et al., 2015) or the level of organizational involvement in intrapreneurial processes taking place in the organization (Alpkan et al., 2010; Baruah et al., 2015; Byrne et al., 2016; Hornsby et al., 2009; Hornsby et al., 2002; Rigtering & Weitzel, 2013).

Antoncic and Hisrich (2001) categorize intrapreneurship into 4 dimensions: innovativeness, self-renewal, new business venturing, and proactiveness. The innovativeness dimension looks at intrapreneurship from the innovation and development of new products and services perspective. Self-renewal dimension refers to strategic choices that the management level of the organization is making. New business dimension regards the outcomes of new business venturing. Proactiveness dimension encompasses initiative, risk-taking, boldness and competitive aggressiveness. However, other authors have made their own interpretations of intrapreneurship dimensions. For instance, Agca et al. (2012) in their study separate strategic renewal aspect from self-renewal dimension and extracts competitive aggressiveness from Antoncics' and Hisrichs' (2001) proactiveness dimension and form a separate dimension – competitive aggressiveness, making it as important aspect as others that are worth considering separately when analyzing intrapreneurial activities within organization.

Another way how to look at intrapreneurship is by examining the level of organizational involvement in intrapreneurial processes taking place in the organization. It can be either a top-down or bottom-up approach. A study done by Rigtering and Weitzel (2013) clearly separates intrapreneurial projects initiated top-down (from the organizational level) and bottom-up (from the individual level - employee) by analyzing the effect on an individual from both points of view.

The top-down approach regards the formation of internal ventures where an organizations' management deliberately creates strategic decisions about internal entrepreneurial activities and encourage employees to participate. The main research areas for the bottom-up approach includes the employees' self-initiated entrepreneurial behaviors and experimentations, indicating that management is relatively limitedly involved in this case (Kacperczyk, 2012).

None of the above-mentioned dimensions and perspectives or even intrapreneurship itself would manifest without the employees of the organization and their human capital – the “*sum of the individual knowledge, skills and abilities of the organizational human resources*” (Alpkan et al., 2010, p. 733). Employees not only create the essential knowledge base needed for entrepreneurial and innovative attempts, but they also strengthen overall competencies and performance of the organization (Alpkan et al., 2010). Human capital has been considered to be the determinant of entrepreneurial

intention, which consequentially leads to the entrepreneurial behavior (Bae et al., 2014) and intrapreneurship.

Entrepreneurial activities within the organization can be better explained by the individual's behavior rather than other attributes because we recognize intrapreneurs through their actions, rather than their psychological profiles or intrapreneurial organizational structure which won't necessarily make an organization entrepreneurial, but the entrepreneurial actions initiated by the employees will (Covin et al., 1991).

Employee's intrapreneurial behavior expresses itself as a "*voluntary employee behavior aimed at the perception of opportunities, generation of ideas, the creation of new products, as well as the development of new business lines*" (Valsania et al., 2016, p. 133).

It has been proven that the employee's intrapreneurial behavior can be associated with the growth in an organization's performance. It is considered to be one of the long-term competitive advantages that can be facilitated within an organization with ongoing learning and can be affected by different levels (Valsania et al., 2016).

All things considered, either intrapreneurship reveals with the help of one individual in the organization or a group of people, the main intention does not change – opportunities are recognized, seized and exploited giving value to the organization (Agca et al., 2012). As in this study, we are focusing and analyzing employees' working in higher education sector, it is essential to highlight some unique intrapreneurial activities, which may not be assessed in employees' working in different sectors.

2.2 Intrapreneurial activities within universities

Although it is more common to study the commercialization aspects of entrepreneurial universities among researchers, universities need to be looked at from the multidimensional perspective that the entrepreneurial university possesses. Therefore, entrepreneurial activities occur at all levels – research, teaching, governance, and through individual members of the university (Abreu et al., 2016).

In today's higher education environment alongside all the conditions universities face, in order to gain benefits from this holistic view of the system, universities' need to find a balance between traditional rules of the university and the shift towards economic development (Rothaermel et al., 2007). Some claim that it is universities' duty to engage in economic development by providing solutions and applications to problems society

face in the region (Audretsch et al., 2015) and meanwhile promoting university-industry close ties (Berbegal-Mirabent et al., 2015).

Audretsch et al. (2015) argue that universities are forced to act like entrepreneurs by seeking out the opportunities in the market in order to satisfy the needs of their stakeholders. Consequently, on the one hand, entrepreneurial activities can benefit the university and the business that integrate them, and also improve the country's economy, but, on the other hand, it can also negatively affect traditional roles required from universities by using resources which are already limited (De Silva, 2016).

According to De Silva (2016), employees from higher education sector can engage in three types of entrepreneurial activities related to teaching, research and company creation as depicted in the Table 1.

Table 1 Academic entrepreneurial activities within university

Teaching-related	Research-related	Company creation
• External teaching • Initiating the development of new external degree programs • Conducting seminars and training sessions for industry	• Research-based industry placement • Research-based consultancy for industry through university • Research-based consultancy privately (but without forming a company) • Developing products or services with potential for commercialization • Collaborating with industry through joint research projects • Research-related assistance to small business owners	• Forming joint ventures in which university and industry are the joint partners • Forming joint venture/s with industry privately • Forming one or more spin-off companies • Establishing university incubators and/or science parks • Forming university centers designed to carry out commercialization activities • Founding your own company/(s)

Source: De Silva, 2016, p. 2171

Organizations which have embraced the intrapreneurial culture need to strategically decide in which entrepreneurial activities to engage in because not every opportunity can or will lead to the desired positive outcome (Bierwerth et al., 2015).

2.3 Organizational and individual outcomes of intrapreneurship

There are many outcomes intrapreneurship can bring to the organization and to individuals working there. Regarding organizations, one of the most and well-researched ones is the change in the performance of an organization (Agca et al., 2012; Rigtering & Weitzel, 2013; Urbano et al., 2013). However, besides performance, other results of intrapreneurship can be observed. There is evidence that intrapreneurial activities facilitate organizations' performance and growth, either in relative terms like market share growth or absolute terms like sales growth or rise in the number of employees (Antoncic & Hisrich, 2001; Bierwerth et al., 2015), boost sustainability of their competitive advantages/capabilities (Agca et al., 2012), can lead to organizational renewal, business venturing and improved flexibility (Rigtering & Weitzel, 2013), enhanced reputation, and increase organizational knowledge (Kuratko et al., 2004).

Nevertheless, it is essential to understand that the decision to engage in intrapreneurship is a decision made by the employee alone, outside the bounds of the regular work environment or an individual's job requirements (Rigtering & Weitzel, 2013).

Therefore, regarding individual outcomes that present themselves to the individual employee who has decided to engage in intrapreneurial activities in the organization, several different outcomes can be identified. Joining intrapreneurial activities within the organization, can lead to enchantment in the employee's skill set, rewards like bonuses or promotions, recognition, stronger link to his /hers core competencies, and contribution to strategy implementation in the organization (Kuratko et al., 2004) among other possible results.

Intrapreneurs compared to entrepreneurs are more risk averse. Additionally, the reward system and entrepreneurial abilities are lower than that of an entrepreneur. Therefore, employees who choose to engage in intrapreneurial activities are most likely to stay as employees rather than leaving a company and engaging in independent entrepreneurship (Martíarena, 2013).

One of the main goals the employees working in the higher education sector seek in intrapreneurial activities is to complement those activities with their own academic work or research. Involvement in intrapreneurial activities can improve their reputation and status among other employees at the university or in sector and society in general, as academic employees are under constant assessment by their peers. Working with the industry can provide academics with not only new ideas, insights, and grants, but also opportunities that can result in published scientific research, which, on the other hand, will improve the individual's credentials (Perkmann et al., 2011).

Besides the individual gains that intrapreneurship can bring to the employees, they inevitably can become an entrepreneurial and information agents of the organization who can help identify rising opportunities and threats by monitoring environmental signals and reporting gathered information back to the organization (Park et al., 2014).

One can measure the success of intrapreneurial activities mostly in two ways – with financial measure and non-financial. In today's literature, more studies are conducted taking into consideration only financial measures of the firm's performance (Antoncic & Hisrich, 2001). In the university one of the most used measures of university's success with entrepreneurial activities are a number of patents and licenses applied for or received, the amount of licensing revenue or the number of spin-offs (Bercovitz et al., 2008).

Due to the easy aspect of measurement of financial measures over nonfinancial measures, many scientists choose the former. For that reason, to understand the whole impact intrapreneurial activities can give to an organization, both financial and non-financial measures should be taken into consideration (Turro, 2016).

But in order to achieve either one of the above-mentioned outcomes, it is essential that the organization establishes an intrapreneurship oriented organizational culture and climate at all levels of the whole organization: individual, group and organizational. This can increase not only financial indicators but also non-financial, like employees' satisfaction rates (Agca et al., 2012). The entrepreneurial culture within universities is most directly related also with the rise of academic entrepreneurship and entrepreneurial education efforts in universities.

2.4 Academic Entrepreneurship and Entrepreneurship Education

The highest resemblance to the intrapreneurship concept has academic entrepreneurship. The basic assumption of academic entrepreneurship is – as the large scope of scientific research takes place in universities, inevitably part of that research work possesses commercial applications, which in turn can generate another source of income for the university. Universities thus act as a catalyst for entrepreneurial activities and revenue-generating agents alongside the traditional duties of the university (Wood, 2011).

Therefore, the main difference between academic entrepreneurship and intrapreneurship within universities is the focus on commercialization efforts – which is the main desirable outcome of academic entrepreneurship, as it is not always the case in intrapreneurship. Academic entrepreneurs are called those academics who have formed a company, and it is even used as a differentiator between academics who have not (De Silva, 2016).

License agreement and the creation of a new company, i.e. a spin-off are the two most commonly used ways how universities commercialize their own innovations (Wood, 2011). Nevertheless, other forms of academic entrepreneurship exist – large-scale science projects, contracted research, consulting, patenting/licensing, external teaching, sales, and testing (Klofsten et al., 2000).

In the case of academic entrepreneurship, usually, Technology Transfer Office (TTO) plays an important part because TTO's main mission is to aid the transfer process between outside partners and the university's intellectual property. Besides that, it also makes sure that all of the innovations taking place in the university are disclosed and that accurate intellectual property protection is applied. After securing the protection of the intellectual property, TTO looks up industry partners who are capable of developing the innovation into a commercially applicable product or service (Wood, 2011).

Wood (2011) is convinced that the university not only benefits financially by engaging in academic entrepreneurship, but it also helps to improve the university's reputation and societal benefits along the way. Boh et al. (2016) have even identified six university programs and practices that help commercialization efforts. They are (1) project-based classes on technology commercialization, (2) mentoring programs, (3) accelerator/incubator programs, (4) business plan competitions, (5) entrepreneurship education for students, and (6) entrepreneurship education for faculty. The main goal of

all of the above-mentioned activities is to provide opportunities and bring together faculty members and students, so that technology transfer may take place (Boh et al., 2016).

Entrepreneurial universities can be considered as business incubators in general. They not only bring together academic staff and students, but also test how technology can be brought from the labs into the industry (Boh et al., 2016). Therefore, inevitably entrepreneurial education has also been quite popular research topic among researchers regarding higher education as well.

As entrepreneurship and innovation, in general, have been viewed as important drivers of sustainable economic development, as well as competitive advantage, the demand to provide high-quality entrepreneurship education has been increasing substantially. Education programs which provide a reflection of the real-world environment instead of static approach to education are in high demand (Kassean et al., 2015).

Universities can not only create a suitable environment for students to learn to find opportunities and acquire resources, but it also can inspire and motivate them to take action not only regarding the university but an outside context as well (Ghina et al., 2015). Universities nowadays are expected to promote an entrepreneurial culture as it may solve problems such as high rates of youth and adult unemployment or economic stagnation of the country. And universities are more than willing to take action because it shows them as active agents who contribute to the economic and social development of their regions (Farhangmehr et al., 2016).

Entrepreneurship in an academic context is an ongoing practice, which is dependent on environmental changes, and therefore should include external partnerships. To establish a strong entrepreneurship education program, universities firstly need to assess three areas: (1) universities' structure and practices, how well they support knowledge exchange with the community around them, (2) available resources to create and sustain insight of entrepreneurship and (3) evaluate the responsibilities of teaching staff and students regarding taking opportunities that environment present and how those opportunities are going to be shared with the society (Johannisson, 2016).

Entrepreneurial education can enhance student's entrepreneurship competencies in areas of relationship, concepts, organizing abilities, strategy and commitment, and that can be a significant predictor of the individual's entrepreneurial motivation to become an entrepreneur later on (Farhangmehr et al., 2016). Universities can prepare students so that

they are skilled to pursue an entrepreneurial career by not only giving them practical knowledge and competencies but also helping them develop the innovative ability and the spirit of entrepreneurship. Entrepreneurship education can also help students determine if being an entrepreneur is what they actually want (Chen et al., 2015). Farhangmehr et al. (2016) are convinced that, in order to increase student's entrepreneurial motivation, universities need to focus on developing psychological and social skills of their students, putting emphasis on critical thinking.

Without a doubt, there are many positive benefits that entrepreneurship education presents, like positive impact on students' motivation and perceived attractiveness of a new venture creation, or positive impact on students' entrepreneurial intention which leads to the student becoming an entrepreneur. Nevertheless, negative outcomes present themselves as well, for instance, it is hard to prove that the entrepreneurship education program may have actually influenced the individual regarding entrepreneurship, as negative effect evaluating the effectiveness of the program has also been found (Kassean et al., 2015).

