

KAUNAS UNIVERSITY OF TECHNOLOGY

LOLITA JURKŠIENĖ

ORGANIZATIONAL AMBIDEXTERITY AND  
FIRM PERFORMANCE: THE ROLE OF  
INTERORGANIZATIONAL COLLABORATION

Doctoral dissertation  
Social sciences, Management (03S)

2018, Kaunas

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LOLITA JURKŠIENĖ

ORGANIZACINĖ AMBIDEKSTERIJA IR  
ĮMONĖS VEIKLOS REZULTATAI:  
TARPOORGANIZACINIO  
BENDRADARBIAVIMO VAIDMUO

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Social sciences, Management (03S)

2018, Kaunas

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## **Key definitions**

**Organizational ambidexterity** – organization's ability to simultaneously balance between exploration-oriented actions and exploitation-oriented actions, which require an alignment of different activities, competencies, and organizational routines in order to achieve contradictory goals. Exploration-oriented actions are based on new knowledge (or transition from existing to new knowledge), radical decisions, emerging markets, and new customers' adaption. In contrast, exploitation-oriented actions are based on the existing knowledge and recourses, meet the existing markets and customers' needs, and implement only minor changes.

**Inter-organizational collaboration** – an agreement between several organizations to collaborate and share all available recourses in order to gain respective benefits and particular market. It allows firms to implement different strategic goals, including entering new markets, developing new technologies, maintaining competitiveness, as well as ensures the division of the existing recourses and capabilities in order to obtain new ones.

**Firm financial performance** – an objective measure which was measured by several indices using the data from Statistics Lithuania: firm's revenue in 2011 and 2012; firm's revenue changes between 2011 and 2012; firm's exports' revenue in 2011 and 2012; firm's exports' revenue changes between 2011 and 2012.

**Firm competitive performance** - a subjective measure which was measured by several indices using a questionnaire: the speed of the sales' growth compared to competitors (including a calculation of the percentage of sales growth); the increased number of employees compared to competitors; the amount of innovations in comparison with competitors; the success of innovations in comparison with competitors.

**Exploration-oriented actions** – exploration-oriented actions mean a transition from the existing knowledge and capabilities to new knowledge, decisions, and radical changes. These actions could also be perceived as production of highly innovative products, services or technologies that are oriented to external, emerging markets.

**Exploitation-oriented actions** – Contrary to exploration-oriented actions, exploitation-oriented actions indicate actions that are based on the existing knowledge and capabilities. Accordingly, these actions are equal to minor, incremental changes, and meet the needs of mostly existing customers and markets.

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## INTRODUCTION

Complex and dynamic environment requires firms to adapt a range of changes to meet altering customers' demands and still remain competitive and constantly increase firm performance (Gütel, Konlechner, 2009). Firms competing in such volatile markets must find the balance between permanent development and stable growth of performance. Over the last decades, theoretical and practical research have focused on attempts to find solutions as to why some firms manage to survive market dynamism and achieve superior performance, while others do not.

This study builds on the theoretical approach of organizational ambidexterity and argues that today it is crucial to focus on finding ways to increase organizational ambidexterity of firms. The concept of organizational ambidexterity has attracted a wide interest of scholars in the field of strategic management. In the last century, a number of scholars (Jansen *et al.*, 2008; O'Reilly and Tushman, 2013; Raisch *et al.*, 2009; etc.) has already named organizational ambidexterity as the key concept for strengthening competitiveness and productivity of the company. Theoretical and practical studies have proved a direct positive relation between organizational ambidexterity and firm performance (Cao *et al.*, 2009; Gibson and Birkinshaw, 2004; Geerts *et al.*, 2010; etc.). However, a lot less is known about the ways or methods which help to foster organizational ambidexterity (Battaglia *et al.*, 2018).

The concept of organizational ambidexterity has evolved and gained lots of different uses in scientific literature within recent years. The concept has been discussed in the contexts of various theoretical perspectives, including organizational learning, organizational behaviour and change management, innovation management, marketing management and others (Turner *et al.*, 2013). Lately particular attention has been focused on firms' ability to jointly pursue contradictory management activities: combine single vs double loops in organizational learning; coordinate operation and human resource management in the context of organizational behaviour; simultaneously implement radical and incremental innovations, etc. In today's scientific literature, a particularly high amount of attention is paid to the simultaneous combination of exploration and exploitation in the strategic management context (e.g., Tushman and O'Reilly, 1996; Li *et al.*, 2008; Raisch *et al.*, 2009; Simsek *et al.*, 2009; Prange and Schlegelmilch, 2010; Mattes and Ohr, 2013ab). The literature concerning organizational ambidexterity has prominently proven the importance of this concept and recognized it as a key issue for gaining sustainable competitive advantage and increased firm performance (Papchroni *et al.*, 2014).

The initial research in the area of organizational ambidexterity were focused mostly on presenting a range of organizational approaches for managing dual and usually competing activities. Controlling the tension that rises while firms try to combine contrary activities is the key challenge. Thus, studies analysing such challenges have become particularly valuable, especially in today's highly dynamic environment. However, recently scholars (e.g. Zimmermann *et al.*, 2015) pointed out another important aspect – the research analysing the conditions under which firm can increase their ambidexterity level are still scarce. Until now, scholars have made

insufficient efforts in order to clarify what could increase organizational ambidexterity and, simultaneously, lead to better performance results.

More than two decades ago, Powell (1990) proposed that one of the ways to solve the problem of ambidexterity is firms' cooperation. Powell (1990) noticed that firms with different specializations could collaborate between each other, and in this collaboration, one firm could be responsible for explorative part of the ambidextrous duality, while another firm would then be responsible for the exploitative part, hereby creating a high balance between exploration-oriented actions and exploitation-oriented actions. Such ambidextrous balance would lead to mutual benefits, including improved performance. In 1999, Gulati and Gargiulo (year) also argued that collaboration among firms is essentially based on accessing and sharing critical resources. A sizeable amount of other scientific papers within the last decades also shows an increasing academic interest in the concept of inter-organizational networks, strategic alliances and other forms of inter-collaboration. Over the last decades, scholars have started to discuss the importance of inter-organizational collaboration which is considered as respective help for firms in order to meet the challenges of global environmental change (Porter, 1990). The emerging interest in inter-organizational collaboration also proposes new insights into the relationship between inter-organizational collaboration and firm's performance.

After a thorough theoretical analysis of organizational ambidexterity and inter-organizational concepts, this study has made the presumption that inter-organizational collaboration can be the answer to the question of how could firms foster their ambidexterity and achieve superior performance. Inter-organizational collaboration can potentially provide opportunities for firms to outsource different recourses and share the risks (Gulati *et al.*, 2000). Accordingly, opportunities to share resources, capabilities and risks can be an appropriate solution for increased organizational ambidexterity within the firm because managing ambidextrous paradoxes is much easier through integration and collaboration across different organizations (Sun and Lo, 2014). Following these assumptions, this study addresses the evident gap in the literature on organizational ambidexterity by proposing new theoretical approaches and a theoretical as well as practical analysis of the relationship between inter-organizational collaboration, organizational ambidexterity and firm performance.

This research points to several research gaps. Firstly, there is a demand to clarify the concept of organizational ambidexterity. Although organizational ambidexterity is conceptualized in a number of studies, it still remains unclear which exact organizational parameters, behaviours, capabilities, and environmental conditions of a particular concept can foster ambidexterity in a firm and thus contribute to successful firm performance. Therefrom, two other relevant research gaps emerge. On the one hand, being ambidextrous means constantly balancing between two contrary activities (or capabilities) and trying to harmonize the opposites. There is a demand on finding the answers of how should firms deal with the challenges that arise while trying to be ambidextrous. On the other hand, despite a number of theoretical and practical evidences of organizational ambidexterity having a positive impact on increased firm performance and competitiveness, the amount of ambidextrous firms is still extremely low. It follows the demand to explore new

possibilities of how could firms increase their ambidexterity and thus achieve better performance results. The author of this thesis focuses on this respective **research problem** and proposes inter-organizational collaboration as one of the imperatives for increased organizational ambidexterity. Outsourcing abilities and recourses that a firm is lacking creates opportunities to foster ambidexterity. The author believes that different forms of inter-organizational collaboration (collaboration with different target groups) can lead to different outcomes. Thus in this study, inter-organizational collaboration with research institutions as well as with international networks are analysed separately.

Although organizational ambidexterity is believed to have a positive impact on firm performance, empirical evidence on the respective relationship in smaller markets is still lacking. Moreover, there are little if any research analysing what contribution does inter-organizational collaboration make towards organizational ambidexterity and firm performance and what impact can inter-organizational collaboration have on the relationship between organizational ambidexterity and firm performance. This leads to the **research question** of this thesis – how to increase firm performance while managing organizational ambidexterity through inter-organizational collaboration? Accordingly, the **object** of this thesis is the relationship between organizational ambidexterity, inter-organizational collaboration and firm performance.

The **aim** of this thesis is to define and analyse the relationship between organizational ambidexterity, inter-organizational collaboration and firm performance.

The aim leads to the following research **objectives**:

1. To conceptualize organizational ambidexterity and inter-organizational collaboration.
2. To emphasize the theoretical relationship between organizational ambidexterity, inter-organizational collaboration and firm performance.
3. To develop a conceptual model that helps to explain the relationship between organizational ambidexterity, inter-organizational collaboration and firm performance.
4. To empirically test the role of inter-organizational collaboration in the relationship between organizational ambidexterity and firm performance.

The first chapter of this theses is appointed for theoretical analysis, including the concepts of organizational ambidexterity and inter-organizational collaboration and firm performance. It covers the theoretical analysis of the concepts and existing research within the field. An introduction to organizational ambidexterity, inter-organizational collaboration and firm performance interrelation is presented as well.

The second chapter presents the research methodology. It introduces the aims and objectives of the research, the proposed conceptual model, and research hypotheses. The research design is defined here as well together with the justification of research sample, variables, and proposed measures.

The third chapter provides the grounding of the proposed conceptual model, presents the empirical research process and its results. The research limitations are

discussed in this chapter as well. The thesis is closed with concluding remarks, scientific discussion and guidelines for further research.

This research has scientific contribution and practical implications. First, the study contributes to the well-established organizational ambidexterity literature since it provides a general conceptualization of the concept of organizational ambidexterity by presenting a generalized review of literature that explores the concept in various theoretical contexts. The second advance of this study is inclusion of inter-organizational collaboration within the research context. Even though the existing research has already promoted inter-organizational collaboration as one of the possible stimulators for organizational ambidexterity, these relations are still the object of limited theoretical and, especially, empirical development. The proposed multidimensional conceptual model of this research has integrated research variables, including separate dimensions of each variable. It is based on different conceptual components and subcomponents thus helping to build new theoretical and practical approaches within the field. Accordingly, this particular conceptual model might become a useful and relevant tool for further development and analysis of presented relationships in both, theoretical and practical ways. Moreover, since implemented in Lithuania, this research helps to understand the impact of organizational ambidexterity on firm performance in relatively small markets. Third, empirical research results help to make recommendations for future research and managerial implications, which provide practical advice on how to increase organizational ambidexterity within a firm.

# **1. THEORETICAL BACKGROUND OF THE RELATIONSHIP BETWEEN ORGANIZATIONAL AMBIDEXTERITY, INTERORGANIZATIONAL COLLABORATION AND FIRM PERFORMANCE**

Competitiveness, knowledge sharing, networking, clustering, and innovation are now recognized as key development factors and essential considerations for organizations seeking to meet their customers' needs and demands of the environment. In the last century, considerable attention has been paid to the dual orientation of exploitation-oriented actions and exploration-oriented actions (Zimmermann *et al.*, 2015). The implementation of organizational dualities, mostly oriented to exploiting the existing knowledge and capabilities and at the same time exploring new knowledge and possibilities is called organizational ambidexterity (Havermans *et al.*, 2015; Zimmermann *et al.*, 2015). This section provides a theoretical analysis of the organizational ambidexterity concept and its relationship to other concepts, which coincides with the purpose to find out the need of increasing the level of ambidexterity within firms.

## **1.1. Introduction to the current concept of organizational ambidexterity.**

### **1.1.1. Organizational ambidexterity in different theoretical contexts**

The concept of organizational ambidexterity dates back to Duncan's (1976) seminal work, where the concept was mentioned for the first time. Other scholars consider March's (1991) landmark article as the initial paper for the research in the area of organizational ambidexterity. Though March (1991) did not specifically mention the concept of organizational ambidexterity, the author provided definitions of exploration and exploitation in the context of organizational learning (Lavie *et al.*, 2010; Raisch and Birkinshaw, 2008; Raisch *et al.*, 2009).

In general, while talking about organizational ambidexterity scholars always mention some kind of dualities. Birkinshaw and Gupta (2013) mention dualities such as:

- efficiency *vs* flexibility;
- adaption *vs* alignment;
- integration *vs* responsiveness;
- exploration *vs* exploitation.

According to March (1991), the duality of exploration *vs* exploitation is mostly used in scientific literature while exploring the concept of organizational ambidexterity. In 1991, March identified exploration and exploitation as two fundamentally different activities that demand particular resources and specified attention (Chang *et al.*, 2011; Raisch and Birkinshaw, 2008). Exploration-oriented actions are equated to experimentation with new alternatives that often have uncertain, risky, and/or negative results. In contrast, exploitation-oriented actions refer to the extension of competencies, technologies, or products that already exist and have positive and predictable results (Raisch and Birkinshaw, 2008; Chang *et al.*, 2011;

Herzog, 2011, etc.). Kauppila (2010) also agreed with March's (year) statements and consider exploration and exploitation to be two disparate and frequently competing actions.

Although highly based on March's (1991) ideas, the literature on organizational ambidexterity is certainly not limited to one theoretical approach. The groundbreaking research in the field of organizational ambidexterity began just two decades later with Tushman and O'Reilly (1996). The scholars' seminal work started a large number of further studies in the field of organizational ambidexterity. Subsequently, a lot of theoretical and empirical research appeared exploring the concept. Most studies focused on analysing the relationship between organizational ambidexterity and firm performance, analysing when does organizational ambidexterity become the most useful for increasing firm performance. In most of the papers, different types of organizational ambidexterity gained particular attention as well (O'Reilly and Tushman, 2013).

Simsek *et al.* (2009) supplemented organizational ambidexterity literature with the proposition that exploration-oriented actions and exploitation-oriented actions can be treated as either competing or complementary determinants. Certainly, in both cases, the key focus is on trying to combine these either competing or complementing activities in order to initiate an ambidextrous orientation of the firm. Even though they require different activities, competencies, and organizational routines, both explorative and exploitative activities can still be pursued simultaneously within one organization (Mattes and Ohr, 2013a). Sun and Lo (2014) in accordance with Andriopoulos and Lewis (2010) revealed organizational ambidexterity as managing paradoxes, such as long-term adaptability versus short-term survival, and possibilities versus constraints. Scholars also identify tension between diversity and cohesiveness as well as between passion and discipline. According to Sun and Lo (2014), all these tensions must be managed through the integration and split of necessary efforts, which organizational ambidexterity is all about.

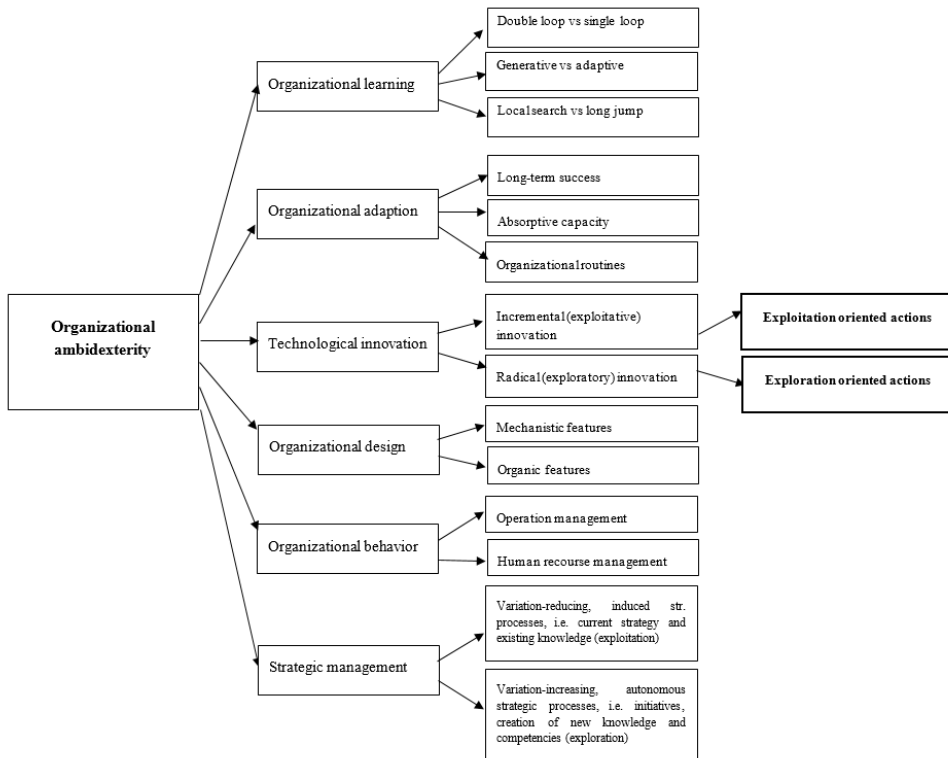
The concept of organizational ambidexterity has gained many different uses in scientific literature within recent years (see Figure 1). Organizational ambidexterity as a concept has been used in contexts of various theoretical perspectives (Turner *et al.*, 2013):

- organizational learning, where organizational ambidexterity is equated to the operation of contradictory knowledge management processes (Gupta *et al.*, 2006; He and Wong, 2004; Im and Rai, 2008; Lackner *et al.*, 2011; Levinthal and March, 1993; March, 1991; Wang and Rafiq, 2009; etc.);
- organizational behaviour, where organizational ambidexterity is the management of inherently conflicting resources (Andriopoulos and Lewis, 2009; Simsek *et al.*, 2009)
- change management and leadership, where organizational ambidexterity means a constant pursuance of contradictory goals (Beckman, 2006; Jansen *et al.*, 2008; Lubatkin *et al.*, 2006; Nosella *et al.*, 2012; Simsek *et al.*, 2009, Smith and Tushman, 2005);
- innovation management, where organizational ambidexterity is perceived as a company's ability to jointly pursue both radical and incremental



innovation (Chang *et al.*, 2011; He and Wong, 2004; Inauen and Schenker-Wicki, 2012; Jansen *et al.*, 2006; Li *et al.*, 2008; Mattes and Ohr, 2013ab; Mueller *et al.*, 2013; Tushman and O’reilly, 1996; Raisch *et al.*, 2009; Simsek *et al.*, 2009; Prange and Schlegelmilch, 2010; Yigit, 2013; etc.);

- dynamic capabilities (Kriz *et al.*, 2014; Güttel and Konlechner, 2009; O’Reilly and Tushman, 2008; Tran, 2008; Xie *et al.*, 2011).



**Figure 1.** Conceptualization of organizational ambidexterity (Source: made by author)

Various scientific articles have contributed to the development of organizational ambidexterity concept. Different contexts help to indicate a number of organizational ambidexterity’s antecedents and outcomes as well as particular relation to other akin research areas (Raisch and Birkinshaw, 2008). However, the diversity of research also brings some confusion and understanding the concept’s impact may become rather difficult. Consequently, the author of this thesis provides a more comprehensive framework of the main research in the organizational ambidexterity literature (see Table 1). Table 1 was made on the basis of the most prevalent literature discussing organizational ambidexterity and covers the main literary contexts.

**Table 1.** The most prevalent research of organizational ambidexterity concept

<b>Research area</b>	<b>Author</b>	<b>Date</b>	<b>Paper</b>	<b>Main aspects</b>
<b>Organizational ambidexterity and organizational learning</b>	March, J.G.	1991	Exploration and Exploitation in Organizational Learning	The seminal paper for the research of simultaneous balance between exploration and exploitation.
	Wang, C.L. and Rafiq, M.	2009	Organizational diversity and shared vision	Conceptualizes how organizational diversity and shared visions help to resolve tensions of organizational ambidexterity.
	Lackner, H., Güttel, W.H., Garaus, C., Konlechner, S. and Müller, B.	2011	Different Ambidextrous Learning Architectures and the Role of HRM Systems	Linking organizational ambidexterity to the human resource management in the context of organizational learning; exploring how to link HRM and organizational ambidexterity successfully.
<b>Organizational ambidexterity and organizational changes</b>	Tushman, M.L. and O'Reilly, C.A.	1996	Ambidextrous Organizations: Managing Evolutionary and Revolutionary Change	Incremental and radical changes must be implemented simultaneously. That will lead to permanent success of a firm.
<b>Organizational ambidexterity and innovation</b>	He, Z.L. and Wong, P.K.	2004	Exploration vs. Exploitation: An Empirical Test of the Ambidexterity Hypothesis	Empirical exploration of interaction between exploratory and exploitative innovation;

				empirical results proved that interaction between exploratory and exploitative innovation positively affects the sales growth rates.
	Jansen, J.J.P., Van den Bosch, F.A.J. and Volberda, H.W.	2005	Exploratory Innovation, Exploitative innovation, and Ambidexterity: The Impact of Environmental and Organizational Antecedents	Exploration of environmental and organizational antecedents' impact on organizational ambidexterity; focus on multi-units; empirically proved that firms are able to simultaneously implement exploratory and exploitative innovation in highly dynamic and competitive environments.
	Andriopoulos, C. and Lewis, M.W.	2009	Exploitation-Exploration Tensions and Organizational Ambidexterity: Managing Paradoxes of Innovation	Case studies in five ambidextrous firms; developing an alternative framework of innovation paradoxes: strategic intent, customer orientation and personal drivers.
<b>Organizational ambidexterity and dynamic capabilities</b>	Tushman, M.L., Smith, W., Wood, R., Westerman, G. and O'Reilly, C.A.	2002	Innovation Streams and Ambidextrous Organizational Designs: On Building Dynamic Capabilities	Exploration of how organizations shape their dynamic capabilities through

				innovation streams. Exploration and exploitation are understood as dynamic capabilities that are built through different and complex organizational forms.
	Güttel, W.H. and Konlechner, S.W.	2009	Continuously Hanging by a Thread: Managing Contextually Ambidextrous Organizations	Focus on contextual ambidexterity; firm's ability to be ambidextrous can be called as higher-order dynamic capability.
	Kriz, A., Voola, R. and Yuksel, U.	2014	The dynamic capability of ambidexterity in hypercompetition: qualitative insights	Exploration of organizational ambidexterity as a type of dynamic capabilities in hypercompetitive and non-hypercompetitive markets; findings based on qualitative research revealed that ambidexterity (as a dynamic capability) should be adopted as a temporary source of firm advantages.
<b>Organizational ambidexterity and leadership</b>	Jansen, J.J.P., George, G., Van den Bosch, F.A.J. and Volberda, H.W.	2008	Senior Team Attributes and Organizational Ambidexterity: The Moderating Role of	Empirically proved the positive relationship between senior teams and organizational

			Transformational Leadership	ambidexterity; leadership is indicated as a moderator of senior teams' effectiveness.
<b>Organizational ambidexterity and networks (inter-organizational collaboration, strategic alliances, etc.)</b>	Tiwana, A.	2008	Do Bridging Ties Complement Strong Ties? An Empirical Examination of Alliance Ambidexterity	Ambidexterity is understood as dual tension between strong and weak alliances' ties; strong and weak ties supplement each other with innovation potential and integration capacities.
	Sun, B. and Lo, Y.J.	2014	Achieving alliance ambidexterity through managing paradoxes of cooperation. A new theoretical framework	Organizational ambidexterity is perceived as management of paradoxes; alignment and adaptability lenses; the main idea of the study: collaboration between firms can strengthen firms' ambidexterity.
	Kauppila, O.	2010	Creating ambidexterity by integrating and balancing structurally separate inter-organizational partnerships	In-depth study of creating ambidexterity by employing inter-organizational relations; results demonstrate that a firm may apply specific mechanisms and successfully balance exploration and exploitation.

(Source: made by author)

The table above contributes to the conceptualization of theoretical and practical research in the field of organizational ambidexterity. Within the area of organizational learning, the key focus of organizational ambidexterity research is on organizational diversity and internal tensions related to human resource management (Lackner *et al.*, 2011) and organizational changes (Tushman and O'Reilly, 1996). Research studies confirm that organizational ambidexterity within the context of radical and incremental innovations is considered as positively affecting firm financial performance (He and Wong, 2004). Accordingly, organizational ambidexterity within the context of dynamic capabilities is considered as a temporary source of firm competitive advantage (Kriz *et al.*, 2014).

Despite a number of organizational ambidexterity studies in different theoretical contexts, literature still lacks explanations on how should organizational ambidexterity be managed in order to reach these benefits. These statements are in agreement with Battaglia *et al.* (2018). Especially relevant scarcity can be found in literature that relates the concepts of organizational ambidexterity and inter-organizational collaboration. Literature explores the relationship between ambidexterity and different types of collaboration (Kauppila, 2010; Sun and Lo, 2014), or equates these concepts (Tiwana, 2008), but there are still no clear and reasonable answers in research literature on what benefits could this relation bring. Moreover, it is not clear as to what should go first in order to get greater performance – either firms should foster organizational ambidexterity in order to strengthen the inter-collaboration issues, or it is crucial to focus on fostering inter-organizational collaboration, if a firm wants to become more ambidextrous.

This provides a more explicit understanding of the concept and gives insights on the still existing gaps in literature that need to be solved. Literature specifically lacks mixing the concepts within different research areas (e.g. organizational ambidexterity, dynamic capabilities and innovation; organizational ambidexterity, organizational learning and networking; and etc.) and looking for answers on how could several different concepts and contexts be related and/or affect each other. This thesis aims to bridge these gaps; however, there are still some limitations. With regards to the wide theoretical background of organizational ambidexterity, the research focus in this study is limited to the innovation context, and organizational ambidexterity is described as an organization's ability to simultaneously balance between exploration-oriented actions and exploitation-oriented actions, which requires an alignment of different activities, competencies, and organizational routines in order to achieve contradictory goals.