The industry should not be excluded in entrepreneurship education, because besides university teaching, industry practices also need to be integrated into courses, to meet the demand from both students and industry (Chen et al., 2015). Two views need to be taken into consideration: an instrumental view, and an existential view. The instrumental view of entrepreneurship education concerns the impact of entrepreneurship education on individuals, as they are the contributors to the economy and society. The existential view looks at the impact entrepreneurship education has on individuals' self-identity as human beings. Besides taking into consideration students and academics, different societal stakeholders should also be included into entrepreneurship education practices, because it is crucial that students are able to be aware of the environment around them, breaking out of academic context that entrepreneurship education provides (Johannisson, 2016). Therefore, in either way, any entrepreneurial activity within the university needs to be regarded from the holistic point of view, including individual, organizational and environmental aspects.

2.5 A multilevel approach

There is evidence that clearly indicates the multilevel nature of intrapreneurship (Gartner, 1985; Ireland et al., 2003; Lumpkin et al., 1996; Rigtering & Weitzel, 2013; Urbano & Turro, 2013). Lumpkin and Dess (1996) even consider interactions between different factors of intrapreneurship as the explaining factor of the appearance of intrapreneurial actions and how they manifest as a characterization of the concept.

First multilevel approaches and models in intrapreneurship appeared already around the mid-80s. In 1985, Gartner created a framework, which contained 4 dimensions of analysis: organizational, environmental, individual and the new venture process itself. One important aspect that needs to be taken into consideration, although, is the fact, that only one of the intrapreneurship dimensions – new venture creation, was considerate at the time.

Already back then intrapreneurship was studied as a complex and multilevel process (Gartner, 1985). Gartner (1985, p.697) wanted to make “*a systematic means of comparing and contrasting complex ventures*” by showing the complexity of the concept. He stressed out that only by examining all four parts of the framework, one can fully understand the effect each part has on the other three and the relationships between them.

Throughout the years different areas of intrapreneurship have been studied using multilevel approach. For example, Lumpkin and Dess (1990) applied 5-dimension framework (autonomy, innovativeness, risk taking, proactiveness and competitive aggressiveness) to the firm’s entrepreneurial orientation.

Nevertheless, Turro (2016) thinks that there is a problem found in studies made applying a multilevel approach. As most of the studies have been done taking into consideration only one geographical region – most commonly America or studies have been done within the borders of just one country, all the models introduced have been rarely tested globally. All things considered, intrapreneurship and intrapreneurial activities within universities not only reveal in different forms and outcomes but also lead to changes within the university with both – advantages and disadvantages. Given the multilevel nature of intrapreneurship, next chapter will examine the individual, organizational and environmental factors and their impact on intrapreneurship and intrapreneurial behavior.

3 Factors affecting intrapreneurship and intrapreneurial behavior

Intrapreneurial behavior and therefore also the intrapreneurial activities within an existing organization can be affected by either environmental, individual or organizational factors (Turro, 2016). More generally speaking, influences to intrapreneurship are external and internal. These contextual influences are one of the main reasons that can push organizations towards success (Zahra et al., 1995). In this section, we are going to take a closer look at the factors that influence intrapreneurship.

3.1 Internal factors

Internal factors are those factors that affect an organization's internal environment, either at the employee's level – individual or organization – organizational (Kuratko et al., 2004). The next sections present each of the levels in detail.

3.1.1 Individual factors

From the sociological point of view, factors influencing the individual's intrapreneurial behavior can be gender, education level, age, or income level among other factors, which can be examined in Table 2 below. Factors such as gender, age or education level have been chosen mainly as control variables meanwhile assessing other factors (Axtell et al., 2000; Clark, 2016; Douglas et al., 2013; Hornsby et al., 2009).

To demonstrate how these control variables may affect the individual's intrapreneurial behavior, regarding gender, there is evidence that men are more likely to engage in any kind of entrepreneurial activities than women (Adachi et al., 2016; David et al., 2013), due to several reasons – level of risk aversion, credit constraints, gender discrimination at the workplace, parenthood or different time flexibility. Even if a woman would have acquired the same set of skills as a man, anyway she would less likely become an intrapreneur (Adachi & Hisada, 2016). Age can limit and influence the intrapreneurial behavior of employees likewise. Older employees may possess lower intentions to engage in entrepreneurial activities within an organization than their younger counterparts (Hatak et al., 2015).

According to Turro et al. (2016) employees with higher education completed are more likely to engage in intrapreneurial activities, however, Douglas & Fitzsimmons (2013), have found that employees with Ph.D. are less likely to develop intrapreneurial intention. Apart from sociological factors, several other determinants have been identified as possible influencers of intrapreneurial behavior such as risk-taking, innovativeness, personal initiative, personal networks, opportunity recognition among others (David et al., 2013; Douglas & Fitzsimmons, 2013; Kearney et al., 2016; Luchsinger et al., 1987; Rigtering & Weitzel, 2013; Turro et al., 2016).

Regarding risk-taking and risk-tolerance, Clark (2016) observed that increased risk tolerance can result not only in increased intrapreneurial behavior, but on the social exchange which happens between employees and managerial level of an organization. Stronger risk tolerance can strengthen employee's trust in management and organization because it indicates that organization value individual as integral part and an asset to the organization. Increased employee's risk tolerance may also manifest in higher levels of creativity, innovation, and solicitation of their ideas.

Intention to engage in entrepreneurial activities within the organization is stronger in situations with a higher propensity towards risk. The same goes for organizational support when stronger organizational support can be felt, the more likely employees will engage in entrepreneurial activities, lowering entrepreneurial risk aversion (Fini et al., 2015). Employees from the public sector generally are more risk-averse and are less likely to pursue entrepreneurial activities while working in public sector organizations (Clark, 2016).

Innovativeness and personal initiative (proactiveness) are also usually associated with employee's intrapreneurial behavior (Rigtering & Weitzel, 2013; Valsania et al., 2016). Innovativeness is the employees' intention to experiment with presented opportunities which may lead to either new products, services or technological processes (Fini & Toschi, 2015). Employees with stronger personal initiative, possess forward-looking perspective by anticipating the future demand of an industry, leading to new changes in the organization (Fini & Toschi, 2015).

Another main driver for an individual to identify opportunities is the cumulative process from the exposure to different ideas or beliefs through personal experiences and professional networking (Moutinho et al., 2016). Previous entrepreneurial experience,

entrepreneurial competencies, and opportunity detection are the skills that increase that individual's chances of engaging in intrapreneurship by becoming an intrapreneur (David et al., 2013).

An individual is more likely to engage in entrepreneurial activity in his/her workplace if they feel confident initiating and performing proactive tasks and if they experience higher levels of concern and ownership about the problem they have found a solution for. In the workplace, individuals seek encouragement and managerial support because they need to feel safe enough to engage in entrepreneurial activities (Axtell et al., 2000).

Employees working in the public university and as so being part of the public sector are inclined to multiple other factors. They are driven by the bounds of professional rules, and specific nature of available opportunities (Hayter, 2015).

As academic personnel now are assigned to more than one role and identity, they need to follow multiple institutional influences. As individual-level actors, they are forced to develop structures and systems in competing and in the majority of times also conflicting environments. A versatile set of competencies in different institutional fields and a priori business or university experience may influence academics to engage more in entrepreneurial activities, due to their cognitive knowledge base (Abreu et al., 2016).

Table 2 Individual factors affecting intrapreneurship

Individual factors	Authors/Year
Risk (taking, tolerance and aversion)	(Agca et al., 2012; Alpan et al., 2010; Chen et al., 2012a; Clark, 2016; Douglas & Fitzsimmons, 2013; Luchsinger & Bagby, 1987; Rigtering & Weitzel, 2013; Seborá et al., 2010)
Innovativeness	(Luchsinger & Bagby, 1987; Rigtering & Weitzel, 2013; Seborá & Theerapatvong, 2010)
Personal initiative	(Agca et al., 2012; Luchsinger & Bagby, 1987; Rigtering & Weitzel, 2013; Seborá & Theerapatvong, 2010; Urban et al., 2013)
Gender	(Adachi & Hisada, 2016; Axtell et al., 2000; Chen et al., 2012b; Clark, 2016; David et al.,

	2013; Douglas & Fitzsimmons, 2013; Luchsinger & Bagby, 1987; Turro et al., 2016; Urban et al., 2013)
Education level	(Adachi & Hisada, 2016; Clark, 2016; Douglas & Fitzsimmons, 2013; Luchsinger & Bagby, 1987; Turro et al., 2016)
Age	(Adachi & Hisada, 2016; Axtell et al., 2000; Chen & Bozeman, 2012b; Clark, 2016) (David et al., 2013; Douglas & Fitzsimmons, 2013; Hatak et al., 2015; Hornsby et al., 2009; Luchsinger & Bagby, 1987; Urban et al., 2013)
Personal networks	(David et al., 2013; Urban et al., 2013)
Opportunity recognition	(David et al., 2013)
Prior experience/knowledge	(Douglas & Fitzsimmons, 2013; Urban et al., 2013)

Source: Own composition

3.1.2 Organizational factors

In 1983, Burgelman argued that in order for the organizations to carry on being viable, they need to support intrapreneurial activities. Organizational factors (cf. Table 3) are control mechanisms that can impact the individual characteristics of an employee to engage in intrapreneurial activities (Perkmann et al., 2013). Both formal and informal work context has to be taken into consideration (Rigtering & Weitzel, 2013).

Firstly, an organizational climate needs to be supportive of entrepreneurial activities, therefore, facilitating employees to engage in opportunity-seeking entrepreneurial behaviors. It can be achieved by managerial practices, organizational policies and processes (Alpkan et al., 2010). Providing an organizational culture of transparency, informality, communality and equipping employees with the necessary tools for their idea generation, organizations create participative and proactive employees which lead to employee initiated ideas (Haase et al., 2016).

Organizational structures and environments conducive to intrapreneurship not only facilitate higher entrepreneurial activity levels but can also benefit from increased growth

and performance potential compared to organizations who don't have the above-described internal climate (Antoncic, 2007).

Individuals who feel that they are working in organizations where they are needed and cared for, where organizational knowledge is shared equally creating an innovative-friendly environment, and, moreover, where the “rules of the game” are widely known and accepted, are most likely to become intrapreneurs benefiting the organization likewise (Moutinho et al., 2016).

The willingness to become an intrapreneur depends on individual's assessment of the opportunity that the environment and organization present because employees assess costs and benefits with personal risks, the time they are dedicating, and the levels of ambiguity and stress, that inevitably occur while engaging in unproven practices within the company, on some occasions even challenging organizations' traditional practices. (Kuratko et al., 2014).

Therefore, Rigtering & Weitzel (2013) are certain that in order for the employee to exhibit intrapreneurial behavior, an open-minded, flexible organization with flat organizational structure, where knowledge sharing is promoted through open communication and cross-functional integration is needed to allow employees to think outside the box. Decentralized decision making, free-flowing information networks, wide spans of control, and loose adherence to rules and policies also make the organizational structure more organic and prone to intrapreneurship. The opposite effect structure is described as more mechanized (Ireland et al., 2009).

The organizational structure is related to formalization and centralization. Formalization is defined as the degree of existing rules, procedures, and instruction within an organization (Alexander et al., 1985). Organizations with a high level of structural centralization, formalization, and complexity are less likely to flourish and encourage intrapreneurship and intrapreneurial behavior among employees than organizations with a low level of structural centralization, formalization, and complexity (Covin & Slevin, 1991).

Usually, organizations set organizational boundaries to control the employees and the information which is going out of the organization to the environment (Leifer et al., 1977). Alexander & Randolph (1985) examining nursing subunits in hospitals identified three characteristics of the structure, they are vertical and horizontal participation and

formalization. Working in an unpredictable environment, employees need to interact with each other more frequently to deal with the problems which have arisen. Vertical participation refers to the amount of communication between supervisors and subordinates while performing job-related tasks and dealing with linked decisions. Horizontal participation, on the other hand, is the degree of employee's involvement in decision making and task definition.

The higher variability of the tasks the employee needs to perform, the higher the need for horizontal participation. As variability is related to differences between work tasks required from an employee in a given position to actual tasks necessary, it can be linked to the degree of employee's opportunity to take part of the decision-making. The more complex problem-solving correlates with more rules and procedures and problems with less uncertainty requires less formalization (rules and procedures) (Alexander & Randolph, 1985).

Restrictive academic regulations negatively affect entrepreneurial activities taking place in universities likewise (Muscio et al., 2016), as universities and academics are forced to follow both regulatory and professional controls (Fini & Toschi, 2015). Abreu et al. (2016) argue that university regulations most of the time are too complex and controversial, without giving clear-cut instructions. It leads to normative and cognitive interpretations being above regulatory when interpreting the rules.

Bureaucratization in the organization can manifest in several other ways, for instance, through role differentiation and specialization, and the routinization of the tasks. Internal routine and job stability are not intrapreneurship encouraging because it can work as a shield, concealing employees from opportunities and threats (Sørensen, 2007).

David et al. 2013 consider resources as key factors in the development of intrapreneurship, if resources are distributed wider, more employees have means to act entrepreneurial (Burstrom & Wilson, 2015). Organizational willingness to provide extra resources for employees' intrapreneurial actions is needed, in order for them to develop, test and implement new innovative ideas (Rigtering & Weitzel, 2013).

In situations where employee experience high levels of resource insufficiency employee's sense of obligation to the organization and normative commitment diminishes (Moss et al., 2007). Kacperczyk (2012) even found that individuals with intrapreneurial mindset who are keen on engaging in autonomous actions tend to leave small and young

companies, which are most likely possessing limited resources, to bigger already established organizations who are better supplied with resources and capabilities to stimulate internal entrepreneurship.

Concerning financial resources, industry-university relationships, in general, can provide an alternative source of funding. Grants and contracts attained from industry partner may influence academics to engage in entrepreneurial activities (Perkmann et al., 2011) because access to alternative funding allows academics to engage in research that is not only demanded by the industry but also is of great interest of researchers themselves (Fini & Toschi, 2015).

Perkmann et al. (2011) argue that public funding and industry funding can be perceived as complementary funding possibilities, in some countries universities are even encouraged to cooperate and obtain available funding from commercial organizations. It benefits organizations as well because in that way they can gain highly qualitative knowledge from skilled academics. However, not only monetary resources are needed, for instance, universities can offer access to their R&D laboratories, facilities, and their own created academic incubators in order to increase the employee's involvement in entrepreneurial actions (Muscio et al., 2016).

Linking several of the above referred factors, Alpkan et al. (2010) suggest to base intrapreneurial oriented organizational structure on five organizational arrangements or managerial tools, which are (1) management support, as in encouragement from the managers for the new idea generation and implementation, (2) allocation of free resources, for instance, time for working on the new side projects, (3) convenient organizational structures with decentralization and decision-making autonomy, work discretion, (4) a suitable reward and incentive system based on performance which encourage innovativeness and (5) a managerial tolerance for failures by recognizing the risk which is associated with entrepreneurial activities.

The managerial level needs to show their attention, encouragement and all the others emotional, physical and monetary assistance to their subordinates, without punishing them if the new idea fails (Alpkan et al., 2010).

Management support could lead to intrapreneurial ambidexterity, defined as capabilities of both organization and individual to support intrapreneurial processes from organizational level and to perform team-based development actions from the individual

level perspective. Moreover, it is culturally conditioned, based on polyphony and negotiated autonomy, involved actors perform the parallel transformation, interpretation, and problem-solving activities (Burstrom & Wilson, 2015).

Successful actions implemented by the manager to increase managerial support will also lead to increased trust from their subordinates. Trust is a crucial factor in intrapreneurship, because, in order for employees to fully engage in entrepreneurial activities within an organization, they need to feel free to develop new innovative but at the same time risky ideas (Alpkan et al., 2010).

Having trustful relationships with the employee's superior can smoothen the way through bureaucratic procedures and organization inertia because the employee will trust their superiors to help them overcome the complications. If the employee does not trust that his/her managers will not harm their job position if they engage in intrapreneurial action, it is less likely that the employee will show intrapreneurial behavior (Rigtering & Weitzel, 2013).

In the university environment, uncertainty is nothing new to researchers, because it is part of the research process, and trust is something that academics value highly, because their reputation is at stake while partaking in research activities and working in teams, which is an integral part of their job (Kolb et al., 2015).

The levels of managerial trust can affect risk aversion (Chen & Bozeman, 2012b). Managers who are risk tolerant and exhibits a more positive view of risk-taking behavior, therefore, may influence other employees to gain higher risk tolerance as well. When the managerial level encourages employees, there is stronger possibility that employees will respond with entrepreneurial behavior providing solutions to problems and overstepping constraints such as risk aversion, timidity or conservatism (Clark, 2016).

Chen & Bozeman (2012) have found that individuals working in public organization are less likely agree with the fact that in their organization risk is being encouraged due to organizations formalized constraints and the level of managerial trust. Managers in the public sector are less likely to experience loss of power and are more unwilling to trust their subordinates (Chen & Bozeman, 2012b). Alpkan et al. (2010) suggest organizations to invest more time and money on recruitment and training of managers to facilitate supportiveness and higher risk tolerance and acceptance of failure rather than reward system (Alpkan et al., 2010).

The employee satisfaction rate of the organization may also drive entrepreneurial activities (Agca et al., 2012; Antoncic et al., 2011; Park et al., 2014). In order to gain high employee satisfaction rate, the important aspect is to have good relationships amongst both workers and supervisors/managers. It can also increase individual and organizational learning (Agca et al., 2012). Employees evaluating job satisfaction can do so in relative terms, meaning, that they evaluate their own satisfaction based on their personal outcomes and inputs as their invested time, effort, and knowledge against pay, recognition, advancement or other outcomes. General satisfaction with work can be measured by different elements, for instance, working time, the reputation of the company or employee relationships. Organizations try hard to keep high employees' job satisfaction because the employee can become a real competitive advantage only if they are dealt in an appropriate manner, which reflects their needs. Which, when accomplished can boost intrapreneurship and growth of the organization (Antoncic & Antoncic, 2011).

To satisfy employees' economic needs and improve intrapreneurship within an organization, it has been proven that reward system and the payment level need to be considered as well (Agca et al., 2012; Alpkhan et al., 2010; Antoncic & Antoncic, 2011; Burstrom & Wilson, 2015; Clark, 2016; Hornsby et al., 2009; Ireland et al., 2009; Kearney & Meynhardt, 2016). The reward system has a strong effect on individuals' decision to become an intrapreneur (Ireland et al., 2009).

Employees working in the public university and as so being part of the public sector are inclined to multiple other factors such as peer recognition, technology development and commercialization, financial gain, the possibility of acquiring additional funding, and public service (Hayter, 2015).

Table 3 Organizational factors affecting intrapreneurship

Organizational factors	Author/Year
Communication openness/symmetry/climate, vertical participation	(Alexander & Randolph, 1985; Antoncic, 2007; Antoncic & Hisrich, 2001; Burstrom & Wilson, 2015; Park et al., 2014; Rigtering & Weitzel, 2013; Rutherford et al., 2007; Tastan et al., 2014)

Organizational and management support	(Alpkan et al., 2010; Antoncic, 2007; Antoncic & Hisrich, 2001; Clark, 2016; Heinonen et al., 2007; Hornsby et al., 2009; Hornsby et al., 2002; Kearney & Meynhardt, 2016; Kuratko et al., 2004; Park et al., 2014; Rutherford & Holt, 2007; Sehora & Theerapatvong, 2010; Tastan & Gucl, 2014)
Organizational culture/structure (values, mindset)	(Antoncic, 2007; Antoncic & Hisrich, 2001; Antoncic & Antoncic, 2011; Covin & Slevin, 1991; Heinonen & Toivonen, 2007; Ireland et al., 2009; Kuratko et al., 2004; Sehora & Theerapatvong, 2010; Tastan & Gucl, 2014)
Satisfaction (work, employee)	(Antoncic & Antoncic, 2011; Park et al., 2014)
Resource availability	(Alpkan et al., 2010; Burstrom & Wilson, 2015; Covin & Slevin, 1991; Heinonen & Toivonen, 2007; Hornsby et al., 2009; Hornsby et al., 2002; Ireland et al., 2009; Kacperczyk, 2012; Kearney & Meynhardt, 2016; Kuratko et al., 2004; Rigtering & Weitzel, 2013)
Formalization (rules, control mechanisms, boundaries)	(Alexander & Randolph, 1985; Antoncic, 2007; Antoncic & Hisrich, 2001; Chen & Bozeman, 2012b; Heinonen & Toivonen, 2007; Hornsby et al., 2002; Kacperczyk, 2012; Kearney & Meynhardt, 2016; Kuratko et al., 2004; Rigtering & Weitzel, 2013)

Trust in manager	(Chen & Bozeman, 2012b; Rigtering & Weitzel, 2013)
Autonomy/discretion (decision, work, task), horizontal participation	(Alexander & Randolph, 1985; Alpkhan et al., 2010; Burstrom & Wilson, 2015; Heinonen & Toivonen, 2007; Hornsby et al., 2009; Hornsby et al., 2002; Kacperczyk, 2012; Kearney & Meynhardt, 2016; Kuratko et al., 2004; Luchsinger & Bagby, 1987; Rigtering & Weitzel, 2013)
Reward system (bonuses, benefits)	(Alpkhan et al., 2010; Antoncic & Antoncic, 2011; Clark, 2016; Heinonen & Toivonen, 2007; Hornsby et al., 2009; Hornsby et al., 2002; Ireland et al., 2009; Kearney & Meynhardt, 2016; Tastan & Gucl, 2014)

Source: Own composition

3.2 External factors

As Gartner (1985, p.700) has said: “*entrepreneurs do not operate in vacuums — they respond to their environments*”. The same can be said about intrapreneurs as well. External factors are those factors that organization, in this case, university, cannot control in a direct way because it is outside the bounds of an organization (Kuratko et al., 2004), however, organizations can affect external forces and element indirectly. It allows the organization to understand the broader context in which they operate taking into consideration economic, sociocultural, political-legal, and technological perspectives (Covin & Slevin, 1991).

3.2.1 Environmental factors

Organizations operating in the public sector have two main set of goals, firstly, they need to maintain and continue to be financially viable, and, secondly, at the same time, they

must serve the needs of society around them. Therefore, they are also subject to external environmental conditions, their own employee individual behavior patterns and challenging task of setting a proper entrepreneurial strategic vision regarding ever-changing and demanding society while providing public value as the outcome (Kearney & Meynhardt, 2016).

Out of the external factors, environmental factors are the main factor group that researchers analyze, specifically industry-related environmental factors (see Table 4), leaving behind cultural or legal factors among others, who may influence intrapreneurship likewise (Turro, 2016).

Environmental factors can be divided into two main categories: favorable for intrapreneurship (munificent) like dynamism, technological opportunities, industry growth, and unfavorable for intrapreneurship (hostile) like unfavorable change, competitive rivalry (Agca et al., 2012; Antoncic & Hisrich, 2001; Zahra, 1993), a small number of opportunities in the market, general vulnerability of an organization towards external conditions of the environment, where an organization is operating (Zahra & Covin, 1995), and industry life-cycle stage (Covin & Slevin, 1991).

Environmental factors create an uncertainty for the organizations. One way how organizations can overcome this uncertainty is by implementing innovative work practices (Agca et al., 2012), also Hornsby et al. (2009) states that environmental opportunities and threats force organizations to look for more intrapreneurial actions and strategies. Therefore, environmental hostility and munificence have a positive effect on intrapreneurship as well because opportunities and threats that can be observed in the environment actually force organizations to act on them by developing intrapreneurial strategies within their organization (Agca et al., 2012).

Agca et al. (2012) argue that several studies highlight that organizations that are operating in high-tech or dynamic environments deal with uncertainty by integrating risk-taking, innovativeness, and proactive organizational stance and apply accordingly strategies based on these tactics. They also found a positive link between environmental uncertainties and product innovation, and overall entrepreneurial activity within an organization and intrapreneurship dimensions mentioned above.

Munificence compared to the environmental hostility cause higher rate of intrapreneurial behavior because it presents more opportunities for employees to recognize them and

implement (Agca et al., 2012). Hostility, on the other hand, may harm an organization, but, it can help to see other opportunities that can be found on the market, triggering an organization to act more intrapreneurial (Kuratko et al., 2004). For instance, an organization which is operating in a hostile environment may need to redesign their competitive advantages many times due to the strong rivalry, but if hostility is high it could lead to significant improvements in the performance of the company (Zahra et al., 2000).

Due to rapid technological changes and advancements, competitive advantages gained from innovative behavior are short-lived. It creates a situation where organizations operating in highly technological innovation driven environments need to innovate continuously, most importantly before their competitors do, to obtain competitive superiority (Ireland et al., 2003). The organization needs to take into account the characteristics of the environment they are in because of the diversity of its nature. Each organization perceives the environment based on their own organizational structure and industry's boundaries (Zahra, 1993).

Competitive rivalry is an almost mandatory element of new innovations, because, in order for organizations to stay on the market and compete with other competitors, they are forced to exploit opportunities by innovating either by pursuing technological, product, market, strategic or business model innovation (Ireland et al., 2003).

Dynamism is related to the continuity of changes an organization experiences from different forces, and it creates new opportunities within the market and puts pressure on companies to vigorously renew themselves by being more innovative. Intrapreneurship within organizations is positively affected also by technological opportunities, industry growth, as well as unfavorable change and competitive rivalry. New advances in the industry stimulate an organization to explore more areas (Zahra, 1993).

Less explored external factor groups are sociocultural factors and norms, although, they not only influence the entrepreneurial behavior of employees but may stimulate political, social and technological changes in the environment where an organization is operating in as well. In order to recognize the opportunities offered, individuals need to acquire skills to monitor various cultural aspects, and being aware of the present and coming conditions of the market, and at the same time gaining a competitive advantage by providing better customer value and satisfaction (Baruah & Ward, 2015).

Many studies have proven the importance and impact of external factors on the organization (Agca et al., 2012; Antoncic & Hisrich, 2001; Kearney & Meynhardt, 2016; Urbano & Turro, 2013; Zahra & Covin, 1995), nevertheless, sometimes organizations do not fully appreciate the opportunities provided by the environment. Some argue that internal factors may influence the organization more than external ones because, for instance, environmental factors are diminished according to the needs and strategies of the organization based on the economic results like expected levels of revenues, profits or sales. In fact, even geographical location may affect how external environment affect entrepreneurial actions, because, for instance, it has been observed that external influence on intrapreneurship is a lot stronger in poorer and resource-restricted regions (Urbano & Turro, 2013).

Kuratko et al. (2004, p. 14) in their study stress out that “*value-creating innovations result only when the firm alters the conditions of its internal environment in ways that result in co-alignment with the realities of its external environment*”, therefore, the internal and external factors affecting an organization and intrapreneurship at the same time need to be monitored separately and together.

Therefore, in order to analyze both internal and external factors affecting intrapreneurial behavior, next chapter will present a theoretical model of employees intrapreneurial behavior, the hypothesis, and information of sampling, data collection, and analysis that has been done to reach the main goals of this study.