### **1.1.2. Most prevalent types of organizational ambidexterity**

Primarily the exploration and exploitation activities were perceived as contradictory and competing (Duncan, 1976; Wang and Rafiq, 2014). Following this, the balance of such activities is understood as structural separation within organizations (Simsek *et al.*, 2009); however, later research in the field of organizational ambidexterity showed that there are numerous ways for balancing exploration and exploitation activities depending on the types of organizational ambidexterity. In other words, a firm's ability to become ambidextrous depends on

the decisions of which mechanisms does a firm choose for achieving it. This leads to the importance of different types of organizational ambidexterity that are mostly based on different strategic decisions.

### ***Structural ambidexterity***

Structural ambidexterity is one of the mostly mentioned types of organizational ambidexterity. Structural ambidexterity indicates the structural separation of responsibilities, which means that explorative and exploitative activities are dedicated for different parts/centres/labs/projects of the firm thus reducing the tension and avoiding conflicting requirements (Gibson and Birkinshaw, 2004; Prange and Schlegelmilch, 2010; etc.). Gibson and Birkinshaw (2004) understand structural ambidexterity as a duality of alignment and adaptability achieving it separately. This means that certain units of the firm focus on alignment processes while others mind adaption processes.

Some authors (e.g. Xiong, 2011) consider structural ambidexterity as a solution for matching conflicting activities. In comparison with other types of ambidexterity (e.g. contextual ambidexterity), structural ambidexterity is mostly related to the creation of dual structures within the firm. Such structures differ in terms of time, place, functions and tasks as well as decision-making (Xiong, 2011). O'Reilly and Tushman (2008) add that structural ambidexterity is not only the structural separation of organization's units but it also implies the differences between organizational culture and processes as well different employees' competences. In their paper, O'Reilly and Tushman (2013) also notice that despite structural separation, firms' units are still kept together by grounding the general strategies, goals, values and culture of the whole firm.

There are lots of studies that have analysed structural ambidexterity and successfully associated it to firm performance (O'Reilly and Tushman, 2013). These studies helped to generate a number of methodologies for measuring organizational ambidexterity and firm performance, as well as the relationship between these two concepts. He and Wong (2004) and Lubatkin *et al.* (2006) analysed the relationship between structural ambidexterity in depth. Other scholars, e.g. Jansen *et al.* (2009), broadened the research field and proposed a range of ways to link organizational ambidexterity and firm performance. However, a large number of those studies was focused on organizational learning or knowledge absorption as a context for research.

### ***Contextual ambidexterity***

Contextual ambidexterity is another commonly used type of organizational ambidexterity. In general, this type of ambidexterity indicates a simultaneous implementation of explorative and exploitative activities within the same business unit (Wang and Rafiq, 2014). Leaders (but not necessarily top managers) develop a supportive context for conflicting areas by building a particular set of processes/systems. Individuals make their own division of work time and make their own decisions (Gibson and Birkinshaw, 2004; Prange and Schlegelmilch, 2010; Simsek *et al.*, 2009; Tushman and O'Reilly, 1996; etc.).

Gibson and Birkinshaw (2004) analysed organizational ambidexterity through the lens of duality between adaptability and alignment. The alignment processes are perceived as leading to better short-term performance results. Meanwhile adaptability

is understood as leading to superior long-term performance. As contextual ambidexterity is a simultaneous balance between alignment and adaptability, scholars understand contextual ambidexterity as the key driver for long-term performance in general. According to Gibson and Birkinshaw (2004) contextual ambidexterity is a kind of behavioural capacity of the firm; it is a multidimensional construct that implies a combination of several interdependent components: stretch, discipline, support and trust.

Simsek *et al.* (2009) see this as a type of harmonic ambidexterity, considering exploration and exploitation as complementary activities. According to Wang and Rafiq (2014) contextual ambidexterity remains crucial for business success. First of all, scholars (e.g. Gibson and Birkinshaw, 2004) recognize contextual ambidexterity as a background for achieving sustainable success. The sustainable success herein is understood as simultaneous success in both, short-term and long-term periods. Moreover, contextual ambidexterity is understood as the key for optimizing a part of organizational cost. Contextual ambidexterity helps to avoid any additional expenditures which would be necessary for structural separation or supplementary coordination within the organization (Gibson and Birkinshaw, 2004; Simsek *et al.*, 2009; Wang and Rafiq, 2014).

Scholars (e.g. Gibson and Birkinshaw, 2004; Simsek *et al.*, 2009; Wang and Rafiq, 2014) believe that the success of contextual ambidexterity depends on the organization's cultural background. The pursuance of contextual ambidexterity mainly relies on individuals' abilities within the organization, including decisions of how to divide their time, efforts and how to integrate activities. Since individual members are a part of organization's culture, contextual ambidexterity is admitted to be a complexed organizational capability (Wang and Rafiq, 2014). Nevertheless, more researches on what kind of organizational culture would enable successful organizational ambidexterity are still missing (Simsek *et al.*, 2009).

#### ***Other types of organizational ambidexterity***

There are also several types of organizational ambidexterity which are rarely mentioned in the scientific literature but still have important implications for organizations. Mostly, they represent a particular way that a firm has chosen to pursue exploitative and exploratory innovations.

*Punctuated ambidexterity* – focusing on a particular type of innovation at a particular time, gaining successful assimilation of new skills and competencies, as well as integration of new functions and activities (Prange, Schlegelmilch, 2010). Some authors call it as cyclical ambidexterity (see e.g. Gupta *et al.*, 2006; Wang and Rafiq, 2014).

In other words, punctuated ambidexterity means temporally separated exploratory and exploitative actions. This type of organizational ambidexterity is characterized by long periods of exploitative activities, while the exploratory activities emerge only in critical situations (Prange, Schlegelmilch, 2010). Thus they remain random rather than strategic actions. Following this, the main problem is that such type of organizational ambidexterity loses its key aspect and does not remain ambidextrous enough.



These assumptions also confirm the ideas of Goossen and Bazazzian (2012), who call this sequential ambidexterity. Despite a different name, the key focus remains the same. In some sense, it is an alternative for simultaneous implementation of radical and incremental innovation.

Peripatric ambidexterity – the concept is borrowed from genetics, where it means the formation of new species through evolution, i.e. the formation of new species is tied to the foundation of new ideas within an isolated niche; changing innovation strategies could mean changing a company's CEO (Prange and Schlegelmilch, 2010). However, to the best of the author's knowledge, there are no more scholars who analyse this type of ambidexterity.

Alliance ambidexterity indicates the explorative and exploitative activities extended to the inter-organizational level (Sun and Lo, 2014). Sharing knowledge, abilities and capabilities thus eliminating the gaps in firm's activities is a key point of alliance ambidexterity. Recently, scholars have started to explore this type of ambidexterity more widely and argue that managing ambidextrous paradoxes is much easier through integration and collaboration across different organizations (Sun and Lo, 2014). This becomes a strong argument to explore alliance ambidexterity more widely taking other concepts as mediating or moderating variables.

While analysing alliance ambidexterity Doganova *et al.* (2009) looked at it from a different perspective. The main focus in the scholars' paper was on ambidextrous alliances, not on alliance ambidexterity. However, looking at this from an opposite perspective, the main idea still remains the same: firms and organizations tend to maintain and develop inter-organizational relations that are useful to manage both exploration and exploitation. It remains extremely important in the future, since sharing resources (knowledge, human, abilities, etc.) is accepted as one of the common solutions for risk management

An analysis of various literature within the field of organizational ambidexterity reveals that there are two types of organizational ambidexterity which get most of scholars' attention. Structural ambidexterity and contextual ambidexterity could be considered as the general types of organizational ambidexterity, overshadowing other types of organizational ambidexterity. However, alliance ambidexterity is another type of organizational ambidexterity that gets growing attention. This is determined by the dynamism of the environment, high competitiveness of global markets, and the need to access external resources. Since inter-organizational relations and networking are considered as crucial aspects in today's volatile markets, ways for achieving organizational ambidexterity through inter-organizational collaboration remains the key agenda for further research.

## **1.2. Defining the current concept of inter-organizational collaboration**

Overall, scholars' interest in inter-organizational collaboration dates back to the 1980s, when scholars started to analyse the concept of networks (Achrol, 1997; Powell, 1990). Gulati (1998) notices that the initial focus of networks was firstly pointed to individuals' behaviour. However, studies about various forms of collaboration were soon extended to the organizational level.

The advantages of enterprises cooperating with each other have been discussed and the benefits of collaboration have been confirmed for a number of years (Porter, 1990; Grant and Baden-Fuller, 2004; Gulati, 1998; Koza and Lewin, 1998; Lavie, Rosekopf, 2006; Lowik *et al.*, 2012; etc.). In a broad sense, inter-organizational collaboration is an agreement between several organizations to collaborate and share all available resources in order to gain respective benefits and a particular market position (Drago, 1997; Koza and Lewin, 1998). Inter-organizational collaboration may also represent a group of firms and organizations with common visions, objectives, and goals (Sprenger, 2001).

Numerous researches have reasoned the benefits of inter-organizational collaboration. Scholars (e.g. Gulati, Gargulio, 1999; Gulati *et al.*, 2000; Lowik *et al.*, 2012; etc.) propose that entering, for example, inter-organizational networks ensures access to new knowledge, relevant information and resources. While talking about inter-organizational collaboration, benefits remain similar because inter-organizational collaboration may be treated as a particular form of inter-organizational networks.

Inter-organizational collaboration allows firms to implement different strategic goals. This includes entering new markets, developing new technologies, maintaining competitiveness (Gulati *et al.*, 2000). Scholars studying the concept of inter-organizational networks (e.g. Hess and Rothaermel, 2011; Inkpen and Pien, 2006; Lavie *et al.*, 2007; Mariotti, 2011) have established that organizations adopt different types of inter-organizational collaboration forms in order to improve their performance as well as competitiveness. Moreover, inter-organizational collaboration ensures the division of existing recourses and capabilities in order to obtain new ones (Gulati *et al.*, 2002).

Popp *et al.* (2014) agree that the literature on inter-organizational collaboration, including all possible types of collaboration, is extremely wide and quite contrasting. Still, most scholars (Capdevila *et al.*, 2014; Cheng and Fu, 2013; Popp *et al.*, 2014; Rehm and Goel, 2015) see several functions common to many forms of inter-organizational collaboration: the information and knowledge exchange function; organizational learning function; innovation development function; capacity building function.

Global dynamic markets force organizations to pay critical attention to their environment. Today successful inter-organizational collaboration means cooperation with relevant partners in internal and external contexts. Collaboration between different firms and organizations helps to manage environmental uncertainty, as well as receive the lacking resources for the firm (Gulati and Gargulio, 1999). Although there are plenty of literature analysing various forms inter-organizational collaboration, the exact definition of the concept is still not clear. Some scholars analyse the concept within a dyadic viewpoint, understanding inter-organizational collaboration as the relationship between only two organizations (Provan *et al.*, 2007). Meanwhile others (e.g. Gulati *et al.*, 2000; Lavie, 2007) propose that inter-organizational collaboration may exist within a group of several interconnected firms and organizations. According to Provan *et al.* (2007), most of the analysis still have some correspondence, such as the context of social network interactions and

relationships, as well as cooperation and collaboration based on trust and connectedness. Inter-organizational collaboration should be based on cooperation, as opposed to competition (Sprenger, 2001).

To achieve the advantages of inter-organizational collaboration, it is important to precisely know the approaches for inter-organizational collaboration. Firms and organizations form different types of inter-organizational collaboration based on different aims and purposes of collaboration (see Table 2).

**Table 2.** Types of inter-organizational collaboration

<b>Authors</b>	<b>Date</b>	<b>Paper</b>	<b>Proposed type of inter-organizational collaboration</b>
<b>Capdevila</b>	2014	Different inter-organizational collaboration approaches in coworking spaces in Barcelona	<ul style="list-style-type: none"> <li>● <i>relational inter-organizational collaboration</i>, based on community's inspiration and empowerment;</li> <li>● <i>resource-based inter-organizational collaboration</i>, based on achieving new knowledge and other resources;</li> <li>● <i>cost-related inter-organizational collaboration</i>, based on reduction of costs.</li> </ul>
<b>Cricelli and Grimaldi</b>	2010	Knowledge-based inter-organizational collaboration	<i>Knowledge-based inter-organizational collaboration</i> , refers to relationships where each collaborating partner on existing competences and on abilities achieve external capabilities and competencies as well.
<b>Tello-Leal, Chiotti, Villarreal</b>	2014	Software Agent Architecture for Managing Inter-Organizational Collaborations	Inter-organizational collaboration <i>as a collaborative business processes</i>
<b>Magnusson and Nilsson</b>	2005	Interorganizational Collaboration Among Small and Medium-sized Enterprises	<i>Supply chain inter-organizational collaboration</i> , meaning close collaborative relations with upwards suppliers and downwards customers; <i>Business inter-organizational collaboration</i> , meaning a collaboration among a group of business partners in order to improve business processes; <i>Research inter-organizational collaboration</i> , meaning a collaboration of experts for developing and/or strengthening research areas, creating new knowledge and expanding competencies.
<b>Lee and Bae</b>	2012	Achieving Ambidexterity through Balancing	<i>Exploitative inter-organizational collaboration</i> , for using and sharing the existing resources and competences;

		Exploration and Exploitation with Interorganizational Collaboration	<i>Explorative inter-organizational collaboration</i> , for obtaining new resources, including knowledge and competencies.
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(Source: made by author)

In the context of this thesis, the author notices that Capdevila's (2014) proposed types of inter-organizational collaboration are related to organizational ambidexterity as well. Following the ideas of the aforementioned scholar, resource-based inter-organizational collaboration and relational inter-organizational collaboration focuses primarily on exploration-oriented activities. Meanwhile cost-related inter-organizational collaboration more likely serves the exploitation-oriented activities. The author of this thesis proposes the assumption that the balance between these types would lead to improved ambidexterity of a firm.

Though the majority of research on inter-organizational collaboration has considered it in terms of benefits for the organizations, the growing importance of inter-organizational collaboration highlights the need to evaluate the potential risks as well. In some cases, collaboration can have negative outcomes, such as unproductive relationships between organizations, distrust, and the absence of partnership (Gulati *et al.*, 2000). If inter-organizational collaboration is based on competition rather than cooperation, it will probably lead to negative outcomes too (Sprenger, 2001). Human and Provan (2000) notice that the success of inter-organizational collaboration also depends on legal and political aspects. Moreover, inter-organizational collaboration is always more successful when based on existing relations. Inter-organizational collaboration without any previous relationships between firms and organizations is more likely to fail (Provan *et al.*, 2007). Provan *et al.* (2007) also notice that sometimes collaboration between firms and organizations may have a negative influence for separate organizations or even for the whole economy. This situation may be influenced by creating collaborative links between firms with the purpose to establish cartels in the market. Similar inter-organizational collaboration for negative purposes distorts the economy thus causing unstable and uncertain markets.

Despite the risks mentioned above, inter-organizational collaboration remains a concept that researchers and practitioners discuss more and more frequently. Again, global competition, dynamism in the markets and expanding customers' demands and expectations force to overstep the comfort zone of a firm. In a global market, various risks and barriers cannot become a brake for making new decisions. Firms must find ways to avoid, eliminate or to cope with the risks. Regarding inter-organizational collaboration, the capacity to collaborate successfully would help a firm to adopt new products, processes or capacities and capabilities successfully. This leads to presumptions that inter-organizational the associations of collaboration with other akin concepts as well as with superior firm performance also exist and should be explored wider.

### 1.3. The relationship between organizational ambidexterity, inter-organizational collaboration and firm performance

The relationship between organizational ambidexterity and inter-organizational collaboration has been highlighted in the scientific literature more than two decades ago. In 1990, Powell proposed that one of the ways to solve the problem of ambidexterity is cooperation of the firms. According to Powell (1990), firms with different specializations should collaborate. Thus one firm would innovate and another firm would serve for exploitation of innovation. In other words, one firm is responsible for the explorative part of the ambidextrous duality, while the other firm is responsible for the exploitative part hereby creating a high balance between the exploratory and exploitative innovation in the market. Such ambidextrous balance would lead to improved performance. Although it seems relatively clear in theory, the practical context does not support such results (Figure 2). That is why it is important to explore the relationship between organizational ambidexterity, inter-organizational collaboration and firm performance more deeply.

<b>Organizational ambidexterity</b> Beckman, 2006; Li <i>et al.</i> , 2008; Lubatkin <i>et al.</i> , 2006; Mattes and Ohr, 2013; O'Reilly and Tushman, 2013; Raisch and Birkinshaw, 2008; Simsek <i>et al.</i> , 2009; etc.		
<b>OA &amp; IOC</b> Doganova <i>et al.</i> , 2009; Sun and Lo, 2014; Tiwana, 2008; etc.	<b>OA &amp; IOC &amp; FP</b>	<b>OA &amp; FP</b> Cao <i>et al.</i> , 2009; Gibson <i>et al.</i> , 2010; Lubatkin <i>et al.</i> , 2006; Raisch <i>et al.</i> , 2009; etc.
Capdevila, 2014; Cricelli and Grimaldi, 2010; Lee and Bae, 2012; Magnusson and Nilsson, 2005; Pavlou and El Sawy, 2011; Tello-Leal, Chiotti, Villarreal, 2014; etc.	Alvarez and Barney, 2007; Pavlou and El Sawy, 2011; Schilke, 2013; Teece, 2007; Wang and Ahmed, 2007; etc.	Bigliardi, 2013; Chan, 2009; Chen <i>et al.</i> , 2005; Geerts <i>et al.</i> , 2010; Zacca <i>et al.</i> , 2015; etc.
<b>Inter-organizational collaboration</b>	<b>IOC &amp; FP</b>	<b>Firm performance</b>

**Figure 2.** Highlighting the research gap (Source: made by author)

As Doganova *et al.* (2009) notice, March's (1991) distinction between firms' abilities to explore new competencies, capabilities and opportunities as well as to exploit the existing resources and opportunities was the first motivation to explore the aspects of inter-organizational collaboration. Firms' structure, strategies and all akin firm-level characteristics appeared to be insufficient for fully explaining the concept of organizational ambidexterity (Kauppila, 2010). This is also one of the reasons why scholars began to search for similar concepts that would complement or strengthen the balance between firms' explorative and exploitative activities. However, for a

number of years, scholars analysed the dichotomy of exploration and exploitation leaving other important concepts aside.

### **1.3.1. A review of the relationship between organizational ambidexterity and inter-organizational collaboration**

The analysis of inter-organizational collaboration and organizational ambidexterity relationship is a rather new phenomenon in the research literature. This relationship still lacks theoretical as well as empirical groundings. Koza and Lewin (1998) were the first who transferred March's (1991) definitions of exploration and exploitation to the strategic alliance literature (Lin *et al.*, 2007). Subsequently there were some scholars (e.g. Deeds and Rothaermel, 2003; Faems *et al.*, 2005) who started to analyse the relationship between organizational ambidexterity and inter-organizational collaboration. However, scholars mainly focused on networks or alliances as specific forms of inter-organizational collaboration and this led to different goals and outcomes of the study. That was the beginning of similar research; a wider interest in inter-organizational collaboration and organizational ambidexterity relations is noticed only for a few years, thus it still lacks clarity.

Recently Sun and Lo (2014) turned their attention to the need of inter-organizational collaboration in order to strengthen organizational ambidexterity. However, the main focus in later research was within organizational learning, meaning explorative and exploitative learning, and it was only a conceptual approach with suggestions to explore it empirically in the near future. Moreover, the latest study of Lavikka *et al.* (2015) is dedicated for understanding the place of organizational ambidexterity in the inter-organizational relationship, but the entire paper is oriented to knowledge aspects in the IT sector, specifically. However, there are only a few rather recent research analysing the relationship between organizational ambidexterity and inter-organizational collaboration.

In 2009, Doganova *et al.* proposed the concept of ambidextrous alliances. According to the scholars, ambidextrous alliances indicate the ability to combine explorative and exploitative activities through inter-firm relationships. Basically, it is a perfect form of collaboration as partners focus not only on sharing existing resources, but on developing the new ones as well. However, in such type of alliances the tension between exploration and exploitation remains the same.

The ideas presented in the paper of Lee and Bae (2012) were probably the first reasonable attempt to relate the concepts of organizational ambidexterity and inter-organizational collaboration. The scholars analysed two aspects: firstly, the study examined what kind of strategic orientation of a firm leads to better performance results; secondly, they explored how would inter-organizational collaboration affect the latter relations. A survey in Korea helped to reconfirm that a balance between exploration and exploitation ensures better performance results. Distinguishing inter-organizational collaboration into two types, explorative and exploitative collaboration, helped to reveal that different types of collaboration have different impacts on firm performance results (Lee and Bae, 2012). It is possible to presume that balancing explorative and exploitative types of inter-organizational collaboration should lead to superior performance as well.

As Capdevila (2014) proposes, the research on inter-organizational collaboration varies in a number of different research areas, including networking, alliances, inter-firm relations, etc. The knowledge perspective in these studies, however, remains the main line that separates the main approaches of inter-organizational collaboration concept. Some firms seek to gain new knowledge without sharing theirs, while others freely share their knowledge resources with other partners and simultaneously achieve new external knowledge. Regarding the contexts of innovation and organizational ambidexterity, this leads to presumptions that the main focus of the firm is either on the existing knowledge and competencies, thus dealing only with incremental innovation within the firm, or concentrating on options to create new knowledge and competencies, thus leading a firm to radical changes and innovativeness. These aspects raise the problem of necessity to harmonize this duality by reaching a balance between the two. Thus, in some sense, it is possible to say that inter-organizational collaboration could help to eliminate the barriers for a successful balance between exploration and exploitation. It could be done by filling the gaps in knowledge, capabilities and competencies by sharing the resources between collaborating partners. Sharing and thus reducing the risk of failures also remains a crucial aspect.

According to Sun and Lo (2014), inter-organizational collaboration ensures benefits from common explorative and exploitative activities. Such benefits include superior knowledge sharing, which leads to better performance result and competitive advantage of the firm. Im and Rai (2008) also highlight that mostly inter-organizational collaboration with a purpose to enhance explorative and exploitative balance leads to better long-term performance results.

Despite a number of previous research that have shown a positive relationship between organizational ambidexterity and increased firm performance, scholars still recognize a lack of specific research. The literature review for this thesis allows to accept the opinion as well. The most common gap in such research field is that most of the studies are explored at individual or firm level (O'Reilly and Tushman, 2013). However, the volatility of markets and globalism forces firms to overstep firm's boundaries and act in open markets. Thus the importance of inter-firm and inter-organizational collaboration rises. Moreover, literature analysis revealed another important aspect: A number of scholars consider organizational ambidexterity as leading to a competitive advantage of a firm. Unfortunately, scientific literature still lacks empirical evidence of this particular relationship. Accordingly, adding competitive performance dimension to this thesis helps to ground these propositions to a certain extent.

The existing research gaps force researchers to focus on the relationships and approaches that are still rather ambiguous but accepted as crucial in today's markets. To address the gaps in the research literature, the author presents an idea that finding the place of inter-organizational collaboration in the organizational ambidexterity area would be the first step to trespass a firm's boundaries and analyse the concept of organizational ambidexterity beyond the range of one firm. Moreover, it is important to highlight that although the existing research evidently confirms the need for companies to maintain a carefully managed balance between exploration and exploitation, there still exists a significant gap in research literature on trying to find

out how should firms increase their ambidexterity and achieve better performance results. This particular research is focused on testing whether organizational ambidexterity and inter-organizational collaboration managed together could be accepted as one of the possible stimulators for increased firm performance.

### 1.3.2. A review of the relationship between organizational ambidexterity and firm performance

The scientific literature analysis revealed that most of the empirical studies analyse the relationship of organizational ambidexterity to firm performance. Organizational ambidexterity has been shown as linked to various variables of firm performance: growth of sales, accounting, market's share, etc. (O'Reilly and Tushman, 2013; Raisch and Birkinshaw, 2008). In spite of a wide range of empirical studies and using a number of different measurements, samples, procedures and outcomes, the link between organizational ambidexterity and superior firm performance raises no doubts (O'Reilly and Tushman, 2013). Scholars also proved that the relationship between organizational ambidexterity and firm performance depends on: environmental conditions (e.g. Jansen *et al.*, 2005; Wang and Li, 2008); competitiveness (e.g. Geerts *et al.*, 2010) existing (and greater) amount of the resources (e.g. Cao *et al.*, 2009) as well as the size of the firm (e.g. Zhiang *et al.*, 2007).

Table 3 provides a more structured analysis with several examples of the most common studies that are focused on empirical research of the relationship between organizational ambidexterity and firm performance.

**Table 3.** Empirical research in the relationship between organizational ambidexterity and firm performance

Paper	Organizational ambidexterity indicators	Firm performance indicators	Relation
The antecedents, consequences, and mediating role of organizational ambidexterity (Gibson and Birkinshaw, 2004)	Combination of two capacities – alignment and adaptability.	Relative firm performance: full potential, satisfaction with the performance results and satisfaction of the customers, opportunities, and stimulus for further strengths.	Contextual ambidexterity is a mediator between organizational ambidexterity and firm performance.
Ambidexterity and Performance in Small- to Medium-Sized Firms: The	Ambidextrous firm orientation: exploratory orientation and exploitative orientation.	Relative firm performance: relative to competitors – sales growth, market share growth, return on	Results approved both: TMT facilitates the ambidexterity attainment in SMEs ; organizational ambidexterity is



Pivotal Role of Top Management Team Behavioral Integration (Lubatkin <i>et al.</i> , 2006)		equity, return on total assets.	positively associated with relative firm performance.
Strategic Ambidexterity and Sales Growth: A Longitudinal Test in the Software Sector (Venkatraman <i>et al.</i> , 2007)	Exploitation and exploration.	Firm performance measured as firm sales growth.	Simultaneous ambidexterity does not have a positive effect on firm's growth; sequential ambidexterity has a positive effect on firm's growth.
Unpacking Organizational Ambidexterity: Contingencies, and Synergistic Effects (Cao <i>et al.</i> , 2009)	Integrative construct of exploration and exploitation.	Sales growth, profit growth, market share growth, operational efficiency, cash flow from market operations and market reputation.	Findings confirm these two dimensions having synergistic effect on firm performance.
Achieving a balance between exploration and exploitation in service firms: A longitudinal study (Geerts <i>et al.</i> , 2010)	Simultaneous ambidexterity – balance between exploration and exploitation; sequential ambidexterity – (punctuated equilibrium) time-spaced sequence of exploration and exploitation.	Performance growth: firm size in employees, firm size in turnover, R&D expenses.	Organizational ambidexterity has a positive effect on manufacturing and service firms' performance.
Organizational Ambidexterity and Firm Performance: The Moderating Role of Organizational Capital (Fu and Morris, 2014).	Simultaneous exploration of new knowledge and exploitation of existing knowledge.	Firm performance measured as firm revenue growth.	Organizational ambidexterity was confirmed as positively associated with firm revenue growth (with control variables of firm age and size); firms with a higher level of organizational capital have a stronger relationship between

			organizational ambidexterity and firm revenue growth.
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(Source: made by author)

An analysis of the related literature in Table 3 presents a range of research exploring the relationship between organizational ambidexterity and firm performance. In general, firm performance should be recognized as a multidimensional construct, implying a range of different measurement dimensions (He and Wong, 2004). Thus, it is not surprising that the positive impact of organizational ambidexterity on firm performance has been proven using a number of different measures and empirical procedures. The most commonly used measures to analyse firm performance in organizational ambidexterity literature are proposed in Table 4.

**Table 4.** Most frequently used measures for firm performance

Scholars	Measures for analysing performance
<b>Gibson and Birkinshaw, 2004</b>	Managers (respondents) had to evaluate 4 items (over the last five years): the <i>achievement</i> of business unit's full <i>potentiality</i> ; <i>satisfaction</i> with the level of business unit's <i>performance</i> ; the <i>satisfaction</i> of the <i>customers</i> ; <i>opportunities</i> and <i>encouragements</i> .
<b>He and Wong, 2004</b>	<i>Sales growth rate</i> , measured as self-reported compounded average sales growth rate (within the last three years)
<b>Lubatkin et al., 2006</b>	Related firm performance (relative to major competitors'): <i>growth in sales</i> ; <i>growth in market share</i> ; <i>return on equity</i> ; <i>return on total assets</i> ; Respondents were only CEOs.
<b>Jansen et al., 2006</b>	Financial performance, measured through internal corporate records by a business unit's <i>average profitability</i> (over a one year period).
<b>Venkatraman et al., 2007</b>	Firm performance measured as firm <i>sales growth</i>
<b>Cao et al., 2009</b>	<i>Sales growth</i> ; <i>profit growth</i> ; <i>market share growth</i> ; <i>operational efficiency</i> ; <i>cash flow from market operations</i> ; <i>market reputation</i> (CEO rated their firm performance over the last year).
<b>Geerts et al., 2010</b>	<i>Performance growth</i> : firm size in employees, firm size in turnover, R&D expenses
<b>De Clercq et al., 2013</b>	Perceptions of the respondents: <i>return on investment</i> ;

	<i>return on sales;</i> <i>profit growth;</i> <i>return on assets;</i> <i>overall efficiency of operations;</i> <i>sales growth;</i> <i>market share growth;</i> <i>cash flow from operations;</i> <i>firm's overall reputation.</i>
<b>Fu and Morris, 2014</b>	Firm performance measured as firm <i>revenue growth</i> .

(Source: made by author)

The results in Table 4 are collected using information from the most prevalent (mostly cited) studies in the organizational ambidexterity research area. A brief analysis helps to confirm that growth of sales (revenues and/or assets) is one of the most frequently used measure to evaluate firm performance in relation to organizational ambidexterity.

In most of the empirical studies firm performance is rated using answers from firms' CEOs or heads of business units, because the exact data on the financial performance, including all financial numbers, are rarely available (Lubatkin *et al.*, 2006). Though firms, even SMEs are legally required to provide all financial data, this information is strictly confidential. These aspects helped to arrange the decisions on one of the most important variables in this thesis as well. In order to avoid biases in firm performance data, the relative firm performance data (firm competitive performance) will be combined with secondary (financial) data (firm financial performance). This will help to explore new perspectives in the relationship between organizational ambidexterity, inter-organizational collaboration, and firm performance. This is explained in more detail in the Research methodology section.

### **1.3.3. The relationship between organizational ambidexterity, inter-organizational collaboration and firm performance**

Today scholars mostly analyse two kinds of this triple interrelationship. Some of them (e.g. Hernandez-Espallardo *et al.*, 2012) explore whether the relationship between organizational ambidexterity and inter-organizational collaboration has any impact on firm performance. Meanwhile others (e.g. Sun and Lo, 2014) explore how inter-organizational collaboration can benefit from organizational ambidexterity.

Scholars have already proven that a successful balance between explorative and exploitative activities, i.e. well-balanced organizational ambidexterity, leads to better performance results. Following the latter ideas, the author of this thesis proposes that the relationship between organizational ambidexterity and inter-organizational collaboration can have similar outcomes in the context of firm results as well. Although there are some studies that present attempts to combine the concepts of organizational ambidexterity and inter-organizational collaboration (Capdevila, 2014; Lee and Bae, 2012; Powell, 1990), to the best of the author's knowledge this study is the first attempt to empirically analyse what role does inter-organizational collaboration play in the relationship between organizational ambidexterity and firm performance.

Below the author proposes a table of the most prevalent research that presents the attempts to explore and evaluate the relation between organizational ambidexterity, inter-organizational collaboration and firm performance (see Table 5). It confirms the novelty of exploration in this thesis, since there still are no studies analysing all related variables together. Moreover, there still are no studies that explore the role of inter-organizational collaboration as a mediator between organizational ambidexterity. Distinguishing firm performance into two types, financial and competitive performance also appeared to be a novel approach in the research literature.

**Table 5.** Most prevalent research in organizational ambidexterity, inter-organizational collaboration and firm performance relations

Subject	Scholars	Date	Name of the paper	Research focus	Main findings
<b>Relation between organizational ambidexterity and inter-organizational collaboration</b>	Tiwana	2008	Do Bridging Ties Complement Strong Ties? An Empirical Examination of Alliance Ambidexterity	Analysing the impact of strong and bridging ties on alliance ambidexterity;	Main focus remained on strategic alliances and networks, thus the findings contribute mainly to the literature of these concepts.
	Doganova <i>et al.</i>	2009	The Impact of Ambidextrous Alliances on Innovation	Building the concept of ambidextrous alliances and testing performance implications of ambidexterity as well as the relation between innovation types and ambidextrous alliances. Ambidextrous alliances are understood as inter-firm collaborations, involving both exploration	Findings showed that ambidextrous alliances are particularly relevant for the creation and broadening of technological innovation. Moreover, ambidextrous alliances tend to be more effective on the strategic level.

				and exploitation at the same time.	
	Sun and Lo	2014	Achieving Alliance Ambidexterity Through Managing Paradoxes of Cooperation	Alliance ambidexterity is explored from the perspective of organizational learning. Conceptual perceptions of balancing exploration and exploitation at the alliance level.	Alliance ambidexterity is beneficial for alliance performance; exploitation at the alliance level is based on technological similarity, structural integration and contracts, while exploration at the alliance level is facilitated by technological complementarity, structural modularity and mutual trust.
<b>Relation between organizational ambidexterity and firm performance</b>	Geerts <i>et al.</i>	2010	Achieving a balance between exploration and exploitation in service firms: A longitudinal study	Exploring organizational ambidexterity through the lens of punctuated equilibrium (cycling periods of exploration and exploitation)	Longitudinal data from more than 500 firms confirmed that organizational ambidexterity (as well as cyclical type of it) have a positive effect on manufacturing and firms' service performance.
	He and Wong	2004	Exploration vs exploitation: An empirical test of the	The joint influence of exploration and exploitation	The interaction between exploratory and

			ambidexterity hypothesis	on firm performance in the context of technological innovation	exploitative innovation has a positive impact on firm performance (measured by growth of sales)
	Cao <i>et al.</i>	2009	Unpacking Organizational Ambidexterity : Contingencies , and Synergistic Effects	Extension of previous concept of organizational ambidexterity with balanced and combined dimensions and testing the impact of organizational ambidexterity on firm performance.	Findings confirm that these two dimensions have a synergistic effect on firm performance; different firm's resource conditions contribute differently to the performance.
	Gibson and Birkinshaw	2004	The antecedents, consequences, and mediating role of organizational ambidexterity	Main focus on contextual ambidexterity and its relation to performance; contextual ambidexterity is defined through the lens of alignment and adaptability.	Contextual ambidexterity is understood as the combination of stretch, discipline, support and trust; contextual ambidexterity is a mediator between these four features and firm performance.
	Lubatkin <i>et al.</i>	2006	Ambidexterity and Performance in Small- to Medium-Sized Firms: The Pivotal Role of Top Management	Focus on the pivotal role of top management team, proposing that TMT facilitates the attainment of	Results proved both: TMT facilitates the ambidexterity attainment in SMEs ; organizational ambidexterity is positively

			Team Behavioral Integration	organizational ambidexterity in SMEs; the importance of ambidexterity is tested with relation to performance.	associated with relative firm performance.
	Tushman <i>et al.</i>	2010	Organizational designs and innovation streams	Exploring the relation between alternative design of an organization and exploration and exploitation; testing the relation between organization design and innovation outcome as well as firm performance.	Ambidextrous organizational design is positively related to increased innovation outcomes as well as with superior ongoing performance of the existing products (incremental innovation).
	Raisch <i>et al.</i>	2009	Organizational ambidexterity: Balancing exploration and exploitation for sustained performance	Focus on four tensions of organizational ambidexterity: differentiation vs integration, individual vs organizational level, static vs dynamic perspectives and internal vs external processes; conceptual paper	The relation between organizational ambidexterity and firm performance differs according to the size, resources, industrial and environmental contexts of a firm; organizational ambidexterity is positively related to a firm's success (meaning fundamental measures:

					survival, resistance to crises, employees' satisfaction, etc.).
	Venkatram an <i>et al.</i>	2007	Strategic Ambidexterity and Sales Growth: A Longitudinal Test in the Software Sector	Scholars empirically explore the effect of simultaneous vs sequential ambidexterity effect on firm performance, including the time aspect and controlling variables, such as the age of the firm, market dominance and multi-market competition.	Simultaneous ambidexterity does not have a positive effect on firm's growth; sequential ambidexterity has a positive effect on firm's growth;
<b>Relation between organizational ambidexterity, inter-organizational collaboration and firm performance</b>	Lee and Bae	2012	The performance consequences for ambidexterity in strategic alliance formations: Empirical investigation and computational theorizing	Scholars examined what kind of strategic orientation of a firm leads to better performance results; it also explored how inter-organizational collaboration affects the latter relations.	Balance between exploration and exploitation ensures better performance results; distinguishing inter-organizational collaboration into explorative and exploitative collaboration helped to reveal that different types of collaboration



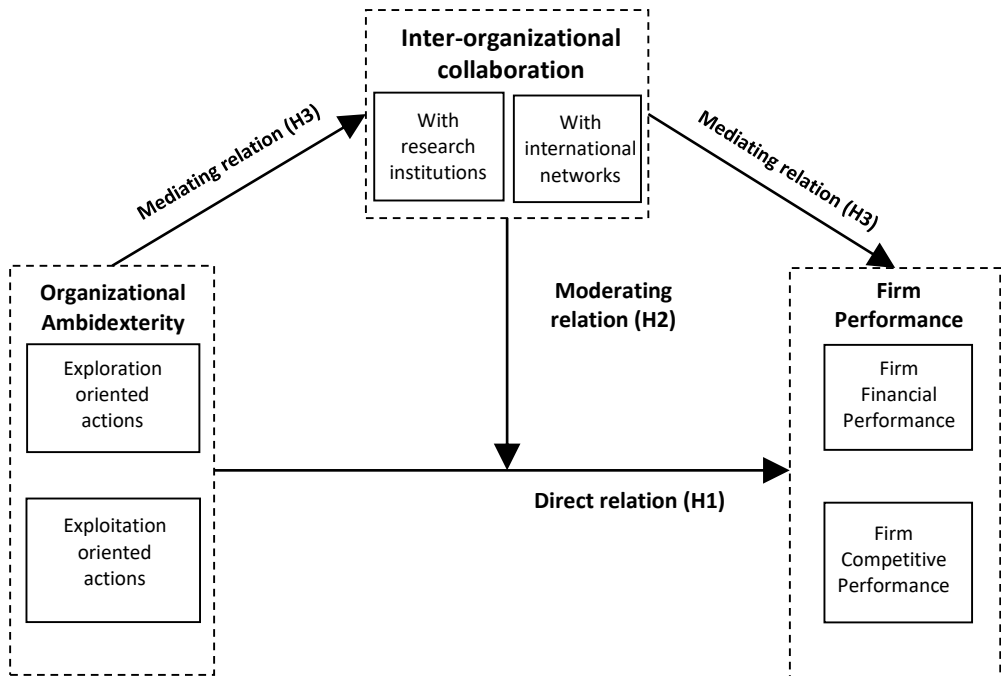
					have a different impact on firm performance results.
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(Source: made by author)

Scholars have already proven that successfully managed exploration-oriented and exploitation-oriented actions, which are equated to well-balanced organizational ambidexterity leads to better performance results. However, scientific literature still has not answered a number of crucial questions. For example, the ways of how firms can prepare for transforming to ambidextrous organizations (Zimmermann *et al.*, 2015) or how to sustain ambidexterity for longer are still explored insufficiently. Another crucial question that still requires scholars’ attention is the factors that can help firms to foster ambidexterity within the firm.

Following these assertions, the author of this thesis assumes that inter-organizational collaboration should be seen as critical to the relation between organizational ambidexterity and firm performance as a possible stimulator of firm’s ambidexterity. Herein the author perceives the latter relations in further sequence. Firstly, organizational ambidexterity contributes to better performance results. The more balance there is between exploration-oriented and exploitation-oriented actions, the more superior firm performance is achieved. Secondly, inter-organizational collaboration ensures the attainment of new knowledge, relevant information, and other resources, as well as the ability to manage environmental uncertainty, share resources and manage risk. Relying on this logic, the author proposes that inter-organizational collaboration may help firms to become more ambidextrous. Thus inter-organizational collaboration can be considered as a reasonable variable in the relation between organizational ambidexterity and firm performance.

To enhance all existing research in the fields of organizational ambidexterity and inter-organizational collaboration, the author of this thesis decided to combine these concepts thus proposing novel approaches regarding the organizational ambidexterity and inter-organizational collaboration. Firm performance was also added as a crucial dependent variable. Building on this, the author composed a conceptual research model (see Figure 3).



**Figure 3.** Proposed conceptual model (Source: made by author)

The proposed conceptual model implies: the concept of organizational ambidexterity, taking exploration-oriented actions and exploitation-oriented actions as components of the organizational ambidexterity concept; inter-organizational collaboration, taking collaboration with research institutions and collaboration with international networks as two separate components of the concept; firm performance, which is divided to firm financial performance and firm competitive performance.

In this study, organizational ambidexterity is regarded as an organization's ability to simultaneously balance between exploration-oriented actions and exploitation-oriented actions, which require an alignment of different activities, competencies, and organizational routines in order to achieve contradictory goals. In agreement with Kortmann (2014), this study considers exploration-oriented actions as actions based on new knowledge (or transition from existing to new knowledge), radical decisions, emerging markets, and new customers' adaption. In contrast, exploitation-oriented actions stand on the existing knowledge and resources, meet the existing markets and customers' needs, and implement only minor changes.

Relations proposed in the conceptual model are tested in the methodological part of this thesis.

## **2. RESEARCH METHODOLOGY**

The aim of the section is to provide detailed descriptions of the research methodology used in this thesis. Firstly, the proposed conceptual model is provided and hypotheses are raised. Building on this model, the author subsequently defines the research aim and objectives, as well as provides the research design. This section also implies information on research sample, variables, and research methods that are used in this study.

### **2.1. Research design and research methods**

Research in this thesis can be defined as a set of several steps. Firstly, a conceptual model that demonstrates the relationship between selected variables was constructed. The proposed conceptual framework was created based on scientific literature analysis performed in the first part of the thesis. Research hypotheses were raised according to the proposed conceptual model.

Due to the complexity of raised hypotheses and studied relations, mixed research methods were applied. Decisions to use mixed methods in research are always justified by a particular research strategy (Creswell, 2003). The choice of methods and research strategies are made by the author of this thesis and were determined by specific research intents. In this research, the author chose a sequential research procedure, i.e. sequential explanatory (Creswell, 2003) which implies testing the concept with a quantitative method which is followed by qualitative research. This was decided in order to provide a more detailed exploration of the proposed conceptual model and explain the object of the research more explicitly. In this case, qualitative research helped to interpret some results from the quantitative research part.

The research has begun with a survey, i.e. a quantitative research method, with the purpose to test the hypotheses raised in this research. A *questionnaire survey* was selected as an appropriate research method in this thesis. It was one of the most suitable methods for collecting a relatively large amount of data and for getting valid statistical information for the research (Watson, 2015).

#### **2.1.1. Quantitative research method and research sample**

Setting and grounding the measurement scales for the validation of the proposed model was the initial step of quantitative research. It is followed by the construction of a questionnaire for measuring all selected variables and testing the suggested relations.

The questionnaire for this survey was constructed taking into account the aim of the research as well as all important theoretical issues. In order to test the questionnaire's validity, a pilot test with 30 selected firms was carried out.

The initial questionnaire had 21 questions-statements. They had to be evaluated on an 11-point Likert scale, where 1 meant "strongly disagree" and 10 meant "strongly agree", and 11 meant "I do not know". Questions were grouped according to the variables. At the end of each group of questions there was one open question for

getting the non-structured answers from the respondents (see further Annex 1). The pilot survey was carried out in June 2014. All 30 obtained questionnaires were valid.

Based on the results received after pilot testing, the initial questionnaire was reconstructed. All problematic questions were modified, displaced between the scales (these steps were used only within the scales of exploration-oriented actions and exploitation-oriented actions) or removed before the main research was launched. These procedures helped to compose the final questionnaire for the research.

The final scales consisted of six questions for exploitation-oriented actions and eight questions for exploration-oriented actions making it fourteen questions in total for the organizational ambidexterity scale. Also, four questions remain for indicating the existence of inter-organizational collaboration. Similarly, it was decided to add an additional three-statement scale in order to get information that would help to evaluate a firm's competitive performance. Therefore, the final questionnaire was composed of 21 question in total.

Conducting the main research was the second step of the research. The survey's respondents were managers, owners of these firms or members of management teams. The final questionnaire was launched for survey in September 2014. Data for the survey was collected via pre-planned telephone interviews during the period September–October 2014. In total, 410 valid questionnaires were received.

Since it was decided to evaluate a firm's financial performance, secondary data was necessary as well. Unfortunately, the research faced the problem regarding financial data collection. Firstly, managers of the firms refused to report exact information regarding any financial data of the firm. Secondly, there were some managers that tend to represent the financial situation of the firm much better than it is in reality. A distortion of real data would affect the research results negatively, thus these aspects appeared as slightly harmful for the validity of the results. In order to avoid any distortion of the results, secondary data was collected during the last stage of the survey (after the primary data was collected). Financial data of the firms that attended the survey was collected from Statistics Lithuania, of the period between 2011 and 2012, since more recent data was unavailable. Because data that concerns financial results of the firm is absolutely confidential, all information related to the firms, including names, codes and contact details was removed. Moreover, after the analysis all data was randomly mixed in order to ensure the maximum confidentiality.

### *Research sample*

The sample of the survey was 410 Lithuanian firms from innovative and non-innovative technology-intensive sectors (based on the division provided by Statistics Lithuania). Sample selection in this research coincides with Aspara *et al.* (2011) and Sidhu *et al.* (2007), who presented exploration and exploitation research with the focus on technology-intensive firms, which requires refining and extending the existing resources, and adoption of new resources and technologies at the same time. Zhang *et al.* (2016), who recently presented an empirical research on different organizational ambidexterity domains, support the sample selection in this study as they once again confirm technology-intensive innovative firms as a common focus for organizational ambidexterity research.

In this research sectors were selected as follows: innovative business sectors include manufacture of pharmaceutical products and preparations (C21), manufacture of computer, electronic and optical products (C26), financial and insurance activities (K), electricity, gas, steam and air conditioning supply (D), information and communication (J), and manufacture of chemicals and chemical products (C20); non-innovative business sectors include manufacture of food products (C10) and manufacture of wood and of wood products (C16). The organizations in these sectors were selected according to several criteria: BERD (Business Enterprise Research and Development) results; the number of new products or services per year; and the percentage of exports in an organization's total annual turnover. Firms from a respective sector must have achieved a minimum scale, presented in Table 6. Half of the firms in this research was from the innovative sectors, meanwhile the other half of the firms – from non-innovative sectors. The minimal meanings of the latter indices were determined based on statistical meanings in respective sectors. This particular statistical information was collected from Statistics Lithuania.

**Table 6.** Sampling criteria

	BERD, %	Firms developing new products, services, %	Revenue from exports in relations to the total revenue, %
<b>Non-innovative sectors</b>			
C16 sector	0.03	25.9	5
C10 sector	0.1	34.4	17
<b>Innovative sectors</b>			
C26 sector	0.9	42.1	3
C21 sector	6.2	40	21
D sector	1.06	47.1	2.9
J sector	0.14	60.4	0.7
K sector	4813 (m EUR)	50.8	<i>no data</i>

(Source: made by author)

The complete sample constituted a 15.06% response rate (Table 7). It is a relatively low response rate, but the purpose was to complete the survey in a relatively small period, which could be a reason for the reduced response rate. The data in Table 7 also shows that the biggest amount of surveyed firms was in the information and communication sector (J). The least amount of firms assessed was in the manufacture of pharmaceutical products and preparations sector (C21). However, it is important to evaluate the percentage of surveyed firms in the sector. For example, only 3 firms were surveyed in the sector of manufacture of pharmaceutical products and preparations, but it makes the biggest percentage in the whole sample of this research as the respective sector constitutes of only 20 firms in Lithuania. A similar situation is with the information and communication sector. Though the number of surveyed firms is the maximum in whole sample of the research, it makes only 6.13% of all firms in the sector.

**Table 7.** Response rate

	Total number of firms in sector	Number of surveyed firms in the sector	Number of surveyed firms in the sector, %
<b>Non-innovative sectors</b>			
C16 sector	1187	85	7.16%
C10 sector	816	85	10.42%
<b>Innovative sectors</b>			
C26 sector	118	10	8.47%
C21 sector	20	3	15%
D sector	679	32	4.71%
J sector	2660	163	6.13%
K sector	697	32	4.59%
<b>Total</b>	6177	410	<i>response rate</i> 15.06%

(Source: made by author)

As it was already mentioned before, two types of firm performance were analysed in this study. However, obtaining the financial data is rather difficult. A number of firms refuse to provide such confidential information. First of all, it is rather dangerous because information can be reached by competitors and do some damage. Also, there are some important aspects related with laws because not all firms act legally, pay all taxes, etc. Accordingly, while implementing this research, financial data of only 265 firms were accessed, thus making this number as the final size of the research sample. 128 firms were from innovative sectors, and 137 from non-innovative sectors. The distribution of all firms within the sample with financial data is given in Table 8.

**Table 8.** The proportion of the sample with financial information

	Number of surveyed firms in the sector	Number of firms with financial data	Number of firms with financial data, % of all surveyed firms in the sector
<b>Non-innovative sectors</b>			
C16 sector	85	67	78.82%
C10 sector	85	70	82.35%
<b>Innovative sectors</b>			
C26 sector	10	7	70%
C21 sector	3	1	33.33%
D sector	32	12	37.5%
J sector	163	103	63.19%
K sector	32	5	15.63%

(Source: made by author)

The most difficult part was to get any financial information in the sector of financial and insurance activities. The financial information of firms in this sector is extremely confidential. Overall, the results in the table show that only approximately 54 percent of firms share their financial information. This may be considered as a

particular limitation for further research. However, the sample still remains sufficient for receiving reasonable research outcomes.

### **2.1.2. Qualitative research method and research sample**

The reason to supplement this study with qualitative research is based on efforts to more explicitly explain the results gained from the quantitative research. Since the limited access to the secondary data has restricted the general sample of research and the results of quantitative data were disclosed with relatively weak statistical meanings, the author decided to supplement this particular research with qualitative research. Accordingly, the qualitative part of the research was included in this study with the purpose to have a more detailed explanation of the concept (Creswell, 2003). Qualitative research was implemented in order to understand the internal details of the phenomenon and answer the questions “why” or “how”, rather than verifying the facts of mediation or moderation.

An embedded multiple case study design was selected. This particular qualitative research design allows researchers to deal with research topics more broadly, to cover complex and contextual conditions, to deploy multiple sources of evidence, and to develop meaningful and more reliable research models (Yin, 1984, 2003). Multiple units of the analysis were included: (1) specific form of inter-organizational collaboration (i.e. collaboration with research institutions and collaboration in international networks); (2) the level of organizational ambidexterity (i.e. the extent of exploration-oriented actions and exploitation-oriented actions); (3) firm performance (including firm financial and firm competitive performance). A multiple case study design enabled the author to compare the findings at the firm level between firms that collaborate and firms that do not collaborate with research institutions and/or international networks. Accordingly, firms were regarded as typical cases to determine if there is a difference in the effect on the firm performance and the level of ambidexterity (i.e. simultaneous orientation to exploration-oriented actions and exploitation-oriented actions), when the circumstances of inter-organizational collaboration differs. In this way, multiple cases contribute to extending the findings of quantitative research.