Table 4 Environmental factors affecting intrapreneurship

Environmental factors	Author/Year
Dynamism	(Agca et al., 2012; Antoncic, 2007; Antoncic & Hisrich, 2001; Covin & Slevin, 1991; Kearney & Meynhardt, 2016; Kuratko et al., 2004; Zahra, 1993)
Technological opportunities/change/stability	(Alexander & Randolph, 1985; Antoncic, 2007; Antoncic & Hisrich, 2001; Covin & Slevin, 1991; Ireland et al., 2009; Kuratko et al., 2004; Zahra, 1993)

Industry growth	(Antoncic, 2007; Antoncic & Hisrich, 2001) (Zahra, 1993; Zahra & Covin, 1995)
Unfavorable change	(Antoncic, 2007; Antoncic & Hisrich, 2001; Zahra, 1993)
Competitive rivalry/intensity	(Antoncic, 2007; Antoncic & Hisrich, 2001; Ireland et al., 2009; Kuratko et al., 2004; Zahra, 1993; Zahra & Covin, 1995)
Geographic location	(Chen & Bozeman, 2012b; Douglas & Fitzsimmons, 2013)
Product/industry life-cycle	(Covin & Slevin, 1991; Kuratko et al., 2004)

Source: Own composition

4 Research objectives and methodology

In this part of the paper, we will present our theoretical model and hypothesis creation. Additionally, description of our data collection process, sample, and measurement scales that we used, along with data analysis tools chosen for this study.

4.1 Hypothesis and theoretical model

In this research, we view intrapreneurship and intrapreneurial activities as a bottom-up process, where the main actor is the individual and his/hers intrapreneurial behavior. Previous research done by Rigtering & Weitzel (2013) highlighted the significance of employees in the intrapreneurship as the basis for any kind of intrapreneurial activity taking place within the organization.

As for this study, we also want to emphasize the importance of the employee in intrapreneurial activities by analyzing determinants of the employee's intrapreneurial behavior.

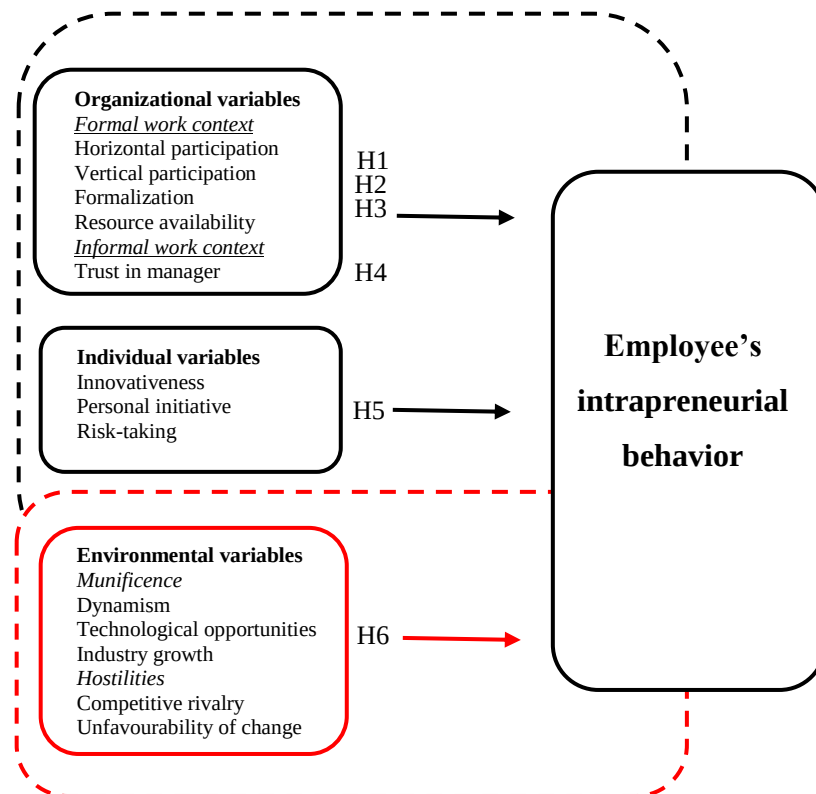


Figure 1 : Theoretical framework of employee's intrapreneurial behavior

Source: Adapted from Rigtering & Weitzel, 2013, Antoncic & Hisrich, 2001

Therefore, we are going to use and test the theoretical model made by Rigtering & Weitzel (2013) (can be viewed in Annexes 2). But as it cannot be called fully multilevel framework because only individual and organizational factors are being analyzed, we are modifying the model by combining it with the *Intrapreneurship model* made and tested by Antoncic & Hisrich (2001) (can be seen in Annexes 3), thus adding a missing external factor dimension – environmental variables. The newly made model can be seen in Figure 1.

13 factors were determined and used as independent variables for the theoretical model based on their relevance in literature review and the factors chosen by Rigtering & Weitzel (2013) and Antoncic & Hisrich (2001) in their theoretical models.

The chosen organizational factors are divided into two categories – informal and formal work context. Formal work context consists of factors such as horizontal and vertical participation (HP/VP), formalization (F) and resource availability (RA). As an informal work context factor, we are going to analyze trust in the manager (TM).

The direct effects of bureaucracy, control mechanisms, communication openness, work, decision or task autonomy are widely researched, showing significant effect on intrapreneurship or intrapreneurial behavior (Alexander & Randolph, 1985; Alpkan et al., 2010; Burstrom & Wilson, 2015; Heinonen & Toivonen, 2007; Hornsby et al., 2009; Hornsby et al., 2002; Kacperczyk, 2012; Kearney & Meynhardt, 2016; Kuratko et al., 2004; Luchsinger & Bagby, 1987; Rigtering & Weitzel, 2013). It is more likely that employees who choose to engage in intrapreneurial activities will face more problems such as bureaucratic or overall organizational inertia (Rigtering & Weitzel, 2013), therefore these factors are especially relevant to study because they work as the main initiators for intrapreneurial activities.

Bureaucratic organizations, which are implementing rigid and conservative policies, not tolerating failures and not encouraging innovation among employees or in the organization in general, lower entrepreneurial behavior within an organization, because of the strong control mechanisms and restrictions (Baruah & Ward, 2015). High levels of vertical and horizontal participation and low levels of formalization are the facilitators for the intrapreneurship (Rigtering & Weitzel, 2013), which leads to the following two hypotheses:

Hypothesis 1: High levels of horizontal and vertical participation leads to higher intrapreneurial behavior.

Hypothesis 2: Highly formalized organizational structure leads to lower levels of intrapreneurial behavior.

The resources and capabilities that the organization possesses and is willing to divert towards intrapreneurship can illustrate organizations' ability to actually engage in entrepreneurial activities because resources and capabilities can also be either facilitators or deterrents of entrepreneurial behavior (Covin & Slevin, 1991). Resource scarcity diminishes employee's creativity and innovative idea generation (Moss et al., 2007), leading to the following hypothesis:

Hypothesis 3: The level of available resources for innovative projects influence intrapreneurial behavior.

Good relationships between employees and organizations can be achieved through trust, decentralized power and communication. Those employees who feel entrust and part of symmetrical communication are more likely to propose new ideas, and likewise to be motivated to engage in intrapreneurship and display intrapreneurial behavior (Park et al., 2014). Therefore, following hypothesis is proposed:

Hypothesis 4: Higher trust in manager leads to higher levels of intrapreneurial behavior.

Innovativeness, risk-taking and personal initiative are not only the main dimensions of intrapreneurship but also represent characteristics of employees intrapreneurial behavior which might lead to active intrapreneurial activities (Agca et al., 2012; Alpkan et al., 2010; Chen & Bozeman, 2012a; Clark, 2016; Douglas & Fitzsimmons, 2013; Luchsinger & Bagby, 1987; Rigtering & Weitzel, 2013; Sebora & Theerapatvong, 2010).

In order to create innovative projects within an organization, employees have to have a need to generate new ideas, recognize opportunities and be able to implement and carry out those ideas. In order to actually introduce their innovative ideas, employees need to have the personal initiative to create them, because, although, the organization where the

employee is working will benefit from entrepreneurial actions, the decision to opt into intrapreneurial projects is personal (Rigtering & Weitzel, 2013). For that reason, we are going to analyze innovativeness, personal initiative and risk-taking as our individual factors affecting intrapreneurial behavior, therefore, following hypothesis was created:

Hypothesis 5: High levels of risk-taking, personal initiative and innovativeness can lead to higher intrapreneurial behavior.

We have identified 5 environmental factors grouped into two categories: environmental munificence and environmental hostilities - favorable and unfavorable conditions for intrapreneurial activities. Environmental munificence includes dynamism (D), technological opportunities (TO), and industry growth (IG), and environmental hostilities express themselves through competitive rivalry (CR) and unfavourability of change (UoC).

Prior research (Agca et al., 2012; Antoncic, 2007; Antoncic & Hisrich, 2001; Covin & Slevin, 1991; Ireland et al., 2009; Kearney & Meynhardt, 2016; Zahra, 1993; Zahra & Covin, 1995; Zahra & Garvis, 2000) clearly indicates that dynamism, technological opportunities, industry growth, competitive rivalry, and unfavourability of change have positive link with intrapreneurship and intrapreneurial behavior, leading to:

Hypothesis 6: High levels of dynamism, technological opportunities, industry growth, competitive rivalry and unfavorable change lead to higher intrapreneurial behavior.

Rigtering and Weitzel (2013) claim that the outcome of employees' engagement in intrapreneurship on the organization is mostly determined by the project initiated by an employee that surpass the initial phase which is described as an idea phase. Therefore, we are going to assess the intrapreneurial behavior by the participation in intrapreneurial activity within the university.

4.2 Sampling

In this study, we chose to focus on Latvian universities, as we believe that it constitutes a rich context to fulfill the research's goal. Latvia is part of the European Union since 2004

and is located in Northern Europe between two other Baltic countries – Estonia and Lithuania, occupying the size of 64 573 km² (The European Union, 2017).

Funding for the higher education system in Latvia is dual: private and public, based on the three-pillar financing model. Which is grounded on (1) reward quality, (2) links with market needs and (3) research institutions and focus on performance, innovation, strategic specialization of institutions and profile development (European Commission, 2015).

Latvia is the first country where the higher education system experienced a tremendous budget cut which affected the whole higher education system after the financial crisis. As European University Association (EUA) (2011) reports – starting from the end of 2009 and continuing in 2010, the state budget for higher education was cut by 66 %.

EUA Public Funding Observatory (2016) reports that starting from 2008, state funding for the higher education in Latvia decreased and haven't improved, experiencing -40% decrease in the growth of students vs. growth of funding to universities (see Annexes 1). And in 2016 the nominal growth in public funding for higher education was expected to grow only 1%.

For all these reasons, Latvian universities are facing severe challenges that may reflect on the entrepreneurial action and, more specifically, in the intrapreneurial behavior of their employees.

For the purpose of this study, a sample of 17 public and 12 private higher education institutions were selected to integrate the study. Only universities and other higher education institutions were chosen excluding colleges due to the nature and differences of the institutions. Considering the goal of the study, the respondents were the universities' faculty and staff.

4.3 Data collection

Data necessary for this study was collected using the online survey as the data collection tool. Many researchers choose to use surveys to observe self-reported data in intrapreneurship studies (Axtell et al., 2000; Moriano et al., 2014; Rigtering & Weitzel, 2013; Valsania et al., 2016).

Two identical versions of the survey were made, one in English and the other one in Latvian so the respondent could choose their preferred language. To ensure that both versions of the survey are equal and that the Latvian translation of the survey is adequate,

a back-translation method was used. (The example of the survey in English can be found in Annexes 4).

Measurement scales

The survey was composed of four main parts. The first part contained questions related to intrapreneurial activities and the role of respondents in those activities. The second part was composed of 4 questions regarding external factors of intrapreneurship. The third part consisted of 4 questions related to organizational and individual factors. The fourth part concerned control variables like age, gender, the level of education, the state of the higher education institution – public or private, job position, and related job field.

Organizational, individual and environmental factors were measured on a 5-point Likert scale. The measurement scales used in the survey can be viewed in Table 6.

Prior to sending the questionnaire to the universities, we run a pre-test of it. We involved 10 employees from different universities, holding different job positions, and asked them to pre-fill the survey and indicate all of the unclear parts and give us feedback to ensure that all parts of the questionnaire are understandable. Afterwards, both versions of the survey with an explanatory letter were sent to the deans of 29 higher education institutions in Latvia through email.

The survey run from the beginning of May 2017 till the end of June 2017. Firstly, each dean was asked to take part in the study and to distribute the survey to both academic and administrative personnel. To raise the response rate, two weeks after the initial email, a second email was sent with a reminder in order to receive any response – either affirmatory or negative one.

At the end of June, 8 out of 29 higher education institutions in Latvia had given an affirmatory response and had distributed the survey among the employees, resulting in 390 responses.

According to the Central Statistical Bureau of Latvia at the beginning of the school year of 2016/2017, 4430 persons were working as academic personnel at 29 higher education institutions of Latvia chosen for this study (Central Statistical Bureau of Latvia, 2017). Before the survey took place, we calculated the desired sample size that would represent the target population and give sufficient statistical power. Therefore, at the time we assumed that the population size is 4430. Accordingly, with the 5% acceptable margin of

error and 95% of confidence level (Lenth, 2001), we calculated the sample size of 354 respondents. As we received 390 responses, we can assume that the sample size is acceptable.

4.4 Data analysis

To test if our data is normally distributed, we looked visually at histograms, the P-P plot, at the skewness and kurtosis levels, and Kolmogorov–Smirnov test and Shapiro–Wilk test (Field, 2009).

Skewness results revealed that the majority of the data are skewed left in some cases with flat and light-tailed distribution. The same can be seen in the histogram and p-p plot graphs, which indicated that not all of the variables can be assumed to be normally distributed. The Kolmogorov-Smirnov and Shapiro-Wilk test also showed a significant difference from a normally distributed data. Therefore, we are going to assume that data is not normally distributed, which will take the important role when tests are going to be chosen for statistical analysis.

To measure the internal consistency of previously mentioned measurement scales (to assess their reliability) we used Cronbach's alpha (α). As our survey in general consists mostly of Likert-scale questions, it is appropriate to use Cronbach's alpha (Field, 2009). Acceptable Cronbach's alpha coefficient value depends on the structure and the goals of research so it is hard to tell one acceptable value (Bonett et al., 2015), however, most researchers accept Cronbach's alpha levels between 0.65–0.80 or higher (Vaske et al., 2017).