The qualitative part of this research was conducted in Spring of 2015. The essential purpose was to explore in-depth the nature of organizational ambidexterity phenomenon in firms from innovative and non-innovative sectors thus adding a wider context of ambidexterity’s relation to inter-organizational collaboration. To be more precise, this part of research aims to understand the nature of inter-organizational collaboration with research institutions and professional networks and the extent to which it adds value to the level of organizational ambidexterity as well as to firm competitive and financial performance.

*Structured interview.* A structured interview method was selected in order to assure comparability of data across cases. The interviewees were senior managers, including owners of the firms. Also, in order to compare different results and ensure reliability of results, a *focus groups* with middle-level managers were organized as well. The interview protocol consisted of twelve standardised open questions. The

questions used during the interviews and focus groups are provided in Annex 2. The questions were based on the quantitative research design and results. Although the interviewees had to answer standard questions, the interviews as well as focus groups provided an opportunity to observe non-verbal communication, get a personal viewpoint, and make informal judgments of the interviewees. A structured interview method, with a limited number of clear questions, was also an effective way to motivate busy senior managers to engage in the study.

The decision to engage middle-management employees of the firms in the focus groups on the same twelve standardised open-ended questions was based on attempts to get more contextual data. The data from the focus groups complemented the answers of the senior managers with more practical examples and provided subjective interpretations of the situations discussed. In some cases, the statements provided by senior managers and employees differed radically.

First of all, primary qualitative data were gathered from interviews with senior managers or owners of selected firms. In order to compare and extend the results, interviews with selected middle-level managers were performed as well. Secondary (quantitative) data comes from an analysis of artefacts, such as performance reports and human resource department data. The integration of multiple types of data and sources enables data triangulation and increases the credibility and validity of data analysis and findings (Yin, 2003; Creswell, 2007). However, as the author expected, secondary data was absolutely confidential information. In order to avoid any data flow, firms agreed to only share the general numbers in revenue and revenue changes within a specific period of time. This is accepted as sufficient information for making valuable insights for relations between organizational ambidexterity, inter-organizational collaboration and firm financial performance.

For data analysis the author has followed fundamental examples of different authors (e.g. Eisenhardt, 1988; 1989; Yin, 1994) and relied on analytical pattern matching and analytical generalisation. All data obtained from interviews were transcribed into the analytical matrix, locating all cases and responses in one place for comparability.

### *Research sample*

The sample of the case study was 12 firms. All firms were selected using the same logics as for quantitative part of this research. Seeking to control the effect of the economic sector itself at least two cases had to be from the same economic sector. Table 9 characterises all the cases that were studied in this research.

**Table 9.** Characteristics of the sample for qualitative research

<b>Firm</b>	<b>Economic sector</b>	<b>Number of Employees</b>	<b>Total number of respondents</b>	<b>Revenue changes in 2012-2014</b>
<b>Case A</b>	Pharmaceutical products (C21)	95 employees	2	From 3 to 5 million EUR (growth)



<b>Case B</b>	Pharmaceutical products (C21)	26 employees	3	Growth of 10% (details are not provided)
<b>Case C</b>	Computer, electronic, and optical products (C26)	92 employees	4	Around 10 million EUR (stable)
<b>Case D</b>	Computer, electronic, and optical products (C26)	14 employees	3	From 0.35 to 0.44 million EUR (growth)
<b>Case E</b>	Financial and insurance activities (Sector K)	36 Employees	4	From 0.55 to 0.67 million EUR (growth)
<b>Case F</b>	Financial and insurance activities (Sector K)	13 employees	2	From 0.07 to 0.13 million EUR (growth)
<b>Case G</b>	Wood processing and furniture production (C16)	30 employees	2	Around 0.5 million EUR (stable)
<b>Case H</b>	Wood processing and furniture production (C16)	250 employees	4	From 14.5 to 12 million EUR (decline)
<b>Case J</b>	Wood processing and furniture production (C16)	5 employees	3	From 0.09 to 0.6 million EUR (growth)
<b>Case K</b>	Food Industry (C10)	86 employees	3	From 4 to 3.5 million EUR (decline)
<b>Case L</b>	Food Industry (C10)	100 employees	3	From 7 to 11 million EUR (growth)
<b>Case M</b>	Food Industry (C10)	44 employee	2	From 3 to 4 million EUR (growth)

Research respondents for the case studies were selected to provide relevant information and insights about the level of organizational ambidexterity and inter-organizational collaboration within the firm as well as the competitive and financial performance of the firm. In addition, respondents were expected to provide information about the level of innovativeness of the firm, key factors for the development of ambidexterity as well as the quality and viability of the existing collaborative relations with research institutions and international networks. For that purpose, interviews were conducted with senior managers or owners of the firms. In line with this decision, focus groups consisted of middle management and employees

– both groups responsible for the implementation of top managers' decisions. Financial performance and demographics of the firm were reported by the owner, manager or finance/account managers.

Data collection in this particular research deals with multiple sources of data gathered across different times. This assures the triangulation of the data as well as the building of an explicit picture of the case. For the interviews with top management and for the focus groups of middle-management employees, the same set of questions were used with the purpose to have synchronic primary data source triangulation. The collected data was analysed with MaxQDA – a qualitative data analysis software used for qualitative research. In order to obtain the essential ideas from cases studies, the data were coded, which helped to provide insights into the qualitative background of case research questions. By coding the data the author was able to, for example, verify whether firms' collaborative relations are viable, to explore whether they are expanding, and to know why they are developed. Additionally, this part of research helped to explore what causes the difference between exploration-oriented actions and exploitation-oriented actions, as well as what are the reasons for firms to stay oriented to local and existing markets or choose to expand into new and/or foreign markets. It is important to provide some qualitative insights into the relationship between organizational ambidexterity and firm financial performance.

Based on research results, qualitative research has strongly justified the findings of quantitative research thus providing confidence for the general research outcomes. Qualitative research questions and results analysis are composed to more broadly explain the answers gained during the quantitative part of the research.

## **2.2. Research variables.**

### *Independent variable: Organizational ambidexterity*

There are multiple ways in which exploration-oriented activities differ from exploitation-oriented activities (e.g. Mattes and Ohr, 2013a). These differences imply various dimensions (organization, processes, culture, strategies, etc.) and balancing them remains a challenge for firms. Thus it is difficult to measure organizational ambidexterity, though measuring remains critical for finding out whether a firm can be considered as ambidextrous.

O'Reilly and Tushman (2013) confirm that organizational ambidexterity has been measured using a number of various types of analysis forms and different variables. However, it is possible to exclude two set of indicators suitable for measuring organizational ambidexterity. One set concentrated to the learning process, teamwork aspects, and the amount of radical innovations and explorative activities. This set of measures is mostly addressed to measure exploration. The other type of organizational ambidexterity measures is focused on financial dimensions, including cost of improvements and optimization processes, financial performance results, reward systems. This set of measures is mostly addressed to measure exploitation (Mattes and Ohr, 2013a).

However, the theoretical analysis of the concept of organizational ambidexterity showed that there is still no commonly recognized scales for measuring organizational ambidexterity in the context of exploration and exploitation-oriented

actions. Thus after a review of relevant literature, the author of this thesis generated the measurement scale for organizational ambidexterity. The main focus while providing the measurement scale remains on exploration-oriented actions and exploitation-oriented actions. Herein exploration-oriented actions mean a transition from the existing knowledge and capabilities to new knowledge, decisions, and radical changes. These actions could also be perceived as the production of highly new products, services or technologies that are oriented to external, emerging markets. Contrary to exploration-oriented actions, exploitation-oriented actions indicate actions that are based on the existing knowledge and capabilities. Accordingly, these actions are equal to minor, incremental changes, and meeting the needs mostly of existing customers and markets (Jansen *et al.*, 2006; Kortmann, 2014; Shahhoseini, Ramezani, 2015). Following this, data to measure organizational ambidexterity was collected by several indices using the questionnaire: the number of new products, services or technologies in the existing and new launched markets; the origin of newly created products or services; the role of newly created products or services in a firm's profit structure; the return of innovative products or services; the ability to scale up the successful innovative products or services; and the like (see Table 6). All these indices were adapted by using the most common organizational ambidexterity literature and coincide with Gibson and Birkinshaw (2004), Im and Rai (2008), Jansen *et al.* (2006), Kortmann (2014), and others.

*Intermediary variable: Inter-organizational collaboration*

In order to measure the inter-organizational collaboration, it is possible to use scales which are provided in the inter-organizational collaboration as well as inter-organizational networks literature. While analysing the contribution which inter-organizational collaboration may have on specific firm's relationships, processes or/and outcomes, the appropriate evaluation of the concept becomes critical. Zacca *et al.* (2015) divide the measures of inter-organizational collaboration into four components, namely, coordination, relationships, knowledge, and communication.

As asserted by Popp *et al.* (2014), the evaluation of how inter-organizational collaboration contributes to any other results of a firm means the evaluation of the overall processes and outcomes, measuring the effectiveness as well. Following this, the measurement of inter-organizational collaboration could be divided into three levels:

- individual level measurements, meaning an assessment of changes in employees' job satisfaction and customers' satisfaction, etc.;
- organizational level measurements, meaning an assessment of new resource acquisition and existing resource improvement;
- overall network level measurements, meaning an assessment of the number of collaborating members, the strength of ties between collaborating members, and the overall contribution to the environment, including economic, social and political aspects (based on Popp *et al.*, 2014).

Considering the aim of this thesis, the main purpose was to specify whether firms have any partners for collaboration. The other purpose was to reveal the basis

of collaborative relations. Accordingly, questions in the questionnaire were focused on firm's relations in the market: either these are partnerships with education and/or research institutions, or memberships in international networks (see Table 6).

*Dependent variable: Firm performance*

The author in this thesis measured two types of firm performance. One of those types is firm financial performance, and the other is called firm competitive performance, which basically reflects the performance in relation to the competitors. Some scholars call it relative performance (see, e.g. Lubatkin *et al.*, 2006).

Competitive performance is a subjective measure and was measured by several indices using a questionnaire: the speed of the sales' growth compared to competitors (including counting the percentage of sales growth); increased number of employees compared to competitors; the amount of innovations in comparison with competitors; the success of innovations in comparison with competitors (see Table 11).

Previous studies illustrate that obtaining sensitive financial data of a firm's performance results can be challenging and problematic (Tippins and Sohi, 2003). This difficulty was faced within the present research since most of the data is confidential and largely inaccessible. However, in order to compare financial and non-financial (competitive) performance results, limited financial data was obtained. As a result, this paper measures financial performance by: firm's revenue in 2011 and 2012; firm's revenue changes between 2011 and 2012; firm's exports revenue in 2011 and 2012; firm's exports revenue changes between 2011 and 2012 (see Table 10).

**Table 10.** Research variables and measures

<b>Independent variable</b>	<b>Variable description</b>	<b>Items</b>	<b>Adapted from</b>
<b>Organizational ambidexterity</b> ( $\alpha=0.844$ )	<i>Exploration-oriented actions</i> ( $\alpha=0.730$ )	<u>Questions:</u> I1.1 We constantly launch new products, services and businesses for new markets I1.3 Our new products and services play an important role in our revenue/ profit structure I2.2 We create and sell technologies but not the final products I2.6 Our innovative products/services are very high-quality but not for the massive use I3.3 We are capable to scale up and commercialize our successful innovative products, services in international markets I3.4 The enterprise is always looking for innovative means around a barrier constraining consumption.	Gibson and Birkinshaw, 2004; He and Wong, 2004; Im and Rai, 2008; Jansen <i>et al.</i> , 2006; Jansen <i>et al.</i> , 2009; Kortmann, 2014; Lisboa, 2011; March, 1991; Shahhoseini and Ramezani, 2015; Yalcinkaya, Calantone and Griffith, 2007.

	<i>Exploitation-oriented actions</i> ( $\alpha=0.772$ )	<p><u>Questions:</u></p> <p>11.2 We constantly launch new products, services and businesses for the existing markets</p> <p>11.4 The enterprise develops new products/services by itself</p> <p>12.1 We are selling our innovative products, services under our own company brand</p> <p>12.3 We are selling our innovative products, services directly – by our own sales unit and sales force</p> <p>12.4 Our innovative products/services are for massive use</p> <p>12.5 Our innovative products/services are for long-term use</p> <p>13.1 We are happy about the success and return of innovative products/services</p> <p>13.2 We are capable to scale up and commercialize our successful innovative products, services in local markets</p>	
<b>Intermediary variable</b>	<b>Variable description</b>	<b>Items</b>	
<b>Inter-organizational collaboration (IOC)</b> ( $\alpha=0.641$ )	<i>IOC with research institutions</i> ( $\alpha=0.646$ )	<p><u>Questions:</u></p> <p>ES1.1 Education and/or research institution is one of the regular partners of the enterprise</p> <p>ES1.4 The enterprise permanently collaborates with researchers, scholars and students</p>	Teece (2007); Wang and Ahmed (2007); Pavlou and El Sawy (2011); Zollo and Winter (2002); Schilke (2013); Alvarez and Barney, 2007.
	<i>IOC with international networks</i> ( $\alpha=0.400$ )	<p><u>Questions:</u></p> <p>ES1.2 Enterprise is a member of international networks/organisations</p> <p>ES1.3 Employees are members of the board of other enterprises and/or expert bodies and external working groups</p>	
<b>Dependent variable</b>	<b>Variable description</b>	<b>Items</b>	
<b>Firm performance</b>	<i>Firm competitive performance (FCP)</i> ( $\alpha=0.793$ )	<p><u>Questions:</u></p> <p>PI.1 Sales of our enterprise rise more than 20% per year</p>	De Clercq et al., 2013; Fu and Morris, 2014; Gibson and Birkinshaw,

		<i>P1.2 The number of employees in our enterprise rises more than 25% per year</i> <i>P1.3 Sales of our enterprise rise faster than sales of our competitors</i> <i>P2.1 Our enterprise creates more products/services per year than our competitors</i> <i>P2.2 The new products/services of our enterprise have better evaluation than new products/services of our competitors.</i>	2004; He and Wong, 2004; Lubatkin, 2006;
	<i>Firm financial performance</i>	<u>Data:</u> <i>Revenue 2011 and 2012</i> <i>Revenue <math>\Delta</math> 2011 to 2012</i> <i>Exports revenue 2011 and 2012</i> <i>Exports revenue <math>\Delta</math> 2011 to 2012</i>	

(Source: made by author)

In order to explore the reliability of the selected variables, the author used Cronbach's  $\alpha$ . Cronbach's  $\alpha$  was developed by Lee Cronbach with the purpose to provide a specific measure for internal consistency of a particular scale (Tavakol, Dennick, 2011). More precisely, internal consistency of questions within one particular questionnaire highlights the relation and connectedness between all questions. The meaning of Cronbach's  $\alpha$  can vary in a scale between 0 and 1 and it shows the consistency between questionnaire's questions as better as it is closer to 1 (Tavakol, Dennick, 2011).

All possible meanings of Cronbach's  $\alpha$  for this research are produced in the table of variables' measures (see Table 6). The Cronbach's  $\alpha$  cannot be counted only for firm financial performance (accordingly, to the general firm performance as well).

Cronbach's  $\alpha$  of the common scale of organizational ambidexterity is 0.844. It also includes exploration-oriented actions with  $\alpha=0.730$  and exploitation-oriented actions with  $\alpha=0.772$ . This indicates a particularly high consistency of the questions.

Cronbach's  $\alpha$  of the common scale of inter-organizational collaboration is 0.641. Cronbach's  $\alpha$  of the inter-organizational collaboration with research institution is 0.646. These questions confirm a high consistency of the questions as well. The minimum Cronbach's  $\alpha$  of the scales is 0.400 for the international collaboration with international networks. Even though most scholars agree that overall the meaning of Cronbach's  $\alpha$  has to be over 0.6, it is still perceived that minimal meanings of this scale are rather reliable in this study. This is due to the number of questions in the questionnaire. Since the questionnaire and scales are relatively narrow, the author of this study accepts this meaning as significant enough. Cronbach's  $\alpha$  of a firm competitive performance scale is 0.793, which is also above the critical level of 0.6.

The decision to exclude inter-organizational collaboration into two dimensions and to test inter-organizational collaboration with research institutions and inter-organizational collaboration with international networks separately was based on

theoretical reasons. According to Goosen (2015), differences between inter-organizational collaboration with research institutions and inter-organizational collaboration with international networks are relatively widely accepted in present research literature. Inter-organizational collaboration with international networks is accepted as an appropriate way to ensure knowledge sharing and to access external knowledge sources outside of the firm. Accordingly, inter-organizational collaboration with research institutions can be considered as an appropriate way to transfer this knowledge and make it “*work*” (Goosen, 2015). The joint impact of the two types of inter-organizational collaboration is considered to be important in the context of firms’ ambidexterity, i.e. firms’ ability to simultaneously implement distinct activities or to acquire distinct capabilities.

Firm performance is divided into two dimensions, including firm financial performance and firm competitive performance. This was proposed due to the reason that most studies which analyse the relations between organizational ambidexterity and firm performance, focus on financial issues. In order to evaluate financial performance properly, scholars need to evaluate firm’s financial performance results within a relatively wide time period. Since financial information is usually confidential, such evaluation evolves with a number of limitations. With the purpose to extend the existing research and enrich it with novel approaches, the author of this thesis included firm competitive performance as another dimension of firm performance. Firm competitive performance is a subjective measure that reflects managers’ opinion in relation to the explored variables and their inter-links.

### **2.3. Research hypotheses**

Decisions concerning the choice of appropriate management in dynamic and constantly changing environments are still extremely challenging for firms. It becomes crucial to manage the constantly emerging tensions in everyday activities. This points to the fact that firms face the necessity to be ambidextrous everyday (De Clercq *et al.*, 2013).

In general, the relationship between organizational ambidexterity and firm performance appears to be rather clear without the need of any extra confirmation. However, scholars (e.g. Chang and Hughes, 2012; De Clercq *et al.*, 2013) keep analysing this relationship as the concept of organizational ambidexterity is still considered to be relatively ambiguous and unexplored. With the growing flow of new research, new variables are periodically incorporated into empirical studies thus providing new insights into the field. Also, although Powell (year) mentioned that the possibility to strengthen the ambidexterity of a firm may rely on inter-organizational collaboration in 1990s, explorations in this field are still extremely lacking.

The relationship between organizational ambidexterity, inter-organizational collaboration and firm performance, however, was supported only theoretically until this period. Sun and Lo (2014) propose that these concepts have a positive relationship. Lee and Bae (2012) also provide the initial attempts to explore respective relationships. Nevertheless, the relationship between organizational ambidexterity, inter-organizational collaboration and firm performance still has a range of unexplored items. One of them is the role of inter-organizational collaboration in the

relationship between organizational ambidexterity and firm performance. Building on the theoretical approaches discussed in the previous sections, the author of this thesis suggests that inter-organizational collaboration should be explored as a mediating and a moderating variable in the relationship between organizational ambidexterity and firm performance. The empirical research is needed to test the following hypotheses:

**H1: Organizational ambidexterity has a direct impact on firm performance.**

**H2: Inter-organizational collaboration plays a moderating role in the relationship between organizational ambidexterity and firm performance.**

**H3: Inter-organizational collaboration plays a mediating role in the relationship between organizational ambidexterity and firm performance.**

Organizational ambidexterity is directed at exploration-oriented actions, including the search for new knowledge and competencies, launching new markets, and creating new products; and exploitation-oriented actions, including modifications and minor changes of the existing products and the use of existing resources, knowledge, and competencies. As these two types of firm actions are recognized as opposites, the author of this thesis expects that if these components of organizational ambidexterity are analysed separately, the empirical results may be different. Thus, H1 is structured as follows (see Table 11):

**Table 11.** Hypotheses for testing the direct relationship between organizational ambidexterity and firm performance

<b><i>H1: Organizational ambidexterity has a direct impact on firm performance.</i></b>	
<b><i>H1.1. Organizational ambidexterity has a direct impact on firm competitive performance</i></b>	
	<b><i>H1.1.1 Exploration-oriented actions have a direct impact on firm competitive performance</i></b>
	<b><i>H1.1.2 Exploitation-oriented actions have a direct impact on firm competitive performance</i></b>
<b><i>H1.2. Organizational ambidexterity has a direct impact on firm's financial performance</i></b>	
<b><i>H1.2.1. Organizational ambidexterity has a direct impact on firm revenue</i></b>	
	<b><i>H1.2.1a</i></b> Exploration-oriented actions have a direct impact on firm revenue.
	<b><i>H1.2.1b</i></b> Exploitation-oriented actions have a direct impact on firm revenue.
<b><i>H1.2.2. Organizational ambidexterity has a direct impact on the growth of firm revenue.</i></b>	
	<b><i>H1.2.2a</i></b> Exploration-oriented actions have a direct impact on the growth of firm revenue.
	<b><i>H1.2.2b</i></b> Exploitation-oriented actions have a direct impact on the growth of firm revenue.
<b><i>H1.2.3. Organizational ambidexterity has a direct impact on the firm exports revenue.</i></b>	



			<b>H1.2.3a</b> Exploration-oriented actions have a direct impact on the firm exports revenue.
			<b>H1.2.3b</b> Exploitation-oriented actions have a direct impact on the firm exports revenue.
		<b>H1.2.4.</b> <i>Organizational ambidexterity has a direct impact on the growth of firm exports revenue.</i>	
			<b>H1.2.4a</b> Exploration-oriented actions have a direct impact on the growth of firm exports revenue.
			<b>H1.2.4b</b> Exploitation-oriented actions have a direct impact on the growth of firm exports revenue.

(Source: made by author)

In this study, the concept of inter-organizational collaboration is analysed taking inter-organizational collaboration with research institutions and inter-organizational collaboration with international networks as two different dimensions of inter-organizational collaboration. This decision is based on presumptions that different types of collaboration may differently affect the relation between organizational ambidexterity and firm performance. Accordingly, H2 and H3 are scaled down into several levels with the purpose to analyse the relations between all concepts thoroughly (see Table 12).

**Table 12.** Hypotheses for testing the role of inter-organizational collaboration in the relationship between organizational ambidexterity and firm performance

<b><i>H2: Inter-organizational collaboration plays a moderating role in the relationship between organizational ambidexterity and firm performance.</i></b>			
		<b><u>H2.1: Inter-organizational collaboration plays a moderating role in the relationship between organizational ambidexterity and firm competitive performance</u></b>	
		<b>H2.1.1</b> <i>Collaboration with research institutions plays a moderating role in the relationship between organizational ambidexterity and firm competitive performance.</i>	
			<b>H2.1.1.1.</b> Collaboration with research institutions plays a moderating role in the relationship between exploration-oriented actions and firm competitive performance.
			<b>H2.1.1.2.</b> Collaboration with research institutions plays a moderating role in the relationship between exploitation-oriented actions and firm competitive performance
		<b>H2.1.2:</b> <i>Collaboration with international networks plays a moderating role in the relationship between organizational ambidexterity and firm competitive performance.</i>	
		<b>H2.1.2.1.</b> Collaboration with international networks plays a moderating role in the relationship between exploration-oriented actions and firm competitive performance.	

		<b>H2.1.2.2.</b> Collaboration with international networks plays a moderating role in the relationship between exploitation-oriented actions and firm competitive performance.
	<b><i>H2.2: Inter-organizational collaboration plays a moderating role in the relationship between organizational ambidexterity and firm financial performance</i></b>	
	<b><i>H2.2.1</i></b> Collaboration with research institutions plays a moderating role in the relationship between organizational ambidexterity and firm financial performance	
		<b>H2.2.1.1</b> Collaboration with research institutions plays a moderating role in the relationship between exploration-oriented actions and firm financial performance.
		<b>H2.2.1.1.a</b> Collaboration with research institutions plays a moderating role in the relationship between exploration-oriented actions and firm revenue.
		<b>H2.2.1.1.b</b> Collaboration with research institutions plays a moderating role in the relationship between exploration-oriented actions and the growth of firm revenue.
		<b>H2.2.1.1.c</b> Collaboration with research institutions plays a moderating role in the relationship between exploration-oriented actions and the firm exports revenue.
		<b>H2.2.1.1.d</b> Collaboration with research institutions plays a moderating role in the relationship between exploration-oriented actions and the growth of firm exports revenue.
		<b>H2.2.1.2</b> Collaboration with research institutions plays a moderating role in the relationship between exploitation-oriented actions and firm financial performance
		<b>H2.2.1.2.a</b> Collaboration with research institutions plays a moderating role in the relationship between exploitation-oriented actions and firm revenue.
		<b>H2.2.1.2.b</b> Collaboration with research institutions plays a moderating role in the relationship between exploitation-oriented actions and the growth of firm revenue
		<b>H2.2.1.2.c</b> Collaboration with research institutions plays a moderating role in the relationship between exploitation-oriented actions and the firm exports revenue
		<b>H2.2.1.2.d</b> Collaboration with research institutions plays a moderating role in the relationship between exploitation-oriented actions and the growth of firm exports revenue.
	<b><i>H2.2.2: Collaboration with international networks plays a moderating role in the relationship between organizational ambidexterity and firm financial performance</i></b>	
		<b>H2.2.2.1</b> Collaboration with international networks plays a moderating role in the relationship between exploration-oriented actions and firm financial performance

			<b>H2.2.2.1.a</b> Collaboration with international networks plays a moderating role in the relationship between exploration-oriented actions and firm revenue
			<b>H2.2.2.1.b</b> Collaboration with international networks plays a moderating role in the relationship between exploration-oriented actions and the growth of firm revenue
			<b>H2.2.2.1.c</b> Collaboration with international networks plays a moderating role in the relationship between exploration-oriented actions and the firm exports revenue
			<b>H2.2.2.1.d</b> Collaboration with international networks plays a moderating role in the relationship between exploration-oriented actions and the growth of firm exports revenue
		<b>H2.2.2.2</b> Collaboration with international plays a moderating role in the relationship between exploitation-oriented actions and firm financial performance	
			<b>H2.2.2.2.a</b> Collaboration with international networks plays a moderating role in the relationship between exploitation-oriented actions and firm revenue
			<b>H2.2.2.2.b</b> Collaboration with international networks plays a moderating role in the relationship between exploitation-oriented actions and the growth of firm revenue
			<b>H2.2.2.2.c</b> Collaboration with international networks plays a moderating role in the relationship between exploitation-oriented actions and the firm exports revenue
			<b>H2.2.2.2.d</b> Collaboration with international networks plays a moderating role in the relationship between exploitation-oriented actions and the growth of firm exports revenue.

***H3: Inter-organizational collaboration plays a mediating role in the relationship between organizational ambidexterity and firm performance.***

	<b><i><u>H3.1: Inter-organizational collaboration plays a mediating role in the relationship between organizational ambidexterity and firm competitive performance</u></i></b>		
	<b><i>H3.1.1</i></b> Collaboration with research institutions plays a mediating role in the relationship between organizational ambidexterity and firm competitive performance		
		<b>H3.1.1.1.</b> Collaboration with research institutions plays a mediating role in the relationship between exploration-oriented actions and firm competitive performance.	
		<b>H3.1.1.2.</b> Collaboration with research institutions plays a mediating role in the relationship between exploitation-oriented actions and firm competitive performance	
	<b><i>H3.1.2: Collaboration with international networks plays a mediating role in the relationship between organizational ambidexterity and firm competitive performance</i></b>		

		<b>H3.1.2.1.</b> Collaboration with international networks plays a mediating role in the relationship between exploration-oriented actions and firm competitive performance.
		<b>H3.1.2.2.</b> Collaboration with international networks plays a mediating role in the relationship between exploitation-oriented actions and firm competitive performance.
<b><u>H3.2: Inter-organizational collaboration plays a mediating role in the relationship between organizational ambidexterity and firm financial performance</u></b>		
	<b>H3.2.1</b> Collaboration with research institutions plays a mediating role in the relationship between organizational ambidexterity and firm financial performance	
		<b>H3.2.1.1</b> Collaboration with research institutions plays a mediating role in the relationship between exploration-oriented actions and firm financial performance
		<b>H3.2.1.1.a</b> Collaboration with research institutions plays a mediating role in the relationship between exploration-oriented actions and firm revenue
		<b>H3.2.1.1.b</b> Collaboration with research institutions plays a mediating role in the relationship between exploration-oriented actions and the growth of firm revenue
		<b>H3.2.1.1.c</b> Collaboration with research institutions plays a mediating role in the relationship between exploration-oriented actions and the firm exports revenue
		<b>H3.2.1.1.d</b> Collaboration with research institutions plays a mediating role in the relationship between exploration-oriented actions and the growth of firm exports revenue
	<b>H3.2.1.2</b> Collaboration with research institutions plays a mediating role in the relationship between exploitation-oriented actions and firm financial performance	
		<b>H3.2.1.2.a</b> Collaboration with research institutions plays a mediating role in the relationship between exploitation-oriented actions and firm revenue
		<b>H3.2.1.2.b</b> Collaboration with research institutions plays a mediating role in the relationship between exploitation-oriented actions and the growth of firm revenue
		<b>H3.2.1.2.c</b> Collaboration with research institutions plays a mediating role in the relationship between exploitation-oriented actions and the firm exports revenue
		<b>H3.2.1.2.d</b> Collaboration with research institutions plays a mediating role in the relationship between exploitation-oriented actions and the growth of firm exports revenue
	<b>H3.2.2:</b> Collaboration with international networks plays a mediating role in the relationship between organizational ambidexterity and firm financial performance	

			<b>H3.2.2.1</b> Collaboration with international networks plays a mediating role in the relationship between exploration-oriented actions and firm financial performance
			<b>H3.2.2.1.a</b> Collaboration with international networks plays a mediating role in the relationship between exploration-oriented actions and firm revenue
			<b>H3.2.2.1.b</b> Collaboration with international networks plays a mediating role in the relationship between exploration-oriented actions and the growth of firm revenue
			<b>H3.2.2.1.c</b> Collaboration with international networks plays a mediating role in the relationship between exploration-oriented actions and the firm exports revenue
			<b>H3.2.2.1.d</b> Collaboration with international networks plays a mediating role in the relationship between exploration-oriented actions and the growth of firm exports revenue
			<b>H3.2.2.2</b> Collaboration with international plays a mediating role in the relationship between exploitation-oriented actions and firm financial performance
			<b>H3.2.2.2.a</b> Collaboration with international networks plays a mediating role in the relationship between exploitation-oriented actions and firm revenue
			<b>H3.2.2.2.b</b> Collaboration with international networks plays a mediating role in the relationship between exploitation-oriented actions and the growth of firm revenue
			<b>H3.2.2.2.c</b> Collaboration with international networks plays a mediating role in the relationship between exploitation-oriented actions and the firm exports revenue
			<b>H3.2.2.2.d</b> Collaboration with international networks plays a mediating role in the relationship between exploitation-oriented actions and the growth of firm exports revenue

(Source: made by author)

All hypotheses are based on the theoretical analysis from previous sections of the thesis. They were raised with the purpose to achieve the aims and objectives of this thesis as well as eliminate the theoretical and empirical research gaps discussed within the theoretical context.

In order to ensure an explicit analysis of the research phenomenon, the research was relied in the qualitative research method. Building on the theoretical analysis and hypotheses raised above, the author of this thesis proposes several propositions to explore:

**P1.** Firms in the innovative sectors are more ambidextrous.

**P2.** Firms in the innovative sectors tend to maintain vitality and development of inter-organizational networks, while firms in the non-innovative sectors mostly confine themselves with stable networks.

**P3.** Firms from both innovative and non-innovative sectors expand their collaborative networks differently, possess different collaboration purposes, and collaborate with different partners.

### **3. EMPIRICAL RESEARCH RESULTS**

This section introduces the results received after collecting and analysing the data. It provides the general results of descriptive statistics as well as tests all proposed hypotheses. The section finishes with a summary of research results and research limitations.

#### **3.1. An analysis of quantitative research results: quantitative testing of mediation and moderation**

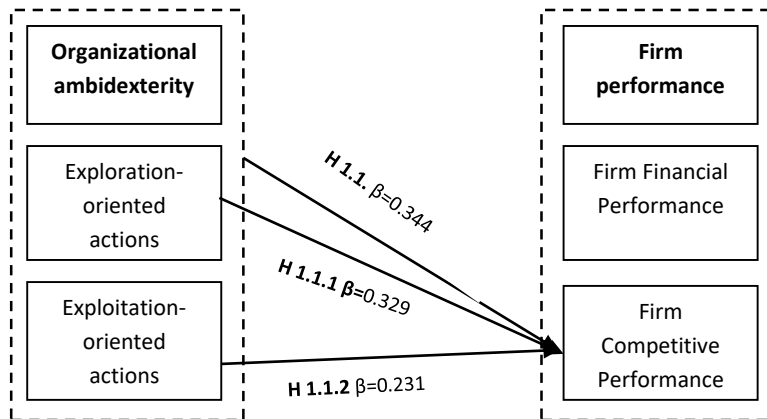
This section of the research focuses on identifying the role of inter-organizational collaboration in the relationship between organizational ambidexterity and firm performance. In the quantitative part of the research, multiple regression analysis was used in order to explore the selected relations in the research model and accept or reject a hypothesis. Traditionally, multiple regression is used to test the components of research testing them simultaneously. When the theoretical part of the research suggests an interest to examine sets of regression components in a different (pre-specified) sequence or there is a need to explore richer models with more regression components, it is rational to use hierarchical regression (Teo, 2013). In this research, hierarchical regression is used to test the moderation and mediation hypotheses. For statistical calculations, PROCESS for SPSS was used. PROCESS is designed by A. F. Hayes (2013) and is one of the most commonly used method for simple (or multiple) mediation and moderation models.

##### **3.1.1. Results of Hypothesis 1. Organizational ambidexterity has a direct impact on firm performance**

To clarify the role of inter-organizational collaboration in the relationship between organizational ambidexterity and firm performance, the first step was to test the direct relationship between organizational ambidexterity and firm performance.

As discussed previously, the direct relation between organizational ambidexterity and firm performance is not new. However, on the one hand, it is necessary to test the direct relationship between dependent and independent variables before analysing further relationships with additional variables. On the other hand, this thesis proposes a novel approach as well as the direct relationship between different dimensions of organizational ambidexterity and different types of firm performance.

The regression analysis confirmed that organizational ambidexterity has a direct impact on firm competitive performance ( $R=0.586$ ;  $R\text{-sq.}=0.344$ ;  $p=0.000$ ). After testing separate dimensions of organizational ambidexterity, it was possible to confirm the direct relationship between exploration-oriented actions and firm competitive performance ( $R=0.574$ ;  $R\text{-sq.}=0.329$ ;  $p=0.000$ ) as well as between exploitation-oriented actions and firm competitive performance ( $R=0.481$ ;  $R\text{-sq.}=0.231$ ;  $p=0.000$ ) (see Figure 4).



**Figure 4.** Testing the direct relationship between organizational ambidexterity and firm performance (Source: made by author)

Accordingly, the same analyses were performed in order to test the direct relationship between organizational ambidexterity and firm financial performance. The summarized results of testing the hypothesis that organizational ambidexterity has a direct impact on firm financial performance (H1.2) are provided in Table 13.

**Table 13.** Testing hypothesis H1.2

<i>Hypotheses</i>	<i>R</i>	<i>R-sq.</i>	<i>p</i>
<b>H1.2.1</b> Organizational ambidexterity has a direct impact on firm revenue (2011).	0.141	0.020	0.0290
<b>H1.2.1</b> Organizational ambidexterity has a direct impact on firm revenue (2012).	0.226	0.116	0.0520
<b>H1.2.1a</b> Exploration-oriented actions have a direct impact on firm revenue (2011).	0.205	0.111	0.0200
<b>H1.2.1a</b> Exploration-oriented actions have a direct impact on firm revenue (2012).	0.171	0.105	0.0345
<b>H1.2.1b</b> Exploitation-oriented actions have a direct impact on firm revenue (2011).	0.214	0.101	0.0468
<b>H1.2.1b</b> Exploitation-oriented actions have a direct impact on firm revenue (2012).	0.106	0.090	0.0359
<b>H1.2.2</b> Organizational ambidexterity has a direct impact on the growth of firm revenue.	0.196	0.088	0.0213
<b>H1.2.2a</b> Exploration-oriented actions have a direct impact on the growth of firm revenue.	0.253	0.123	0.0402
<b>H1.2.2b</b> Exploitation-oriented actions have a direct impact on the growth of firm revenue.	0.298	0.139	0.0187
<b>H1.2.3</b> Organizational ambidexterity has a direct impact on firm exports revenue (2011).	0.413	0.171	0.1053
<b>H1.2.3</b> Organizational ambidexterity has a direct impact on firm exports revenue (2012).	0.346	0.120	0.1338



<b>H1.2.3a</b> Exploration-oriented actions have a direct impact on firm exports revenue (2011).	0.141	0.020	0.5210
<b>H1.2.3a</b> Exploration-oriented actions have a direct impact on firm exports revenue (2012).	0.184	0.034	0.4242
<b>H1.2.3b</b> Exploitation-oriented actions have a direct impact on firm exports revenue (2011).	0.385	0.148	0.0632
<b>H1.2.3b</b> Exploitation-oriented actions have a direct impact on firm exports revenue (2012).	0.302	0.091	0.1831
<b>H1.2.4</b> Organizational ambidexterity has a direct impact on the growth of firm exports revenue.	0.748	0.559	0.1299
<b>H1.2.4a</b> Exploration-oriented actions have a direct impact on the growth of firm exports revenue.	0.089	0.008	0.8340
<b>H1.2.4b</b> Exploitation-oriented actions have a direct impact on the growth of firm exports revenue.	0.547	0.299	0.2161

(Source: made by author)

After analysing the relationship between separate dimensions of organizational ambidexterity and firm financial performance, the results confirmed that exploitation-oriented actions and exploration-oriented actions have a direct impact on firm revenue and its growth. However, the relationships appear to be relatively weak (meanings of R and R-sq.). While testing the relationships with data of exports revenue, the results raised some doubts about these links. All tested relationships between organizational ambidexterity and exports revenue were rejected. Since there was no direct relation to the exports revenue and its changes, the author decided to eliminate the exports revenue data and test the relation between organizational ambidexterity and firm financial performance data one more time. This time only firm revenue (in year 2011 and 2012) and growth of firm revenue data were tested as firm financial performance (Table 14).

**Table 14.** Repeated testing of hypothesis H1.2

<i>Hypotheses</i>	<i>R</i>	<i>R-sq.</i>	<i>p</i>
<b>H1.2.1</b> Organizational ambidexterity has a direct impact on firm revenue (2011).	0.311	0.220	0.0002
<b>H1.2.1</b> Organizational ambidexterity has a direct impact on firm revenue (2012).	0.386	0.258	0.0254
<b>H1.2.1a</b> Exploration-oriented actions have a direct impact on firm revenue (2011).	0.325	0.241	0.0200
<b>H1.2.1a</b> Exploration-oriented actions have a direct impact on firm revenue (2012).	0.351	0.223	0.0054
<b>H1.2.1b</b> Exploitation-oriented actions have a direct impact on firm revenue (2011).	0.314	0.202	0.0082
<b>H1.2.1b</b> Exploitation-oriented actions have a direct impact on firm revenue (2012).	0.402	0.307	0.0001
<b>H1.2.2</b> Organizational ambidexterity has a direct impact on the growth of firm revenue.	0.366	0.238	0.0210
<b>H1.2.2a</b> Exploration-oriented actions have a direct impact on the growth of firm revenue.	0.353	0.243	0.0040
<b>H1.2.2b</b> Exploitation-oriented actions have a direct impact on the growth of firm revenue.	0.388	0.236	0.0018

Table 14 reveals that the tested relationships between organizational ambidexterity and firm financial performance appeared to be considerably stronger. Based on these results, the author eliminated the exports revenue data while testing further moderation and mediation models as well.

### 3.1.2. Results of Hypothesis 2. Inter-organizational collaboration plays a moderating role in the relationship between organizational ambidexterity and firm performance

The direct relationship between organizational ambidexterity and firm performance was confirmed in the previous section. Following the aims and logic of this research, the next step is to test whether inter-organizational collaboration plays a moderating role in the relation between organizational ambidexterity and firm performance.

Including a moderating variable into a particular relationship between the other two variables, i.e. dependent and independent, helps to explain the conditions under which dependent and independent variables are related (Hayes, 2013). Following Hayes' (2013) ideas, this research tests whether inter-organizational collaboration helps to increase the effect of direct relationship between organizational ambidexterity and firm performance.

To test the hypothesis that inter-organizational collaboration is a moderator in the relationship between organizational ambidexterity and firm performance, a hierarchical multiple regression analysis was performed. The process of testing the moderation hypotheses was implemented step by step. This was done in accordance with the decision to test different dimensions of all explored concepts separately. The results of regression analysis helped to confirm the hypothesis that inter-organizational collaboration plays a moderating role in the relationship between organizational ambidexterity and firm competitive performance.

The results denied the hypotheses that collaboration with research institutions plays a moderating role in the relationship between exploration-oriented actions and firm competitive performance ( $R=0.2905$ ;  $R\text{-sq.}=0.0844$ ;  $p=0.6727$ ) as well as that collaboration with research institutions plays a moderating role in the relationship between exploitation-oriented actions and firm competitive performance ( $R=0.5512$ ;  $R\text{-sq.}=0.3038$ ;  $p=0.6577$ ). Accordingly, the hypothesis that collaboration with research institutions plays a moderating role in the relationship between organizational ambidexterity and firm competitive performance was rejected as well ( $R=0.1690$ ;  $R\text{-sq.}=0.0286$ ;  $p=0.0504$ ). Results are summarized in Table 15.

**Table 15.** Testing hypothesis H2.1.1

<i>Hypotheses</i>	<i>R</i>	<i>R-sq.</i>	<i>p</i>
<b>H2.1.1.</b> Collaboration with research institutions plays a moderating role in the relationship between organizational ambidexterity and firm competitive performance.	0.1690	0.0286	0.0504

<b>H2.1.1.1.</b> Collaboration with research institutions plays a moderating role in the relationship between exploration-oriented actions and firm competitive performance.	0.2905	0.0844	0.6727
<b>H2.1.1.2.</b> Collaboration with research institutions plays a moderating role in the relationship between exploitation-oriented actions and firm competitive performance	0.5512	0.3038	0.6577

(Source: made by author)

The hypothesis that collaboration with international networks plays a moderating role in the relationship between organizational ambidexterity and firm competitive performance was rejected ( $R=0.3936$ ;  $R\text{-sq.}=0.1549$ ;  $p=0.3275$ ). A weak but positive moderation of collaboration with international networks exists in the relationship between exploration-oriented actions and firm competitive performance ( $R=0.2855$ ;  $R\text{-sq.}=0.1428$ ;  $p=0.0420$ ), but there is no moderation in the relationship between exploitation-oriented actions and firm competitive performance ( $R=0.7651$ ;  $R\text{-sq.}=0.5854$ ;  $p=0.0673$ ). The results are summarized in Table 16.

**Table 16.** Testing hypothesis H2.1.2

<i>Hypotheses</i>	<i>R</i>	<i>R-sq.</i>	<i>p</i>
<b>H2.1.2.</b> Collaboration with international networks plays a moderating role in the relationship between organizational ambidexterity and firm competitive performance.	0.3936	0.1549	0.3275
<b>H2.1.2.1.</b> Collaboration with international networks plays a moderating role in the relationship between exploration-oriented actions and firm competitive performance	0.2855	0.1428	0.0420
<b>H2.1.2.2.</b> Collaboration with international networks plays a moderating role in the relationship between exploitation-oriented actions and firm competitive performance.	0.7651	0.5854	0.0673

(Source: made by author)

An analysis of the results rejected the hypothesis that inter-organizational collaboration plays a moderating role in the relationship between organizational ambidexterity and firm competitive performance.

The second step was to test whether inter-organizational collaboration can be considered as a moderator in the relationship between organizational ambidexterity and firm financial performance. Firstly, the research tested whether collaboration with research institutions plays a moderating role in the relationship between organizational ambidexterity and firm financial performance.

The hypothesis that collaboration with research institutions plays a moderating role in the relationship between exploration-oriented actions and firm financial performance was rejected. There was no moderating effect with any of the selected measures for firm financial performance (Table 17).

**Table 17.** Testing hypothesis H2.2.1.1

<i>Hypotheses</i>	<i>R</i>	<i>R-sq.</i>	<i>p</i>
<b>H2.2.1.1.a</b> Collaboration with research institutions plays a moderating role in the relationship between exploration-oriented actions and firm revenue (2011):	0.2121	0.0450	0.0788

<b>H2.2.1.1.a</b> Collaboration with research institutions plays a moderating role in the relationship between exploration-oriented actions and firm revenue (2012):	0.1076	0.116	0.5686
<b>H2.2.1.1.b</b> Collaboration with research institutions plays a moderating role in the relationship between exploration-oriented actions and the growth of firm revenue.	0.1945	0.378	0.1534

(Source: made by author)

Similarly, the study tested whether collaboration with research institutions plays a moderating role in the relationship between exploitation-oriented actions and firm financial performance. The hypothesis that collaboration with research institutions plays a moderating role in the relationship between exploitation-oriented actions and firm financial performance was rejected as well. There was no moderating effect with any of the selected measures for firm financial performance (Table 18).

**Table 18.** Testing hypothesis H2.2.1.2

<i>Hypotheses</i>	<i>R</i>	<i>R-sq.</i>	<i>p</i>
<b>H2.2.1.2.a</b> Collaboration with research institutions plays a moderating role in the relationship between exploitation-oriented actions and firm revenue (2011).	0.2137	0.0456	0.0724
<b>H2.2.1.2.a</b> Collaboration with research institutions plays a moderating role in the relationship between exploitation-oriented actions and firm revenue (2012).	0.1159	0.0134	0.4908
<b>H2.2.1.2.b</b> Collaboration with research institutions plays a moderating role in the relationship between exploitation-oriented actions and the growth of firm revenue.	0.2169	0.0470	0.0830

(Source: made by author)

is the results clearly indicate that collaboration with research institutions does not play a moderating role in the relationship between organizational ambidexterity and firm financial performance. Accordingly, the same steps were done with the purpose to test whether collaboration with international networks plays a moderating role in the relationship between organizational ambidexterity and firm financial performance.

The results rejected all assumptions that collaboration with international networks plays a moderating role in the relationship between exploration-oriented actions and firm revenue in 2011 ( $R=0.1590$ ;  $R\text{-sq.}=0.0253$ ;  $p=0.2868$ ) and in 2012 ( $R=0.1075$ ;  $R\text{-sq.}=0.0116$ ;  $p=0.5710$ ). Collaboration with international networks plays a moderating role in the growth of firm revenue. Even though the moderating effect is relatively weak ( $R=0.2918$ ;  $R\text{-sq.}=0.0852$ ;  $p=0.0069$ ), the author decided to accept this as a positive effect due to the low number of questions in the scale of inter-organizational collaborations (Table 19).

**Table 19.** Testing hypothesis H2.2.2.1

<i>Hypotheses</i>	<i>R</i>	<i>R-sq.</i>	<i>p</i>
<b>H2.2.2.1.a</b> Collaboration with international networks plays a moderating role in the relationship between exploration-oriented actions and firm revenue (2011).	0.1590	0.0253	0.2868

<b>H2.2.2.1.a</b> Collaboration with international networks plays a moderating role in the relationship between exploration-oriented actions and firm revenue (2012).	0.1075	0.0116	0.5710
<b>H2.2.2.1.b</b> Collaboration with international networks plays a moderating role in the relationship between exploration-oriented actions and the growth of firm revenue.	0.2918	0.0852	0.0069

(Source: made by author)

Previous results strongly suggest a rejection of the hypothesis that collaboration with international networks plays a moderating role in the relationship between exploration-oriented actions and firm financial performance (H2.2.2.1).

Further, the same analysis was performed in order to test whether collaboration with international networks plays a moderating role in the relationship between organizational ambidexterity and firm financial performance. The moderating effect (though relatively weak as well) of collaboration with international networks was revealed between exploitation-oriented actions and firm revenue in 2011 ( $R=0.4430$ ;  $R\text{-sq.}=0.1962$ ;  $p=0.0214$ ), but it was rejected in the year 2012 ( $R=0.0373$ ;  $R\text{-sq.}=0.0014$ ;  $p=0.9697$ ). The moderating effect of collaboration with international networks was rejected in the relationship between exploitation-oriented actions and growth of firm revenue ( $R=0.4430$ ;  $R\text{-sq.}=0.1962$ ;  $p=0.2146$ ) as well. Accordingly, collaboration with international networks was not approved as a moderator in the relationship between exploitation-oriented actions and different firm financial performance dimensions (Table 20).

**Table 20.** Testing hypothesis H2.2.2.2

<i>Hypotheses</i>	<i>R</i>	<i>R-sq.</i>	<i>p</i>
<b>H2.2.2.2.a</b> Collaboration with international networks plays a moderating role in the relationship between exploitation-oriented actions and firm revenue (2011).	0.4430	0.1962	0.0214
<b>H2.2.2.2.a</b> Collaboration with international networks plays a moderating role in the relationship between exploitation-oriented actions and firm revenue (2012).	0.0373	0.0014	0.9697
<b>H2.2.2.2.b</b> Collaboration with international networks plays a moderating role in the relationship between exploitation-oriented actions and the growth of firm revenue.	0.4430	0.1962	0.2146

(Source: made by author)

Based on the research results, the hypothesis that collaboration with international networks plays a moderating role in the relationship between organizational ambidexterity and firm financial performance (H2.2.2) was rejected. All summarized results rejected the hypothesis that inter-organizational collaboration can be considered as a moderator in the relationship between organizational ambidexterity and firm financial performance. The results showed that inter-organizational collaboration cannot be considered as a moderator in the relation between organizational ambidexterity and firm competitive performance. Therefore, the general hypothesis that inter-organizational collaboration plays a moderating role

in the relationship between organizational ambidexterity and firm performance (H2) is rejected.

### 3.1.3. Results of Hypothesis 3. Inter-organizational collaboration plays a mediating role in the relationship between organizational ambidexterity and firm performance

The final step for testing the role of inter-organizational collaboration in the relationship between organizational ambidexterity and firm performance was including inter-organizational collaboration as a mediator.

Including a mediator into a particular relationship between other two variables, i.e. dependent and independent, helps to explain whether the mediating variable is able to strengthen the primary relationship (Hayes, 2013). Following Hayes' (2013) ideas, this research tested whether inter-organizational collaboration helps to strengthen the direct relationship between organizational ambidexterity and firm performance.

The mediation model was tested step by step, as it was done in the previous section with moderation. Firstly, it was confirmed that inter-organizational collaboration plays a mediating role in the relationship between organizational ambidexterity and firm competitive performance (H3.1).

According to the results, collaboration with research institutions plays a mediating role in the relationship between exploration-oriented actions and firm competitive performance ( $R=0.5780$ ;  $R\text{-sq.}=0.3341$ ;  $p=0.000$ ) as well as between exploitation-oriented actions and firm competitive performance ( $R=0.4913$ ;  $R\text{-sq.}=0.2414$ ;  $p=0.000$ ). This allows to confirm hypothesis H3.1.1, which claims that collaboration with research institutions plays a mediating role in the relationship between organizational ambidexterity and firm competitive performance.