Our survey contains multiple scales, so reliability was tested for each factor and scale separately or in combined groups if it was possible. Consistency in the bounds of each scale was maintained by coding and reverse coding each variable as necessary. The summary of all Cronbach's alpha values can be viewed in Table 5.

Almost all of the Cronbach's alpha values show values between 0.6 and 0.8, therefore, they can be accepted indicators for reliable measurement scales. Only risk-taking and personal initiative ($\alpha = 0.64$) show a lower value than 0.65.

Table 5 The summary of Cronbach's alpha scores

Factor	Cronbach's alpha (α)
Dynamism (D)	.77
Technological opportunities/industry growth (TO/IG)	.66
Unfavourability of change (UoC)	.68
Competitive rivalry (CR)	.72
Horizontal and vertical participation, Formalization (HP, VP, F)	.73
Resource availability (RA)	.81
Trust in manager (TM)	.89
Risk-taking, personal initiative (RT, PI)	.64
Innovativeness (I)	.85

Source: Own composition

In order to test the model fit, we used confirmatory factor analysis (maximum likelihood method) and compared several fit indices as Root Mean Square Error of Approximation (RMSEA), Chi-square (CMIN, χ^2), normed chi-square (NC), goodness of fit index (GFI) and the comparative fit index (CFI) (Kline, 2005), in more detail at Table 7.

At first, the results show inconsistency because χ^2 results show that the model fit is not good ($\chi^2 = 206.514$, $p=.000$ and $df=63$), with p being significant, but as we compare the results with RMSEA (.077) and NC (3.278), the model fit is within the bounds of acceptable fit indices measure.

Table 6 The list of measurement scales used in the survey

Hypothesis	Factor	Measurement scale	Author
H1: High levels of horizontal and vertical participation leads to higher intrapreneurial behavior	Horizontal participation	Please, state to what degree do you agree with the following statements about you and your work context (5-point Likert scale: 1. I am not likely to express my feelings openly about my job. 2. In my work group/department, most people do not have a voice in decision making. 3. My job is not clearly defined. 4. I do not share any influence with my superior when he/she is making decisions. 5. I do not play an active role in making most decisions in my working group.	(Alexander & Randolph, 1985)
	Vertical participation	Please, state to what degree do you agree with the following statements about you and your work context: 1. I am encouraged to make suggestions in decisions relevant to my work. 2. I am encouraged to speak my mind on the job even if it means disagreeing with my superior. 3. My superior often seeks out my advice before decisions are made. 4. I have to check with my superior before I do almost anything in my job. 5. The superior in this group usually makes the decisions himself/herself.	

H2: Highly formalized organizational structure leads to lower levels of intrapreneurial behavior	Formalization	Please, state to what degree do you agree with the following statements about you and your work context: 1. There are rules and procedures for handling most kinds of problems which arise in making decisions. 2. The same rules and procedures are generally followed in making decisions.	
H3: The level of available resources for innovative projects influence intrapreneurial behavior	Resource availability	State to what degree do you agree with the following statements about resources that are available to you in your work context: 1. My superior gives me enough time to work on new ideas that can improve my work environment/sector. 2. My superior ensures that I have the required resources available to work on innovations. 3. My superior is willing to obtain and invest time and money in innovative initiatives. 4. Funding is an obstacle for being innovative at my workplace.	De Jong & Den Hartog (2005) (Cit. by (Rigtering & Weitzel, 2013))
H4: Higher trust in manager leads to higher level of intrapreneurial behavior	Trust in manager	Please, state to what degree you agree with the following statements about yourself and your superior: 1. I trust my superior. 2. My superior is well aware of whether I perform as expected. 3. My superior offers help and guidance to improve my performance. 4. My superior will always support me in cases of problems with other people involved. 5. The atmosphere at work makes me feel secure in suggesting improvements. 6. If I do a good job appreciation is clearly shown.	(Bijlsma et al., 2003)

		How often does it happen in your team/department that a problem cannot be solved because of differences of opinion between people?	
H5: High levels of risk-taking, personal initiative and innovativeness can lead to higher levels of intrapreneurial behavior	Risk-taking	Indicate how following statements relate to you at your work environment at university you are currently working for. I see myself as someone, who: 1. Takes risk in my job. 2. First acts and then asks for approval, even if I know that would annoy other people.	(De Jong et al., 2011)
	Personal initiative	Indicate how following statements relate to you at your work environment at university you are currently working for. I see myself as someone, who: 1. When confronted with a new task, is often afraid of not being able to handle it. 2. Likes to make suggestions on how to improve the work process. 3. Can overcome setbacks without giving up my goals If I want to achieve something. 4. Do only what I am told to do. 5. Would rather be told exactly what I have to do. Then I make fewer mistakes and work is easier. 6. Want to decide more things myself regarding my work context.	(Frese et al., 1996)
	Innovativeness	In your job, how often do you: 1. Make suggestions to improve work practices. 2. Produce ideas to improve work practices. 3. Actively contribute to the development of new products or services. 4. Optimize the organization of work.	(De Jong et al., 2010)

H6: High levels of dynamism, technological opportunities, industry growth, competitive rivalry and unfavorable change lead to higher intrapreneurial behavior	Dynamism	Please, rate the extent of changes that might have occurred in your university's environment, in your opinion: 1. Changes in technology. 2. Changes in country's consumer demographics. 3. Government regulation in higher education sector. 4. Domestic competition intensity. 5. Number of foreign competitors. 6. Industry-wide spending on advertising and marketing.	(Zahra, 1993)
	Technological opportunities	Please, indicate how true or untrue are the following statements of your university's situation, in your opinion: 1. Higher education sector offers many opportunities for technological innovation. 2. Demand for new technology in higher education sector is growing. 3. New technology is needed for growth in higher education sector.	
	Industry growth	Please, indicate how true or untrue are the following statements of your university's situation, in your opinion: 1. There are very few opportunities for growth in higher education sector. 2. The higher education sector offers many attractive opportunities for future growth.	
	Unfavourability of change	Please, rate how the changes that might have taken place in higher education sector affected your university over the past two years: 1. Changes in government regulations in higher education sector. 2. Changes in demographics 3. Technological changes. 4. Changes in the number of foreign competitors. 5. Changes in the number of domestic competitors.	

		6. Changes in industry-wide spending on advertising and marketing. 7. Changes in funding granted to higher education.	
	Competitive rivalry	Please, rate the intensity of competition your university has faced over the past two years. Competition from: 1. Established domestic higher education establishments. 2. Established foreign competitors. 3. New domestic competitors. 4. New foreign competitors.	
Intrapreneurial activity		Have you taken part in any of the following activities in your university over the past two years? 1. Development of new degree program/department 2. Conducting seminars or training sessions for an industry 3. Development of new products or services 4. Spin-offs 5. Patents 6. Other (please specify) 7. I have not If yes, what part did you take in the project? (If you took part in more than one activity, please, specify the role in the most important one by your opinion). 1. Leading 2. Supporting	(Rigtering & Weitzel, 2013)

One of the explanations for the resulting situation is the fact, that, although χ^2 has been used often, there are multiple problems that can occur relying only on χ^2 . It is reported to be a sensitive measure that can be easily influenced by the size of the correlation or sample size. If the sample size is large, the rejection of the model fit may occur often (Kline, 2005). As in this case, the sample size (N) is 390 it could be perceived as large, therefore leading to rejection of the model fit.

For that reason, we looked at other indices. One of the ways how to minimize the sensitivity of χ^2 is to calculate NC, although it may not eliminate the influence of the sample size – simply dividing the value with a degree of freedom (DF). Usually, values between 2.0/3.0 up to 5.0 demonstrate reasonable model fit (Kline, 2005). In our case, the NC is 3.278, therefore, showing acceptable model fit.

The RMSEA fit index was chosen because it is not affected by the sample size and does not estimate central chi-square distribution. Normally, RMSEA of $\leq .05$ show close approximate model fit, RMSEA between .05 and .08 – reasonable approximate model fit but values $\geq .10$ – poor approximate model fit (Kline, 2005). Our analysis show RMSEA value of .077, therefore, it can be considered to be reasonable approximate model fit. Also, both GFI (.922) and CFI (.865) show acceptable scores. Thus, in conclusion, we can consider our theoretical model of the employee's intrapreneurial behavior fit.

Table 7 Model fit indices results

Fit indexes	Results
CMIN – χ^2	206.514
1. DF	63
2. P	.000
3. CMIN/DF	3.278
RMSEA	.077
GFI	.922
CFI	.865

Source: Own composition

As we are using self-reported data collected at a certain point in time, we need to be careful of common-method variance (CMV) which can lead to measurement error, which

in turn can compromise the validity of the conclusions made of the relationships between different constructs (Podsakoff et al., 2003).

To see if any of our data contains CMV, we did Harman's single factor test to see if one single factor from the theoretical model explains more than 50% of the variance (Rigtering & Weitzel, 2013). The data showed that a single factor explains 25.566 % of the variance, which indicates that CMV is in the bounds, therefore acceptable.

As it was mentioned before when the normality of the data was tested, we have a data set that is not normally distributed, Therefore, we chose non-parametric tests to analyze them.

In order to analyze the relationship between three-level factors (individual, organizational, and environmental), we will use Spearman's correlations, sometimes called also – Spearman's rho, because of the characteristics of the data – mainly because our data is not normally distributed and is measured on the ordinal scale. Firstly, Spearman's test ranks the data, and, secondly, it applies Pearson's equations to the ranks that were previously made (Field, 2009).

To test out hypothesis, we have chosen Ordinal logistic regression, also because all of our independent variables are measured on an ordinal scale. It will help us analyze which of the independent factors (organizational, individual or/and environmental) affect the dependent factor (intrapreneurial behavior) on the significance level (Harrell, 2015).

Lastly, to see if there are any differences between distinctive groups based on gender, education level, the field of work or the level or participation in any intrapreneurial activity within the university, we will use the Kruskal-Wallis H test (Field, 2009). It has been chosen once more because of the characteristics of the dataset. As we want to analyze if there is any significant difference between two or more groups of independent and control variables using ordinal and categorical data.

To see if there is any difference between our control variables and employees' intrapreneurial behavior we are going to use the Chi-square test of homogeneity because our dependent variable is categorical and the data set is not normally distributed (Field, 2009).

Now that we concluded the description of the research goal and methodology adopted in this study, the next chapter presents and analyses the results obtained.

5 Results

In this chapter, we are going to present the overview of our sample and introduce the results of the statistical tests we have chosen and provided reasoning behind our choices in the previous chapter. We will present the results of Spearman's rank-order correlations (associations), ordinal logistic regression (predictions) and the Kruskal-Wallis H test and the Chi-square test of homogeneity (differences between groups). For further knowledge, each dimension was constructed as one variable by the average score (see Table 9) and then, in order to compare, standardized into scales. Significance level threshold was $p < .05$.

As the survey was online and it allowed to mark all responses as mandatory before proceeding to submission, there were reported no missing data from submitted responses, as respondents who wished not to answer any question, could not submit the survey. The overview of the respondents (sample) can be seen in Table 8.

Table 8 Overview of the respondents

Control variables	Results
Total number of responses received	390
Male respondents (%)	32.3
Female respondents (%)	67.7
Age (%)	
- 18-24 years old	3.6
- 25-34 years old	26.7
- 35-44 years old	25.1
- 45-54 years old	22.3
- 55-64 years old	16.2
- 65-74 years old	5.4
- 75 years or older	.8
Job position (%)	
- Teaching/research	68.72
- Administrative personnel	31.28
Participation in intrapreneurial activities (%)	
- Yes	63.1
- No	36.9

Education level (%)	
- Associate's degree	0.8
- Bachelor's degree	7.4
- Master's degree	43.8
- Ph.D.	45.9

Source: Own composition

Out of the 390 participants, 36,9 % have never taken any part in the intrapreneurial activity. 40,6 % out of the participants who, on the other hand, had taken part in the intrapreneurial activity, was in the leading position, but 59,4 % in supporting position.

Table 9 Mean and standard deviation data for each variable

	N	Mean	Std. Deviation
Environmental factors			
D	390	3.3423	.84553
TO	390	3.7628	.61642
IG	390	3.6141	.76587
UoC	390	2.9443	.51882
CR	390	2.9205	.83873
Organizational factors			
<i>Formal work context</i>			
HP	390	3.3754	.70809
VP	390	3.1269	.69513
F	390	3.3026	.75934
RA	390	3.1256	.91881
<i>Informal work context</i>			
TM	390	3.5427	.79156

Individual factors			
RT	390	3.0026	.77642
PI	390	3.6607	.56935
I	390	3.3410	.75035

Source: Own composition

Table 9 presents the mean and standard deviation data for an individual, organizational and environmental determinants. The lowest mean between all of the variables can be observed with the competitive rivalry (2.9205) and unfavourability of change (2.9443). Meaning that, on the average, respondents reported low intensity of competition for the university they work for, and changes that have taken place in higher education sector in Latvia is more unfavorable to universities than it is favorable, in their opinion.

Out of the variables, the highest mean had technological opportunities (3.7628), and personal initiative (3.6607). Respondents, on average, feel more that the environment offers many opportunities and that the demand for technology is growing. Regarding personal initiative, on average, more respondents showed that they see themselves as proactive employees who would like to freely make suggestions to improve their work processes and decide for themselves in more occasions – be more independent.

5.1 Spearman's correlations

A Spearman's rank-order correlation was used to determine the degree of relationships between external factors - environmental, and internal factors – individual and organizational (cf. details in Table 10).