An analysis of the results allows to confirm the hypothesis that collaboration with international networks plays a mediating role in the relationship between organizational ambidexterity and firm competitive performance (H3.1.2). Collaboration with international networks plays a mediating role in the relationship between exploration-oriented actions and firm competitive performance ( $R=0.5823$ ;  $R\text{-sq.}=0.3391$ ;  $p=0.000$ ) as well as between exploitation-oriented actions and firm competitive performance ( $R=0.4852$ ;  $R\text{-sq.}=0.2354$ ;  $p=0.000$ ). The results are summarized in Table 21.

**Table 21.** Testing hypothesis H3.1.

<i>Hypotheses</i>	<i>R</i>	<i>R-sq.</i>	<i>p</i>
<b>H3.1.1.1.</b> Collaboration with research institutions plays a mediating role in the relationship between exploration-oriented actions and firm competitive performance.	0.5780	0.3341	0.000
<b>H3.1.1.2.</b> Collaboration with research institutions plays a mediating role in the relationship between exploitation-oriented actions and firm competitive performance	0.4913	0.2414	

<b>H3.1.2.1.</b> Collaboration with international networks plays a mediating role in the relationship between exploration-oriented actions and firm competitive performance.	0.5823	0.3391	
<b>H3.1.2.2.</b> Collaboration with international networks plays a mediating role in the relationship between exploitation-oriented actions and firm competitive performance.	0.4852	0.2354	

(Source: made by author)

The results were then analysed to find out whether collaboration with research institutions plays a mediating role in the relationship between organizational ambidexterity and firm financial performance (H3.2). The hypotheses that collaboration with research institutions plays a mediating role in the relationship between organizational ambidexterity and firm financial performance (H3.2.1) and that collaboration with international networks plays a mediating role in the relationship between organizational ambidexterity and firm financial performance (H3.2.2) were tested separately.

Research results show that a mediating effect of collaboration with research institutions exists in the relationship between exploration-oriented actions and firm revenue as well as in the relationship between exploration-oriented actions and the growth of firm revenue. Although the effect is relatively weak, the hypothesis that collaboration with research institutions plays a mediating role in the relationship between exploration-oriented actions and firm financial performance (H3.2.1.1) is accepted. The hypothesis that collaboration with research institutions plays a mediating role in the relationship between exploration-oriented actions and firm revenue in 2011 is accepted with the results  $R=0.3703$ ;  $R\text{-sq.}=0.1731$ ;  $p=0.0008$ . The hypothesis that collaboration with research institutions plays a mediating role in the relationship between exploration-oriented actions and firm revenue in 2012 is accepted with the results  $R=0.3401$ ;  $R\text{-sq.}=0.1785$ ;  $p=0.0002$ . Accordingly, the presumption that collaboration with research institutions plays a mediating role in the relationship between exploration-oriented actions and the growth of firm revenue is accepted with the results  $R=0.3802$ ;  $R\text{-sq.}=0.1901$ ;  $p=0.0003$ ). Following these results, the hypothesis that collaboration with research institutions plays a mediating role in the relationship between exploration-oriented actions and firm financial performance is confirmed (Table 22).

**Table 22.** Testing hypothesis H3.2.1.

<i>Hypotheses</i>	<i>R</i>	<i>R-sq.</i>	<i>p</i>
<b>H3.2.1.1.a</b> Collaboration with research institutions plays a mediating role in the relationship between exploration-oriented actions and firm revenue (2011):	0.3703	0.1731	0.0008
<b>H3.2.1.1.a</b> Collaboration with research institutions plays a mediating role in the relationship between exploration-oriented actions and firm revenue (2012):	0.3401	0.1785	0.0002
<b>H3.2.1.1.b</b> Collaboration with research institutions plays a mediating role in the relationship between exploration-oriented actions and the growth of firm revenue.	0.3802	0.1901	0.0003

(Source: made by author)

Similarly, the analysis highlighted the mediating effect of collaboration with research institutions in the relationship between exploitation-oriented actions and firm revenue as well as in the relationship between exploitation-oriented actions and the growth of firm revenue. The hypothesis that collaboration with research institutions plays a mediating role in the relationship between exploitation-oriented actions and firm revenue in 2011 was accepted with the results  $R=0.3033$ ;  $R\text{-sq.}=0.1413$ ;  $p=0.0422$ . The hypothesis that collaboration with research institutions plays a mediating role in the relationship between exploitation-oriented actions and firm revenue in 2012 was accepted with the results  $R=0.3257$ ;  $R\text{-sq.}=0.1509$ ;  $p=0.0022$ . The hypothesis that collaboration with research institutions plays a mediating role in the relationship between exploitation-oriented actions and the growth of firm revenue was accepted with the results  $R=0.3156$ ;  $R\text{-sq.}=0.1465$ ;  $p=0.0366$  (Table 23).

**Table 23.** Testing hypothesis H3.2.1.2.

<i>Hypotheses</i>	<i>R</i>	<i>R-sq.</i>	<i>p</i>
<b>H3.2.1.2.a</b> Collaboration with research institutions plays a mediating role in the relationship between exploitation-oriented actions and firm revenue (2011):	0.3033	0.1413	0.0422
<b>H3.2.1.2.a</b> Collaboration with research institutions plays a mediating role in the relationship between exploitation-oriented actions and firm revenue (2012):	0.3257	0.1509	0.0022
<b>H3.2.1.2.b</b> Collaboration with research institutions plays a mediating role in the relationship between exploitation-oriented actions and the growth of firm revenue.	0.3156	0.1465	0.0366

(Source: made by author)

Based on the results, the hypothesis that collaboration with research institutions plays a mediating role in the relationship between organizational ambidexterity and firm financial performance (H3.2.1) was accepted.

The same procedures were performed in order to test if collaboration with international networks plays a mediating role in the relationship between organizational ambidexterity and firm financial performance (H3.2.2). Research results were similar to the results received while testing hypothesis H3.2.1. The hypotheses that collaboration with international networks plays a mediating role in the relationship between exploration-oriented actions and firm revenue as well as between exploitation-oriented actions and firm revenue were accepted. Accordingly, the hypotheses that collaboration with international networks plays a mediating role in the relationship between exploration-oriented actions and growth of revenue as well as between exploitation-oriented actions and growth of firm revenue were accepted as well. Only the hypothesis that collaboration with international networks plays a mediating role in the relationship between exploitation-oriented actions and firm revenue was rejected while testing firm revenue data of the year 2011. All these results are generalized in Table 24.



**Table 24.** Testing the hypothesis H3.2.2.

<i>Hypotheses</i>	<i>R</i>	<i>R-sq.</i>	<i>p</i>
<b>H3.2.2.1.a</b> Collaboration with international networks plays a mediating role in the relationship between exploration-oriented actions and firm revenue (2011):	0.3176	0.1473	0.0073
<b>H3.2.2.1.a</b> Collaboration with international networks plays a mediating role in the relationship between exploration-oriented actions and firm revenue (2012):	0.3114	0.1970	0.000
<b>H3.2.2.1.b</b> Collaboration with international networks plays a mediating role in the relationship between exploration-oriented actions and the growth of firm revenue.	0.2999	0.1224	0.0029
<b>H3.2.2.2.a</b> Collaboration with international networks plays a mediating role in the relationship between exploitation-oriented actions and firm revenue (2011):	0.1986	0.0821	0.0668
<b>H3.2.2.2.a</b> Collaboration with international networks plays a mediating role in the relationship between exploitation-oriented actions and firm revenue (2012):	0.3294	0.1398	0.0071
<b>H3.2.2.2.b</b> Collaboration with international networks plays a mediating role in the relationship between exploitation-oriented actions and the growth of firm revenue.	0.3772	0.1769	0.0039

(Source: made by author)

The results of this research allowed to confirm the hypothesis with presumptions that collaboration with international networks plays a mediating role in the relationship between organizational ambidexterity and firm financial performance (H3.2.2). Therefore, the general hypothesis that inter-organizational collaboration plays a mediating role in the relationship between organizational ambidexterity and firm performance (H3) is confirmed and accepted.

### **3.2. Analysis of qualitative research results: a comparison between firms from innovative and non-innovative sectors**

One of the reasons to implement qualitative research in this thesis was to discuss the impact which organizational ambidexterity has on firm performance results in greater detail. Based on scientific literature, this thesis defines organizational ambidexterity as simultaneous implementation of exploration-oriented actions and exploitation-oriented actions. It is important to mention that during the interviews, respondents consistently compared exploration-oriented actions to radical changes and radical innovation, and considered exploitation-oriented actions to be minor changes and incremental innovation. These alignments are justified in the scientific literature as well (e.g. Mattes and Ohr, 2013) and briefly discussed in the literature review of this thesis.

Two questions were included in order to explore the development of organizational ambidexterity. During the interviews, the author asked how much time does a firm need to introduce new products or services to the market and how often (in what periodicity) does the firm introduce products or services. Relevant issues appeared when the answers of all respondents were compared as well as the managers' and employees' answers (Table 25).

**Table 25.** Introduction of new products/services

Sector	Document name	Code	Answer
inn	A case	development/ Innovative/mngr	1 year, sometimes more.
inn	A case	development / innovative/empl	Yes, sometimes, more than 1 year. It can take 4 years.
inn	A case	development/ innovative/empl	Calculating the average, up to 10–15 new would be fine, even more would be better.
inn	A case	development/ innovative/empl	Of course, the more the better
inn	B case	development/ innovative/mngr	A year.
inn	B case	development/ innovative/empl	I would say that this takes a long time. I think it takes a year or more.
inn	B case	development/ innovative/empl	Very rarely because the market is full of everything.
inn	C case	development/ innovative/mngr	It varies from a year to two.
inn	C case	development/ innovative/empl	An average project from 2 to 3 years.
inn	C case	development/ innovative/empl	Yearly.
inn	D case	development/ innovative/mngr	If we have something and it requires only improvement it may take half a year, a year. But if we have to start from a fresh idea and we have to develop a conception it may take several years.
inn	D case	development/ innovative/empl	We introduce a new product once per year, once per half a year.
inn	D case	development/ innovative/empl	But in general, 3–4 years and several years are needed.
inn	D case	development/ innovative/empl	We introduce innovative products once per two years approximately.
inn	E case	development/ innovative/mngr	It takes half a year.
inn	E case	development/ innovative/empl	It is difficult to say how long it takes
inn	F case	development/ innovative/mngr	The last service within half a year
inn	F case	development/ innovative/empl	For example, I have two ideas, I work a lot on one, but little on the other. It is difficult to assess. Maybe a year.
inn	F case	development/ innovative/empl	Once a year.

<b>non-inn</b>	G case	development/ non-innovative/ mngr	From minutes to hours. It depends on what the production queue is. There might be a queue for 3–4 months
<b>non-inn</b>	G case	development/ non-innovative/ empl	The minimum is a month but here a lot depends on the product. In general, it takes 3–4 months on average.
<b>non-inn</b>	G case	development/ non-innovative/ empl	When a new client comes, a new product appears.
<b>non-inn</b>	G case	development/ non-innovative/ empl	We have big projects which last for a year. In general, every month we have a new product. And every month it might be more than one product. They are all different, different sizes.
<b>non-inn</b>	H case	development/ non-innovative/ mngr	It takes from 3 to 4 months.
<b>non-inn</b>	H case	development/ non-innovative/ empl	3–4 weeks or 1.5 month. Happens differently. Usually, it takes 1–2 months. In extreme situations, it can take much shorter.
<b>non-inn</b>	H case	development/ non-innovative/ empl	We could introduce more than 20 new models per year to the market but it would cause some problems in the production because every new model lowers the efficiency of work
<b>non-inn</b>	H case	development/ non-innovative/ empl	Every year, every spring but generally it depends on the demand. The client dictates everything; if he asks, we develop.
<b>non-inn</b>	J case	development/ non-innovative/ mngr	It depends on the product. With one product it is a couple of weeks, if we only have some improvements. With another product it could take a couple of months.
<b>non-inn</b>	J case	development/ non-innovative/ empl	1–2 months in average
<b>non-inn</b>	J case	development/ non-innovative/ empl	We introduce new products whenever we have new ideas. It is no more than 5 products a year.
<b>non-inn</b>	J case	development/ non-innovative/ empl	4 in average
<b>non-inn</b>	K case	development/ non-innovative/ mngr	We have planned to introduce at least 10 or 8 products per year, we innovate them constantly
<b>non-inn</b>	K case	development/ non-innovative/ empl	It depends on many factors. Half a year on average.

<b>non-inn</b>	K case	development/ non-innovative/ empl	From 3 months to half a year
<b>non-inn</b>	K case	development/ non-innovative/ empl	Maybe up to 10 products per annum. Most often it's a line.
<b>non-inn</b>	L case	development/ non-innovative/ mngr	From one month to half a year. It depends on the product, if we do no research, it is also faster. If there are some sort of ideas and surveys, then it takes more time.
<b>non-inn</b>	L case	development/ non-innovative/ empl	The quickest variant is a month of time. On average, about 2 to 2.5 months.
<b>non-inn</b>	L case	development/ non-innovative/ empl	There have been many, but now I will try to slow down a little. After all, there have been many, 2–3 times a year. Now we have selected because it costs the company a lot.
<b>non-inn</b>	L case	development/ non-innovative/ empl	Sometimes I make 10 new designs a month. We introduce a lot in a year. We are now renewing all the products, designs, composition, we really did a lot. Maybe 100.
<b>non-inn</b>	M case	development/ non-innovative/ mngr	It may vary from one month to two years.
<b>non-inn</b>	M case	development/ non-innovative/ empl	Some products can be introduced very quickly
<b>non-inn</b>	M case	development/ non-innovative/ empl	At least one per year. It does not necessarily have to be a product, it could be some kind of a novelty.

(Source: made by author)

First of all, the respondents' answers highlighted that the concept of new product / innovation is treated differently by managers and employees, especially in firms from non-innovative sectors. The key issue is that in those firms every minor change is considered as innovation, thus skewing the real meaning of innovation. Following these interpretations, firms from non-innovative sectors often regard themselves as innovative and ambidextrous, although they constantly implement only minor improvements for their products and/or services. The differences once again appear in firms from innovative and non-innovative sectors, when the author explored the period that firms need to introduce a new product or service. Most respondents from innovative sectors confirmed that one year and more is the period necessary for the development of a new product or service. In contrary, a major part of respondents from non-innovative sectors asserted that a few weeks or months is enough. Some respondents, for example a manager from case L, mentioned that they were trying to focus on explorative production; however it did not appear as an efficient decision. Here, it is extremely important to highlight that respondents expected efficiency results in a short period of time and this is not quite right. Usually, any results after

producing any radically innovative products appear only after a longer period of time, thus it requires patience and some inefficient periods within firm turnover. It also requires some changes in “efficiency of work”, as a manager from case H mentioned. In contrary, respondents from innovative sectors were usually talking about both, incremental and radical changes, i.e. exploitation and exploration-oriented actions. In this context, the analysis confirms the proposition that firms from innovative sectors are better prepared to develop organizational ambidexterity. This is because they accept and understand the need to simultaneously balance between explorative and exploitative actions, while firms from non-innovative sectors consider even minor changes as innovation and mostly perceive it as sufficient activities in the context of innovation and organizational ambidexterity.

The latter aspect was also confirmed while asking the respondents to clarify if their new production has any impact for firm performance results. In order to keep consistency of the research, firm revenue in a particular period of time was regarded as firm performance. Surprisingly, almost all respondents, despite the sector they are acting in, confirmed the positive impact between innovation and firm performance. These answer even came from respondents of firms from non-innovative sectors (Table 26).

**Table 26.** New production impact on firm performance

Sector	Document name	Code	Answer
inn	A case	innovation impact on firm revenue (FFP)\YES	Yes. Complicated to calculate.
inn	A case	innovation impact on firm revenue (FFP)\YES	Yes.
inn	B case	innovation impact on firm revenue (FFP)\NO	No, mainly from the current/existing products
inn	B case	innovation impact on firm revenue (FFP)\NO	Hard to say as we do not regularly introduce new products. Today only the existing products.
inn	C case	innovation impact on firm revenue (FFP)\YES	Yes (from the context of the interview)
inn	C case	innovation impact on firm revenue (FFP)\NO	No. If we are talking about what our initiative is, I think not.
inn	D case	innovation impact on firm revenue (FFP)\YES	In principle, the major part. (
inn	D case	innovation impact on firm revenue (FFP)\YES	But in the essence they make a significant part.
inn	E case	innovation impact on firm revenue (FFP)\YES	Do not make an important contribution. Although, according to the last two years of experience, new services accounted for a significant share.
inn	E case	innovation impact on firm revenue (FFP)\NO	Does not make a significant part, because we do not really provide any.

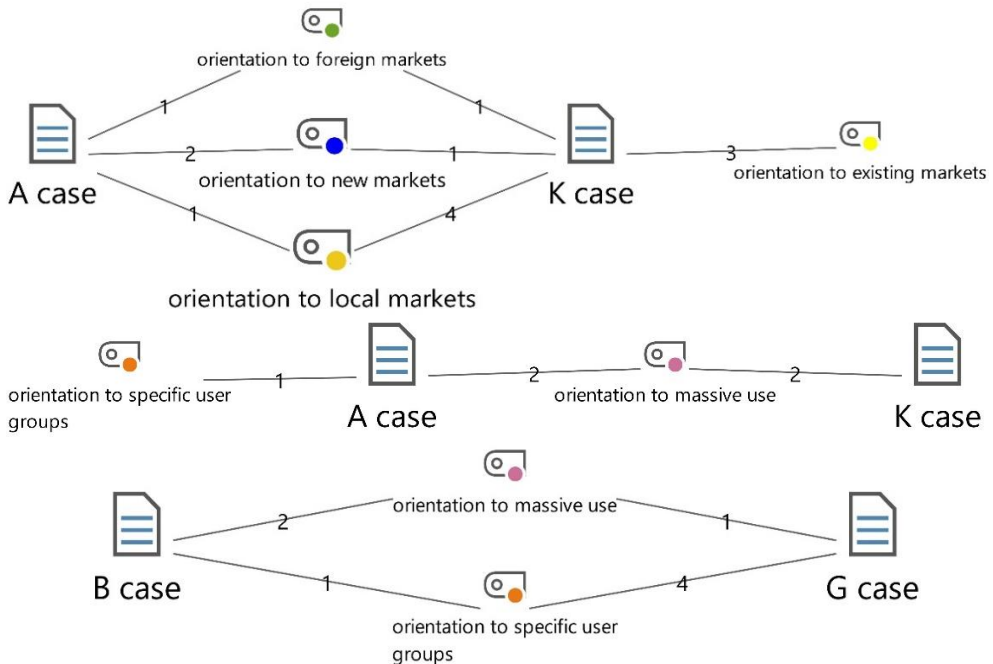
<b>inn</b>	F case	innovation impact on firm revenue (FFP)\YES	It is only a matter of time and you may need more and better advertising.
<b>inn</b>	F case	innovation impact on firm revenue (FFP)\NO	I think that they don't make a large percentage, because it is only a start.
<b>inn</b>	F case	innovation impact on firm revenue (FFP)\NO	So far no, but I really want to expect and will really make every effort to ensure that it would evolve. I even know the reason why it is not.
<b>non-inn</b>	G case	innovation impact on firm revenue (FFP)\YES	All the time. Around 90%.
<b>non-inn</b>	G case	innovation impact on firm revenue (FFP)\YES	The principle is the same if the kitchen is of 5 or 4 dressers. Something differs, maybe the frame can be different, dressers, drawers, colours, arrangement. The basis is new products. All the time we have novelties.
<b>non-inn</b>	H case	innovation impact on firm revenue (FFP)\YES	Yes, they constitute an important part and depending on the year and on the models, it may make up to 50–60%
<b>non-inn</b>	H case	innovation impact on firm revenue (FFP)\YES	Yes, and after a new exhibition we have new orders
<b>non-inn</b>	J case	innovation impact on firm revenue (FFP)\YES	The company is new, it is only three years old, it is difficult to see in the long run. We hope that this is how it will be in the future.
<b>non-inn</b>	J case	innovation impact on firm revenue (FFP)\NO	No, not the new ones are the most important. The new constitute about 30%. Most of the products are classic, but a successful new product adjusts the numbers
<b>non-inn</b>	K case	innovation impact on firm revenue (FFP)\YES	I would say not always new. Not the new ones. More the existing ones, then we slowly grow them and introduce into another market.
<b>non-inn</b>	K case	innovation impact on firm revenue (FFP)\YES	If new, it is 10–15%. The existing products are well established in the market and generate the main revenue.
<b>non-inn</b>	L case	innovation impact on firm revenue (FFP)\YES	Yes, they do, as the new product requires high costs. After the introduction of a new product you can see the real situation only in 3 months, whether the product is

			worth it, or brings profit, or is purchased.
<b>non-inn</b>	L case	innovation impact on firm revenue (FFP)\NO	No, you know, new products don't work, the existing products do more.
<b>non-inn</b>	M case	innovation impact on firm revenue (FFP)\YES	The more innovations we have, the better.
<b>non-inn</b>	M case	innovation impact on firm revenue (FFP)\YES	It depends on the product. For example, the income from our new ecological line made about 30% of the budget.

(Source: made by author)

These issues verified the finding that even firms from non-innovative sectors with only minor exploitative actions consider them as fully innovating firms. In some cases, firms from non-innovative sectors are even more enthusiastic about the impact that new production makes on firm budget.

Research analysis helped to confirm that firms from non-innovative sectors tend to focus more on the local and existing markets and entering new or foreign markets becomes a considerable challenge. Firms from innovative sectors, on the contrary, new and foreign markets are core concentration. Figure 5 below demonstrates this situation, taking several cases as an example.



**Figure 5.** A comparison between firms from innovative and non-innovative sectors (Source: made by author)

Cases A and B in the example are from innovative sectors and cases K and G are from non-innovative sectors. The coloured bubbles match different codes of explored

issues and numbers on the lines show the frequency of mentioning a particular answer. Accordingly, the example presented above reflects the fact that firms from innovative sectors orient more towards new and foreign markets. Also, contrary to firms from non-innovative sectors, firms from innovative sectors balance between orientation to massive and specific user groups.

Following the theoretical analysis results which show that the focus on different types of markets as well as orientation not only to massive use but to specific user groups as well is inherent for ambidextrous firms, this research proposes the presumptions that innovativeness of a firm is directly related to the level of ambidexterity – ambidextrous are firms from innovative sectors. Accordingly, all issues discussed above highlight the following – ambidextrous are firms from innovative sectors and firms from innovative sectors are those that collaborate with research institutions and constantly work on network development. To some extent, these results propose the presumption that collaboration with research institutions may be considered as an important factor for ambidexterity (as well as innovativeness) development within the firm.

Four questions were included to analyse inter-organizational collaboration during the interviews. Respondents were asked if their firms are permanently collaborating with research institutions and what are the reasons for it. To analyse how a firm itself stimulates the growth of the collaboration extent, respondents were asked to explain if they are involved in any public/research/other activities. Also, the research also asked whether firms' networks are expanding regularly and why. These questions were raised with the purpose to explore whether inter-organizational collaboration is viable within firms (or they just declare as having ones but with no actual motion in it). These questions helped to analyse the issues of network development and, above all, to understand the purpose why firms start collaborating with other organizations.

An analysis of results showed the differences among firms from innovative and non-innovative sectors. For example, one of the key reasons for firms from innovative sectors to collaborate is opportunity to learn, share knowledge, transfer innovation and enter new markets. These firms also accept inter-organizational collaboration as a solution for meeting talented employees, developing competences and developing scientific approach. For firms from non-innovative sectors, inter-organizational collaboration mostly serves as promotion for the firm or its products and for free labour force. The model-map of the main respondent-named purposes for inter-organizational collaboration is provided in Annex 3. It highlights the differences between answers, received from innovative and non-innovative sectors. This information confirms the proposition that firms from innovative and non-innovative sectors expand their collaborative networks differently, possess different collaboration purposes, and hold different kind of collaboration partners.

When comparing firms from innovative and non-innovative sectors in the context of inter-organizational collaboration development, a major number of firms confirmed that they are trying to expand their network and it is growing permanently. However, the most crucial findings in this part of analysis comes after analysing the respondents' answers to the question about collaboration with research institutions.



The direct relationship between firm innovativeness and collaboration with research institutions appeared. All respondents from innovative sectors confirmed their collaboration with research institutions. And vice versa, all respondents, except one small company from non-innovative sectors, responded that they do not collaborate with research institutions (Table 27).

**Table 27.** Collaboration with research institutions – differences in innovative and non-innovative sectors

Sector	Document name	Answer
inn	A case	Just with them the agreements are signed and we cannot imagine our work without scientific institutions
inn	A case	For sure our company is active
inn	B case	The relation with universities is rather close
inn	C case	Joint projects are currently few, a few years ago there was a joint project together with the University of ...
inn	D case	Yes, from the very beginning of our activity
inn	E case	Yes, we have partners.
inn	E case	Yes.
inn	F case	Currently I have signed a partnership agreement with two universities and a college.
inn	F case	The Head directly interacts with educational institutions
non-inn	G case	No. I don't know why we should.
non-inn	G case	At this moment not. A good question. As we are a production company, it is a completely different profile. We have less hand work, less technologies, it is more creative work. It needs more investments, which impedes us a bit
non-inn	H case	Not, because we don't see areas where we could cooperate.
non-inn	H case	Not [...] none of higher education institutions prepare specialists we need.
non-inn	J case	We are actively cooperating with X College,
non-inn	J case	It is more yes.
non-inn	K case	No, because we are occupied, [...] Science does not come to us itself.
non-inn	K case	Currently, no.
non-inn	L case	In principle, they are not. Maybe there was no need or lack of a proposal from the institutions themselves.