Informal and formal work context only demonstrated positive significant relationship between horizontal/vertical participation ($r_s(388) = .252, p < .05$), formalization ($r_s(388) = .149, p < .05$), trust in manager ($r_s(388) = .127, p < .05$) and innovativeness, as well as between vertical participation ($r_s(388) = .109, p < .05$) and personal initiative. Moreover, resource availability ($r_s(388) = -.115, p < .05$) and trust in manager ($r_s(388) = -.117, p > .05$) showed negative but significant correlation with risk-taking. This could be expected because if, for instance, resources or trust diminishes, the employee would be forced to take higher risks rather than in situations where resources are plenty available and there is a high level of trust between the employee and their supervisor. It also correlates with

the Fini & Toschi (2015), who discovered that risk diminishes if employees feel that their superiors support them.

Overall, external factors did not show strong correlation with employees' individual factors. The only significant positive correlations that were detected were between (1) technological opportunities ($r_s(388) = .212, p < .05$) and innovativeness, (2) industry growth, and personal initiative ($r_s(388) = .151, p < .05$) and innovativeness ($r_s(388) = .136, p < .05$), (3) unfavourability of change ($r_s(388) = .114, p < .05$) and innovativeness and (4) competitive rivalry ($r_s(388) = .137, p < .05$) and innovativeness.

There might be indirect effect through innovativeness between horizontal/vertical participation, formalization, trust in manager and technological opportunities, industry growth, unfavourability of change. Likewise, there might be indirect effect through personal initiative between vertical participation and industry growth.

We can distinguish that environmental munificence is having a higher correlation with employees' individual factors (in this case one of them – innovativeness) than environmental hostilities. Technological opportunities and industry growth stimulate university employees to demonstrate higher levels of intrapreneurship rather than unfavourability of change or competitive rivalry. An innovative and competitive university should be more aware of environmental munificence rather than focusing on environmental hostilities. Instead of monitoring the threats coming from the environment, universities should explore opportunities that are presenting themselves in the market by seizing them and benefiting the university. It is also consistent with Agca et al. (2012), who found that opportunities that the environment offers – munificence, has a higher effect on intrapreneurship.

As we could see from the results, risk-taking is not a favorable factor to choose as a characteristic of employees' individual factors that are affecting intrapreneurship, in terms of the relationship between variables, because there was almost no significant correlation between any of the factors. Rigtering & Weitzel (2013) explains that it is hard to find a relationship between organizational factors and risk-taking, due to the fact, that it is hard to encourage risk-taking in employees through organizational policies and interaction. They even suggest that risk-taking may be the less significant dimension of intrapreneurship than it has been though before.

Table 10 Spearman's rho correlations

		D	TO	IG	UoC	CR	HP	VP	F	RA	TM	RT	PI	I
D	Correlation Coefficient	1.000	.236**	.114*	.035	.107*	.020	.025	.150**	.043	.026	.002	.070	.088
	Sig. (2-tailed)	.	.000	.024	.489	.034	.693	.623	.003	.399	.607	.963	.168	.084
TO	Correlation Coefficient	.236**	1.000	.441**	.306**	.189**	.237**	.256**	.224**	.195**	.205**	.001	.092	.212**
	Sig. (2-tailed)	.000	.	.000	.000	.000	.000	.000	.000	.000	.000	.981	.068	.000
IG	Correlation Coefficient	.114*	.441**	1.000	.291**	.127*	.282**	.250**	.117*	.214**	.256**	-.033	.151**	.136**
	Sig. (2-tailed)	.024	.000	.	.000	.012	.000	.000	.021	.000	.000	.521	.003	.007
UoC	Correlation Coefficient	.035	.306**	.291**	1.000	.171**	.167**	.210**	.127*	.188**	.221**	-.057	.040	.114*
	Sig. (2-tailed)	.489	.000	.000	.	.001	.001	.000	.012	.000	.000	.264	.426	.024
CR	Correlation Coefficient	.107*	.189**	.127*	.171**	1.000	-.009	.084	.111*	.040	.093	-.029	.052	.137**
	Sig. (2-tailed)	.034	.000	.012	.001	.	.857	.096	.029	.425	.068	.573	.305	.007
HP	Correlation Coefficient	.020	.237**	.282**	.167**	-.009	1.000	.434**	.163**	.358**	.472**	-.018	.041	.252**
	Sig. (2-tailed)	.693	.000	.000	.001	.857	.	.000	.001	.000	.000	.716	.418	.000
VP	Correlation Coefficient	.025	.256**	.250**	.210**	.084	.434**	1.000	.265**	.349**	.518**	.015	.109*	.280**
	Sig. (2-tailed)	.623	.000	.000	.000	.096	.000	.	.000	.000	.000	.774	.031	.000
F	Correlation Coefficient	.150**	.224**	.117*	.127*	.111*	.163**	.265**	1.000	.196**	.236**	.091	.089	.149**
	Sig. (2-tailed)	.003	.000	.021	.012	.029	.001	.000	.	.000	.000	.074	.080	.003
RA	Correlation Coefficient	.043	.195**	.214**	.188**	.040	.358**	.349**	.196**	1.000	.657**	-.115*	-.036	.063
	Sig. (2-tailed)	.399	.000	.000	.000	.425	.000	.000	.000	.	.000	.023	.480	.218
TM	Correlation Coefficient	.026	.205**	.256**	.221**	.093	.472**	.518**	.236**	.657**	1.000	-.117*	.048	.127*
	Sig. (2-tailed)	.607	.000	.000	.000	.068	.000	.000	.000	.000	.	.021	.341	.012
RT	Correlation Coefficient	.002	.001	-.033	-.057	-.029	-.018	.015	.091	-.115*	-.117*	1.000	.392**	.316**
	Sig. (2-tailed)	.963	.981	.521	.264	.573	.716	.774	.074	.023	.021	.	.000	.000

PI	Correlation Coefficient	.070	.092	.151**	.040	.052	.041	.109*	.089	-.036	.048	.392**	1.000	.487**
	Sig. (2-tailed)	.168	.068	.003	.426	.305	.418	.031	.080	.480	.341	.000		.000
I	Correlation Coefficient	.088	.212**	.136**	.114*	.137**	.252**	.280**	.149**	.063	.127*	.316**		1.000
	Sig. (2-tailed)	.084	.000	.007	.024	.007	.000	.000	.003	.218	.012	.000		.

** . Correlation is significant at the 0.01 level (2-tailed). * . Correlation is significant at the 0.05 level (2-tailed). N = 390

Source: Own composition (from SPSS)

5.2 Ordinal logistic regression

An ordinal logistic regression was used to find out which of the independent variables have a statistically significant effect on employees' intrapreneurial behavior. More specifically, we used cumulative odds ordinal logistic regression with proportional odds (Harrell, 2015).

Comparing the full model and the intercept-only model we found out that the final model showed statistically significant prediction of the dependent variable – intrapreneurial behavior ($\chi^2(13) = 67.376$; $p < .05$). It means that the model shows a good fit.

To see if any of our independent variables have a statistically significant effect on the dependent variable, we checked the Test of Model Effects using the Wald test statistics, see the results in detail in Table 11, because our independent variables were polytomous – being ordinal variables with more than 3 values.

Based on our findings, vertical participation showed no significant impact on employees' intrapreneurial behavior ($\chi^2(1) = .181$; $p > .05$), however, we found that horizontal participation, on the other hand, revealed statistically significant effect on employees' intrapreneurial behavior ($\chi^2(1) = 4.750$; $p < .05$). Meaning that higher levels of horizontal participation employee experiences at work could be associated with higher intrapreneurial behavior he/she would express. Therefore, the **Hypothesis 1**: “High level of horizontal and vertical participation leads to higher intrapreneurial behavior” is partially supported, by the data.

Table 11 The results of the Test of Model Effects

Type III N=390	Intrapreneurial behavior		
	Wald χ^2	df	Sig.
<i>Environmental v.</i>			
Dynamism	3.028	111	.082
Tech. Opp.	4.993	1	.025
Industry growth	.185	1	.667
Unfav. of change	1.666		.197
Compet. Rivalry	.273		.601
<i>Organizational v.</i>			
<i>Formal work c.</i>			

Horizontal part.	4.750	1	.029
Vertical part.	.181	1	.671
Formalization	1.331	1	.249
Resource availab.	.002	1	.963
<i>Informal work c.</i>			
Trust in manger	6.262	1	.012
<i>Individual variables</i>			
Risk-taking	.882	1	.348
Personal initiative	1.187	1	.276
Innovativeness	18.841	1	.000

Source: Own composition

The results are coherent with other studies (Antoncic, 2007; Hornsby et al., 2002; Park et al., 2014; Tastan & Gucl, 2014). Hornsby et al. (2002) found a significant effect of work autonomy on managers that could influence them to promote intrapreneurial activities within the organization. Based on the findings of Park et al. (2014), an organizational strategy that includes decentralized power is one of the key how to raise employees' voluntary intrapreneurship.

Formalization did not show statistically significant effect on intrapreneurial behavior ($\chi^2(1) = 1.331$; $p > .05$). Therefore, the **Hypothesis 2**: "Highly formalized organizational structure leads to lower levels of intrapreneurial behavior", is not supported. Our findings are quite different from other studies (Alexander & Randolph, 1985; Antoncic, 2007; Antoncic & Hisrich, 2001; Hornsby et al., 2002; Kacperczyk, 2012). Kacperczyk, (2012), found that formalization affects employees intrapreneurial behavior. Employees working in an organization with lower levels of formalization show higher levels of intrapreneurial behavior.

An analysis showed that resource availability also did not significantly affect employees' intrapreneurial behavior ($\chi^2(1) = .002$; $p > .05$). So, the **Hypothesis 3**: "The level of available resources for innovative projects influence intrapreneurial behavior" is also not supported, because the significant effect was not found

However, results indicated that trust in manager did show a significant effect on employees' intrapreneurial behavior. Therefore, **Hypothesis 4**: "Higher trust in manager leads to higher levels of intrapreneurial behavior", is supported, meaning that employees' who feel that they can trust their managers, therefore, more freely come up with new ideas, show higher intrapreneurial behavior. Other studies have also indicated that trust in manager is an important predictor of intrapreneurship (Chen & Bozeman, 2012a;

Rigtering & Weitzel, 2013). Chen & Bozeman (2012b) in their study have found that trust in manager influence not only employees' intrapreneurial behavior but also employees and top-management risk-aversion.

Innovativeness is the only factor from employees' individual factors, which revealed a significant effect on intrapreneurial behavior ($\chi^2 (1) = 18.841$; $p < .05$). For this reason,

Hypothesis 5: "High levels of risk-taking, personal initiative and innovativeness can lead to higher intrapreneurial behavior", is only partially supported. It means that employees should be encouraged to act and think more innovative because it could lead to higher intrapreneurial behavior displayed.

Rigtering & Weitzel, (2013) findings also indicate that innovative workplace behavior is affecting intrapreneurship and indirectly also work context.

Our data and analysis show that from environmental factors only technological opportunities ($\chi^2 (1) = 4.993$; $p < .05$), showed a significant effect on intrapreneurial behavior.

Therefore, the **Hypothesis 6:** "High levels of dynamism, technological opportunities, industry growth, competitive rivalry and unfavourability of change can lead to higher intrapreneurial behavior" was only partially supported. Our findings were not consistent with the results from the other studies (Agca et al., 2012; Antoncic, 2007; Antoncic & Hisrich, 2001).

5.3 Kruskal-Wallis H test

After the relationship between the variables and the effect independent variables had on dependent variable were tested, we analyzed if there was any difference in the results between groups based on our control variables by using Kruskal-Wallis H test.

To see if individual factors differed based on the gender of the sample – male and female, we run the Kruskal-Wallis H test. The median scores were significantly different between two groups only in case of risk-taking ($\chi^2 (1) = 11.486$; $p < .05$), where the male had the mean rank of 222.93 and female – 182.41, indicating that male participants reported having higher levels of risk-taking. Scores for innovativeness and personal initiative were similar and not statistically significant. Other studies show the same results, meaning that

it is less likely that women would become intrapreneurs compared to men, indicating that women are more risk-averse (Adachi & Hisada, 2016; David et al., 2013).

All of the environmental factors showed significant difference between male and female participants: dynamism ($\chi^2(1) = 9.709$; $p < .05$), unfavourability of change ($\chi^2(1) = 6.190$; $p < .05$), industry growth ($\chi^2(1) = 4.259$; $p < .05$), technological opportunities ($\chi^2(1) = 12.227$; $p < .05$) and competitive rivalry ($\chi^2(1) = 8.634$; $p < .05$). In all of the cases female participants experienced higher impact from environmental factors on their behavior compared to the male participants. Male and female participants did not reveal any significant difference between organizational variables.

The median scores were significantly different also comparing different age groups. Risk-taking dimension out of three dimensions of intrapreneurial behavior showed significant difference ($\chi^2(6) = 18.353$; $p < .05$). The highest mean ranks had 65 – 74 years old (mean rank = 255.12) and 55 – 64 (mean rank = 220.64) years old participants. The lowest mean ranks had our youngest participants: 18 – 24-year-old ones (mean rank = 135.89) and 25 – 34 years old (175.90), implying that younger employees in universities are less risk-taking, therefore, also less eager to engage in risky activities. However, Kacperczyk (2012) have found that, on the contrary, younger people are keener to risk at their work place, than older employees.

Significant difference was found also between participants age and formalization ($\chi^2(6) = 12.641$; $p < .05$), resource availability ($\chi^2(6) = 21.234$; $p < .05$) and trust in manager ($\chi^2(6) = 26.046$; $p < .05$). Higher formalization at their work context experienced older participants: 65 – 74 years old ones (mean rank = 219.17). Yet, the youngest participants (18 – 24 years old) felt bigger effect regarding the level of available resources at their university (mean rank = 219.17) compared to other groups. They also trusted more their superior (mean rank = 274.46). The least trust in manager was shown by 55 to 64-year-old (mean rank = 161.80). There was not recorded any difference between age groups and environmental factors.