<b>non-inn</b>	L case	Sometimes, there are some, but not many. It is more related to the events, when there is a need of support or advertisement.
<b>non-inn</b>	M case	No. In reality they were not.

(Source: made by author)

Results in Table 27 highlight that in most cases, firms from non-innovative sectors do not see the reason why they should collaborate with research institutions. Two of six firms also mentioned that they would expect initiative from research institutions rather than looking for collaboration reasons themselves. This could and should be an important signal for research institutions supposing that an extension of business collaboration with research institutions directly depends on research institutions' efforts to develop the amounts of inter-organizational collaboration.

There are some cases where an opinion of a firm owner/manager and other employees differs significantly. Case E is a good example of this situation. For example, manager of E case says that innovative production "does not make an important contribution", but straightaway mentions the fact when "new services accounted for a significant share". However, the most uncommon is the fact that an employer from this firm denies the positive relationship between innovation and firm performance, because the firm "doesn't really provide any novelties".

There are more cases in this research where the answers of a firm manager and other employees differ significantly. For example, in Case F, the manager and employee disagree about the markets that they are focusing on. According to the manager, they are working for specific user groups, while the employee thinks that their production is for massive use. Another important difference appeared in Case H, when the respondents were asked about network development issues. The manager of the firm confirmed that "the network is more or less stable", while the employee was glad because "the network is growing".

The differences discussed above highlight rather clear misunderstandings between firm employees and managers, which possibly may turn into a barrier for organizational ambidexterity development. Moreover, in the context of quantitative research (when the answers are counted but not analysed) situations like these may prevent mismatches in research analysis and data interpretation.

### **3.3. A summary of empirical research results.**

The section is dedicated to review the major findings of empirical research and to present the final model of interrelationship between organizational ambidexterity, inter-organizational collaboration and firm performance.

As the author chose to investigate the ways on how to increase ambidexterity within the firm proposing inter-organizational collaboration as a possible stimulator, firstly it was important to prove that there is a direct relationship between organizational ambidexterity and firm performance results. A summary of hypotheses testing the direct relationship between organizational ambidexterity and firm performance is portrayed in Table 28.

**Table 28.** The results of H1 (direct relation) testing

<b><i>H1: Organizational ambidexterity has a direct impact on firm performance.</i></b>	<b><i>Accepted</i></b>
<b><i><u>H1.1. Organizational ambidexterity has a direct impact on firm competitive performance</u></i></b>	<b><i>Accepted</i></b>
<b><i>H1.1.1 Exploration-oriented actions have a direct impact on the firm competitive performance</i></b>	<b><i>Accepted</i></b>
<b><i>H1.1.2 Exploitation-oriented actions have a direct impact on the firm competitive performance</i></b>	<b><i>Accepted</i></b>
<b><i><u>H1.2. Organizational ambidexterity has a direct impact on firm financial performance</u></i></b>	<b><i>Accepted</i></b>
<b><i>H1.2.1. Organizational-ambidexterity has a direct impact on the firm revenue</i></b>	<b><i>Accepted</i></b>
<b><i>H1.2.1a Exploration-oriented actions have a direct impact on the firm revenue.</i></b>	<b><i>Accepted</i></b>
<b><i>H1.2.1b Exploitation-oriented actions have a direct impact on the firm revenue.</i></b>	<b><i>Accepted</i></b>
<b><i>H1.2.2. Organizational ambidexterity has a direct impact on the growth of firm revenue.</i></b>	<b><i>Accepted</i></b>
<b><i>H1.2.2a Exploration-oriented actions have a direct impact on the growth of firm revenue.</i></b>	<b><i>Accepted</i></b>
<b><i>H1.2.2b Exploitation-oriented actions have a direct impact on the growth of firm revenue.</i></b>	<b><i>Accepted</i></b>
<b><i>H1.2.3. Organizational ambidexterity has a direct impact on firm exports revenue.</i></b>	<b><i>Rejected</i></b>
<b><i>H1.2.3a Exploration-oriented actions have a direct impact on the firm exports revenue.</i></b>	<b><i>Rejected</i></b>
<b><i>H1.2.3b Exploitation-oriented actions have a direct impact on the firm exports revenue.</i></b>	<b><i>Rejected</i></b>
<b><i>H1.2.4. Organizational ambidexterity has a direct impact on the growth of firm exports revenue.</i></b>	<b><i>Rejected</i></b>
<b><i>H1.2.4a Exploration-oriented actions have a direct impact on the growth of firm exports revenue.</i></b>	<b><i>Rejected</i></b>
<b><i>H1.2.4b Exploitation-oriented actions have a direct impact on the growth of firm exports revenue.</i></b>	<b><i>Rejected</i></b>

(Source: made by author)

The general results confirmed that there is a direct relationship between organizational ambidexterity and firm performance. However, empirical analysis highlights that a slightly stronger relationship can be detected in the relationship between organizational ambidexterity and firm competitive performance. This fact explains that managers are more likely to accept the advantages of being ambidextrous. An analysis of financial data demonstrates that organizational ambidexterity has a direct relationship to firm revenue and its growth. According to the empirical results, the presumptions that organizational ambidexterity may have direct relation to exports revenues were denied. Based on the fact that most of the hypotheses related to financial data were accepted, the results of comparing financial and competitive performance are considered as clearly correlating. Managers consider organizational ambidexterity as positive to firm performance results. These results are based on the subjective opinion and experience of managers. Accordingly, this was approved with a positive relationship to firm revenue and growth of firm revenue

while testing the financial data, i.e. objective measure. The author of this thesis interprets these results as confirmed direct relationship between organizational ambidexterity and firm performance.

Since the study aims to answer whether inter-organizational collaboration can be considered as a stimulator for firm ambidexterity, inter-organizational collaboration was tested as a moderator and a mediator in the relationship between organizational ambidexterity and firm performance. In order to get clear and reliable results, the author decided to test the respective relationships between separate dimensions of the concepts. The summary of hypotheses testing moderation results is portrayed in the Table 29.

**Table 29.** The results of H2 (moderation) testing

<b><i>H2: Inter-organizational collaboration plays a moderating role in the relationship between organizational ambidexterity and firm performance.</i></b>		<b><i>Rejected</i></b>
<b><i><u>H2.1: Inter-organizational collaboration plays a moderating role in the relationship between organizational ambidexterity and firm competitive performance</u></i></b>		<b><i>Rejected</i></b>
<b><i>H2.1.1 Collaboration with research institutions plays a moderating role in the relationship between organizational ambidexterity and firm competitive performance.</i></b>		<b><i>Rejected</i></b>
<b><i>H2.1.1.1. Collaboration with research institutions plays a moderating role in the relationship between exploration-oriented actions and firm competitive performance.</i></b>		<b><i>Rejected</i></b>
<b><i>H2.1.1.2. Collaboration with research institutions plays a moderating role in the relationship between exploitation-oriented actions and firm competitive performance</i></b>		<b><i>Rejected</i></b>
<b><i>H2.1.2: Collaboration with international networks plays a moderating role in the relationship between organizational ambidexterity and firm competitive performance.</i></b>		<b><i>Rejected</i></b>
<b><i>H2.1.2.1. Collaboration with international networks plays a moderating role in the relationship between exploration-oriented actions and firm competitive performance.</i></b>		<b><i>Accepted</i></b>
<b><i>H2.1.2.2. Collaboration with international networks plays a moderating role in the relationship between exploitation-oriented actions and firm competitive performance.</i></b>		<b><i>Rejected</i></b>
<b><i><u>H2.2: Inter-organizational collaboration plays a moderating role in the relationship between organizational ambidexterity and firm financial performance</u></i></b>		<b><i>Rejected</i></b>
<b><i>H2.2.1 Collaboration with research institutions plays a moderating role in the relationship between organizational ambidexterity and firm financial performance</i></b>		<b><i>Rejected</i></b>
<b><i>H2.2.1.1 Collaboration with research institutions plays a moderating role in the relationship between exploration-oriented actions and firm financial performance.</i></b>		<b><i>Rejected</i></b>
<b><i>H2.2.1.1.a Collaboration with research institutions plays a moderating role in the relationship between exploration-oriented actions and firm revenue.</i></b>		<b><i>Rejected</i></b>

		<b>H2.2.1.1.b</b> Collaboration with research institutions plays a moderating role in the relationship between exploration-oriented actions and the growth of firm revenue.	<i>Rejected</i>
		<b>H2.2.1.2</b> Collaboration with research institutions plays a moderating role in the relationship between exploitation oriented-actions and firm financial performance	<i>Rejected</i>
		<b>H2.2.1.2.a</b> Collaboration with research institutions plays a moderating role in the relationship between exploitation-oriented actions and firm revenue.	<i>Rejected</i>
		<b>H2.2.1.2.b</b> Collaboration with research institutions plays a moderating role in the relationship between exploitation-oriented actions and the growth of firm revenue	<i>Rejected</i>
		<b>H2.2.2:</b> <i>Collaboration with international networks plays a moderating role in the relationship between organizational ambidexterity and firm financial performance</i>	<i>Rejected</i>
		<b>H2.2.2.1</b> Collaboration with international networks plays a moderating role in the relationship between exploration-oriented actions and firm financial performance	<i>Rejected</i>
		<b>H2.2.2.1.a</b> Collaboration with international networks plays a moderating role in the relationship between exploration-oriented actions and firm revenue	<i>Rejected</i>
		<b>H2.2.2.1.b</b> Collaboration with international networks plays a moderating role in the relationship between exploration-oriented actions and the growth of firm revenue	<i>Accepted</i>
		<b>H2.2.2.2</b> Collaboration with international networks plays a moderating role in the relationship between exploitation-oriented actions and firm financial performance	<i>Rejected</i>
		<b>H2.2.2.2.a</b> Collaboration with international networks plays a moderating role in the relationship between exploitation-oriented actions and firm revenue	<i>Partly accepted</i>
		<b>H2.2.2.2.b</b> Collaboration with international networks plays a moderating role in the relationship between exploitation-oriented actions and the growth of firm revenue	<i>Rejected</i>

(Source: made by author)

The results revealed a negative mediating effect of inter-organizational collaboration in the relationship between organizational ambidexterity and firm competitive performance. Taking separate dimensions of all concepts, neither collaboration with research institutions, nor collaboration with international networks had a moderating effect on the relationship between organizational ambidexterity and firm competitive performance. This means that managers regard both types of collaboration as having no impact for increasing organizational ambidexterity and thus leading to better performance results. The results also highlight that taking separate dimensions of organizational ambidexterity, i.e. exploration-oriented actions and exploitation-oriented actions, did not highlight any other results. There was no moderating effect of inter-organizational collaboration (both types) either in the relationship between exploration oriented actions and firm competitive performance, or in the relationship between exploitation-oriented actions and firm competitive performance.

While testing the hypotheses related to firm financial performance, it became evident that inter-organizational collaboration is also rejected as a moderator in the

relationship between organizational ambidexterity and firm financial performance. The results highlight that only collaboration with international networks plays a moderating role in the relationship between exploration-oriented actions and the growth of firm revenue as well as between exploitation-oriented actions and firm revenue in 2011. Any other moderating hypotheses were denied thus making the author accept the fact that inter-organizational collaboration cannot be accepted as a moderator in the relationship between organizational ambidexterity and firm performance.

Rather different results were confirmed while testing the mediating effect of inter-organizational collaboration on the relationship between organizational ambidexterity and firm performance. The summary of hypotheses testing mediation results is provided in Table 30.

**Table 30.** The results of H3 (mediation) testing

<b><i>H3: Inter-organizational collaboration plays a mediating role in the relationship between organizational ambidexterity and firm performance.</i></b>	<i>Accepted</i>
<b><i>H3.1: Inter-organizational collaboration plays a mediating role in the relationship between organizational ambidexterity and firm competitive performance</i></b>	<i>Accepted</i>
<b><i>H3.1.1 Collaboration with research institutions plays a mediating role in the relationship between organizational ambidexterity and firm competitive performance</i></b>	<i>Accepted</i>
<b><i>H3.1.1.1.</i> Collaboration with research institutions plays a mediating role in the relationship between exploration-oriented actions and firm competitive performance.</b>	<i>Accepted</i>
<b><i>H3.1.1.2.</i> Collaboration with research institutions plays a mediating role in the relationship between exploitation-oriented actions and firm competitive performance</b>	<i>Accepted</i>
<b><i>H3.1.2: Collaboration with international networks plays a mediating role in the relationship between organizational ambidexterity and firm competitive performance</i></b>	<i>Accepted</i>
<b><i>H3.1.2.1.</i> Collaboration with international networks plays a mediating role in the relationship between exploration-oriented actions and firm competitive performance.</b>	<i>Accepted</i>
<b><i>H3.1.2.2.</i> Collaboration with international networks plays a mediating role in the relationship between exploitation oriented actions and firm competitive performance.</b>	<i>Accepted</i>
<b><i>H3.2: Inter-organizational collaboration plays a mediating role in the relationship between organizational ambidexterity and firm financial performance</i></b>	<i>Accepted</i>
<b><i>H3.2.1 Collaboration with research institutions plays a mediating role in the relationship between organizational ambidexterity and firm financial performance</i></b>	<i>Accepted</i>
<b><i>H3.2.1.1</i> Collaboration with research institutions plays a mediating role in the relationship between exploration-oriented actions and firm financial performance</b>	<i>Accepted</i>
<b><i>H3.2.1.1.a</i> Collaboration with research institutions plays a mediating role in the relationship between exploration-oriented actions and firm revenue</b>	<i>Accepted</i>

	<b>H3.2.1.1.b</b> Collaboration with research institutions plays a mediating role in the relationship between exploration-oriented actions and the growth of firm revenue	<i>Accepted</i>
	<b>H3.2.1.2</b> Collaboration with research institutions plays a mediating role in the relationship between exploitation-oriented actions and firm financial performance	<i>Accepted</i>
	<b>H3.2.1.2.a</b> Collaboration with research institutions plays a mediating role in the relationship between exploitation-oriented actions and firm revenue	<i>Accepted</i>
	<b>H3.2.1.2.b</b> Collaboration with research institutions plays a mediating role in the relationship between exploitation-oriented actions and the growth of firm revenue	<i>Accepted</i>
	<b>H3.2.2:</b> <i>Collaboration with international networks plays a mediating role in the relationship between organizational ambidexterity and firm financial performance</i>	<i>Accepted</i>
	<b>H3.2.2.1</b> Collaboration with international networks plays a mediating role in the relationship between exploration-oriented actions and firm financial performance	<i>Accepted</i>
	<b>H3.2.2.1.a</b> Collaboration with international networks plays a mediating role in the relationship between exploration-oriented actions and firm revenue	<i>Accepted</i>
	<b>H3.2.2.1.b</b> Collaboration with international networks plays a mediating role in the relationship between exploration-oriented actions and the growth of firm revenue	<i>Accepted</i>
	<b>H3.2.2.2</b> Collaboration with international networks plays a mediating role in the relationship between exploitation-oriented actions and firm financial performance	<i>Accepted</i>
	<b>H3.2.2.2.a</b> Collaboration with international networks plays a mediating role in the relationship between exploitation-oriented actions and firm revenue	<i>Partly accepted</i>
	<b>H3.2.2.2.b</b> Collaboration with international networks plays a mediating role in the relationship between exploitation-oriented actions and the growth of firm revenue	<i>Accepted</i>

(Source: made by author)

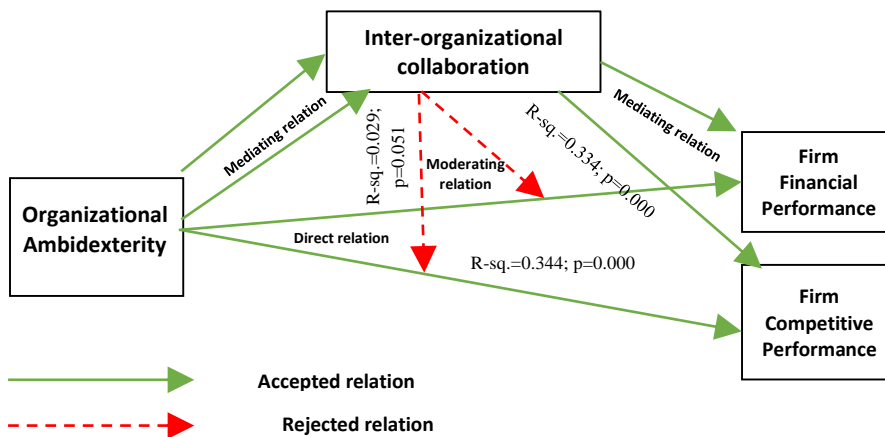
A clear mediating effect of inter-organizational collaboration in the relationship between organizational ambidexterity and firm competitive performance was confirmed. Taking separate dimensions of all concepts it turned out that collaboration with research institutions has approximately the same mediating effect as collaboration with international networks. This means that managers accept both types of collaboration as a crucial mediator for increasing organizational ambidexterity and thus leading to better performance results. Also, while testing separate dimensions of organizational ambidexterity, results allowed to presume that mediating the effect of inter-organizational collaboration (both types) is comparable between exploration-oriented actions and firm competitive performance, and between exploitation-oriented actions and firm competitive performance. This just confirms the appropriate selection of organizational ambidexterity dimensions.

While testing the hypotheses related to firm financial performance, the results confirmed the hypotheses of mediating relationship as well. Inter-organizational collaboration is accepted as a mediator in the relationship between organizational ambidexterity and firm financial performance. Only the hypothesis that collaboration with international networks mediates the relationship between exploitation-oriented

actions and firm revenue in 2011 was rejected. All other hypotheses were accepted, although the R-square values are not very high.

As it was explained in previous sections, a direct relationship between organizational ambidexterity and exports revenue as well as the growth of exports revenue was not confirmed, thus the moderation or mediation effect was not tested in further data analysis.

Summarizing the whole quantitative research results allows adjusting the proposed conceptual model, confirming inter-organizational collaboration as a possible stimulator (i.e. mediator) for fostering organizational collaboration and thus leading the firm to better performance results (Figure 6).



**Figure 6.** Proposed model of interrelationship between organizational ambidexterity, inter-organizational collaboration and firm performance (Source: made by author)

The results of qualitative research highlighted clear differences between firms from innovative and non-innovative sectors. These differences were not so clear in the quantitative part of the research. Qualitative research analysis confirmed the proposition that firms from innovative sectors are more ambidextrous than the firms that operate in non-innovative sectors. The balance between exploration-oriented actions and exploitation-oriented actions, i.e. organizational ambidexterity, is more evidenced in firms from innovative sectors. Accordingly, respondents from firms from innovative sectors frequently named organizational ambidexterity as crucial to firm performance results, while most respondents from non-innovative sectors' firms did not accept organizational ambidexterity as having a positive impact on firm performance.

Results in this research also confirmed the presumption that the relationship between innovativeness of the firm and vitality of firms' collaborative networks exists. Research results confirmed that firms from innovative sectors have more functional networks that are developing and expanding permanently. Contrary to this, firms from non-innovative sectors tend to maintain stable networks with no significant changes in their collaborative relations.



Moreover, firms from innovative sectors expand their networks more broadly and mainly collaborate with the purpose to constantly learn and improve. Firms from innovative sectors tend to collaborate with universities and research institutions as well. Respondents confirmed their need of specific collaboration forms that must be renewed permanently. In contrary, firms from non-innovative sectors mostly attend some of professional organizations or non-specific societies. These firms usually see inter-organizational collaboration just as a possible way for advertising for costumers or to observe competitors' actions. Results also highlighted that, contrary to firms from innovative sectors, firms from non-innovative sectors usually collaborate mostly with the local and existing markets and do not develop their inter-organizational collaboration to foreign markets. These issues confirmed the proposition that firms from innovative and non-innovative sectors possess different collaboration purposes and hold different kind of collaboration partners.

In general, qualitative research results confirmed the existing relationship between organizational ambidexterity, inter-organizational collaboration and firm performance results. However, an analysis of research results highlights that inter-organizational collaboration is a valuable promoter of ambidexterity within a longer period of time. Accordingly, the proposed conceptual model of interrelationship between organizational ambidexterity, inter-organizational collaboration and firm performance can be used in future research to further explore the concepts and prove inter-organizational collaboration as an important stimulator for fostering ambidextrous orientation of firms.

**Table 31.** The results of tested propositions

<b>P1.</b>	Firms from innovative sectors are more ambidextrous.	<i>Confirmed</i>
<b>P2.</b>	Firms from innovative sectors tend to maintain vitality and development of inter-organizational networks, while firms from non-innovative sectors mostly confine themselves with stable networks.	<i>Confirmed</i>
<b>P3.</b>	Firms from innovative and non-innovative sectors expand their collaborative networks differently, possess different collaboration purposes, and hold different collaboration partners	<i>Confirmed</i>

(Source: made by author)

Overall, the empirical research findings allowed the author of this thesis to state that inter-organizational collaboration mediates the relationship between organizational ambidexterity and firm performance. It can be concluded that the proposed model of organizational ambidexterity, inter-organizational collaboration and firm performance can be further used to explore organizational ambidexterity and firm performance interaction.

## SCIENTIFIC DISCUSSION

With this study, the author contributed to the well-establishing organizational ambidexterity literature in two ways. First, this thesis advances the general conceptualization of organizational ambidexterity concept, presenting a generalized review of literature that explores the concept in various theoretical contexts. In theoretical research, Gupta *et al.* (2006) and other scholars (e.g. Lackner *et al.*, 2011; March, 1991) explore organizational ambidexterity in the context of organizational learning. Chang *et al.* (2011) and others (e.g. Jansen *et al.*, 2006; Yigit, 2013) have identified organizational ambidexterity as crucial in the innovation context; Kriz *et al.* (2014) and others (e.g. O'Reilly and Tushman, 2008; Xie *et al.*, 2011) – in the context of dynamic capabilities, and others. While organizational ambidexterity has been a subject of wide scientific discussions for the last several years, there still are very few theoretical studies that compare different theoretical frameworks to investigate organizational ambidexterity. While a number of past research mostly focused on one specific theoretical context, this study compared different points of view towards organizational ambidexterity in one paper. This helped to reveal the lack of different context combinations in order to explain the concept and its relationship to firm performance more clearly and broadly. This issue also points to the fact that organizational ambidexterity literature still lacks research disclosing the relationship between organizational ambidexterity and other different theoretical concepts.

In parallel, the observed research gaps clearly highlight the need for wider research in the field of organizational ambidexterity with the purpose to explore the stimulators for organizational ambidexterity within the firm. As confirmed by a number of authors (Atuahene-Gima, 2005; He and Wong, 2004; Jansen *et al.*, 2006; and etc.), the balance between exploration-oriented actions and exploitation-oriented actions decide the success of innovation and firm performance results. However, having in mind the challenges for managing these actions, none of the prior literature clarified under what conditions does organizational ambidexterity enhance firm performance. Gibson and Birkinshaw (2004) and others (e.g. Cao *et al.*, 2009; Fu and Morris, 2014; Geerts *et al.*, 2010) have identified and empirically tested the relationship between organizational ambidexterity and firm performance. This allowed to argue that the present relationship may depend on other additional factors which can stimulate the level of organizational ambidexterity and/or have effect on the relation between organizational ambidexterity and firm performance. Additionally, the second advance of this study was embracing inter-organizational collaboration within the research context. This study also responds to the call for research on organizational ambidexterity by stepping outside firms' boundaries (O'Reilly and Tushman, 2013).

In order to avoid too much complexity within the study, the decision to include an additional theoretical concept was followed by the need to narrow down the theoretical background of organizational ambidexterity. With reference to the pre-planned research, organizational ambidexterity in this study was considered in the innovation context, following He and Wong (2004), Jansen *et al.* (2006), Yigit (2013) and others.

The existing research (e.g. Doganowa, 2009; Sun and Lo, 2014) promotes the notion that inter-organizational collaboration is one of the possible stimulators for organizational ambidexterity. The author of this thesis relied on these presumptions and proposed inter-organizational collaboration as likely to be effective for fostering organizational ambidexterity within the firm. However, within the theoretical approach, inter-organizational collaboration implies a wide range of different collaboration forms, such as clusters, alliances, networks. Following the line of innovation context, embraced within organizational ambidexterity literature, inter-organizational collaboration forms were limited to inter-organizational collaboration with research institutions (national and international universities, research institutes, and etc.) and inter-organizational collaboration in international and professional networks, meaning different professional organizations, inter-firm collaborative networks, etc. (not including research institutions). In this perspective, both organizational ambidexterity and inter-organizational collaboration literature was enriched by new theoretical and empirical settings of exploring the relationship between organizational ambidexterity, inter-organizational collaboration and firm performance.

The conceptual model of this research has integrated organizational ambidexterity with two dimensions of exploration and exploitation-oriented actions, inter-organizational collaboration, separately exploring inter-organizational collaboration with research institutions and inter-organizational collaboration in international and professional networks, and firm performance with separate dimensions of firm financial and firm competitive performance. Different dimensions of variables appeared in order to compare the relative significance of these dimensions and measure, whether exploration-oriented actions have the same impact on firm performance as exploitation-oriented actions as well as to measure if different types of inter-organizational collaboration have the same moderation/mediation effect on the relationship between organizational ambidexterity and firm performance. In general, having in mind the theoretical limitations discussed before, the conceptual model was composed in a way to explore the accepted variables as widely as possible. Thus, the conceptual model has helped to understand these constructs and their interactions.