The median scores were significantly different in the risk-taking dimension comparing the highest education level completed by our sample group ($\chi^2(5) = 18.258$; $p < .05$), vertical participation ($\chi^2(5) = 19.770$; $p < .05$) and trust in the manager ($\chi^2(5) = 15.134$; $p < .05$). The most likely to engage in risk-taking activities were participants who had obtained a Ph.D. degree (mean rank = 213.78) and Master's degree (mean rank = 184.92).

However, Douglas & Fitzsimmons (2013) have found that employees who had completed their Ph.D. studies showed less intrapreneurial intentions compared to the rest of the employees. Higher levels of vertical participation experienced participants who had completed second level professional higher education programs (mean rank = 338) and the lowest level – participants who have obtained Master's degree (mean rank = 185.45). Participants with Bachelor's degree tend to trust their manager more than the rest of the groups (mean rank = 252.76).

To see if any of the factors differ between employees working in the public and private higher education establishment did not give us valid enough results because from all sample size only 1.3 % of the participants worked in the private higher education institution, the rest stated public higher education institution as their work place.

Regarding job position, we found statistically significant difference between job position and vertical participation ($\chi^2(7) = 16.033$; $p < .05$), horizontal participation ($\chi^2(7) = 21.323$; $p < .05$), dynamism ($\chi^2(7) = 14.153$; $p < .05$), and formalization ($\chi^2(7) = 18.729$; $p < .05$). Employees working as professors reported having better communication with their supervisors in situations related to their job (vertical participation) (mean rank = 211.85) than the rest of the groups. The deans of the faculties reported to have a higher involvement in decision making at their universities (horizontal participation) (336.75), but prorectors felt that their university has higher levels of formal rules and procedures (formalization) (mean rank = 295.83). Management service officers revealed that they feel that university they are working in is affected more by the dynamic environment of higher education sector than other respondents.

Testing the difference between different fields that employees associated their work with, significant difference were found in innovativeness dimension ($\chi^2(21) = 42.432$; $p < .05$), dynamism ($\chi^2(21) = 50.958$; $p < .05$), technological opportunities ($\chi^2(21) = 38.889$; $p < .05$), unfavourability of change ($\chi^2(21) = 43.314$; $p < .05$), horizontal participation ($\chi^2(21) = 46.373$; $p < .05$), formalization ($\chi^2(21) = 45.630$; $p < .05$), resource availability ($\chi^2(21) = 41.356$; $p < .05$).

Respondents reported showing higher innovativeness levels working in the fields such as chemistry (mean rank = 248.11), medicine (mean rank = 222.82) and physics (mean rank = 213.47). It could be explained by the nature of the field and the budget allocation in Latvian higher education. The state budget for higher education institutions is divided

based on the demand of the market and long-term strategy of Latvian economy, for instance, some areas of study, like natural sciences, engineering or mathematics have received more funding than other fields (OECD, 2017). Therefore, fields which have received more resources would also express higher innovativeness and intrapreneurship levels.

Employees working in the administration felt that the university they are working in is more affected by dynamism – the constant changes in the environment (mean rank = 254.24) because managerial and administrative level employees are the ones that most likely are the first ones who have to respond to changes in the environment.

Technological opportunities were reported having a higher impact on employees working in the field of architecture and design (mean rank = 344.00). Unfavourability of change impacted employees from medicine (257.85) more than the rest employees. Employees from the field of law (mean rank = 309.20) felt that they are more involved in the decision making in their universities. The highest level of formal rules and procedures were reported from the employees from the political science field (mean rank = 271.25), but employees working in the field of physics (mean rank = 250.87) reported having more available resources for innovation than the rest of the employees working in different fields. These differences between different fields and internal and external determinants of intrapreneurship can be explained by the specific nature of each field.

Employees who have not taken part in any of the intrapreneurial activities showed also less risk taking (mean rank = 167.45) ($\chi^2(1) = 14.728$; $p < .05$), personal initiative (mean rank = 162.23) ($\chi^2(1) = 20.661$; $p < .05$), and innovativeness (mean rank = 138.60) ($\chi^2(1) = 59.031$; $p < .05$), compared to the employees who had taken part in intrapreneurial activities.

The role employee took while participating in an intrapreneurial activity also showed significant difference between all of the intrapreneurial dimensions, as well as formal work context. Those employees who were taking a leading position in intrapreneurial activities reported having higher levels (mean rank = 229.12) of risk-taking ($\chi^2(2) = 18.819$; $p < .05$), personal initiative (mean rank = 218.35) ($\chi^2(2) = 20.818$; $p < .05$) and innovativeness (mean rank = 243.27) ($\chi^2(2) = 61.847$; $p < .05$). Respondents having a leader position while participating in intrapreneurial activity also reported that they are more involved in decision making (mean rank = 218.47) ($\chi^2(2) = 9.574$; $p < .05$), that

they feel that the university they are working for have many rules and procedures (mean rank = 218.87) ($\chi^2(2) = 7.289$; $p < .05$), and that they feel that they can openly communicate with their superiors (mean rank = 225.85) ($\chi^2(2) = 10.024$; $p < .05$).

5.3.1 Chi-square test of homogeneity

After the differences between independent factors and our control variables were stated, we analyzed if any of the control variables affected employee's intrapreneurial behavior differently.

The levels of intrapreneurial behavior showed a difference between age ($\chi^2(6) = 36.725$; $p < .05$), the level of education ($\chi^2(5) = 20.421$; $p < .05$), and job position: academic staff ($\chi^2(7) = 27.491$; $p < .05$).

By performing z-test of two proportions with Bonferroni correction, we were able to determine where the differences in groups are in more detail.

Respondents being between 35 and 64 years old showed higher significant difference compared to the youngest and the oldest respondents of this study – 18 to 24 years old (.214) and 65 and more years old employees (.132), indicating that employees aged between 35 and 64 years old showed higher levels of intrapreneurial behavior.

Respondents having completed their Ph.D. studies showed statistically significantly more intrapreneurial behavior (.721) than respondents with their Bachelors' (.448), Masters' (.591) or respondents who have completed professional higher education program (.667). There was not reported any statistically significant difference between respondents with Bachelors', Masters' degree or respondents completed professional higher education program. Respondents working as professors at the university had expressed statistically significantly more intrapreneurial behavior (.891) than research assistants (.474) or researchers (.57).

This chapter has shown not only that internal and external factors have positive significant influence on employees intrapreneurial behavior, but also that our control variables show different correlations between internal and external factors additionally to intrapreneurial behavior. Therefore, in the next chapter, we will present the conclusions that are drawn from this study, and provide our theoretical and practical contributions, research limitations and recommendations for the future research.

6 Conclusions

This study explored how internal and external determinants of intrapreneurial behavior affect employees who are working in the higher education sector in Latvia while facing significant funding insufficiency. Moreover, we analyzed the relationships between internal and external factors and tested if the theoretical model of intrapreneurship can be applicable not only analyzing the industrial sector but the public sector likewise.

The study provides not only the explanation of what intrapreneurship is, how it manifest and what benefits organization may achieve if it chooses to engage in facilitating intrapreneurial behavior among employees, but also, we have examined different factors who can affect intrapreneurship and intrapreneurial behavior.

The results indicated that one of the main factors affecting the employee's intrapreneurial behavior in the highest education sector is horizontal participation. Employees who feel that the university, where he/she is working, deal with the decisions accepting various opinions, and where superiors involve employees in their decision-making would demonstrate higher levels of intrapreneurial behavior. Therefore, it indicates that management actions are important for intrapreneurship.

Trust in manager clearly influence the levels of employees' intrapreneurial behavior as well. If employee feels that they can trust their managers to support them in case of problems or when they decide to act more intrapreneurial, they are more likely to show higher levels of intrapreneurial behavior. The atmosphere at the work place has to be secure, and supervisor should offer help and guidance.

Surprising is the fact, that we did not find evidence that resource availability affects employees intrapreneurial behavior as universities are facing budget cuts. Perhaps, if employees are used to working in a resource-restrictive environment for a long time, they adapt to the situation by finding other means to act intrapreneurial.

We found out that out of the three individual factors chosen for this study, – innovativeness can be considered as the most important factor. Horizontal and vertical participation, formalization, and trust in manager might even have an indirect effect on technological opportunities, industry growth and unfavourability of change through innovativeness.

Women in the academic sector are less likely to become intrapreneurs due to the higher risk-aversion compared to their male colleagues. Opposing other studies (Adachi &

Hisada, 2016; Kacperczyk, 2012), we found that older-aged employees have higher intrapreneurial behavior levels than their younger colleagues.

Employees who have taken either the leading or supporting role in any of the intrapreneurial activities taking place in the university, consequentially show higher levels of intrapreneurial behavior. We could say that the employees from higher education institutions in Latvia who engage in intrapreneurial activities are older than 40 years old with Ph.D. or Master's degree, and the majority of them coming from the exact sciences.

6.1 Theoretical and practical contribution

Our study offers several theoretical and practical contributions. Unlike other studies available at the intrapreneurship research field we have started to explore intrapreneurship by examining how intrapreneurship manifests in the public sector, rather than the most common choice – industrial sector, therefore, contributing to the existing academic literature base.

Our study looks at the situation in the higher academic sector in Latvia, where higher education is still under the pressure from the economic crisis and severe budget cuts to the higher education funding. We have documented the existence of intrapreneurship in the higher academic sector in Latvia by testing internal and external determinants that are associated with the higher degree of intrapreneurship within an organization.

We have analyzed a set of variables that illustrates the relationship and effects on intrapreneurial behavior, moreover putting emphasis on the bottom-up approach of intrapreneurship, therefore, putting emphasis on the individual, not the organization. Our findings of horizontal participation playing an important role in employees intrapreneurial behavior, as well, the impact of trust in manager and environmental factor impact on employees' innovativeness, can be used as a base for other studies by improving the chosen factors, adding and testing new ones thus extending the theoretical model.

By showing that intrapreneurship can be also applicable to public sector organizations – universities, we have highlighted the problem areas for improvement for the organizations themselves, where universities should put the focus on if they desire to implement intrapreneurial practices. Organizations can use the information when planning their strategy, including innovation as a long-term goal.

The managerial level should play a higher role by creating an intrapreneurial environment with open communication and higher levels of job autonomy and decision making. It will give employees higher assurance that it is acceptable to be innovative which could lead to higher levels of intrapreneurship.

Superiors should adopt a different approach to employees from different age groups by providing guidance, earning trust and allowing their subordinates freer resources out of their official job duties, that could drive their innovativeness which consequentially could lead them to new idea generation and implementation.

Organizations should pay more attention to technological opportunities that appear in the environment, and monitor competitive rivalry and unfavourability of change because they affect intrapreneurship more than other factors.

6.2 Research limitations

This study is not without its limitations. Firstly, in our study, we used self-reported data that were collected at a certain point in time. Also, we didn't receive a high response from private higher education institutions which could give us insight into differences in terms of resources and funding. A majority of our sample was working at the public university, therefore, we could not compare between public and private universities. Colleges were also excluded from the analysis, if we included them, we could have amplified our results and the finding may have been better generalizable.

We tested a theoretical model of intrapreneurship that combined two other theoretical models that were used to analyze organizations/firms operating in the industrial sector. Therefore, we may have unknowingly excluded some variables whose relationships might only appear among the population of higher education individuals who are exposed to certain, specific conditions.

We included only environmental factors as external determinants, the sociocultural factors may have had a higher influence over employees intrapreneurial behavior. As innovativeness dimension was the main dimension which was affected by the majority of the factors, but risk-taking dimension was showing almost no correlation or effects, other factors may have shown more relevant results.

As the study was done in the bounds of one country, we did not test or take into consideration cultural differences among employees.

We did not analyze intrapreneurial outcomes, although, many studies have analyzed how internal and external determinants of intrapreneurship and intrapreneurship itself affect both financial and nonfinancial outcomes (Agca et al., 2012; Rigtering & Weitzel, 2013; Urbano et al., 2013; Antoncic & Hisrich, 2001; Bierwerth et al., 2015).

As our results indicate, the variables are affected by several explanatory factors which were not included in the main analyze, just as control variables, but may have been an important source of information and give even more interesting results.

Therefore, future research may (1) look more closely at the public and private higher education institutions, if there is any difference between how employees respond to internal and external factors based on the funding model, (2) alongside environmental factors affecting intrapreneurial behavior include also sociocultural determinants of employees intrapreneurial behavior and (3) in the theoretical model and analysis include the outcomes of intrapreneurship, how intrapreneurial behavior and internal and external determinants affect the outcomes of intrapreneurship in the organization operating in the public sector – higher education sector.