The scales for measuring organizational ambidexterity and inter-organizational collaboration were adapted and extended following Gibson and Birkishaw (2004), Jansen *et al.* (2006), Kortmann (2014), Pavlou and El Sawy (2011) and others. These scales are related to the context of innovation and technology-intensive firms, first offered by He and Wong (2004) as a specific domain for organizational ambidexterity, and thus fitting the general focus of organizational ambidexterity of this study. The sample selection in this study coincides with Aspara *et al.* (2011) and Sidhu *et al.* (2007), who presented exploration and exploitation research with the focus on technology-intensive firms. Zhang *et al.* (2016), who recently presented an empirical research on different domains of organizational ambidexterity, support the sample of this thesis and once again confirm technology-intensive innovative firms as a common focus for organizational ambidexterity research. Additionally, the scales appeared as advanced in theoretical and empirical approaches. It helped to explore the relationship

between the variables which had been discussed in the theoretical literature but still remained the object of limited empirical justification.

Gupta *et al.* (2006), Jansen *et al.* (2008), Gibson and Birkinshaw (2004), and a number of other scholars assume that the ability to successfully manage contradictory activities and balance between exploration-oriented actions and exploitation-oriented actions ensures superior and sustained performance. Despite a number of empirically proved facts, this relationship is still an object of limited empirical development. In line with a number of other studies (e.g. Geerts *et al.*, 2010; He and Wong, 2004; Lubatkin *et al.*, 2006)), this study confirmed the direct relationship between organizational ambidexterity and firm performance. In addition, the study's results show that direct the relationship between organizational ambidexterity and firm financial performance is stronger after eliminating the exports revenue data from data analysis procedures. To some extent, this has similarities to the results obtained by Battaglia *et al.* (2018), who found that a combination of ambidextrous actions and exports intensity has a negative effect on growth of revenue in small and medium firms.

In this research, the author did not identify the moderation effect. Both, inter-organizational collaboration with research institutions and inter-organizational collaboration in international and professional networks did not act as a moderator in direct relationship between organizational ambidexterity and firm performance. In addition, the moderation between organizational ambidexterity and firm competitive performance and moderation between organizational ambidexterity and firm financial performance was rejected as well. On the contrary, research results confirmed inter-organizational collaboration as mediator in the relationship between organizational ambidexterity and firm performance. The results of regression analysis disclosed that the mediation effect is approximately 10% stronger in the relationship between exploration-oriented actions and firm performance than in the relationship between exploitation-oriented actions and firm performance. This proved inter-organizational collaboration as being significantly important for exploration development within a firm in order to increase organizational ambidexterity. Data analysis revealed that inter-organizational collaboration with research institutions demonstrates stronger relationships in this context in comparison with inter-organizational collaboration in international and professional networks. In addition, empirical findings show that mediation appeared to be at least 15% stronger while measuring the relationship between organizational ambidexterity and firm competitive performance. This explains that managers appreciate inter-organizational collaboration as crucial for strengthening ambidexterity within the firm and thus leading to better performance results. Mediation in the relationship between organizational ambidexterity and firm financial performance, however, appeared to be stronger not to the revenue results in one year, but to the growth of revenue within several years. This issue grounded the finding that positive outcomes of organizational ambidexterity, inter-organizational collaboration and firm performance relationship might improve over a longer period of time.

Qualitative research results pointed at several important issues. First, it cleared the differences between firms from innovative and non-innovative sectors, which, as

the control variable did not appear significant within the quantitative part of the research. In detail, firms from innovative sectors collaborate with research institutions more purposefully and have clearer collaboration goals. All firms from innovative sectors and only 20% of firms from non-innovative sectors confirmed that they are collaborating with research institutions. The purpose of inter-organizational collaboration for firms from innovative sectors usually are equated to opportunities for learning, sharing knowledge, transferring innovation and entering new markets. These firms also accept inter-organizational collaboration as a solution for meeting talented employees, developing competences and developing a scientific approach. For firms from non-innovative sectors, inter-organizational collaboration mostly serves as promotion for firm or its products and for free labour force and this is unrelated to the development of organizational ambidexterity within a firm. In line with these results, firms from innovative sectors sustain more vital and functioning inter-organizational collaboration.

## CONCLUSIONS AND RESEARCH LIMITATIONS

This thesis contributes by providing empirical evidence for the relationship between organizational ambidexterity, inter-organizational collaboration and firm performance, confirming inter-organizational collaboration as a possible stimulator for strengthening the direct relationship between organizational ambidexterity and firm performance. In this study, the author explores the impact that inter-organizational collaboration has on the direct relationship between organizational ambidexterity and firm performance. The research started by assuming that different results may occur while exploring two different types of inter-organizational collaboration, that is, inter-organizational collaboration with research institutions and inter-organizational collaboration in international and professional networks. Similarly, different types of firm performance were explored, i.e. firm financial and firm competitive performance. This decision is based on a presumption that the data obtained from firm managers may somewhat differ to those obtained from Statistics Department.

By developing the hypotheses and using the theoretical framework of organizational ambidexterity, the author has highlighted that the direct relationship between organizational ambidexterity and firm performance may be strengthened by promoting inter-organizational collaboration of firms. These hypotheses were tested empirically. The empirical analysis of this study is based on a mixed research method. Quantitative research was implemented by using multiple regression analysis on data collected through a survey that was implemented in 2014. The sample for the survey was 410 technology-intensive firms from innovative and non-innovative sectors, as defined by Statistics Lithuania. Seeking to maintain research integrity, the selection of firms was related to the innovation context. Similarly, it was decided to focus on inter-organizational collaboration with research institutions, as it is one of the most common components for technology-intensive firms. Quantitative research in this study was followed by qualitative research in 12 technology-intensive firms, using a sequential explanatory research procedure. This procedure was beneficial for the research, as the quantitative research part helped the author to measure the relationship between the explored variables (as well as measuring the impact that the independent variable has on the dependent variable), while qualitative research helped to explain the respective relationship more broadly.

While exploring the relationship between organizational ambidexterity and firm performance, inter-organizational collaboration has been rejected as a possible moderator. Research results show that neither moderation between organizational ambidexterity and firm competitive performance, nor moderation between organizational ambidexterity and firm financial performance was accepted. In contrast, inter-organizational collaboration was approved as a mediator. In detail, firm managers accept inter-organizational collaboration as strengthening firm's ambidexterity and thus leading to better performance. The financial performance results, measured using secondary data (i.e. objective data, obtained from Statistics Lithuania) confirmed these results as well. In addition, inter-organizational collaboration appeared to be more important for developing explorative activities,

whose development, fundamentally, requires more time, knowledge, human resources, and capabilities.

The results from qualitative research highlighted clear differences between firms from innovative and non-innovative sectors. Contrary to firms from non-innovative sectors, firms from innovative sectors tend to be more ambidextrous and purposefully collaborate with research institutions. The purposes of inter-organizational collaboration for firms from innovative sectors usually are equated to learning, sharing and innovating opportunities with possibilities to meet talented employees and thus develop new competences and strengthen scientific approach. For firms from non-innovative sectors, inter-organizational collaboration mostly serves as promotion for firm or its products and for free labour force. Moreover, research results confirmed that inter-organizational collaboration is developed better in firms from innovative sectors, since these firms are focused on collaborative network development and improvement.

Based on results discussed above, this particular study contributes to the existing research in several ways. First, to the best of the author's knowledge, this is the first attempt to apply inter-organizational collaboration as a stimulator for organizational ambidexterity, testing inter-organizational collaboration as mediator and moderator within the particular relation. Second, the proposed multidimensional conceptual model is based on different conceptual components and subcomponents. This helped to build new theoretical and practical approaches within the field, as it explores combinations of inter-organizational collaboration with research institutions and inter-organizational collaboration with international and professional networks, thus proving the particular relevance of inter-organizational collaboration with research institutions for technology-intensive firms. Moreover, combinations between financial and competitive firm performance were estimated as well, thus verifying the correspondence between objective and subjective firm performance variables. Accordingly, exploring the particular conceptual model in this study might become a useful and relevant tool for further development and analysis of particular relationships in both, theoretical and practical ways. In addition, this thesis offers further explanation that the effect which inter-organizational collaboration has on the relationship between organizational ambidexterity and firm performance would be more explicit and comprehensive within a longer period of time.

Like most research, this thesis is subject to some research limitations:

- **The length of the research:** a number of studies that explore organizational ambidexterity are focused on longitudinal research. Firms that decide to become ambidextrous need a long period in order to change the organizational thinking, organizational processes, actions, etc. Accordingly, firms need a certain period in order to accept all changes and perceive any positive outcomes. Thus performing the exploration of organizational ambidexterity for just one or two years (especially in those firms that became ambidextrous only recently) may cause some variance with final research results. Unfortunately, the implementation of longitudinal study was impossible because of the difficulties while collecting financial data (previously mentioned in the Section 2.5.).

- **Availability of the data:** the limitation is highly related with the previously mentioned issue, because it was difficult to get eligible financial data. Moreover, managers were not satisfied with the requests to reveal any data related to firm performance results, so it was difficult to get eligible data on firm competitive performance as well (these problems were previously mentioned in Section 2.5.).
- **The location of the study:** Lithuania is relatively small country, with a low number of ambidextrous organizations. Also, there is a large amount of small and medium enterprises in Lithuania. This becomes a limitation since it is difficult to become ambidextrous, if the firm is quite small. Accordingly, it was difficult to build a suitable research sample in order to answer the main aims of the study. The author admits that the results may differ if the research would be implemented in the larger country with a higher innovation index and a major number of ambidextrous companies.
- **Selected variables:** the number of different studies with different research samples, variables and measures is an example that research results highly depend on researcher's decisions made on research design. The author agrees that there is a number of other different ways to measure and test the same concepts. Certainly, there is a possibility that this would lead to different research results. However, the research design in this thesis was prepared according the most common circumstances and opportunities, and all variables were selected with reference to the most common literature with the purpose the carry out the research in the most appropriate way.



## **MANAGERIAL IMPLICATIONS AND FUTURE RESEARCH RECOMMENDATIONS**

The further use of this research results can be extremely relevant, especially for firms, where exploration-oriented actions and exploitation-oriented actions are often difficult to distinguish and balance simultaneously. The managerial implications of this thesis mainly cover the results that were highlighted during the research results analysis, which proves that organizational ambidexterity is crucial for firms, especially because of confirmed direct effect to the growth of firm revenue.

Organizational ambidexterity in today's volatile business environment is widely accepted as crucial for the creation of new products and services, innovation development and superior firm performance. Since the results of this study confirmed the impact of organizational ambidexterity on firm performance, thus suggesting that managers focus more on circumstances (and/or factors) under which organizational ambidexterity could be developed.

Further results highlight the importance of inter-organizational collaboration for fostering organizational ambidexterity within the firm. Managers of firms must take into account that inter-organizational collaboration, including collaboration with research institutions and collaboration with international and professional networks, is a decent stimulator for organizational ambidexterity, which, in turn, leads to better performance results. Accordingly, firm managers are recommended to look for collaboration opportunities in local and foreign markets. Fostering integration to international networks and collaboration with different research institutions is the answer if organizations want to increase their abilities to manage exploration-oriented as well as exploitation-oriented actions and to simultaneously balance them.

Empirical results also suggested that performance related to exports intensity has a negative effect on the relationship between organizational ambidexterity and firm performance. These issues suggest that firm managers are to take into account the potential need to make strategic decisions in terms of further business development. With reference to the research results, decisions related to internationalization at first must be focused on inter-organizational collaboration acquisition rather than exports development.

Moreover, it is important to note that the research results point to the fact that collaboration as a stimulator for organizational ambidexterity should be a long-term decision. Based on this, it is crucial to presume that the positive outcomes of the organizational ambidexterity, inter-organizational collaboration and firm performance might improve over a longer period of time. Accordingly, managers should not expect to achieve much larger ambidexterity level suddenly after starting any collaboration relations.

It is important for managers to take into account that a successfully managed inter-organizational collaboration can provide much more opportunities than promotion or free labour force for a couple weeks. Inter-organizational collaboration, especially developed more with research institutions, is a source of new resources and possibilities, including knowledge sharing, innovation development, new market entries and likewise.

In 2008, Raisch and Birkinshaw emphasized that scholars suggest different ambidexterity supporting elements, such as structural mechanisms (Addler *et al.*, 1999; Tushman, O'Reilly, 1996), organizational context (Gibson, Birkinshaw, 2004) and leadership characteristics (Beckman, 2006; Lubatkin *et al.*, 2006; Smith, Tushman, 2005). However, these elements are still object of limited theoretical and empirical development. This agrees with Battaglia *et al.* (2018), who recently confirmed the need to elaborate organizational ambidexterity literature with research exploring certain factors that help firms successfully balance between conflicting activities and thus increase their ambidexterity. The author of the thesis suggests this work as highly relevant and valuable as it represents a further step toward portraying the way in which inter-organizational collaboration is related to the development of organizational ambidexterity within a firm.

The proposed organizational ambidexterity measurement scale is composed merging several different theoretical sources. Since it is adapted based on different theoretical approaches, it can be further used by other scholars. And, certainly, this scale might be adapted and become a valuable managerial tool to be used in managerial practice, e.g. for measuring the level of ambidexterity within the firm.

Based on theoretical and empirical findings as well as on the newly proposed perspectives, further research recommendations can be proposed:

- It would be valuable to continue the research focused on the relationship between organizational ambidexterity, inter-organizational collaboration and firm performance by choosing different research scales and measures of variables. Selecting different economic sectors for the research sample may also propose different research results and new theoretical insights. Choosing new conceptualization of explored concepts might also be crucial for shifting organizational ambidexterity literature to the new level.
- As it was mentioned before, a longitudinal study would be extremely important for analysing organizational ambidexterity. A longitudinal research would help to confirm (or reject) the primary insights in this particular research. Moreover, performing research within the longer period would propose new understanding on how and if organizational environment or different organizational maturity level might affect the level of organizational ambidexterity. Since organizational ambidexterity is a relatively new concept, these are aspects that still lack theoretical and empirical contributions.
- Pointing again to research limitations, it is crucial to transfer a similar research out of Lithuania. Lithuania is a relatively small country with a major amount of small and medium enterprises that usually are not ambidextrous enough. Moreover, Lithuania's organizational and managerial culture may be rather different from other countries, and this might potentially affect the research results. Following this, further research should be expanded to other countries using the same conceptualization of explored concepts. It would help to ascertain whether particular results are applicable only to the region of Lithuania or more broadly, in Europe or beyond.
- In general, the literature on organizational ambidexterity lacks research exploring and explaining how to prepare the organization for becoming

ambidextrous, what should be the steps before turning to ambidextrous orientation. Since scholars widely accept that managing the tensions between two opposite activities and/or capabilities is the key challenge for firms, more research must be focused on finding out how to manage these challenges. Also, organizational ambidexterity literature still misses more studies exploring the stimulators for organizational ambidexterity. Perhaps it is already possible to start longitudinal studies in ambidextrous organizations with the purpose to analyse how organizational ambidexterity evolves within different stages of organizational maturity. Combining organizational ambidexterity theory together with competitive advantage of the firm is also an approach that still misses scholars' attention.

### **Author's scientific publications related to the context of Doctoral thesis**

1. Jurkšienė, Lolita; Pundzienė, Asta. The relationship between dynamic capabilities and firm competitive advantage: the mediating role of organizational ambidexterity // *European business review*. Bingley : Emerald. ISSN 0955-534X. 2016, vol. 28, iss. 4, p. 431-448. DOI: 10.1108/EBR-09-2015-0088. [Emerging Sources Citation Index (Web of Science); Scopus; Business Source Complete] [CiteScore: 2,39, SNIP: 1,235, SJR: 0,678 (2016, Scopus JM)].
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## ANNEX 1

**Hello,**

I am Lolita Jurksiene, doctoral student from Kaunas University of Technology. Currently I am conducting a survey on relationship between firm's organizational ambidexterity, inter-organizational collaboration and firm performance. It is very important for me that you answer all the following questions.

This survey is completely anonymous and all your answers will be used only for generalized data analysis and scientific purposes.

How to fill the questionnaire in?

Answering the questions will be easy. In most cases, I will read you a question and possible answers to this question. You will have to choose the answer that is appropriate for you from the read ones. There will be some space for you to answer in your own words – in the way you think, and I will write down your answer word for word.

If you have doubts over some questions, please ask, I will repeat or explain it.

Thank you for taking part in this survey!

Start of interview: \_\_\_\_\_

**ES. Now I will list you various statements, related with ability of your company to monitor and assess the environment. Please rate their accuracy from 1 to 10. One means that you strongly disagree with statement, while ten means that you strongly agree with statement.** (Read the statements. Tick the answer in the table. If a respondent does not know or cannot answer, tick the appropriate column).

No.	Question	Strongly disagree		Disagree			Agree			Strongly agree		I do not know/cannot answer
		1	2	3	4	5	6	7	8	9	10	
ES1.1	Education and/or research institution is one of the regular partners of the enterprise											
ES1.2	Enterprise is a member of the international networks/organisations											
ES1.3	Employees are members of the board of other enterprises and/or expert bodies and external working groups											
ES1.4	Enterprise permanently collaborates with researchers, scholars and students											

**I. Now I will list various statements, related with ability of your company to manage ambidexterity. Please rate their accuracy from 1 to 10. One means that you strongly disagree with statement, while ten means that you strongly agree with statement.** (Read the statements. Tick the answer in the table. If a respondent does not know or cannot answer, tick the appropriate column).

No.	Question	Strongly disagree		Disagree			Agree			Strongly agree		I do not know/cannot answer
		1	2	3	4	5	6	7	8	9	10	
I1.1	We constantly launch new products, services and businesses for the new markets											

I1.2	We constantly launch new products, services and businesses for existing markets	1	2	3	4	5	6	7	8	9	10	
I1.3	Our new products and services play important role in our revenue/ profit structure	1	2	3	4	5	6	7	8	9	10	
I1.4	Enterprise develop new products/services by itself	1	2	3	4	5	6	7	8	9	10	
I2.1	We are selling our innovative products, services under our own company brand	1	2	3	4	5	6	7	8	9	10	
I2.2	We create and sell technologies but not the final products	1	2	3	4	5	6	7	8	9	10	
I2.3	We are selling our innovative products, services directly – by our own sales unit and sales force	1	2	3	4	5	6	7	8	9	10	
I2.4	Our innovative products/services are for massive use	1	2	3	4	5	6	7	8	9	10	
I2.5	Our innovative products/services are for long-term use	1	2	3	4	5	6	7	8	9	10	
I2.6	Our innovative products/services are very high quality but not for the massive use	1	2	3	4	5	6	7	8	9	10	
I3.1	We are happy about the success and return of innovative products/services	1	2	3	4	5	6	7	8	9	10	
I3.2	We are capable to scale up and commercialize our successful innovative	1	2	3	4	5	6	7	8	9	10	

	products, services in local markets											
I3.3	We are capable to scale up and commercialize our successful innovative products, services in international markets	1	2	3	4	5	6	7	8	9	10	
I3.4	Enterprise is always looking for innovative means around a barrier constraining consumption	1	2	3	4	5	6	7	8	9	10	

**P. Now I will list you various statements, related with your company’s business achievements. Please rate their accuracy from 1 to 10. One means that you strongly disagree with statement, while ten means that you strongly agree with statement.** (Read the statements. Tick the answer in the table. If a respondent does not know or cannot answer, tick the appropriate column).

No.	Question	Strongly disagree		Disagree			Agree			Strongly agree		I do not know/cannot answer
		1	2	3	4	5	6	7	8	9	10	
P1.3	The sales of your firm is growing faster than your competitors.	1	2	3	4	5	6	7	8	9	10	
P2.1	Your firm launches more new products/ services than your competitors.	1	2	3	4	5	6	7	8	9	10	
P2.2	New products/ services of your firm are more successful in the market than your competitors.	1	2	3	4	5	6	7	8	9	10	



**D1. How many years old were you on the last birthday?**

(WRITE IN)\_\_\_\_\_

**D2. Gender:**

1. Male;

2. Female.

**D3. How many years have you been working as manager?**

(WRITE IN)\_\_\_\_\_

THESE ARE ALL QUESTIONS I WANTED TO ASK,

**THANK YOU ONE MORE TIME!**

THE EXACT END TIME AND DATE OF INTERVIEW.

**Interview end time**\_\_\_\_\_.

**Interview date**\_\_\_\_\_

## ANNEX 2

### Name of the firm

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#### General information about the company

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#### Vision / mission

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#### Main products/services

#### Number of employees

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#### Additional information

#### Questions for interviews/focus groups:

Question	Sector code	
	Head	Employer
1. Are higher education institutions (universities, institutes) regular partners of your company? Why yes/ Why not?		
2. Do you have a regularly increasing network of partners (suppliers, clients, customers, knowledge bodies, professional institutions and etc.)? Why yes/Not? What type of?		
3. Do you/ Does your manager actively participate in public life/activities? Why yes/No? What type of?		
4. Do employees of the company actively participate in public life/activities? Why yes/No? What type of?		

5. Does your company regularly introduce new products / services to the new markets? Why yes/ No?		
6. Does your company regularly introduce new products / services to the current markets? Why yes/ No?		
7. Do new services / products make an important impact to the company budget?		
8. Are your new services / products of massive use or they are oriented to a specific target group?		
9. How much time does your company need to introduce new product / service to the market?		
10. How often (in what periodicity) does your company have to introduce new product / service to the market in order to ensure the development of the company?		
11. Does your company have the required capacities to develop volumes and sales of new products /services in the Lithuanian market?		
12. Does your company have the required capacities to develop volumes and sales of new products /services in the foreign markets?		

**Financial and activity results of the company**

	2012	2013	2014
Company income, Eur			
Export volume, Eur			
Average salary, Eur			
Percentage of salaries from the total of the company costs %			
Income for one employee, Eur			
Do the sales of your company increase faster than sales of your competitors?			
Does your company introduce to the market more products / services than your competitors?			
Do customers evaluate your products/services better than your competitors?			

**Demographic data**

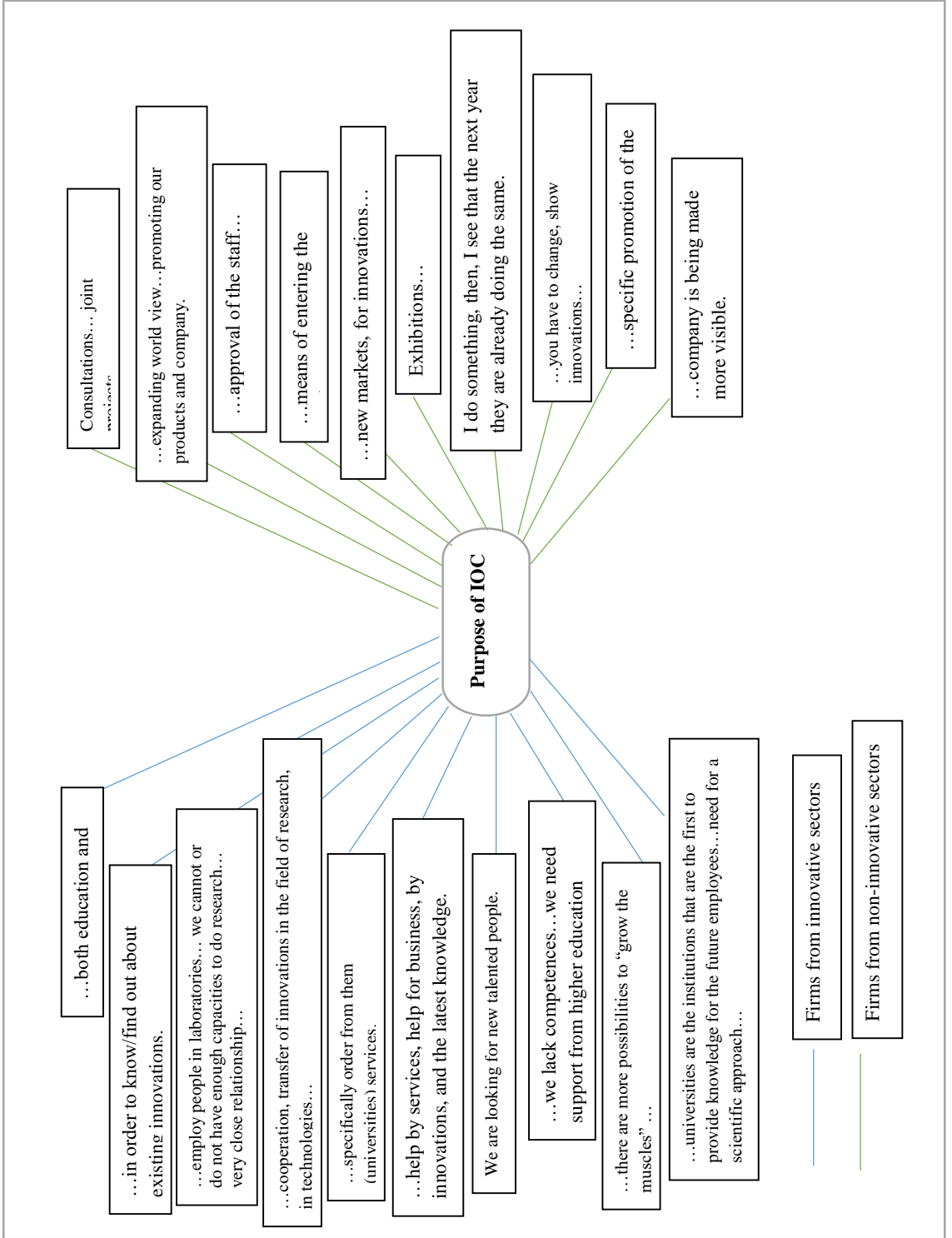
Interviewee	Age, years	
	Gender	
	How many years do you work as a manager?	

	In how many companies do you worked as a manager?	
	Education	
	What did you study (in BA, MA and/or Doctoral studies)?	
Company	Place of the company registration	
	Number of employees in the company	
	Economic activity sector	
	How many of new products/services does your company introduce to the market?	
	How much (Eur) your company invest to R&D?	

### **Demographic data about employees**

Age	
Education	
Position	
Work experience	

### **Organisational structure**





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