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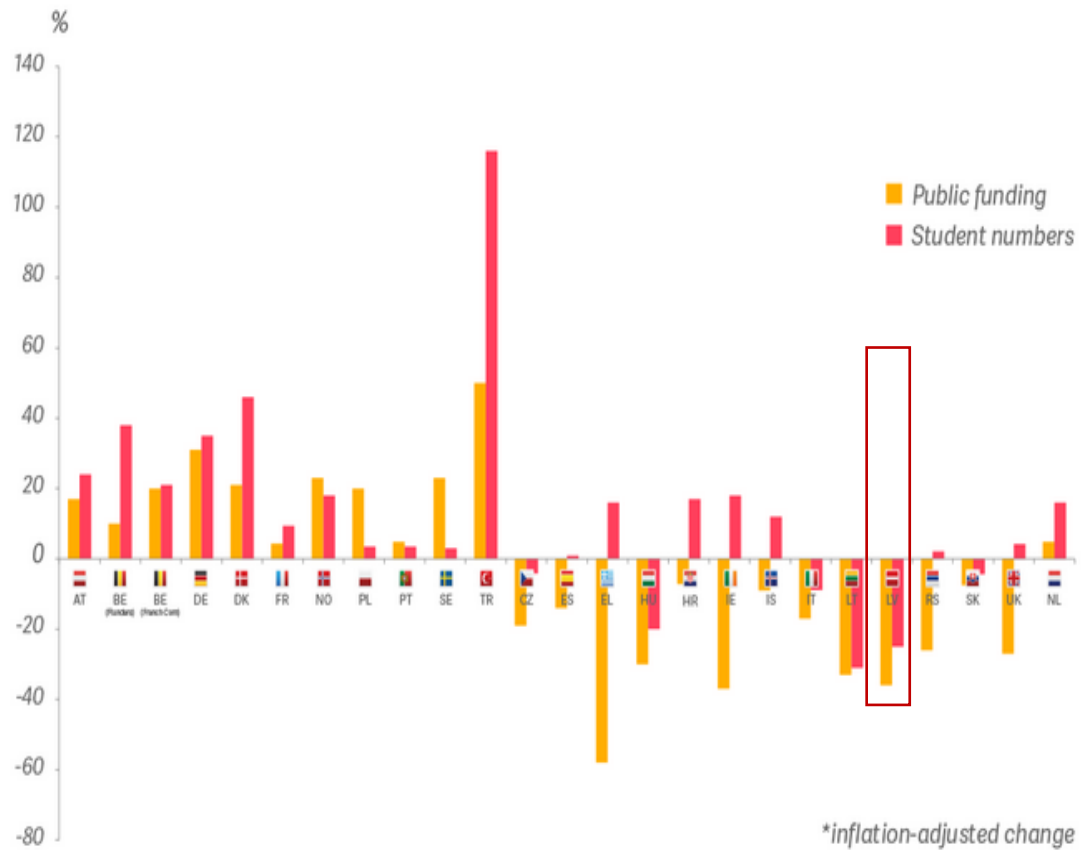
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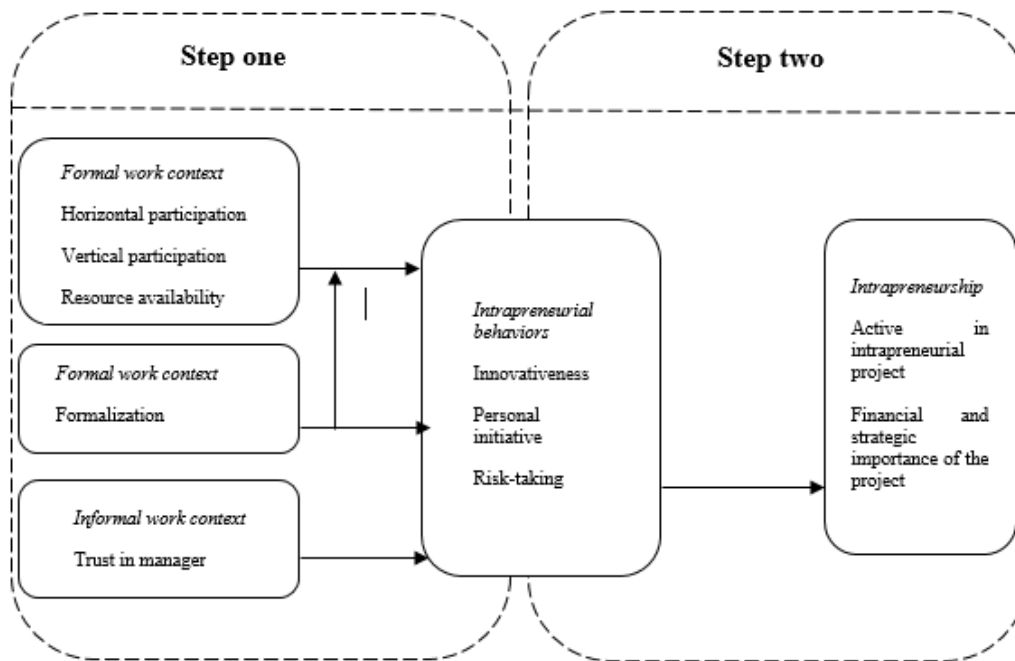
Annexes

Annexes 1: Growth of students vs. growth of funding to universities (2008-2016)



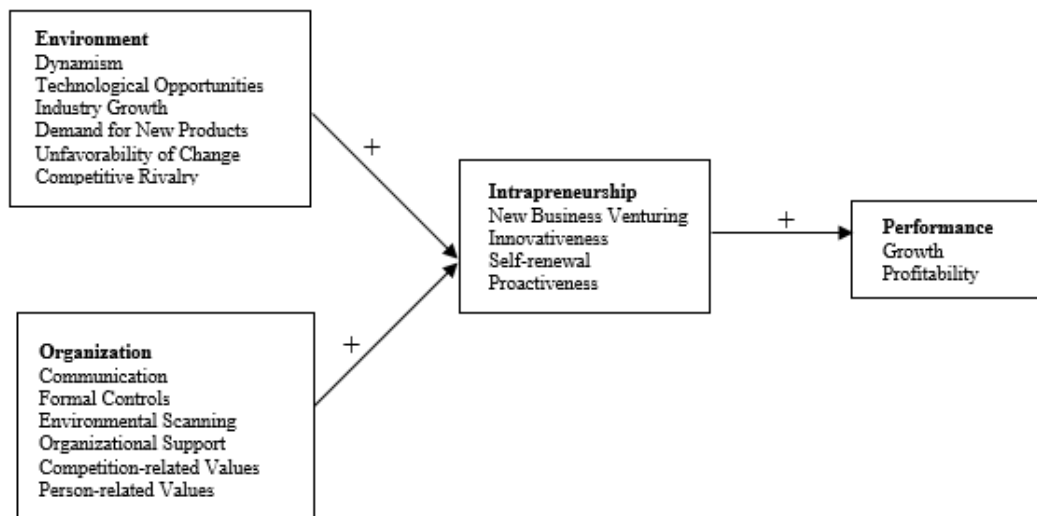
Source: Lamborelle & Álvarez, 2016; European University Association, 2015

Annexes 2: Two-step model of Intrapreneurship



Source: Rigtering & Weitzel, 2013, p. 345

Annexes 3: The Intrapreneurship Model



Source: Antoncic & Hisrich, 2001, p. 505

Annexes 4: The example of the survey in English

1. Have you taken part in any of the following activities in your university over the past two years?
☐ Development of new degree program/department ☐ Conducting seminars or training sessions for an industry ☐ Development of new products or services ☐ Spin-offs* ☐ Patents ☐ Other (please specify) ☐ I have not
<i>*The creation of an independent company through an existing business or division of a parent company.</i>
2. If yes, what part did you take in the project? (If you took part in more than one activity, please, specify the role in the most important one by your opinion).
☐ Leading ☐ Supporting ☐ I didn't take part
3. Please, rate the extent of changes that might have occurred in your university's environment, in your opinion.

	(1) No change	(2) Minor change	(3) Neutral	(4) Moderate change	(5) Major change
Changes in technology	☐	☐	☐	☐	☐
Changes in country's consumer demographics	☐	☐	☐	☐	☐
Government regulation in higher education sector	☐	☐	☐	☐	☐
Domestic competition intensity	☐	☐	☐	☐	☐
Number of foreign competitors	☐	☐	☐	☐	☐
Industry-wide spending on advertising and marketing	☐	☐	☐	☐	☐
4. Please, indicate how true or untrue are the following statements of your university's situation, in your opinion.					
	(1) Very untrue	(2) Untrue	(3) Neutral	(4) True	(5) Very true
Higher education sector offers many opportunities for technological innovation	☐	☐	☐	☐	☐
Demand for new technology in higher education sector is growing	☐	☐	☐	☐	☐
New technology is needed for growth in higher education sector	☐	☐	☐	☐	☐
There are very few opportunities for growth in higher education sector	☐	☐	☐	☐	☐

The higher education sector offers many attractive opportunities for future growth	☐	☐	☐	☐	☐
5. Please, rate how the changes that might have taken place in higher education sector affected your university over the past two years?					
	(1) Very Unfavorable	(2) Unfavorable	(3) Neutral	(4) Favorable	(5) Very Favorable
Changes in government regulations in higher education sector	☐	☐	☐	☐	☐
Changes in demographics	☐	☐	☐	☐	☐
Technological changes	☐	☐	☐	☐	☐
Changes in the number of foreign competitors	☐	☐	☐	☐	☐
Changes in the number of domestic competitors	☐	☐	☐	☐	☐
Changes in industry-wide spending on advertising and marketing	☐	☐	☐	☐	☐
Changes in funding granted to higher education	☐	☐	☐	☐	☐
6. Please, rate the intensity of competition your university has faced over the past two years.					
Competition from:	(1) Very low	(2) Low	(3) Neutral	(4) High	(5) Very High
Established domestic higher education establishments	☐	☐	☐	☐	☐
Established foreign competitors	☐	☐	☐	☐	☐
New domestic competitors	☐	☐	☐	☐	☐

New foreign competitors	☐	☐	☐	☐	☐
7. Please, state to what degree do you agree with the following statements about you and your work context					
	(1) Strongly disagree	(2) Disagree	(3) Neither agree or disagree	(4) Agree	(5) Strongly agree
I am not likely to express my feelings openly about my job	☐	☐	☐	☐	☐
In my work group/department, most people do not have a voice in decision making	☐	☐	☐	☐	☐
I am encouraged to make suggestions in decisions relevant to my work	☐	☐	☐	☐	☐
I am encouraged to speak my mind on the job even if it means disagreeing with my superior	☐	☐	☐	☐	☐
My superior often seeks out my advice before decisions are made	☐	☐	☐	☐	☐
My job is not clearly defined	☐	☐	☐	☐	☐
I have to check with my superior before I do almost anything in my job	☐	☐	☐	☐	☐
I do not share any influence with my superior when he/she is making decisions	☐	☐	☐	☐	☐

There are rules and procedures for handling most kinds of problems which arise in making decisions	☐	☐	☐	☐	☐
The same rules and procedures are generally followed in making decisions	☐	☐	☐	☐	☐
The superior in this group usually makes the decisions himself/herself	☐	☐	☐	☐	☐
I do not play an active role in making most decisions in my working group	☐	☐	☐	☐	☐
8. State to what degree do you agree with the following statements about resources that are available to you in your work context					
	(1) Strongly disagree	(2) Disagree	(3) Neither agree or disagree	(4) Agree	(5) Strongly agree
My superior gives me enough time to work on new ideas that can improve my work environment/sector	☐	☐	☐	☐	☐
My superior ensures that I have the required resources available to work on innovations.	☐	☐	☐	☐	☐
My superior is willing to obtain and invest time and money in innovative initiatives.	☐	☐	☐	☐	☐
Funding is an obstacle for being innovative at my workplace.	☐	☐	☐	☐	☐

9. Please, state to what degree you agree with the following statements about yourself and your superior.					
	(1) Strongly disagree	(2) Disagree	(3) Neither agree or disagree	(4) Agree	(5) Strongly agree
I trust my superior	☐	☐	☐	☐	☐
My superior is well aware of whether I perform as expected	☐	☐	☐	☐	☐
My superior offers help and guidance to improve my performance	☐	☐	☐	☐	☐
My superior will always support me in cases of problems with other people involved	☐	☐	☐	☐	☐
The atmosphere at work makes me feel secure in suggesting improvements	☐	☐	☐	☐	☐
If I do a good job appreciation is clearly shown	☐	☐	☐	☐	☐
10. How often does it happen in your team/department that a problem cannot be solved because of differences of opinion between people?					
	(1) Almost never	(2) Rarely ever	(3) Sometimes	(4) Often	(5) Almost always
	☐	☐	☐	☐	☐
11. Indicate how following statements relate to you at your work environment at university you are currently working for.					

I see myself as someone, who	(1) not true at all	(2)	(3) Neutral	(4)	(5) Very true
Takes risk in my job	☐	☐	☐	☐	☐
First acts and then asks for approval, even if I know that would annoy other people	☐	☐	☐	☐	☐
When confronted with a new task, is often afraid of not being able to handle it	☐	☐	☐	☐	☐
Likes to make suggestions on how to improve the work process	☐	☐	☐	☐	☐
Can overcome setbacks without giving up my goals If I want to achieve something	☐	☐	☐	☐	☐
Do only what I am told to do	☐	☐	☐	☐	☐
Would rather be told exactly what I have to do. Then I make fewer mistakes and work is easier	☐	☐	☐	☐	☐
Want to decide more things myself regarding my work context	☐	☐	☐	☐	☐
In your job, how often do you:	(1) Never	(2) Rarely	(3) Sometimes	(4) Often	(5) Always
Make suggestions to improve work practices	☐	☐	☐	☐	☐
Produce ideas to improve work practices	☐	☐	☐	☐	☐
Actively contribute to the development of new products or services	☐	☐	☐	☐	☐

Optimize the organization of work	☐	☐	☐	☐	☐
General information about yourself:					
How old are you?					
18-24 years old 25-34 years old 35-44 years old 45-54 years old 55-64 years old 65-74 years old 75 years or older					
What is your gender?					
☐ Male / ☐ Female					
What is the highest level of education you have completed?					
Less than high school High school graduate (includes equivalency) Some college, no degree Associate's degree Bachelor's degree Master's degree					

Ph.D.
Other
Is the university you are working for public or private?
☐ Public
☐ Private
If you are part of the teaching staff, what is your main job position? (If not, please proceed to the next question)
Assistant/ Associate Professor Professor Post Doc. Lecturer/ Senior lecturer Research assistant Researcher Other (Please specify)
If you are part of the administration staff, please name your position.
Dean Rector Prorector Management service officer Head of department Finance

Other
Doesn't work
Please, state with which industry your job is most directly linked?
My job is part of administration Agricultural science Architecture and Design Arts and culture Biology Chemistry Information technology Economics Education Engineering Geosciences History Law Linguistics Mathematics Medicine Philosophy Physics

Political science

Social science

Theology

Human science

Other (please specify)